

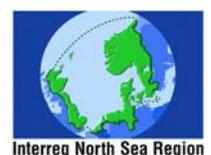
LancewadPlan
Description of Cultural Entities in the Wadden Sea Region

Elaborated by the project LancewadPlan
(Integrated Landscape and Cultural Heritage Management and
Development Plan for the Wadden Sea Region)

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Contents

SUMMARY	4
Blåvandshuk to Ribe, DK.....	5
Ribe to Tønder, DK.....	16
Wadden Sea Islands Rømø - Mandø – Fanø, DK.....	25
Sylt, SH.....	37
Wiedingharde, SH	44
Bökingharde, SH	50
Nordergosharde, SH.....	56
Föhr, SH	62
Amrum, SH.....	69
Halligen, SH.....	75
Pellworm, SH.....	82
Nordstrand, SH.....	94
Eiderstedt, SH	99
Norderdithmarschen, SH	106
Süderdithmarschen, SH	112
Kremper Marsch and Wilster Marsch, SH.....	118
Haseldorfer Marsch, SH	124
Neuwerk, Hamburg.....	130
Altes Land, LS	135
Land Kehdingen, LS	142
Land Hadeln, SH	149
Land Wursten, LS.....	157
Land Würden, LS.....	166
Osterstade, LS.....	173
Butjadingen, LS	181
Stedingen, LS	190
Stadland, LS	199

Friesische Wehde, LS	207
Wangerland/Jeverland, LS	216
Wangerooge, LS.....	226
Spiekerooog, LS.....	231
Langeoog, LS	237
Baltrum, LS.....	244
Nordeney, LS.....	248
Juist, LS.....	253
Borkum, LS.....	259
Harlinger Land, LS.....	266
Auricher Land, LS.....	276
Norderland, LS	285
Brookmerland, LS.....	293
Krummhörn, LS	301
Moormerland, LS	309
Overledingen, LS.....	318
Rheiderland, LS.....	324
Oldambt, NL	331
Fivelingo, NL.....	336
Schiermonnikoog, NL	341
Hunsingo, NL.....	346
Lauwers, NL	351
Oostergo, NL	356
Ameland, NL.....	361
Terschelling, NL.....	366
Middelzee, NL.....	371
Westergo, NL.....	376
Vlieland, NL	382
Texel, NL	386
Wieringen, NL.....	390
Kop Noord-Holland, NL	394
The Wash, UK	398

SUMMARY

This project provides a characterisation of the cultural heritage and in particular the historic landscape, of the Wadden Sea Region. The area has been sub-divided into 60 separate cultural entities which were identified and described by workers in their respective countries (The Netherlands, Federal Republic of Germany and Denmark). The cultural entities range from Kop van Noord Holland in the south to the Danish Wadden Sea islands in the north. They include the islands of the Wadden Sea, the Wadden Sea itself, the areas immediately adjoining the coast, and a number along the rivers and estuaries flowing into the Wadden Sea. The cultural entities are described through the historic development, of settlement patterns, flood defences, fields and the economy against a background of natural landscape characteristics. In addition the vulnerability and potential of the cultural heritage has been assessed and issues crucial to their conservation, and management identified. The synthesis provides an overview of the character of the cultural heritage of the Wadden Sea Region, identifies the over-arching vulnerabilities and potentials and suggests some future directions where a character based approach to conservation and management might be progressed.



Location of the cultural entities in the Wadden Sea region

Blåvandshuk to Ribe, DK

1. Overview

Delimitation: The northern part of the mainland – including the peninsula of Skallingen and the island of Langli in Ho Bugt

Size: Max. dimensions 36 x 30km

Location-map: The northern part of the mainland from Ribe to Blåvandshuk – including the peninsula of Skallingen and the island of Langli in Ho Bugt

Origin of name: None

Relationship with other cultural entities:

Borders the southern entity on the mainland.

Characteristic elements and ensembles:

The glacial hills (oldest quaternary Danish landscapes) and sandy outwash plains, together named “Geest”. Different stages of marshlands represent the youngest quaternary landscapes of Denmark and also unique elements in the international Wadden Sea context (peninsula of Skallingen; largest natural salt marshes and Varde Stream Estuary only non-embanked estuary). In NW the huge dune landscape with plantations and today thousands of summer cottages and a military exercise ground. Many settlements from prehistoric times (around Esbjerg). From medieval time the town of Ribe (oldest town of Scandinavia) and the newest “city” Esbjerg. Fine examples of best preserved villages of Denmark. More industries and larger urban settlements than in the other parts of the Danish Wadden Sea Region.

Prehistoric burial mounds, Romanesque churches, ‘celtic’ fields, ‘enclosure’ fields, lighthouses, marshland, dikes, WWII defences of Atlantic wall, early modern stone built houses

2. Geology and geography

2.1 General

The main geological elements of the area are the geest, comprising the glacial hill islands and the out-wash plains, the marshlands which stretch like “tongues” in between the geest and the dune landscapes in the west and the peninsula of Skallingen.

During the last Ice Age (Weichsel) the ice only covered the eastern part of Jutland. The moraine formations in the western part have thus been created during the second-last Ice Age (Saale) and therefore constitute the oldest quaternary landscapes in Denmark. The melting of the ice cap during the last Ice Age created large glacial streams, which washed out over the southwest of Jutland. The low-lying areas of the original moraine formations experienced erosion and were replaced by the deposited glacial sand (out-wash plains). The highest-lying parts of these plains were left as islands (hill islands) and typically consist of moraine clay with sand and gravel deposit at the surface. The hill islands are often dome-shaped, with hillsides (cliffs) against the Wadden Sea (Marbæk and Sjelborg), against the marshlands (Ho, Varde Stream Estuary) and between Darum and Gredstedbro. The highest part reaches up to 35 metres above sea level.

Among the oldest Danish quaternary landscapes can also be found the youngest, the marshlands created by the sea. The marshland formation in the Danish part of the Wadden Sea began approximately 3,000 years ago (from the south going north). In the embanked

marshlands at Tjæreborg and Ribe, the deposition of sea clay ended with the establishment of embankments during the 1900s. In the non-embanked areas (forelands and salt meadows) the marsh formation is still ongoing. North of the Ribe-marsken the marshlands are limited in size compared to those in the southern part of the Danish Wadden sea mainland and are distinct from the marshlands in Germany and the Netherlands.

The Varde Stream Estuary is the best example in the entire international Wadden Sea Area of a non-embanked river mouth where the marsh creation processes are still ongoing, and the peninsula of Skallingen is the largest, natural salt marsh of the international Wadden Sea area (1,100 ha).

Since the last Ice Age the Wadden Sea Region has undergone changing periods of upheaval and subsidence. These processes have influenced the course of the coastline and have together with wind deposits, especially in the western part, created huge dune landscapes and scattered inland dunes elsewhere.

A special feature of the area is the formation of the island of Langli in Ho Bugt which is visible evidence of the influence of storm-surges: before the great storm surge in October 1634 Langli was the former "Skallingen" (dunes to the west and salt marshes to the east). The storm surge, however, transformed Langli into an island.

2.2 Present landscape

Some of the largest streams in Denmark (named "Å'er") flow through the area and into the Wadden Sea: Varde Å is the northernmost and the only uncontrolled stream, followed by Sneum Å, Kongeåen and Ribe Å. In the winter, either seawater or inland freshwater submerges large parts of the marshlands, as none of these northern streams are bounded by river-dikes.

With the exception of the locations where the geest meets the Wadden Sea, the transition zone to the sea is dominated by strips of salt marshes. Apart from Skallingen, the salt marshes east of Esbjerg (Måde Enge) and beside Ribe are the most dominant.

In general the landscape can be divided into two main characters, dependent on its "open" or "closed" appearance:

- South of Esbjerg, where the marshlands are dominant elements, the landscape is characterized by vast and bare features, "parcelled out" into large units.
- In contrast, North and west of Esbjerg the landscape is characterized by an enclosed appearance (hedges and plantations), divided into smaller units. Exceptions are the Varde Å Estuary and the island of Langli.
- On the west coast the open dune landscape at Blåvand and the natural marshlands on Skallingen are all open landscapes.

3. Landscape and settlement history

Like other places in the Wadden Sea Area the infrastructure, ranging from the ancient trading routes, embankment places, the early settlements and town foundations to the modern road and rail infrastructure, depends on the level of, and accessibility to, water (both sea and fresh water). The area includes fine examples of ribbon development at Kjelst, Varde Å Estuary and at Øster Vedsted, Ribemarsken. The oldest and newest towns in Denmark are located within the area, and have developed in accordance with this "guiding principle"; respectively Ribe (700s) and Esbjerg (1860s). The location of the town of Varde (1150s) is similar to the location of Ribe, at the crossing of water- and land trading routes.

3.1 Prehistoric and Medieval Times

The earliest settlement in the area dates to the Older Stone Age, more than 8,000 years ago. Temporary hunting and fishing grounds were placed along the streams, whereas the more permanent settlements were located along the former coastline. Remnants of permanent residences have survived from the Later Stone Age 6,000 years ago.

Traces of numerous prehistoric settlements, not least the burial mounds testify to this. In Marbæk Plantage (plantation) there are two preserved Iron Age dwellings, where remains of the houses and paving still can be seen. In the plantation there are also large protected field systems, called Celtic fields, from the same time period. In a small heathland area north of Hjerting, there is a group of more than 15 protected burial mounds, out of a total of 18 which have been discovered. Around Esbjerg a range of historic dwellings have been excavated, which show the whole development of settlement from the Stone Age to the Middle Ages. On the inner part of the old moraine, settlements have historically been hamlets or individual farms. It is clear that the occurrence of marshlands made it possible to establish larger villages, while the lack of pasture on the moraine only allowed smaller settlements. However, it seems that the old moraine land was densely inhabited in prehistoric times.

The combination of cattle-farming in the marsh and grain-growing on the geest can be traced back to the time when the marshland was formed (Bronze Age). The close concentration of settlements along the geest indicates this. In addition, where the hilly islands reach all the way to the coast there have been many settlements since the early Iron Age. The history of many villages can be traced back to the centuries before Christ and many of these started as single farms in the early Stone Age or Bronze Age. However, as the villages, until the year 1000, were often moved there is no continuity on any specific site, but rather within the same natural resource areas; what is known today as an association of house owners. It was not until the beginning of the medieval times that most villages found a permanent location, and the prehistoric villages are often found in the surrounding areas.

Trade links can be traced both in the finds material from the prehistoric tombs and in the later settlements. In particular, the settlement of Dankirke (Iron Age) SW of Ribe has an exceptional position. Here finds from the farmhouses from 200 BC to 750 AD indicate that they played an important role in trade, with luxury goods from the Roman and Frankish areas and later contacts with the Frisian and Anglo-Saxon areas.

The majority of the village churches are large churches built in Romanesque style during 1100-1200s. Further additions were added to the churches at a later date. Many of the churches are made of calcareous tuff, imported from the Rhine area, and compared to the inland churches they demonstrate the wealth in the coastal area of the Wadden Sea. Distinctive finds from the Viking period are known from the entire area, however, the town of Ribe is unique.

Ribe – the oldest town of Scandinavia - was founded as a market place on the north bank of Ribe stream in the beginning of the 700s and spread to the south side of the stream in the early Middle Age, where the present cathedral was established in the period of 1100-1200. Throughout the medieval times Ribe was the “Gateway to Europe”, which apart from the in-town embankment place, consisted of a number of anchoring places behind the Wadden Sea Islands. From Ribe a variety of foodstuffs fish, grain, and salted meat were exported. From the 1400s Ribe was one of the main export trade centres in Denmark for oxen, to the Dutch market in particular, either driven to the south (Husum or Wedel west of Hamburg) or shipped directly. The imports included cloth and luxury goods from Flanders and Frisia and tuff stones from the Rhine area - the main building blocks for the churches in the area. Very early Ribe also became a religious centre and hometown for the powerful bishop of the diocese and several religious houses. The impressive cathedral, and preserved monastery of Sct. Catharina (1228), are visible features of the past. The monastery was then occupied by the Order of the Black Friars. The Grey Friars also played a dominant role in Ribe. Royal power was strongly represented in the town and the king’s Castle of Riberhus was built in the high Middle Ages, but abandoned around 1660 and later demolished. Today only the castle bank with a few building remains is left.

Until the mid 1600s Ribe was one of the most important towns in Denmark, but it was to

experience severe recession in the following centuries. This was hastened by the frontier delineation by Germany in 1864, just six kilometres to the south and, in the same period, by the development of Esbjerg. From a commercial point of view Ribe lost a large hinterland. A vain attempt to regain some of Ribe's former position involved improving the trade accessibility to the Wadden Sea by straightening part of Ribe Å in 1855-56.

The financial recession, however, together with the absence of large fires (since 1580) and the river system, are the main reasons why Ribe has maintained its unique potential. Its age, history, the almost unchanged medieval streets and the well-preserved buildings make Ribe absolutely unique and an inalienable part of history in the Wadden Sea Area.

The town of Varde is the other important medieval trade centre within the entity. Varde was mentioned for the first time in the 1100s and was granted a municipal charter in 1442. The history and development of the town is strongly connected with accessibility to the Wadden Sea, the embarkment places there and the inland trading routes. The structure of the town is medieval but Varde was devastated by fires in 1779 and 1821, which to a large extent have contributed to the fact that almost all the buildings built before the 1770s have vanished. However, some buildings erected after the fires are still present in the town.

3.2 Early Modern Times

The outer embarkment places by Ribe were the mud flats in the Wadden Sea. The most important embarkment place for Varde was the coastline by Hjerting, which evolved into the largest harbour in the Danish part of the Wadden Sea in the 1700s. Today Hjerting has almost amalgamated with Esbjerg, but there are still several well-preserved houses and roads, which can be traced back to the sea trade.

Structural changes

Between 1750 and 1850 large-scale land reform was carried out in Denmark, in order to improve the agriculture and aid a general development of the rural areas. A central element was "The Enclosure", which aimed to merge all plots of each farm in a village.

Enclosure in the Wadden Sea Region mainly took place in the period from 1762–1800. As in the rest of the country, Enclosure also left its mark on the landscape, but not in the same degree as in many other places in Denmark. Because of the many soil-types represented: salt marsh, meadow, grain fields, heath and moor, it was not possible to gather together the land of the individual farms and still ensure access to all soil-types. Therefore the farms, in most cases, remained where they were, with the same distance to fields as before.

In the marshlands Enclosure left its mark in the form of the characteristic field structure of long, narrow pastures divided by ditches e.g. at Vilslev, where Enclosure had already taken place in 1762. In the northern part of the area in particular, the land belonging to smaller manors were sold at the end of the 1700s. As a consequence new farms were parcelled out, and in some places small holding colonies were founded. An example of this is the manor of Krogsgård (by Tjæreborg) in 1792, which was parcelled out into small holdings at Krogsgård Mark. The well preserved structures are visible today as a fine group.

In many parts of the region there was one manor per parish. Most of them were small and over the years the main buildings disappeared. This is true, for example, for the manors of Sneumgård, Krogsgård and Visselbjerg, where it is not immediately obvious that c.1700 these were the cores of medium sized estates. At the manor of Hesselmed near Oksbøl you can still see what the main building of a small south-west Jutland manor looked like in the 1700s.

3.3 Modern Times

Agriculture and forestry

The embankment of the marshlands in this part of the Wadden Sea began in the 1900s, and a gradual change in the usage of these fenlands becomes apparent, especially after World War II. The undeveloped and treeless landscape is the main characteristic of the fenlands

within this entity. This is in a distinct contrast to almost all the other fenlands in the Wadden Sea. Moreover this characteristic clearly demarcates the marshes from the geest.

The Esbjerg hill island is characterised by the cultivation of the moor, which took place from the mid-1800s and with its many fields and plantations represents a relatively young cultural landscape. In order to stop the sand drift west of Ho Bugt, large plantations were created. The first plantations here date from the middle of the 1800s, and are among the first plantations in Denmark.

In contrast to the full time farming in the marshland, the original occupation in these sandy areas was dune farming combined with fishing, commerce and shipping. The farming was based on livestock, mainly sheep but also cattle, which grazed the lush salt marshes on Skallingen.

Settlement development

In the 1920s and 1950s there was some parcelling out of land, but smallholder farms have never been a dominant feature of the area.

In most parts of Denmark the older farmhouses are half-timbered structures. However, stone-built houses dominate in the Wadden Sea area. This is partly due to the lack of wood in the area, and partly due to inspiration from the south. These stone-built houses became common in the rural area from 1750 onwards. There are only few well-preserved farm buildings from the time before the construction of the stone-built houses.

In the outskirts of the medieval town centres of Ribe and Varde, residential neighbourhoods developed from the beginning of 1900. This process also subsequently occurred in the smaller towns.

Industry and energy

In the middle of the 1800s steamships were introduced, giving rise to discussions about the location of a new large steamship harbour. After 1864 the border between Germany and Denmark was almost identical to the southern border of this entity. In 1868 it was decided to establish a harbour at Esbjerg with a rail connection to the rest of the country; mainly for export and import from England. The harbour also benefited from the growth in Danish animal food production, primarily in connection with the newly established co-operative dairies and the increase in international trade. Moreover fishermen moved from the surrounding coastal areas to the "city" and thereby created the basis for a fishery harbour.

As a consequence of the decision to build a harbour, Esbjerg grew from a couple of farms to be the fifth largest city in Denmark today (80,000 inhabitants). The strong growth resulted in the elaboration of a city plan with a right-angled system of streets, which is unique in Danish city planning. Esbjerg became the centre of industry in the Wadden Sea region, with its main emphasis on the maritime industry, fishery and the preparation of foodstuffs.

Together with shipping developments, the navigation and lighthouse system were also established, especially around the new harbour in Esbjerg where both onshore lighthouses were built and lightships placed. The most prominent lighthouse is, however, located at Blåvandshuk (the most westerly point of Denmark), this was constructed in 1888 (the present tower is from 1900) to warn about the shallow waters of Horns Rev (reef), stretching over 40 kilometres to the west, which has resulted in countless shipwrecks over time. The reef was for that reason named "Duyvels Horn" (the devils reef) by the Dutch.

At the end of the 1800s an electricity supply was established and it was extended throughout the 1900s. Today some former power stations have been converted to other activities: Esbjerg power station from 1907 is now The Academy of Music of West Jutland (Vestjysk Musikonservatorium) and Ribe power station established in 1923 has become The Museum of Vikings (Museet Ribes Vikinger).

Infrastructure

The infrastructure was extended with the establishment of railways and roads. The rail section Lunderskov-Esbjerg-Varde was introduced in 1874. In 1875 the section Bramming-Ribe was introduced, and in 1887 the section Ribe-Tønder was opened. The establishment of railway stations added a certain type of development to the towns. The village Hviding

south of Ribe is an example of this development. Until the 1920s, when the Danish–German border was moved to its present position, Hviding functioned as frontier station with a complex of German and Danish station buildings. Together they made up the longest railway station in Denmark. In 1922 the old frontier station was replaced by a psychiatric hospital, which has been extended several times.

Tourism

A characteristic feature is that almost all recreational cottages are located north and west of Esbjerg. In the 1900s the dunes and beaches by Blåvand began to attract townspeople and tourists. The first summer cottages were built here in the 1930s, often using driftwood. This was the beginning of the tourist boom characteristic of the Blåvand area today.

In Marbæk (north of Esbjerg) and by Sneum Sluse east of Esbjerg the first “do-it-yourself” cottages emerged in 1930s for recreation (fishing and hunting). There is a similar, slightly earlier, cottage cluster at Ribe Kammersluse.

In Ribe the tourist association was founded in 1899, aiming through its work to preserve the old houses to promote the town as an important tourist attraction.

4. Modern development and planning

4.1 Land use

150 years ago the natural areas or semi-natural areas with grazing, or other forms of extensive agriculture, formed approximately 60-70% of the country. Today it is approximately 10%.

In the last 35 years the EF/EU has played an increased role regarding the land use in the rural areas (agriculture and nature), and this affects the Wadden Sea Region. The EU Common Agricultural Policy (CAP) has contributed to the cultivation of many coastal habitats, e.g. marshlands, with a severe impact on the cultural landscapes and assets. Cattle, however, still play an important role within the region, although continuous structural development is reducing the number of farms and many farms have switched from cattle to pigs.

The introduction of the environmental directives (EIA, Birds-, Habitats and Water Framework directives), the EU set-aside schemes and EU nature restoration programmes (Life) has changed this development. In 2003 EU introduced a CAP-reform bill, which aims at integrating agricultural production together with environmental-, natural- and cultural aspects. All these new regulations provide a possibility to regain cultural values of the past in the Wadden Sea Region.

1. The west coast. Today the area has almost no arable agriculture and solely consists of nature- and ‘half-culture’ areas and plantations, with large areas laid out for summer cottages and military training grounds. Large areas are today owned by the state.
2. From Skallingen to Varde Å. Skallingen remains in its original natural stage with grazing on part of the salt meadows, and is in part state property. Today, the area must be considered as the most untouched of the landscapes in the Wadden Sea region. The salt meadows along Ho Bugt and Varde Å-valley comprise a mixture of grazing land and wetlands. This is due to a nature restoration project, which was initiated in mid 1990s (EU-Life and set a-side schemes) with a 20 year time scale in order to restore the earlier cultural landscape.
3. From Varde Å to Esbjerg. The eastern part is today a mixture of intensive agriculture areas and more permanent grassland areas. Moreover, the area holds smaller heath areas, which shows how the area looked before the land reform movement. The most westerly part has several recreation-industry agricultural holdings (horses- and riding centres) and mink farms. The Marbæk area in NW is almost without agriculture but has plantations and heath areas, and is mainly used as recreational area for Esbjerg.

4. From Esbjerg to Darum. The hill island is dominated by intensive agriculture with large pig- and cattle farms and several mink farms. By Tjæreborg there are comprehensive gravel pits, which have been enlarged during the latest decades. Måde Enge (non-embanked) consists of forest of reeds and grazed fields. In parts of the embanked marshland between Tjæreborg and Darum several different types of wind turbines have been erected and a larger lake area has emerged in connection with the reinforcement of the sea dike in 1990s.
5. From Darum to Ribe. Today almost all marshlands here are grassland in rotation and grain crops. Only small parts are wetlands and permanent grass.

4.2 Settlement development

Housing and industrial estates

Since the 1960s the communities of Varde, Ribe, and especially Esbjerg, have developed large housing and industrial estates. The town of Esbjerg has, like many other communities, encircled its surrounded villages, which has caused considerable impact on the former cultural and landscape assets there.

The medieval town centre of Ribe is visible in the landscape from north and west, because of the river running through the centre with its high winter water levels in the surrounding water-meadows. This is a unique feature in Denmark and, to some extent, is also valid for the town of Varde.

Tourism

In the area near Blåvand and Ho most of the old summer cottages have been converted into modern all year-cottages and many new buildings have been added (approximately 3,500 cottages). In addition, there are large camping sites and holiday apartments with varied offers of recreational all year facilities. Today this area is one of the largest recreational areas in Denmark.

In addition the cottages by Marbæk, Sneum Sluse and Ribe Kammersluse have been extended and developed. After World War II a cluster of cottages emerged and developed as a recreational area close to Esbjerg.

Except for the establishment of a large number of holiday apartments in Ribe (Ribe Byferie) and a number of smaller camping sites, there have been no noticeable tourist extension south of Esbjerg.

Military and War activities

Since 1929 the coastal areas west of the town of Oksbøl have been designated a national military exercise ground and a permanent military camp was established. During World War II the German occupying forces took over and the exercise ground and camps were extended. At the end of the War and up to 1948 a German refugee camp with 36,000 refugees lived in the camp (the sixth largest town in Denmark then). The cemetery, where 1800 refugees and soldiers were buried, is still visible in Oksbøl.

The entire coastline within the entity was part of the "Atlantic Wall" of World War II. In Denmark nearly 1800 large and countless smaller bunkers were built and many of them (or part hereof) can still be seen all over this coastal area, also at many locations in the dune area. The bunker "Tirpitz" by Oksby, a never finished emplacement bunker from 1944 is one of the most spectacular sites.

The area around Esbjerg was one of the most fortified areas in Denmark during the War. Esbjerg had the only harbour which could be used in case of an invasion by the Allied Forces and was therefore an important strongpoint for the German occupying forces. Several German facilities are still visible in many places along the coast north of Esbjerg (Sjølberg).

After the War the shooting range by Oksbøl was re-established as a military training area. In the 1960s a large expropriation was carried out, which amongst other things, affected 60

farms and 42 permanent habitations. Many of the properties are still extant and form a part of the military training area. Today the training area covers approximately 6,000 hectare (dune, moor, marsh and forest). Approximately half of this area is located within the entity.

4.3 Industry and energy

After World War II the fishery developed and Esbjerg became the largest fishery harbour in Denmark (in the late 1960s it peaked with 600 vessels). The harbour has been enlarged several times and is today among the four largest harbours in Denmark with a multi-faceted composition of activities: container and passenger traffic, edible- and industrial fishing, offshore, ferry traffic, shipyard, power station and several harbour-related companies such as fishmeal production. Today less than 50 fishing vessels are left, but Esbjerg has become the most important offshore harbour in Denmark.

Today the most visible industry of the harbour is energy-generation: the coal-burning power station with the highest chimney in Denmark (250 metres) and the refuse disposal plant from 2003.

At the end of the 1970s the modern wind power industry emerged and many wind turbines and wind farms have been erected since then all over Denmark, but are most dominant in the westerly (windy) part of the country. Within the entity the main part is located east of Esbjerg, some even within and at the edge of the marshlands.

In 2002 the world's largest offshore wind farm was built at Horns Rev in the North Sea, 14-20 km west of Blåvandshuk.

4.4 Infrastructure

The main road traffic arteries are main road A1 (Esbjerg-Copenhagen) and main road A 11 (along the west coast). The increased road traffic in the second half of 1900s has caused many new road constructions, often with severe impact on the cultural landscapes. Some examples are:

- The medieval towns Ribe and Varde have both been subject to construction of westerly bypasses, respectively in 1950s and 1990s crossing the vulnerable cultural landscapes (marshlands and stream valley).
- In 1998 the A1 was replaced by a highway leading almost to the harbour of Esbjerg.

5. Legal and spatial planning aspects

All salt marshes and almost all embanked marshlands are included in the Trilateral Cooperation Area and are also part of Natura 2000. Moreover, many (small) inland habitats like bogs, heathers and meadows are preserved under the national Nature Preservation Act. In addition preservation regulations of buildings (churches) and ancient monuments (burial mounds) and their surroundings are common features in the rural areas. Preservations and (strict) regulations in urban areas, e.g. medieval town centres of Ribe and Varde, have been introduced for many decades.

In relation to spatial planning, Denmark is divided into three zones: the urban zone, the rural zone and the summer cottage zone, in which there are different regulations to achieve different objectives and preferences.

In order to protect the coastal zone of Denmark, a three kilometre wide protection zone from the coastline (outside towns) has been introduced, with the intention of keeping the area clear of buildings and constructions which are not dependent on the coastal position. Moreover, recreational facilities can only be located inside this zone in combination with already existing facilities or urban areas.

It should be mentioned that the official policy states that no new areas for wind turbines and wind-farms will be appointed, and that renewal of existing wind turbines will only be allowed in the rural zone on special conditions in relation to landscape and cultural features and assets.

In connection with the extension of the energy supply a master plan for the rationalization of the existing high-voltage transmission lines has been decided. Within the entity this includes dismantling of lines crossing The Wadden Sea, Varde Å Estuary and through other vulnerable nature areas and landscapes.

From 2007 and onwards the main responsibility of the administration of rules and regulations and overall spatial planning will be located at the three municipalities. Among other things they will be obliged to map, designate and preserve the main cultural heritage and be requested to take similar actions regarding the landscape features. Apart from this the municipalities already have the powers to issue a “preservative local plan” to protect specific and local cultural features.

6. Vulnerabilities

6.1 Settlement

In Ribe, the wide and undisturbed view to the town centre and the cathedral is probably the “quintessential image” of the Danish marshlands. Urban developments, in particular within the industrial and housing sectors, and road constructions with extensive use of lighting have reduced and in many cases deteriorated this unique feature. Around Esbjerg, the city skyline dominates and influences the long distance perception of the landscape. Entering the city from the east, the mixture of industrial sites and plants, high-voltage cables etc. creates a very poor visual connection between the city and its surroundings. The development of Esbjerg, especially to the north, needs to take into account the richness of the ancient monuments (burial mounds) and their surroundings which must be preserved. From Skallingen to Varde Å the characteristic building pattern must be preserved by avoiding new buildings, particularly where these would alter the clear border between the meadows and buildings at the ridges, or where they would hinder the open view to and from the churches and between the building clusters and the marsh areas. From Esbjerg to Darum preservation of villages and old farms is essential. In order to preserve the character of the area. The cottages by Sneum Sluse (lock) and Kammerslusen for example, are not very special individually but together the close buildings and the special charm should be maintained. Similarly, from Darum to Ribe the very characteristic settlement pattern with large villages on the geest edge needs to be preserved and is vulnerable to change. Today, the majority of the villages are “drained” of functions.

6.2 Agriculture

With the comprehensive structural changes within the agricultural industry it is expected that even more holdings will be given up or amalgamated and agricultural facilities will become redundant. It is likely that there will be fewer farms and that new agricultural buildings will become considerably larger to accommodate large machinery. Such buildings are all ready visible in the landscape today. Redundant historic farm buildings will face neglect and eventual decay unless appropriate adaptive re-use can be found that retains their historic integrity and characteristic appearance. The area between Varde Å and Esbjerg is particularly vulnerable to any change with the characteristics of the landscape requiring the maintenance of agriculture. Between Skallingen and Varde Å the well preserved landscape would be threatened by the discontinuation of farms, and changes in cultivation of the marsh, such as draining, which would blur the boundaries between fields and thereby the complicated historic property divisions. Continued farming and the preservation of old farms and the historic field structure is also important for the character of the area from Esbjerg to Darum and from Darum to Ribe the narrow ditched land parcels also need to be preserved and would be vulnerable to structural changes. It is particularly important for the marshlands ‘in front of’ Ribe that it is kept wide open and that the meadows are grassed. The increased utilisation of the fertile marsh soil for agriculture has particular consequences for the preservation of the medieval town centre in Ribe. The town is built upon a “cultural sponge” which constantly requires moistening in order to maintain a firm foundation for the old buildings. The farmers on the other hand prefer a low water level in the spring and summer

seasons, particularly in the meadows east of the town. This practice has contributed to increased subsidence of the houses in the town centre.

6.3 Nature conservation

From Skallingen to Varde Å the areas are very vulnerable to afforestation, which can divide and parcel out, what are currently large, coherent meadows. Plantations which will hinder the free view to and from the churches should also be avoided. Varde Å and the estuary have regularly been subject to discussions concerning embankment. However, the recent developments regarding agricultural subsidies and a nature restoration project have resulted in the abandonment of this (discussion) for many years.

6.4 Tourism

An increase in pressure from tourism, in some areas such as between Ho and Blåvand (more than 1 million visitors a year) will place greater stress on the cultural heritage due to recreational activities, leading to erosion of the landscape. Development of new holiday accommodation and an increase in the number of camp sites and other amusement facilities will also impact both physically, and visually, on the historic landscape of the area.

6.5 Energy and industry

Wind turbines and high voltage transmission lines are a significant threat to the landscape. The wind farm located at Kjelst between Skallingen and Varde Å underlines this point.

6.6 Infrastructure

In order to preserve the wide open views across the landscape, this area needs to be kept free from technical installations and high stands.

7. Potentials

7.1 Settlement

The villages in the Danish part of the Wadden Sea Region are among the best preserved in Denmark and the medieval town centre of Ribe is also well preserved making them attractive places to live and work.

7.2 Agriculture

A change in emphasis from paying subsidies for production to environmental management provides opportunities to protect and enhance cultural landscapes. An increase in grassland in the areas 'in front of' Ribe will support the character of the landscape through a return to their traditional use and will make the connection between the cultural historical origin and the natural foundation of the landscape more evident. Similarly, between Darum and Ribe, the original character of the landscape will be strengthened if the streams are restored to their original appearance. Also in this area, the very characteristic field structure with the narrow ditched parcels should be preserved. A special characteristic for the villages along the marsh is the large undeveloped thwarts with a view over the flat landscape.

7.3 Management of the cultural heritage

The requirement for each municipality to map, designate and preserve the cultural heritage and landscape features from 2007, will provide the opportunity for more effective management of the cultural landscape.

7.4 Tourism

The areas well preserved villages, historic towns, ancient monuments (e.g. prehistoric burial mounds, Celtic fields and dwellings in the Marbæk Plantage) and wider landscapes provide a focus for developing further cultural tourism opportunities that will bring economic benefits to the region, and help to strengthen the areas 'sense of place'.

7.5 Energy and industry

The agreement of a master plan for rationalisation of existing transmission lines will lead to positive improvements to vulnerable landscape areas in the Wadden Sea such as the Varde Å estuary.

8. Sources

Author: Charlotte Lindhardt and John Frederiksen

Sources: Lancewad – Landscape and Cultural Heritage in the Wadden Sea Region, 2001
Kulturarvsstyrelsen: 1. Arbejdsrapport, Karakteristik af hovedtræk, 2006.
Regionplan 2016, Ribe Amt.

Maps: Kort- og Matrikelstyrelsen©

Ribe to Tønder, DK

1. Overview

Name:	The southern Danish mainland from Ribe to Tønder
Delimitation:	Ribe to the north, Tønder to the south, neighbouring entities Wiedingharde, Sylt, the northern Danish mainland
Size:	Approx. 48 x 10km
Location – map:	South-western Danish coastal area bordering the Wadden Sea
Origin of name:	Not known
Relationship/similarities with other cultural entities:	Embanked marshlands, polders, mound villages as in Frisia

Characteristic elements and ensembles:

The entity is dominated by large embanked marshlands (some of the youngest Danish landscapes) bordered by glacial hills (oldest quaternary Danish landscapes) and sandy outwash plains. The only Danish polder landscape is located here (Tøndermarsken) including the newest polder in Denmark (1982). There are many examples of Frisian cultural elements among others the remains of the most northern Frisian settlement in the Wadden Sea Area (Misthusum in Ballum Marsh) and the largest mound village (Ubjerg). The marsh town of Tønder with many gable houses and bow windows bears witness of the close connection to the Dutch building tradition. The entire area has through centuries been thrown backwards and forwards between different Danish and German kings and dukes and from 1864 to 1920 the area belonged to Germany.

Linear geest edge settlement, dykes, prehistoric burial mounds, sluices, bush groyne fields, 'west Schleswig' style farms and houses, railway line

2. Geology and geography

2.1 General

The main geological elements are the marshlands (polders) stretching like "tongues" between the glacial hill islands and the out-wash plains (together named "the geest").

During the last Ice Age (Weichsel) the ice cap only covered the eastern part of Jutland. The moraine formations in the western part were created during the second-last Ice Age (Saale) and thus constitute the oldest quaternary landscapes in Denmark. Within the cultural entity Hjerpsted Hill Island is the most dominant example of this type of landscape.

The melting of the ice cap during the last Ice Age created large glacial streams, which washed out over the southwest of Jutland. The low-lying areas of the original moraine formations experienced erosion and were replaced by the deposited glacial sand (out-wash plains). The highest parts of these plains were left as islands (hill islands) and typically consist of moraine clay with a sand and gravel deposit on the surface. The hill islands are often dome-shaped with hillsides (cliffs) against the Wadden Sea (Emmerlev Klev) and against the marshlands (Hjemsted at Skærbæk).

Among the oldest Danish quaternary landscapes you will also find the youngest, the sea-created marshlands. The marshland formations of the Danish part of the Wadden Sea began approximately 3,000 years ago (from south going north). The Tønder marshlands (Tøndermarsken) hold the only Danish example of a centuries old and inhabited polder landscape, similar to those in North Frisia. The first sea dike was established in 1556 (Højer-Møgeltønder polder) followed by dike establishments in 1692 (Gl. Frederiks Polder), in 1715 (Rudbøl Polder), in 1861 (Ny Frederiks Polder) and in 1982 (Margrethe Polder). The northern

marshlands were not embanked before the 1900s: The Ballum Marshland (Ballummarsken) in 1918 and the Rejsby Marshland (Rejsbymarsken) in 1925.

2.2 Present landscape

The salt marshes from V. Vedsted to Ballum

This area consists of a number of salt marshes along the Wadden Sea mainland coast, delimited mainly by sea dikes and in many stretches by bush-groyne fields in the Wadden Sea, which are there to enhance the creation of new salt marshes in order to stabilise the sea dike. Between Astrup Banke and the Rømø Dam there are well developed natural salt marsh formations. From the sea dike there is a wide view over the embanked marshlands and the Wadden Sea. The tidal dynamic in the landscape and the coastal protection installations tell a story which is unique for Denmark.

The area holds many cultural remains. Apart from the sea dikes, the sluices and the bush-groynes fields constitute the cultural history of the marshlands from different time periods. Between the Rømø Dam and Astrup Banke a summer dike is recorded (summer polder), which may be the northern part of an old summer dike system in Ballummarsken. The actual dating for this is, however, still lacking. The highest located parts of the summer polder are in rotation with different crops and are perhaps the only area of its kind in the entire Wadden Sea Area.

The embanked marshlands between V.Vedsted and the Rømø Dam

This area is formed by a long marshland between the Rejsby Dike and Toftlund Hilly Island. The area appears as a homogeneous, level and open landscape, without any buildings and technical installations. The villages along the geest edge with their churches clearly mark the border between marsh and geest. There is almost no tree growth, apart from some scrub along the many drainage ditches in the area. The area has a number of artificial lakes in the west as a consequence of clay extraction for the present reinforcement of the sea dike. Several streams run through the area and pass the sluices into the Wadden Sea, e.g. the Rejsby Stream and the regulated Brøns Stream. The area is primarily used for agriculture with permanent grass and cultivated crops.

The glacial hill island and outwash plains between Ribe and Skærbæk

The character of this landscape is dominated by agricultural use, with large farms primarily for livestock. The farms are gathered in long ribbon villages along the geest edge. Many of the villages are recorded from the 1200s and there are several old well-preserved farms. The location bears witness to a thousand year old tradition for the use of two different nature resources in the area: the wet pasture area of the marshlands and the dry arable land on the hill islands. As the terrain is only gently sloping and the fields are mostly only delimited by one row fences on two or three sides the farm land appears open and level. The many landscape elements are in the form of villages with older and newer houses, the varied size of the fields, large farms, wind mills, hedges and smaller woods provide significant variations to the landscape. In contrast, the area around Vester Vedsted differs from the surrounding area with large plantations, woodland and hedges.

The Ballum Marshlands

Ballummarsken is characterised by being a vast embanked, open and level area. It is delimited by the Ballum Dike and the geest at the town of Skærbæk. The area is used solely for agriculture, with intensively cultivated crop and grasslands. The location of the farms, the dwelling-mounds and the summer dike are evidence of the long battle against the forces of nature, creating an evident connection between nature and culture. Other characteristic cultural historical elements are the Ballum Dike (1918) and the water mills by Misthusum (1842).

FAKTA

Hierpsted glacial hill island

The Hierpsted hill island is characterised by intensively cropped agricultural fields delimited by hedges, smaller conifer forests and a few larger plantations. The peripheral area of the hill

island consists of larger fields, where several villages are located. The buildings consists of many large, and often old, well-preserved farms from the 1700s and 1800s, many with large new extensions for livestock. The geest edge has, due to the distinct contrast with the surrounding marshlands, a high cultural landscape value. The area holds many prehistoric monuments, including settlements and especially burial mounds. There are several large churches in the area and a large wind farm north of the village of Hjerpsted. The town of Højer is located on the southern tip of the glacial hill landscape and forms a distinct transition zone to the bordering polders of Tøndermarsken.

FAKTA

The Tønder Marshlands (the outer polders)

This polder landscape is characterised by its plain, wide open features without technical installations, divided by (former) sea dikes and dikes along the large streams (Vidåen) into polders of different ages. The regular pattern of dense drainage and watering ditches, dividing the marsh into rectangular fenlands, is a unique feature in Denmark.

The Tønder Marshlands (the inner polders)

The inner marshlands by Tønder and Møgeltønder are delimited to the west by the sea dike of 1556 between Højer and Rudbøl. The area is characterised by its openness, and its embanked areas with large arable land. The area holds many medieval dwelling mounds. The stream dikes are also important elements in the landscape. These few, but important, elements provide the area with a large scale appearance. There are only a few industrial installations, including a few wind turbines, the high voltage connection from Højer to Tønder and the railroad from Tønder to the border. To the south, the wetlands around Vidåen and Rudbøl Lake form a contrasting area.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Since the beginning of the early Stone Age, approximately 6,000 years ago, the area was permanently occupied in the form of scattered single farms along the meadow on the geest. The many settlements and burial mounds are examples of this, as at Abterp and Hjerpsted.

The combination of cattle farming in the marshlands and grain-growing on the geest can be dated back to when the marshlands were created in the Bronze Age 3,000 years ago. This fact can be derived from the dense concentration of buildings following the geest edges, but also by the large amount of burial mounds from this period e.g. by Hjerpsted. In addition, where the hill islands reach the Wadden Sea, there has been a dense concentration of buildings since the beginning of the Iron Age. The history of many of the present villages can be traced back to the centuries B.C and several have their origins as single farms in the early Stone Age or Bronze Age. Until the 1000s the villages were often moved around, so continuous building can not usually be traced at the same location, but instead within the same natural resource area, today called association of house owners. In the beginning of the Middle Ages most of the villages settled at a permanent location, whilst the prehistoric villages are often found in the hinterland.

The fertile marshlands resulted in wealth for the area, and despite the difficulties of navigation in the Wadden Sea, contacts with the west European area can be traced back to the early Iron Age. A number of Iron Age burials have been found in the coastal area e.g. Hjemsted by Skærbæk. The trade links are evident both through finds in the burials and at the settlements. The settlement of Dankirke near Vester Vedsted has a special position. Here traces from a manor, which probably played a central role in the 500s and 600s in the trading of luxury goods from first the Roman and later the Frankish area, have been found. In the burials from the 600s and 700s there are also items from the Saxon-Frisian and Anglo-Saxon area.

During the Middle Ages the inhabitants moved from the geest into the marshlands.

In Ballummarsken, for example, settlement took place on small moraine outcrops such as Mjolden, Lunde and Forballum. The later construction shows a change in the use of the mounds, which artificially-elevated natural hummocks. Further out in the Ballummarsken, the village of Misthusum also shows some evidence of early habitation. Misthusum is the most northerly mound settlement in the entire Wadden Sea Region. In the Middle Ages eight mounds were built here, and also a summer dyke, to protect against the less severe storm-surges of the summer season. However, the village was inundated several times during winter times and during the 1700s, the inhabitants started to move onto the geest, and in 1814 the last family left Misthusum. All that remains now are the remains of the summer dyke and the eight mounds, including most of the freshwater reservoir (fething).

The Tønder Polders is the northern part of the large marshlands extending to Husum in Germany. These were inhabited in the Middle Ages. At the location called "Ved Åen" (along the stream) in Møgeltønder Polder ten dwelling mounds, originally located upon the former river levees of the old course of the Vidå, can be seen. In this polder two of the three known wheels¹ in the Danish part of the Wadden Sea Area are located. In comparison to the rest of the Wadden Sea Area the dwelling mounds are both small and recent. In the Danish part, however, it is quite exceptional to have approximately forty dwelling mounds within a relatively limited area, as can be found in Tønder Marsh. Many of the mounds are no longer inhabited, but remain as proof of mankind's eagerness to exploit the fertile soil.

The many channels in the area served both as boundaries and for transport, with cargo carried in flat-bottomed marshland boats. The polders at Tønder, Møgeltønder and Højer were all embanked, with the construction of the Højer-Rudbøl-Lægan-Grelsbøl (now in Germany) dyke in 1556. The effect of this was that the old harbour town of Tønder was cut off from the Wadden sea, although sailing was still possible on the Vidå. In subsequent centuries new embankments were regularly built, moving the coast and the course of Vidå further and further to the west. The polder Gammel Frederikskog was embanked in 1692, Rudbøl Kog in 1715, Ny Frederikskog in 1861 and finally Margrethe Kog in 1982. Although all the polders are part of the same development, each reflects different phases of the exploitation of the embanked land. Behind the first embankment of 1556, the field structure is typical of the medieval irregular division of the land. This is largely due to the old tidal gullies, which determined the shapes of the fields. In contrast, the polders of 1662, 1715 and 1861 show very regular divisions of the pasture-land. They were embanked through a charter, tendered and contracted by the Danish king. The contractor could invest their money in dike building and be granted a piece of land in return in the new polder. The pattern of ownership can still be seen today from the gates, which often carry the original initials of the owner.

Tønder – the mediaeval town

Tønder is the old market town of the entity and is first mentioned around 1130. It probably was founded as an anchor- and quay at the end of the Vidå delta and acquired a municipal charter in 1243, which amongst other things provided the town with privileges concerning trade and craft.

The extensive work on embankments and land reclamation in the middle of the 1500s cut off access to the sea, and Tønder lost its importance as harbour town. Nonetheless it continued to be an important trading centre, especially for grain and cattle. Later, trading in lace became very important for the economy of the town, so that Tønder continued to be a significant trading centre right up to the beginning of the 1800s. The historic town layout, with its narrow gable houses facing the streets and the characteristic house plan still dominates the town. Bay windows and portals set in two gated doors are typical. While there are few remains of the old castle, Tønder has preserved several of the brick-built houses of the 1500s and the 1600s. The oldest, apart from the church, is the large grey gabled house on

¹ I.e. "høl", a deep waterhole behind a dike created when it was breached in a storm surge.

the market square from the mid 1500s, the partially rebuilt watermill (Slotsmøllen) from the 1590s, the grammar school from around 1610 and the Town Hall from the 1640s.

Manors

Within this entity there used to be several private manors, in particular around Højer and Tønder. The most notable were the castles of Trøjborg and Schackenberg. The history of Trøjborg can be traced back to the 1300s, but all that remains today are the picturesque ruins of the Renaissance building, which was demolished in the 1850s. The farm buildings from the 1700s and the rampart have been preserved, and give a good impression of the construction of the manor in the 1600-1700s. In contrast, the main building at Schackenberg is very well preserved, but it lost its farm buildings as early as the 1700s. The castle was known as "Møgeltønderhus" back in 1200s, when it belonged to the Bishopric of Ribe. In the 1400s the estate was annexed as a Danish enclave by the Duchy of Schleswig and, with the rest of the Episcopal estate, it went to the crown during the Reformation. The royal general Hans Schack was given the estate in 1661 by the Danish king as a reward for long and loyal service. In the 1660s he commissioned the current main building. The previous outer wall is still a part of the south wing. The current appearance of the main building, with its hipped roof and the rococo ornamentation on the side wings is the result of work in the 1700s. Schackenberg is currently considered one of the most authentic examples of a castle from 17th-18th centuries, and the street Slotsgaden towards Møgeltønder is quite unique, with an extraordinary number of typical and well-preserved houses from the 1700s and 1800s. These were built by the owners of Schackenberg both to strengthen commerce and crafts in the town and as living quarters for the estate workers.

Churches

The churches on the Wadden Sea mainland area are almost exclusively Romanesque in form, and date from the 1100-1200s. They are generally bigger than those immediately to the east and are typical expressions of the wealth which the parishes along the marshlands enjoyed in the Middle Ages. It should be mentioned that the church in Brøns is one of the largest Romanesque village churches in Denmark and also the best preserved tuff church in South Jutland.

Trade

A large part of the wealth in the Wadden Sea Area derives from the fattening of and trade in oxen. The large stone-built stable from 1585 at the farm Solvig by Tønder is a token of the importance of the ox trade; it was probably built to hold the oxen in winter before they were sold to merchants in the spring.

The market towns along the Wadden Sea had a monopoly in seafaring and there were problems with regard to the larger vessels coming all the way into the towns. Therefore, there were a number of outer embarkment places where the goods could be reloaded onto smaller vessels.

In Tønder a sluice by Lægan was established when the 1556 dike was built, and concurrently with the embankment more sluices were established to the west. Seafaring was still important for Tønder, and in 1611 a canal was dug through to the town to allow passage for smaller vessels. Larger ships were put to and unloaded off Emmerlev, later the town of Højer became the harbour place for Tønder. In 1736 Højer was granted a royal charter for commerce and craftwork, thus becoming a so-called "flække" (market town), a type of town particular to the Duchies of Schleswig and Holstein. From the end of the 1700s the town economy stagnated due to a decline in the market for oxen, as well as the war with England in 1807-14 and the subsequent crisis. Several attempts were made to revive trade, but with little success. Today the many well-preserved and protected buildings testify to the town's status as a market town, including the high medieval church, the vicarage from the 1700s, the merchant's house and Kier's House from the 1760s and the mill from the 1850s.

A peculiar industry within the entity was the production of lace. It started slowly in the 1500s, and peaked at the end of 1700s. The big farmers and the merchants of Tønder employed

several thousand women and children in the rural areas around Tønder who produced lace in their own homes.

3.2 Early Modern Times

The enclosure movement in the area took place more or less in the period 1762-1800, but not to the same degree as in many other areas of Denmark. Due to the variety of natural landscapes represented (marshes, meadow, arable land, heath and moor) it was more difficult to gather the fields of the single farms. Therefore most farms stayed in the same location as before with the same distance to their many fields. Around 1830 almost all farmers of the area were freeholders. However, Trøjborg and Schackenborg still had copyhold, the last part of which was sold in the late 1800s.

By the middle of the 1700s the golden days for the oxen trade were over and the agricultural industry lost one of its primary exports. This also meant a decline for several of the embarkment places in the area and for Højer as harbour town, which despite several attempts had no success in promoting alternative trade. Lace also lost ground as an export good in this period.

Building style

The entire entity, especially the southern part, is rich in brick-built farms and houses in the 'west Schleswig' building style. In the early Middle Ages, churches, castles and manors were brick built, however structures in rural areas were not before the 1700s. This method of building was adopted from the north German and Dutch areas where brick building had been established since the 1600s. In west Jutland coastal areas the brick walls were a distinct improvement, as they were much more durable compared to the mud-built timber frames. A bricked house was also considered superior to a timber-framed house. The bricks were made at small brickworks along the entire coast and the lime produced by lime kilns where cockle and oyster shells from the Wadden Sea were burned.

The Wadden Sea Area, in common with areas further to the north, has four-winged farms which are "inside out". However, the Frisian style, where the stall and the living quarter are in the same wing divided by a crossways hall, is much more common here than further north. Although the agrarian buildings were influenced by contacts with Frisia, the Haubarg or Saxon house (Fachhallenhaus) are not traditionally found in the area.

The farms are built of dark red bricks with hipped thatched roofs. Above the main entrance is the characteristic gable with a hatch (the arkengaf), which in this area and further south takes the form of a gabled attic. These non-insulated houses are often tiled inside. In some of the houses on Tøndermarsken dating from the 1700s, behind the outer brick wall, roof-bearing posts have been preserved. In the latter half of the 1800s, the agrarian architecture of the area was distinguished by the use of new materials, and the reaction to this at the start of the 1900s through the movements "Baupflege" and "Bedre Byggeskik". When the people of Bedre Byggeskik sought the traditions of "the Danish house" they found that the style of building in Møgeltønder was an exemplary model. Today, there are several examples of Bedre Byggeskik along the entire Wadden Sea coast.

3.3. Modern Times

The Wadden Sea coast has undergone comprehensive changes through the establishment of dikes, sluices and dams, regulation of streams and the draining of the marshlands, since the end of the 1800s. The majority of dikes in the Danish part of the Wadden Sea area originate in this period.

In the Tønder Polders, Ny Frederikskog was embanked in 1861, the last polder embanked for agricultural reasons. The most recent polder, dating from 1982, shows a different form of exploitation of the land as the main purpose of the embankment changed from being a way of bringing more land into use to being a way of protecting the inward-lying land. The creation of a reservoir for inland water and a salt water lake for the loss of salt marsh habitats - resulted in a landscape different to that of the polders behind. The new sluice does not allow passage through and thus signals the very end of seafaring for Tønder.

Tøndermarsken is characterized by the drainage work that took place in 1928-30. The landscape was considerably altered by the creation of the embankment along the Vidå stream and the introduction of pumping stations, while at the same time the old wind mills previously used for drainage disappeared. Today, Tøndermarsken is the only Danish example of a polder landscape where the traditional method of working (in the outer polders) is to a large extent maintained. Also in an international context, the area holds great value with regard to the cultural history and landscape assets.

In the early decades of the 1900s the northern marshlands were also embanked. After the reunion in 1920, the sea dike was built between Vester Vedsted and Astrup Banke. In 1918 the dike from Astrup Banke to Ballum was finished by the Germans. At Ballum Sluice a sluice inn was built and the ferry to Kongsmark on Rømø was moved here from the previous location north of the present Rømø Dam.

Infrastructure

The Wadden Sea area has never been the centre of large-scale industrial development. As in other parts of the country the infrastructure in the Wadden Sea area was extended in the form of railroads and roads. The Bramming-Ribe-rail opened in 1875 and the Ribe/Tønder-railway in 1887. In addition, several smaller railways were opened, such as the one from Tønder to Højer Sluice (1892), which amongst other things transported tourists to the ferry connection to the island of Sylt. The passenger transport ended in 1935, transport of goods in 1962 and the station buildings were taken down in 1985. Many traces from the railway can still be seen in the landscape between Tønder and Højer.

Borders

The Wadden Sea area is a border region characterised by continual changes in the borders and the rulers. The Wadden Sea coast from Ribe and north has “always” belonged to the Danish Kingdom. The coast area south of Ribe is historically part of the Duchy of Slesvig, with the exception of the so called royal enclaves. The Duchy was formerly part of the Danish state, but after the war in 1864 the area was included in Prussia. The new border followed Kongeåen (north of Ribe), but farther to the west, the royal enclaves were compensated, and therefore the area around Ribe belonged to the King.

To increase the “Germanness” in the principally Danish-minded area, the Prussian government began to buy up larger farms in 1896, which were often expanded through purchases. These state-owned farms were leased on very favourable terms to German farmers, who, in return, were expected to take political and cultural initiatives to increase the “Germanness” of the region. Most of these state-owned farms are to the east, and there are only a few in the Wadden Sea region. One example is the farm yard “Røj” at Møgeltønder, which was bought by the Prussian state in 1903, and where the recent main buildings date from 1916. Later the farm was bought by Schackenborg

4. Modern development and planning

The towns in the area have only been influenced by industrialisation to a limited extent, most obviously in Tønder when in the 1900s many old houses disappeared in favour of new buildings and extensions of older properties. The dock at Skibbroen was filled-in in the 1930s. In 1936 the new military barrack in the northern outskirt of Tønder was opened. In 1940 the new by-pass road around the old town centre was finished. In the period 1900–1940s new residential neighbourhoods emerged, characterised by “Bedre Byggeskik”. In 1963 “the Foundation for The Preservation of Old Houses in Tønder”, in cooperation with Tønder Town Council, bought and restored a number of old town houses.

Today, Tønder has several industrial enterprises of international importance (Hartmanns Fabrikker, Norsk Hydro and the centre of the ECCO Shoes), but the main trade is (cross border) tourism, which to a large extent has turned Tønder into a busy commercial town. More than 30 Folk Festivals have given the town an international reputation.

In the other towns small industrial areas have developed, e.g. a spinning mill and a slaughter house in Skærbæk and a carpet factory in Højer. ECCO, which moved the last part of its shoe production abroad in 2001, has its headquarter in Bredebro.

5. Legal and spatial planning aspects

All the salt marshes and almost all the embanked marshlands are included in the Trilateral Cooperation Area and are also part of Natura 2000. Moreover, many (small) inland habitats like bogs, heathers and meadows are preserved under the national Nature Preservation Act. In 1988 the outer polders in Tøndermarsken were preserved by law in order to secure both the natural, landscape and cultural historical values. In addition, the preservation regulations of buildings (churches) and ancient monuments (burial mounds) and their surroundings are common features in the rural areas. Preservations and (strict) regulations in urban areas, e.g. medieval town centres of Tønder and Højer have been in place for many decades. In relation to spatial planning, Denmark is divided into three zones: the urban zone, the rural zone and the summer cottage zone, for which there are different regulations to achieve different objectives and preferences.

In order to protect the coastal zone of Denmark, in particular, a three kilometre wide protection zone from the coastline (outside towns) has been introduced with the aim of keeping the area clear of buildings and constructions which are not related to the coastal position. Moreover, recreational facilities can only be located inside this zone in combination with already existing facilities or urban areas.

It should be mentioned that the official policy states that no new areas for wind turbines -and farms will be appointed, and that renewal of existing wind turbines will only be allowed in the rural zone on special conditions in relation to landscape and cultural features and assets.

From 2007 and onwards the main responsibility of the administration of rules and regulations and the overall spatial planning will be located at the three municipalities. Among other things they will be obliged to map, designate and preserve the main cultural heritage and be requested to take similar actions regarding the landscape features. Apart from this the municipalities already have the powers to issue a "preservative local plan" to protect specific and local cultural features.

6. Vulnerabilities

6.1 Settlement

The structure of the geest edge, hill island and outwash plain villages and farming settlements are sensitive to development which does not fit with the historic settlement pattern and to extensions in new building styles. The historic town of Højer is characterised partly by a uniform building style with old west Schleswig houses with thatched or tiled roofs. The town is vulnerable to major changes which do not harmonise with the existing old houses but the biggest threat is lack of maintenance. The area outside the town centre appears neglected and the houses are threatened by decay and possible demolition.

6.2 Agriculture

The area is vulnerable to agricultural intensification of existing farmland. Further loss of grassland would be detrimental to the original character of the marshland areas, stream valleys on the glacial hill island and outwash plains between Ribe and Skærbæk. Changes to the traditional method of working (in the outer polders) of Tøndermarsken would have a negative impact on the historic landscape.

6.3 Natural conservation

The glacial hill and outwash plains between Ribe and Skærbæk, the marshlands and peripheral areas of the glacial hill islands are vulnerable to changes in historic character resulting from the establishment of forestry plantations. The creation of new habitats e.g. salt

water lakes can have a detrimental impact on buried archaeological deposits and the wider historic landscape.

6.4 Toursim

Tønder's success as a tourist destination could put pressure on the cultural landscape of the adjacent marshland.

6.5 Infrastructure

New technical installations would have a negative impact on the cultural landscapes of the area, particularly in the salt marshes and embanked marshlands.

7. Potentials

7.1 Settlement

The rich historic building stock of the areas towns, villages and farms provides opportunities for sensitive adaptation and re-use, to fit the existing settlement pattern and character of the built cultural heritage.

7.2 Agriculture

Agri-environment schemes provide the opportunity to restore and maintain areas of traditional extensively managed grassland, such as the wet meadowland within the embanked marshes, stream valleys of the glacial hill island and outwash plains between Ribe and Skærbæk. Any opportunity to re-instate moorland fields on the Hjørpsted glacial hill island and grassed areas on the inner polders of the Tønder Marshlands would also strengthen the original character of the landscape and illustrate the connection between the cultural historical origin and the natural foundation.

7.3 Management of cultural heritage

The rich cultural heritage of the area provides opportunities to preserve, maintain and investigate features which will enable visitors and local residents to consider, understand and experience its historical development. Examples include the preservation and maintenance of individual bush-groins fields in the salt marshes from V. Vedsted to Ballum; and the archaeological investigation and dating of a possible connection between the summer dike in front of Astrup Banke and the summer dike along Misthusum, which may shed new light on the embankment history of Ballummarsken.

7.4 Nature conservation

The creation and enhancement of wildlife habitats could provide the opportunity to integrate nature conservation management with the cultural heritage in order to derive enhancement and positive management of both.

7.5 Tourism

The areas rich heritage, such as its prehistoric burial mounds, historic landscapes and historic towns and settlements are rich for exploitation through sustainable tourism. Tønder's identity as the capital of the marshland could be further strengthened in this way.

8. Sources

Author: Charlotte Lindhardt and John Frederiksen

Sources: Lancewad – Landscape and Cultural Heritage in the Wadden Sea Region, 2001 (Mette Guldborg)

1. Arbejdsrapport, Karakteristik af hovedtræk, Kulturarvsstyrelsen, januar 2006

2. Arbejdsrapport, Oversigt over kortlægningsemner. Kulturarvsstyrelsen, august 2006

Maps: Kort- og Matrikelstyrelsen©

Wadden Sea Islands Rømø - Mandø – Fanø, DK

1. Overview

Name:	The Danish Islands of Rømø, Mandø, Fanø
Delimitation:	Wadden Sea, neighbouring entities North and South Danish mainland and Sylt
Size and population:	Rømø: 85 km ² (680 inhabitants)
Mandø:	8 km ² (50 inhabitants)
Fanø:	56 km ² (3200 inhabitants)
Origin of names:	The ending “Ø” means “island”.
Rømø:	1190 Rimma. The root rimme means “long rigde” = the island with the long sand dunes.
Mandø:	From the pronoun “mand” (man) = the island of the men.
Fanø:	1)The root Fani is similar to fenne (fen), meaning soft bog or mud. 2) Fani is the original name of the water/fairway = the island at the fairway or 3) relates to the old Nordic word Fønn, which means snowdrift = the island with the white dunes.
Location – map:	Located at the Danish end of the Wadden Sea
Relationship/similarities with other cultural entities:	Low-lying inshore island, similar to the island entities of Sylt, Amrum etc.
Characteristic elements and ensembles:	Polders, dunes, summer cottages, salt marsh, ‘captain’s houses’, ‘T’- and ‘L’- shaped houses, garden dikes, duck decoys on Fanø

2. Geology and geography

2.1 General

The formation of the Danish Wadden Sea is primarily determined by two localities: 1) to the north is the reef of Horns Rev, a moraine deposit which stretches approximately 40 kilometres into the North sea west of Blåvandshuk and 2) to the south is Rote Kliff on the German island of Sylt, which like the geest-core of the island as a whole, is formed by tertiary and quaternary successions of strata. Between these two points wind, tide and storm surges have during the latest 3–4000 years created the Danish Wadden Sea land and seascape, a formation process that is still ongoing. The islands of Rømø and Fanø are at one stage in this formation as sand barriers (high sand banks) built up above sea level. Mandø, however, has emerged in the shelter of the high sand bank (Koresand) to the west of the island.

The Danish Wadden Sea islands, together with the other islands in North Frisia, traditionally have been regarded as remainders of the land submerged in the post-glacial period. However, study of sand movement within the Danish Wadden Sea has shown that the sand is filling-in the area between Jutland’s mainland and the “equilibrium line”. The yearly sand feed of Danish Wadden Sea is several hundred thousands m³. The west coast of Skallingen and the large high sand bank Koresand south west of Mandø have almost reached the “equilibrium line”. Fanø and especially Rømø are still located far to the east. As a consequence the west coast beaches are still growing with the formation of new sand dunes.

2.2 Present landscape

RØMØ

The island can be sub-divided into zones running north-south, respectively salt marshes, embanked marshland, moors and bogs, sandy marshes, dunes and beaches.

Juvre-Kongsmark Polder

To the north and east the area is a flat, open marshland whilst to the west there are sand- and dune areas. The area is used for extensive agriculture, with many old, well-preserved farms and houses gathered along the north-south going road. The Juvre dike from the 1920s embanks the marshland (reinforced in 1964-65), which south of the Rømø Dam is edged by salt marshes towards the Wadden Sea. The fields are primarily laid out for grazing and several larger areas are outside rotation and production.

The central dune landscapes

The central dune landscapes include the two oldest ranges of dunes with large, open dune heath, three large conifer plantations and six summer-cottage areas. To the south there are well-preserved farmyards. By Kromose in the south the oldest range of dunes stretches almost all the way to the Wadden Sea, delimited by a small strip of salt marsh.

Havneby differs from the rest of the area with a densely built-up structure and harbour. To the south of Havneby there is a small embanked marshland area. In the recent years there has been extensive development in the form of holiday apartments to the west of Havneby.

The sandy marshes

This area comprises long, flat and open marshland with three different types of marsh and land use: 1) The southern part consists of polder marshland with intensive and extensive agriculture and a newly established golf course. 2) The area in the middle is a freshwater reed swamp. 3) To the north salt marshes with well developed marsh gullies. The entire area is almost without buildings and other structures. The northernmost part is a military shooting range.

The North Sea beaches and dunes

The beach landscape comprises the “world’s widest sandy beach”, which to the north and south is 3 km wide. A new dune row has emerged to the west, to the east the beach is delimited by a 10 metres high row of dunes. The summer cottage area, the camping site and the shopping centre at Lakolk are sited in the middle of the dunes, but the level of disturbance is only local in effect in this otherwise large and undisturbed area. There are no technical installations. To the north of Lakolk there is a small group of small, red-painted summerhouses and some low water lakes, formed by water from the hinterland, which has broken through the dune row.

MANDØ

In contrast to Rømø and Fanø, Mandø today is almost circular and primarily composed of embanked marshlands edged by narrow dune ranges to the west (12 metres). Outside the dikes and dunes Mandø is encircled by salt marshes (these are widest to the east).

Mandø has, over the period of several centuries, been created by the gradual merging of various islands and islets. “Old Mandø” to the north and “New Mandø” to the south are the largest, and are divided by a wide tidal gully. The merging process was completed by the construction of a large embankment around the entire island in 1937.

In connection with the village of Mandø there are some scattered summer cottages in the dunes. Apart from the establishment of the state smallholding along the village dike (Bydiget) in the first half of the 1950s and newer farm installations below the village, the area is largely devoid of buildings and there are no plantations. The area is used extensively for cattle

grazing. The dikes, with flocks of sheep, and the many ditches underlining the creation and use of the landscape.

FANØ

Similar in nature to Rømø, the island of Fanø consists of several north-south parallel ranges of dunes with intermediate hollows. The oldest systems are located to the east and are edged by variously sized, newer marshlands, some of which are embanked.

Grønningen

Grønningen was formed in 1730-70, and is a dune landscape with salt marshes on the northernmost part of the island covering approximately 200 hectares. To the north the landscape is open and flat (sandy marshes), whilst the southern part comprises a hilly landscape with four parallel north-south dune rows separated by lower areas. Apart from a couple of farms and three wind turbines, the area has no buildings or technical installations. There is only one plantation and some small stands of trees. The entire area has a varied aspect, of salt marshes, heath, plantation and agriculture. There is however one common denominator in the form of the large grassed areas, which contribute to the specific character of the area.

The North Sea beach

The beach area consists of a beach in the north (Søren Jessens Sand), up to 1.5km wide, with an intense natural dynamic. As late as the 1960s Søren Jessens Sand was separated from Fanø by a deep tidal gully. Today it is possible, even during high tide, to cross the sands by foot. To the east the area is delimited by a dune range.

The towns of Nordby and Rindby

The entire area is built-up. The town of Nordby is located in north east with the ferry connection to the mainland, it is old and densely built-up. Rindby to the south is dominated by a large holiday and summer-cottage area located in an open and hilly dune landscape (22 metres high) with intersecting hollows. In the eastern part of this area several smaller camping sites are located and by Fanø Vesterhavsbad (the North Sea) there are hotels, shops, coffee shops, a pool centre and the oldest golf courses (1902) in Denmark. The landscape has both visually closed areas in the hollows and wide views from the dunes. The summer cottages dominate the landscape as they are located both high and low within the dune area and are therefore very visible.

The plain of Rindby

The area is a distinct cultural landscape with open, grassed fields and salt marshes. The agricultural areas in the dune landscape are slightly elevated in the area. Large areas contain no buildings or technical installations, and provide a view of the overall flat area. The scattered small farms, comprising small plots separated by ditches, located so as to use the grass in the meadows and the salt marshes to the east, underline the fact that the cultural landscape has a long history.

The central dune and marsh landscapes

This area constitutes a large coherent nature area consisting of open, hilly dune heaths, plantations with strains of moor, reed swamps, lakes, meadows and a strip of salt marsh along the east coast. The forestry plantation area primarily consists of mountain pine and birch which, because of the wind, have a peculiarly wild character. The area is almost without buildings and technical installations and apart from the nearby north-south road there are only a few smaller dirt roads. In the western and southern part there are several rows of dunes (21 metres high) while the eastern part of the area is less hilly.

In contrast to the linear west coast the east coast is characterized by an irregularity in outline, where the peninsula "Halen" stretches into the Wadden Sea. This might be a remainder of the oldest part of Fanø, whilst the western side is more recent due to marine

deposition and dune development, which formed the island as it appears today. Alternatively “Halen” could be the result of the particularly strong eastern migration of large drifting dune systems. In the east there are several large parabolic dunes. “Halen” also differs from the rest of the area, with only a few of the smaller summer cottages scattered over the area and some tree plantations. The “Halen” has one of the few larger technical installations of Fanø, the high voltage connection to the mainland.

The Sønderho dune landscape

The entire area is built-up. To the east is the old and densely built-up town of Sønderho. West of this are summer cottages scattered evenly over the area. The landscape is a very hilly dune landscape alternating with flat wind-blown plains. In the northern part there are several old summer cottages sheltered by some old conifer plantations. Along the east-west road through the area there are a number of new summer cottages, all adapted to the old building style in Sønderho. South of these there are several old summer cottages. In the northern part of the area the well-preserved Sønderho mill is located on a dune top.

The southern point of Fanø (“Hønen”) has, after a period in the early 1900s with accretion of dunes and marshland, experienced a comprehensive disintegration of its landscape, particularly following the storm surges of the last few decades.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Contrary to the mainland and the German geest islands (Sylt, Amrum and Föhr) there was probably no permanent settlement on the Danish Wadden Sea islands before the Middle Ages. The first information concerning the three Danish Wadden Sea islands is from 1231 (“The Court Roll of King Valdemar Sejr”).

RØMØ

The oldest trace of settlement is the castle mound “Borrebjerg” in the salt marshes to the north of Havneby. This five meter high castle mound is believed to date from the Middle Ages and is constructed of clay from the adjacent marshland. Around the mound there are faint traces of at least two tombs. Excavations in 1874-75 revealed more remains from the castle.

Apart from Havneby there are no urban structures on Rømø. The original settlements comprise a string of small open villages along the east coast (on the oldest dune chain). The first mention of these small communities was in 1290-91, where the Ribe bishopric properties on Rømø were settled, together with other places in the northern part of Juvre and in Toftum and probably also in Kongsmark to the south. Excavations in Juvre have located the first settlement on a natural sand-ridge, which in the 1500s was made higher with clay. Similar settlements are found between Juvre and Toftum.

The economy of these early settlements was dominated by fishing by fishery, with the Rømø fishermen eagerly participating in the “herring adventure” by the island of Heligoland in 1400s–1500s. In addition Rømø had close connections to Ribe, whose heyday was in the Middle Ages, resulting in a development of a mercantile trade partnership in the 1500s. The navigation to Ribe at that time was not the current route between Mandø and Fanø, but between Sylt and Rømø and Mandø, close by the shores of Rømø.

MANDØ

The original settlement on Mandø was located on the northern island (“Old Mandø”). Powerful storm surges in the 1500s are believed to be the reason why the original inhabitants relocated to the southern island (“New Mandø”), which was higher and sandier. There are no traces of these former settlements.

During the Middle Ages fishing was the primary occupation of the inhabitants. At the end of this period, however, the income from this trade was decreasing, and agriculture became the main trade.

FANØ

In the Middle Ages Fanø was believed, like Mandø, to be separated into two main islands by a wide tidal gully, approximately six kilometres north of the town Sønderho, which at that time was also the name of the southern island. Fanø was merely the name of the northern part².

It is presumed that Fanø was populated in the Viking Age, as the first church (St. Anna) is believed to have been erected in the area where the tidal gully had its course: today known as “Anne’s Dal”; but previously by the heathen name of “Gudehovs Dal”.

The main livelihood on Fanø in the Middle Ages was fishing and agriculture. Sønderho and Nordby were two of the biggest fishing hamlets in the 1500-1600s. While no trace remains of the fishery, the agricultural structures can still be seen in the landscape around Nordby. Examples of these include the pastures north of Nordby and the roads to them, the old fields on the outskirts of Nordby, and the fields, salt meadows and heath south of Nordby.

3.2 Early Modern Times

The landscape and the building developments of this period were largely determined by the requirements of agriculture in combination with fishery, coupled with changes in the natural environment. These included increasing sand drift in the 1600s with changes in the navigation routes to Ribe and the vicious storm surge of 1634. In addition changes within trade practises and land ownership also had a role: the shipmasters outside Ribe gained the right to independent trade (1680s); the people of Mandø and Fanø purchased their islands from the Crown (1741). In Rømø in particular, the division into two juridical units in 1580 (the northern part belonging to the Duchy of Schleswig and the southern part to the Kingdom of Denmark) and the Thirty Years' War had an impact.

RØMØ

After the Middle Ages the partnership of trade with merchants from Ribe developed into the new commercial sector of shipping. From around 1630, shipping combined with oyster fishing in the wintertime, dominated the commercial industry of Rømø. The Swedish occupation of Rømø in 1644, however, marked a sudden end of the zenith in Rømø’s own shipping economy.

In the period 1650-1800 the main income of the inhabitants was whaling and seal hunting in the North Atlantic, supported by a combination of agriculture and small-scale fishing. From March until November almost all men of working age signed up for voyages on whalers from Hamburg (Altona) and Bremen, but also from Amsterdam and Harlingen. Many Rømø-sailors became captains on board the whalers. At the peak, in 1770s, there were more than 30 whaler captains from Rømø.

Many houses and farmyards on Rømø originate during this period of whaling. A distinct feature of these houses is the “T”- or “L”-shape, with the main house located east-west and the living quarters in the eastern (sheltered) end. Today several of these farms, together with their interiors, reflect the development and prosperity of the island between 1650 and 1800. The “Captain’s House” in Toftum (owned by the National Museum) is the most impressive example, the ground plan is similar to a “tuning fork” and as such unusual within the North Frisian and Danish Wadden Sea Area.

The location of many of the houses is a result of the repeated parcelling out of larger farms through the generations. Although the houses were owned by sailors, it was usually the wives who undertook the agricultural work whilst their husbands were away at sea. One of the best-preserved sites of this kind is found at Vråby (between Havneby and the church of Rømø), where the characteristic garden dikes surround small plots as shelter from the

² Today people on [Fanø](#) [20], [21], [22], [23] distinguish between “sønderhøninger” (those from [Sønderho](#) [20]) and “faniker” (those from [Nordby](#) [21]).

drifting sand. The plantations on Rømø, as a large-scale prevention against sand drifting, did not take place before the 1900s.

The period is also represented by the distinctive church, which is consecrated to St. Clemens, the saint of the seafarers. It originated in the 1500s but several rebuilds in 1600-1700s have made this church into today's five-nave church. The interior, with four votive ships, underlines the importance of shipping for Rømø. In the churchyard a unique collection of seamen's tombstones can be seen, which the great captains prior to their death ordered to be carved by German and Dutch monumental masons. The sixty metres long whalebone fence in Toftum is also a unique feature of this period.

The war in Europe in the early 1800s and the Danish national bankruptcy in 1813 resulted in a collapse of the Rømø economy. After the end of the war in 1814 the whaling industry never reached the same levels, and Rømø was forced to find alternative sources of income. The inhabitants shipped as seamen aboard Danish and foreign merchant vessels and as owners of smaller cargo vessels. One of these persons was Peter Maersk Møller, the founder of the worldwide "Maersk shipping company". He was born on Rømø in 1836.

MANDØ

Mandø was never characterised by the prosperity found on the two neighbouring islands. This was partly due to its isolated location, without direct access to the waterways and larger vessels (see section 4.2). In the 1600-1700s the inhabitants of Mandø were engaged in agriculture, hunting and fishing and some trade. The houses were gathered together in the village, as today, in the southwest by the sheltering dunes and on high ground so that the smaller storm surges were not a direct threat to their survival. The church in the southern part of the village was erected in this period (1727).

Located to the east of the village was a row of narrow cultivated fields. Low summer dikes protected them, constructed of turf and eelgrass. The earthen dike was not erected around this area before the beginning of the 1800s. This dike has gone today but the "embanked" location can still be recognized by the east-west field structures to the east of Mandø village. Outside the cultivated land the unprotected salt meadows were used for grazing and haymaking.

At the end of the 1700s the income from shipping became more and more dominant and the women were (like on Rømø and Fanø) now the primary workers within agriculture. The small farms and the fact that agriculture partly was a subsidiary occupation meant that agricultural reform in the 1800s did not have the same impact here as elsewhere. From the 1870s onwards a number of changes were undertaken on the island, including the registration of the land and the establishment of the first actual sea dike (Bydiget, 1887). This embankment increased the size of the protected areas from approximately 60 hectares to approximately 200 hectares. The population of 293 persons around 1890 was the highest ever on the island. The dike has subsequently been breached several times by storm floods, for example in 1911 and 1923 and most recently in 1981. The 1923 breach eroded a pond inside the dike at the eastern section, which still can be seen, as can a bend in the dyke line at this point. The road passage through the dike (støpe) is one of few locations in the Danish Wadden Sea Area where this can be seen today. When there is a severe storm surge the passage can be closed up with planks and sandbags. The present sea dike was built in 1935-37 around the entire island. Thus Mandø is the only place in Denmark, besides the Tønder Marsh, with several embanked marsh polders.

FANØ

As mentioned before, the dissolving in 1680s of Ribe's monopoly of marine trade in the Wadden Sea Area and the purchase of Fanø from the Crown in 1741, were epoch-making events for the development of a shipping industry of international dimensions in the late half of the 1700s and the 1800s.

The purchase in 1741 offered not only ownership of the land but also the right to conduct maritime transport. This freedom, combined with the traditional 'Evert' ship, the maritime experience of the people and the location of the port of Nordby, which was one of only two sheltered ports on the western coast of Denmark, resulted in a flourishing maritime industry. Shipbuilding and a maritime college soon followed and by the beginning of the 1800s, Fanø was at the centre of the maritime transport in the region, with an astounding 180 vessels in 1806. They traded with Norway, Germany, the Netherlands, the United Kingdom, France, the Baltic and the Mediterranean.

The war against England (1807-14) halted for a time the glory days of seafaring and around 200 Fanø vessels were lost. From 1840s, however, the industry became global with large vessels trading on all continents. By 1896 Fanø was second only to Copenhagen in terms of shipping tonnage in Denmark and Fanø played an integral part in the formation of Denmark as the major global shipping nation.

The attractive shipping towns of Nordby and Sønderho show impressive evidence for this development and the pre-eminence of Fanø in 1700-1800s. Both towns have developed a special, densely populated maritime character with a typical architectural style, narrow lanes and slipways, as well as institutions linked to shipping. They are amongst the best preserved towns in Denmark today representing this glory period of the Danish history.

In contrast to the houses on Rømø, the traditional "Fanø-house" is in single blocks. Like on Rømø, with the animal stalls at one end and the living quarters at the other, divided by a transverse hall with a "Frisian" hatch over the door. The roof was thatched, but unlike on the mainland, the gables were entirely boarded. Frisian and Dutch influence can be seen not just in the colours of the woodwork and the painted lintels over the doors and windows, but also the interiors, for which wall tiles were imported in huge quantities during the first period of the growth of shipping from Fanø at the end of 1700s.

Until inland transport was developed with rail from around 1870, the sea was not the divider but the link binding together not only the islands and the mainland but also towns and villages along the same coast. When this development reached Fanø, with the establishment of the railway to the Danish west coast, together with the planned city of 'Esbjerg' complete with a North Sea port (1874), Fanø lost its role in the local and regional chain of transport. During the same period Fanø, favoured the tall sailing ships during the long transition from wind to steam powered ships, and eventually lost out.

Duck Decoys

From the 1860s the export of wild ducks became a particular subsidiary occupation on Fanø. The wild ducks were captured in decoys with the use of tame ducks until this was prohibited in Denmark in 1931. A single decoy could capture as many as 5000-7000 birds annually.

Duck decoys were introduced in the Netherlands during the 1500s and from there spread to the other North Sea countries. Today they are common in many parts of the Wadden Sea in the Netherlands and Germany, but have almost solely been used in Denmark on Fanø. The remainder of the original four duck decoys can be seen on the east side of the island, of which two are restored.

3.3 Modern Times

Development on the three Danish Wadden Sea islands in the 1900s was to a large degree determined by the different degrees of access to the mainland and the ability to use the developments in the overall regional infrastructures (see section 4.2). This was especially significant in the development of tourism, which became more and more important for the economic situation of the islands and thereby also a decisive factor in the utilization and the

building especially after World War II. The first initiatives to promote tourism date from the end of the 1800s.

RØMØ

From 1864 to 1920 Rømø was part of Germany. In 1898, Pastor Jacobsen, an entrepreneur from the mainland, opened the first spa for German tourists at Lakolk. However, although there was a train connection from Hamburg to the town of Skærbæk on the mainland, the last part of the journey was difficult, comprising a long, and sometimes erratic, sail from the mainland (just to the north of the present Rømø Dam) to Kongsmark on Rømø. A horse-drawn carriage then brought the visitors across the island to Lakolk, where new log cabins from Norway (and Harzen) and the restaurant "Keiserhalle" awaited for them. After three years pastor Jacobsen went bankrupt and several attempts to revive the spa failed. Its memory is preserved through some of the surviving log cabins at Lakolk. Also the rail road (without rails) across the island can still be seen in the landscape. Unfortunately, the original hotel (Römerhof) in Kongsmark was demolished a few years ago, in order to give space for holiday apartments in "Rømø style".

FANØ

The establishment of Esbjerg Harbour with a regular ferry connection to Fanø by steamship (1878), and the rail connection to Esbjerg (1874), enabled the development of tourism on Fanø. As with Rømø a fashionable spa came into existence at Fanø Bad in 1892 with German investors. Prior to 1905 hotels, guesthouses, houses and Denmark's first golf course were established. After 1920 summer cottages were established in the so-called Fanø style and around 1930 there was an extension with small summer cottages in allotment style by Rindby Strand (the "huts"). The overall picture of this environment has gone (the hotels were demolished 1968-1990), but the original urban plan and certain elements from that time can still be seen: the golf course and 3-4 of the original cottages and the "huts".

MANDØ

The isolated location of the island (see section 4.2) and a lack of an attractive beach are primary reasons for the fact that Mandø, unlike the neighbouring islands, did not take part in the first tourist "wave". Mandø has through the 1900s remained a farming society, assisted in 1937 by the embankment of approximately 380 ha of salt marshes.

4. Modern development and planning

4.1 Land use

After World War II agriculture on Fanø and Rømø plays an ever decreasing role in the landscape as large areas were laid out for tourist purposes. On Mandø agriculture is still the dominant land use.

RØMØ

The number of fulltime holdings has through the years been constant at 7. Apart from one holding, they are all located at the northern part of the island (500 cattle and 1000 sheep). In addition there are also a few part-time holdings (200 horses and 200 sheep). It is estimated that the number of full-time holdings will further decline.

Today there are approximately 1,500 summer cottages and 550 holiday apartments, many quite new. There are also three camp-sites, a large hotel and several holiday and recreational facilities (golf course etc.). Rømø has approximately 1.3 million overnight stays per year and approximately 1 million one-day tourists. The municipality authority has passed local plans for several areas on the island, including Lakolk and Vesterhede.

The north-western part of the island has been a military shooting range since 1954. The area covers approximately 22 km² (approx. 25% of Rømø). Together with large beach areas and the plantations, the State owns half of the island.

MANDØ

There are only two full-time holdings left. Cattle graze two-thirds of the embanked marshland. The majority of these are transported each year from the mainland to the island. The non-embanked areas and the dikes are grazed by sheep.

The tourist feature consists of approximately 25 smaller summer cottages in the dunes around the village. They have continuously been built, expanded and renovated since World War II. Furthermore in the 1990s an area in the village was laid out as a small camp site with seminar- and school camp facilities in connection with the old school buildings. There are plans to build additionally 17 summer cottages.

FANØ

On Fanø agriculture is primary linked to the three, fulltime holdings (600 grazing cattle at Grønningen and "Halen"). To this must be added a number of part-time holdings and a couple of sheep-keepers (150 sheep).

On Fanø there are approximately 2,800 summer cottages, concentrated into two areas: by "Fanø Bad-Rindby Strand" and by "Sønderho". Moreover there are seven camping sites and seven hotels/holiday apartments. There are approximately 1.1 million overnight stays a year and 1 million one-day tourists.

4.2 Settlement development and industry

Overall the urban and industrial development has, since World War II, been limited on all three islands.

RØMØ

Here the most striking feature is the establishment of the new harbour in Havenby in 1964 in Havneby for 40 vessels, which was first and foremost intended as a strengthening of the fishery. Today the harbour has a fleet of twelve vessels (mussel- and shrimp fishery) and other harbour related industries. Today, Havneby is the centre of the largest transit-port in Denmark for both German and Dutch shrimp trawlers. The ferry connection to Sylt also provides a large amount of transit traffic of goods and tourists between the two countries. Approximately half of the island population lives in Havneby, where the only housing estate was built in the 1970s. The freshwater supply comes from the mainland (except for Lakolk), as does the electricity supply.

MANDØ

Apart from the establishment of three state smallholdings in 1953 along "bydiget" and the summer cottages, only a few houses have been established in the town. However considerable change has taken place in the use of the old buildings. Today they are let to tourists. Both water and electrical supply comes from the mainland.

FANØ

On Fanø urban development has primarily taken place around Nordby, with a large housing estate area to the west. Currently there are decisions to expand Nordby to the north into the embanked marshland.

Fanø has three wind turbines (Grønningen), which contribute 20% of the power supply on the island. Surplus heat to Nordby and electricity supply for the entire island comes from the power plant in Esbjerg. The water supply is from borings on the island.

4.3 Infrastructure

The three islands are connected to the mainland in three different ways.

Rømø with a 10 km long highway (1948) and a ferry connection to the German island of Sylt; Mandø is connected with a 6 km long low-water dam (not passable at high water) and Fanø with a permanent ferry connection to Esbjerg (12 minutes). All three islands have one main road from which smaller roads and paths "radiate". In comparison to almost all the other

Wadden Sea islands, vehicles are allowed on the North Sea beaches on Rømø and Fanø, which attracts many day-trippers. On Fanø, the beach is even laid out for a public bus route between Nordby and Sønderho.

5. Legal and spatial planning aspects

All the salt marshes and almost all the embanked marshlands are included in the Trilateral Cooperation Area and are also part of Natura 2000. Moreover, many (small) habitats like bogs, heathers and meadows are preserved under the national Nature Preservation Act. Moreover several areas are today recorded a preservation order.

Along the Jutland West coast, including the three Wadden Sea islands, the dune areas are under a specific protection and maintenance programme, in order to prevent sand drifting and coastal erosion.

In relation to spatial planning, Denmark is divided into three zones: the urban zone, the rural zone and the summer cottage zone, in which there are different regulations to achieve different objectives and preferences.

In order to protect the coastal zone of Denmark, in particular, a three kilometre wide protection zone from the coastline (outside towns) has been introduced with the aim to keep clear of buildings and constructions which are not pending on the coastal position. Moreover, recreational facilities can only be located inside this zone in combination with already existing facilities or urban areas.

Also preservation regulations of buildings (churches) and ancient monuments (burial mounds) and their surroundings are common features in the rural areas. Preservation orders and (strict) regulations in the urban centres in Nordby and Sønderho have been in force for decades.

From 2007 and onwards the main responsibility for the administration of rules and regulations and for overall spatial planning will be located at the three municipalities. Amongst other things, they will be obliged to map, designate and preserve the main cultural heritage and be requested to take similar actions regarding the landscape features. Apart from this the municipalities have already the powers to issue a "preservative local plan" to protect specific and local cultural features.

6. Vulnerabilities

6.1 Spatial planning

Although there are several preserved houses on the island of Rømø, the unique cultural environments are not subject to preservative local plans.

6.2 Settlement

On Rømø the well-preserved farms and villages of the Juvre-Kongsmark Polder form a striking unit and the villages are therefore vulnerable with regard to the establishment of new technical installations and new buildings. On Mandø, depopulation of the island is the biggest problem with regard to the cultural history and landscape, especially of the polder areas. On Fanø, the area of Grønningen is vulnerable to the expansion of Nordby and its facilities to the north and the central dune and marsh landscapes need to be kept clear of buildings in order to preserve the waste character.

6.3 Agriculture

On the sandy marshes of Rømø, any change in the use of the flat and open terrain in the marshland would seem out-of-place and in order to maintain the character it is important that the delimitation of the fields and salt marshes is continued. In order to maintain the character in the embanked marsh landscape on Mandø it is important that the landscape is kept open and that the marshland is grassed. On Fanø an important function for the preservation of the

special character of the area is that the Grønningen is grassed and that the marsh areas are kept clear. On the plain of Rindby, in order to preserve the relation between the origin of the cultural history and the natural foundation it is important that the area is maintained as an open agricultural landscape with the old farm- and field structure and that the salt marshes are grassed. The area is vulnerable towards further extensification.

6.4 Nature conservation

On the North Sea beaches and dune landscapes of Rømø it is important to maintain the wide open views and therefore the Lakolk area is vulnerable to more forestry plantations. On Fanø the open dune landscape around Nordby and Rindby, is also vulnerable to more forestry plantations and the open dune heaths of the central dune and marsh landscapes and the possibility of a clear view of the dune formation in the landscape are vulnerable to scrub encroachment. The Sønderho dune landscape is vulnerable to both of these processes.

6.5 Tourism

On Rømø, from a cultural historical point of view, the island is very threatened by pressure from the growth of tourism and the establishment of related summer cottages and other installations such as golf courses. In the island's central dune landscapes it is important that overcrowding is avoided in order to safeguard the open dune heaths and the marshland. The large, open dune heath could lose its magnificence if more summer cottages are established. The establishment of holiday apartments west of Havneby appears as very "aggressive" and misplaced. Any change in the use of flat and open terrain in the sandy marshes would seem out-of-place and the cultural history of the area is vulnerable to any new establishments like the present golf course. The dunes of the North sea beaches are vulnerable with regard to attrition from the large scale movements of tourists. It is also important to maintain the wide views and therefore the Lakolk area is vulnerable to an extension of the shopping centre and the camping site. Furthermore, additional renovations of the old summer cottages from the 1900s will blur the cultural historical value. On the polders of Mandø new buildings (summer cottages) need to be established close to the existing so that they do not appear dominating. On the North Sea beach of Fanø the landscape character is sensitive towards further visual disturbance and large scale movement on the beach and in the dunes. The open dune landscape around the towns of Nordby and Rindby is also vulnerable from a further concentration of development in the summer cottage area and the plain of Rindby, which forms a functioning cultural environment of great value, is vulnerable to the growth of tourism. The Sønderho dune landscape is also vulnerable towards more buildings, and expansion in connection with the tourism sector.

7. Potentials

7.1 Spatial planning

Among the potentials for the "survival" of the islands is the designation of the Wadden Sea as a National Park. Experiences abroad have shown that this designation will attract people to settle permanently in "remote" areas.

7.2 Agriculture

On Rømø in order to maintain the area of the Juvre-Kongsmark Polder as an open, extensively used marsh and agricultural area, the grass areas and the meadows continuously should be grassed. More grassed and wet meadow areas support the character of the landscape in direction to the original cultural history. In the sandy marshes of Rømø an extensification towards more wet meadows will support the character of the area. The northern salt marshes are being grassed and provide the landscape with an authentic character. In the salt marshes in the east of the central dune and marsh landscape of Mandø, use of grazing and reed harvesting contributes to the maintenance of the open character of the area.

7.3 Tourism

In the central dunes of Rømø the summer cottage areas are partly fitted in to the landscape through tree plantations around the houses and appear as well-defined units and the remainder of the landscape overall appears as one coherent, varied and harmonic area – with well preserved cultural environments e.g. Vråby. Within the Sønderho dune landscape of Mandø, the number and appearance of new summer cottages is in harmony with the surroundings. On the polders of Mandø the location of the village sheltered from the west wind behind the row of dunes, the old farms and the dikes bare witness to many years of the human struggle against the forces of nature and has great cultural historical value and the potential to tell the story of the area. Equally, on the plain of Rindby on the island of Fanø the scattered small farms, grass in the meadows and the salt marsh to the east and the small plots separated by ditches underline that the cultural landscape has a long continuity.

7.4 Managing the cultural heritage

The residents of the islands and planners fully realize that the islands of the Wadden Sea are unique in Denmark; that the architectural tradition, the original structure of towns and the preservation of the old houses are generally in good order. This helps create a constant awareness and willingness to maintain these conditions throughout the islands. In this context the residents of the islands have a strong awareness of and responsibility for their cultural assets, which forms one of the greatest potentials for the long term preservation of the islands landscapes and cultural environments.

8. Sources

Author: John Frederiksen and Charlotte Lindhardt

Sources:

Lancewad – Landscape and Cultural Heritage in the Wadden Sea Region, 2001

Kulturarvsstyrelsen: Arbejdsrapport Karakteristik af hovedtræk, 2006.

Kulturarvsstyrelsen: Vadehavet Kulturatlas, Oversigt over kortlægningssemner - 2. arbejdsrapport, august 2006.

Fanøs Historie, N.H. Kromann, 1933-34.

Rømø, et vesterhavspræget samfund, Bert Kelm, 1999.

Dansk Stednavne Leksikon, 1983

Sylt, SH

1. Overview

Name:	Sylt
Delimitation:	Island in North Frisia, neighbouring entities Amrum, Föhr and Wiedingharde on the mainland, Island of Rømø in Denmark
Size:	99 km ² , 38 km from south to north, 12.6 km from east to west
Location:	Island in the very north-west of North Frisia, Schleswig-Holstein, Germany
Origin of name:	Probably derived from a word meaning sill, which referred to the elongated shape.
Relationship/similarities with other cultural entities:	Clustered villages like on Föhr and moraine mainland; built heritage includes farmhouses, churches, residential houses, lighthouses as in other entities; field enclosures with low banks as on Föhr; heath land; burial mounds and megalithic tombs as on Föhr; Amrum and mainland moraines; spa architecture as on Amrum, Wyk on Föhr
Characteristic elements and ensembles:	Clustered villages with irregular fields enclosed by low banks; Uthlande style farmhouses with Frisian walls; medieval churches; 19 th century lighthouses; spa buildings; heath land, burial mounds and megalithic tombs; raised prehistoric settlement sites; areas of imported soil; prehistoric and early historic remains underneath dunes; medieval fortification; duck decoy; WWII fortifications and facilities; dam; railway

2. Geology and geography

2.1 General

The central part of the island around Westerland and Ost-Sylt consists of remains of moraines from Saalian ice age glaciers and parts of earlier rock formations from before the ice age, like the cliffs of Morsum. These have been strongly eroded since the North Sea reached Schleswig-Holstein some 8 000 years ago. Tidal and coastal parallel currents have formed the characteristic, elongated sand arms, reaching several kilometres to the south and north, by constant erosion and sedimentation, these presumably on top of older bits of land. However, the sea has eroded away the western part of the moraines over the centuries, resulting in cliffs up to 25m high, like the Rote Klif. This erosion is also a constant threat to settlements. Dunes have developed on a large scale especially since the Middle Ages and now cover vast expanses along the western shore and the whole of the sandy northern and southern arms. Their constant and unhindered movement westward in the past has covered earlier settlements. Sylt used to be part of the vast area of salt marshes and bogs which spread across the Wadden Sea of North Frisia until the late Middle Ages. Today, embanked marsh areas only exist along the southern coast of the central part. Smaller stretches of salt marshes are located east of Rantum and north of Archsum. The southern and northern fringes of the moraines gradually slope down to the marshes.

2.2 Present landscape

Most of the elongated northern and southern parts is dune covered and largely uninhabited. The larger villages of List and Hörnum on the northern and southern tips and the few smaller settlements in between being the exceptions to the rule. The central, Pleistocene core in the west around Westerland, Wennigstedt and Kampen is more densely inhabited, whilst the hinterland between Kampen and Keitum still has some open areas consisting of heath land,

golf courses and the area of the airport. The eastern part of the moraines on Sylt-Ost is more rural, with fields and pastures divided by low banks around small villages and scattered single farmsteads and houses. The embanked marshes in the south are mostly uninhabited and intersected by a small-scale pattern of rectangular drainage ditches orientated along the new roads and irregular former tidal inlets. The adjacent Rantum Basin is an enclosed area of open water and marshland without built structures. The island is dotted with small forests, especially between the villages in the west. Buildings are of different type, from larger structures like barracks, apartment buildings, public houses, spas and resorts to single, detached houses, the latter forming the most frequent building type on the island. Some buildings exceed 3 or 4 storeys, like the apartments blocks along the promenade in Westerland and a number of lighthouses. The large aerial in Rantum is over 200m high. The central part of the island is sub-divided by a dense network of roads and bisected by the railway from Niebüll to Westerland. The airfield with two runways is located in a large open space near Westerland.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Megalithic tombs like the Denghoog in Wenningstedt and a multitude of still extant single mounds and mound cemeteries of Bronze Age to Viking Age origin, like the Tinghooger on the airfield and mounds near the lighthouse of Kampen, provide ample visible proof of almost constant settlement on the island from the late Stone Age onwards. The remains of mounds and megalithic tombs sited in the marshes, like those close to Weststeg near Keitum, are unique as they were originally placed on low moraine hillocks which are now covered by marshland. The island was quite densely inhabited in prehistoric times, as the many settlements remains demonstrate, like Melenknop in Archsum. Here, as on many other spots around the area, clay and other material was introduced to create a more fertile soil. Settlements were raised in height due to the constant occupation of the same site, a situation quite distinct to the moraines of the Wadden Sea area of Schleswig-Holstein. However both features are scarcely noticeable today. In Roman Times the salt marshes were used for stock-breeding by a growing number of settlements along the edge of the moraines.

Settlement seemed to cease for a while in the 5th and 6th century AD, an absence usually ascribed to migration to Britain. During the Viking Age, the island was inhabited again, presumably by Frisians from the western Wadden Sea, this period is represented by cemeteries with large numbers of mounds as at Morsum Kliff. The circular earthen rampart of the Tinnumburg, a fortified Viking age settlement, provides the most prominent archaeological monument on Sylt. Vestiges of medieval settlement have been preserved underneath the dunes, like the site of Alt-List which was an important natural harbour, with abundant finds from ship construction. Villages and farms frequently had to move eastwards due to the constant erosion of the west coast and the movement of the dunes. Westerland, for instance, was founded in the hinterland as a successor to the village of Eidum, which perished in the waves during the 15th century. Other villages, like Keitum, Morsum and Kampen, had their origins in the high and late Middle Ages, usually as a cluster of farms without a specific structure. Stock-breeding and farming formed the principal elements of the local economy, and starting in the 15th century, herring fishing around Helgoland became an important feature of the economy. A now vanished harbour in Buder near Hörnum served the herring industry. Eventually intensive land use and the removal of top soil turned agricultural land into unfertile heath land, which used to cover large parts of the island till modern times. Remains of the heath land are still extant between Wenningstedt and Braderup, and near Keitum. The earliest stone churches were partly erected in tuff from the Rhineland and in brick as simple Romanesque hall constructions during the 1100s, usually without an attached stone belfry as at Keitum and Morsum.

3.2 Early Modern Times

Herring fishing brought a moderate income to Sylt, but when the shoals declined by the end of the 16th century, a new means of subsistence was found on the whaling ships of Hamburg and Dutch ownership bound for Greenland and Svalbard. This new wealth is reflected in the construction of new houses on the island. The grave slabs, like in the cemetery of Keitum, illustrate the dangers inherent in whaling. Uthlande style farmhouses were built from the 17th century until about 1800, these were more adapted to cattle breeding than to arable agriculture. Agriculture, which decreased in importance, was maintained mainly by the women of the seafarers and the elderly people. Some of the sometimes splendidly fitted farmsteads, often connected to other farm buildings in the typical angular shape, have survived in the old village centres, as in Wenningstedt or Morsum, but are now used as apartments or second homes. The island was administered by a representative of the Danish county administration in Tønder, who lived in the Landvogtei in Tinum, a large, thatched Baroque building of mid 17th century origin.

The incessant threat of erosion along the cliffs and the shifting sand dunes required the abandonment of many buildings, including at least two churches in Rantum built in short succession in the second half of the 18th century. Trees were planted in order to slow down the movement of the dunes. The first duck decoy on Sylt, duck catching facilities quite common on the islands of North and West Frisia, in Groningen and in England, was constructed in this period to the north of Kampen. By the end of the century the administration ordered land consolidation, especially of former commons, resulting in larger fields and pastures now divided by low banks. Work on the whaling vessels was eventually replaced by even more profitable employment on trading ships, which led to a short economic bloom furnishing yet more splendid sitting rooms, ending rather abruptly by the Napoleonic continental blockade. The settlement structure of loosely scattered villages, hamlets and farmsteads of the time has mostly disappeared, it is best preserved around Morsum and Archsum.

3.3 Modern Times

The end of the trading ships as the most important source of income following the Napoleonic blockade caused considerable economic problems on Sylt. However, the development of tourism on the island in the first half of the 19th century began with the foundation of a spa in the village of Westerland in 1855. This triggered a rapid and massive landscape change which has lasted until today. During the 19th and early 20th century, however, building activities connected with tourism remained mostly confined to Westerland. The village grew rapidly, taking over the role as the island's most important village from Keitum by the end of the 19th century. Visitors arrived from the harbour of Hoyer, which came under Prussian, and later German rule, after 1864. New harbours like Hörnum were subsequently developed on Sylt to cater for the incoming ships. This village was founded around 1900 on the formerly uninhabited southern tip to welcome cruisers, mainly on the route from Hamburg to Helgoland. A railway was installed for tourist transport, like on Amrum, in the later half of the 19th century. It was taken down again only in the 1970s when the predominance of cars meant it was no longer economic and its track routes are nowadays used for walking and cycling. Despite these developments, most of the island had scarcely changed. The extensive salt marshes south of the moraine core were largely intersected by tidal inlets and only very few artificial ditches. Remains of former natural watercourses can still be seen in sinuous ditches like Krüts-Wial and Archs-Wial. The first measures to secure the waning cliffs in the west with wooden groynes were installed. The architecture of the several, still extant, lighthouses on the island, built since the middle of the 19th century like List-West and List-Ost, displays the typical mix of individual and general construction features of the time.

In the first half of the 20th century, Westerland had an economic climax as a world-class spa, reflected in the construction of spa and tourism related buildings like the Strandhalle. The First World War caused a heavy decline in tourism, which continued when Sylt lost its

connecting harbour on the mainland when Hoyer became Danish soon after. The ensuing link to the Wiedingharde by a dam, the Hindenburgdamm, the installation of a railway on top of it and an early airport near Westerland were largely conceived as a substitute to this link. The strategically important situation of Sylt also caused the military to leave its mark on the island, with the construction of barracks and bunkers. The preparation for the Second World War and, later, the island's status as a so-called fortress, however, triggered heavy building measures and landscape changes. Besides the bunkers in the dunes, such as near Westerland, the barracks were extended, as at Hörnum, List and Westerland. The Rantum Basin was originally embanked as a tide-independent harbour for water planes but then was soon abandoned in favour of the airfield close to Westerland and turned into a nature reserve in the 1960s. The southern salt marshes were reclaimed, embanked and drained by a mesh of ditches in the 1930s, due to a program of the Nazi regime to gain new land for settlement and agriculture. A large amount of refugees arrived on the island after the war, inflating the population further. In the 1950s the island was opened for tourism again and has thrived economically since. This caused an enormous spread of residential areas especially from the 1970s to the 1990s. Large areas of the north-western part of the moraine core are now covered by areas of detached, single-family houses, with some apartment blocks in Hörnum. The small villages on the dune extensions have also expanded significantly. Some settlements like Westerheide are altogether new, loosely built housing areas with no definite centre, detached from adjacent villages. Sylt has further been equipped with youth centres, recreation homes and other groups of houses of specific purposes in detached locations. Modern coastal protection has also left its marks in form of concrete tripods from the 1960s and concrete groynes which have largely proved ineffective.

4. Modern development and planning

4.1 Land use

Agriculture is confined to the eastern part of the island and plays only a minor economic role. Large parts of the uninhabited areas in the west of the island, which mostly consist of dunes and heath land, are preserved as areas of nature protection. Together with the long beach at the west coast they are extremely important for the tourism and spa industry of the island. Many of the tourist facilities are therefore located in or around these areas. Few forests have been planted and plans about new plantations are still being discussed. Coastal protection is a very important issue on the island because of the immediate threat by erosion to settled areas in the west. It is mainly achieved today by the costly procedure of sand being pumped in front of the beaches and dunes (beach recharge).

4.2 Settlement development

Sylt is probably the spot with the highest number of tourists in the Wadden Sea Area. This has shaped the cultural landscape of Sylt over the last 150 years considerably and still is the major factor. New building activities for tourism can only be implemented in restricted areas now and are to be co-ordinated with tourist relevant aspects like landscape. However large building projects are still in progress, like a major hotel in Rantum. The many golf courses have also caused large-scale changes to the landscape. A zoo in Tinnum, an aquarium in Westerland and a planned marine leisure park are designed to attract younger visitors and families.

The continuing spread of settlement is curbed by spatial planning. However, the settlement pressure is very high, which has resulted in new development areas solely for inhabitants of the island in order to provide real estate at affordable prices. Plans for new areas are under way. Spatial planning requires the preservation of the remaining free space between the villages around Westerland, which would otherwise merge with one another. The rural area on the Nösse peninsular in the east is supposed to be kept loosely settled with fields and pastures in-between. The construction of large scale shops and malls is restricted.

The German defence forces are shutting down their facilities on the island, leaving barracks and training areas for other uses. Some of the facilities have been taken down already, while others are being re-modelled, e.g. barracks in Hörnum are to be replaced by a new golf course.

4.3 Industry and energy

Wind power generators and a production industry do not exist on the island. A development area beside the airport is especially designated for the relocation of local enterprises which interfere negatively with their surroundings. Other large facilities belong to the German defence forces.

4.4 Infrastructure

The island has a dense network of roads. Access to the island is largely by train, with a car-transporter, therefore the train connection from Sylt to Hamburg via Niebüll is essential for the connection to the main land. A car ferry still crosses from List to **Rømø**. The airport occupies a large area on the western moraines, this keeps them free from buildings but has caused the alteration of a large expanse of former heath land. Air traffic is likely to increase, especially as a new hotel of a major travel company is likely to receive its guests via plane. The increase in cars poses a great burden to the island, as many visitors bring their vehicles. Therefore, improvements to the public transport is strongly recommended by spatial planning. Train traffic is, however, already on a high level and increasing due to a growing number of commuters from the Wiedingharde on the mainland. Commuting is also restricted by the single-way track.

5. Legal and spatial planning aspects

The Wadden Sea area around the island is part of the Wadden Sea national park of Schleswig-Holstein. The major part of the mud flats is archaeological protection area. The island is a focus region for tourism with several spas. The landscape framework plan considers several villages, like Keitum, Alt-Westerland or Archsum, as well as the farmhouses of Uthlande style with dry stone walls and some churches, as cultural landscapes of special importance. The island is valued as area of high suitability for recreation. A nature experience area is proposed for the meadows south of Westerland. The island boasts of some 10 nature reserves, RAMSAR and Natura 2000 areas, like Nord-Sylt, Braruper Heide or Morsum Kliff, some of which are subject to enlargement, and several new sanctuaries. The areas of Sylt-Ost and Westerland-Kampen are suitable as landscape protection areas.

6. Vulnerabilities

6.1 Spatial planning

Despite the fact that cultural heritage and landscape assets are rated as very important in the regional development plans, a failure to integrate these factors into practical implementation can lead to a deterioration of the historic landscape and its associated elements.

6.2 Settlement

Settlement pressure on the island is high and new developments such as the construction of affordable housing for local inhabitants can threaten the remaining cultural heritage.

6.3 Management of the cultural heritage

Few areas of historic landscape and individual historic landscape features and only a small number of prehistoric monuments have survived on the island.

6.4 Nature conservation

The establishment of new forest plantations could result in damage to the cultural heritage and a negative impact on the historic landscape of the island if current proposals for planting are agreed. The proposed enlargement of existing nature reserves and the creation of new wildlife sanctuaries could result in damage to the cultural heritage and historic landscape.

6.5 Tourism

Tourism related large-scale building projects such as the hotel in Rantum and a planned marine leisure park have the potential to impact negatively on buried archaeological remains and the wider historic landscape.

6.6 Infrastructure

Large scale construction projects affecting the island's infrastructure have all led to a complete transformation of the appearance of Sylt. There is already heavy car use on the island and improvements to its transport infrastructure, especially the airport and roads, could threaten the remaining cultural heritage.

7. Potentials

7.1 Spatial Planning

Further integration of the cultural heritage into tourist concepts and spatial plans can help strengthen the islands unique selling points and help develop sustainable tourism, especially in the health sector.

7.2 Management of the Cultural Heritage

Sylt has a high rate of remaining prehistoric monuments under protection and several of the earthworks and other historic features, such as the circular ramparts of Tinnumberg and the island's Romanesque churches, are highly visible in the landscape.

7.3 Nature conservation

The island has a large number of nature reserves and special geological features, and there are plans to create more. These provide the opportunity to integrate nature conservation management with the cultural heritage in order to derive enhancement and positive management of both.

7.4 Tourism

The island has a healthy economy, based on its status as the number one tourist destination in the Wadden Sea Area, with a large number of high income inhabitants. The islands heritage could be further exploited for tourism and amenity use by the island's residents and could be used to offer an additional dimension to the attractiveness of the island for its health facilities and recreational tourism. The economic benefits derived from the tourism industry could be used to manage and enhance surviving elements of the cultural heritage.

7.5 Infrastructure

Closure of the German defence forces facilities on the island provides the opportunity to absorb development which would otherwise impact negatively on the islands remaining cultural heritage.

7.6 Natural processes

Wind erosion of the sand dunes sometimes reveals the remains of settlements dating from the Early Stone Age up to the Early Middle Ages, providing opportunities for the discovery, recording and understanding of the geest island's history of occupation.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.) 2002. Landschaftsrahmenplan für den Planungsraum V. Kiel.

Kunz, Panten. Die Köge Nordfrieslands (Bredstedt 1997)

Bantelmann, A, et. al. (ed.). Das große Nordfrieslandbuch (Bredstedt 2000)

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart. Wedemeyer, Kleine Geschichte der Insel Sylt (Essen 1993)

Bantelmann, Landschaft und Besiedlung Nordfrieslands in vorgeschichtlicher Zeit (Husum 1992)

Beseler, Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Braun, Strehl (eds.), Langhaus und Winkelbau. Uthlandfriesische Bauformen im 18. und 19. Jahrhundert (Bredstedt 1989)

Vogel, Der nordfriesische Geestrand, die Entwicklung seiner ländlichen Siedlungen und ihrer Flurformen (Bräist/Bredstedt 1996)

Fohrbeck, Schikotanz. Die Region „Uthlande“ Ein Regionales Entwicklungskonzept (unpublished)

Fahrenkrug et. al. Regionales Entwicklungskonzept Nordfriesland (unpublished, 2003)

Sylt-Lexikon

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Map of H. du Plat of 1804/05

Map of J. Mejer, 1648

Map of J Meier, 1648, Reconstruction of Sylt in 1240

Wiedingharde, SH

1. Overview

Name:	Wiedingharde
Delimitation:	Encompassed by the Karrharde on the Pleistocene Geest around Humtrup and Uphusum in the east, the marshland area of the Bökingharde in the south and the Wadden Sea with the island of Sylt in the west
Size:	Ca. 13 km from south to north, ca. 15 km from east to west
Location – map:	Sited at the northernmost tip of the marshland area of North Frisia, bordering the Danish Tönder marsh, Schleswig-Holstein, Germany
Origin of name:	The name is derived from Widhing, the inhabitants along the Widau River, and has been in use since the 17 th century when it replaced the former denomination of Horsbüllsharde
Relationship/similarities with other cultural entities:	Single farm mounds and village mounds like Pellworm, Dithmarschen; rows of mounds like Föhr, Nordstrand; modern, geometrical planned polders like Bökingharde, Nordergosharde, Süderdithmarschen; medieval dikes; nature reserve polder like Bökingharde; Nordergosharde, Südergosharde, Nordstrand, Dithmarschen; farm buildings like other entities of North Frisia
Characteristic elements and ensembles:	Early medieval, dispersed farm and village mounds; elongated village mounds; parts of medieval dikes; rows of mounds; dikes built up in early modern time; churches with detached belfry; large Uthlande style farmhouses of that time; ponds and other water bodies and vestiges from dike breeches

2. Geology and geography

2.1 General

The marshland area has developed due to the repeated erosion of Saale Ice Age deposits, the latter form a stable core under the Wiedingharder Alter Koog, and subsequent sedimentation by the advancing sea since the end of the last glacial period. The sea has generated bog and higher marsh areas, which are repeatedly flooded and intersected by tidal inlets. A high moraine core is missing below the Gotteskoog polder, where the ground level had never reached the height of the neighbouring, elevated salt marshes. A sand barrier in the west of the Wadden Sea area of North Frisia kept maritime influence at bay until the high Middle Ages when the North Sea broke the barriers, advancing far inland. The lower marshes of the modern Gotteskoog polder in particular were inundated, whilst the higher western parts of the Wiedingharde became a marsh island, comparable to modern Pellworm.

2.2 Present landscape

The present landscape consists of two major parts; the old marshland polder of the Wiedingharder Alter Koog together with the modern polders in the west separated the low marsh and bog area of the Gotteskoog from the Wadden Sea and inhibited a similar growth of high marshland there. The marshes of Wiedingharde are about 1m above sea level in the west and up to 2m below high tide level in the low Gotteskoog area. They have very little relief and are structured by sinuous roads along the courses of, or on top of, old dikes and irregular drainage canals in the west. The railway line to Sylt with a parallel road traverses

the cultural entity from south-east to north-west. Roads, drainage canals and fields are more rectilinear and large-scale in the south-east and have a totally straight and planned appearance in the far western polder. Fields in the old polders in the west are irregular, small scale enclosures, intersected by sinuous ditches. The marshland is mostly used as pasture and, to a lesser degree, for arable farming. Areas in the centre and in the north of the Gotteskoog and parts of the north-western polder are permanently covered by water. Settlements are arranged in rows in the centre and east of Wiedingharder Alter Koog, sometimes on old sea walls, whereas farm mounds are dispersed in the east. These are supplemented by modern farmsteads in detached location along roads, a settlement pattern that also appears in the western polder. Modern residential areas have spread notably into the marshland around Neuenkirchen and Klanxbüll. Some trees have been planted around farms and within villages as windbreaks. Small forests are situated in the Gotteskoog. Houses are usually one to two storeys high and are often built in traditional style. Large detached historic farmsteads in a square arrangement are landmarks in the west. Taller constructions are limited to some churches, granaries and wind turbines in the south and along the western dike of the old polder.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The earliest settlement in Mesolithic times was probably solely located on the moraines, only a few traces of that time can be found in the marshland, such as flint tools from near Bosbül. Remains of settlements on level ground from the Migration Period, as in Toftum and Horsbüll, have also been excavated on the old marshland area of the Alte Wiedingharder Koog, demonstrating that it is amongst the oldest surviving marshland in Schleswig-Holstein. During the early Middle Ages Frisians immigrated into the area of modern Northern Frisia. Reflecting the increasing threat of storm floods, the earliest farms and villages, like Klanxbüll, Großbombüll and Nordhörn, were built on elevated mounds at the western coast from the 10th century on. To this Hallig-like landscape, elongated, east-west orientated mounds like Oldorf were added in the hinterland at a next stage. In late medieval times settlements were then more systematically arranged in long lines of mounds as in Rodenäs. Some villages had probably been connected by low ring dikes from an early stage, of which the so-called Schneedeich near Rodenäs or an old dike line connecting northern and southern Hesbüll, could be remnants. This structure of early settlement is still mirrored today by block fields around the earliest village mounds and long, parallel strips of land adjoining the linear settlements and usually separated from other villages' land by low embankments for water regulation, called Sietwenden. The aforementioned Schneedeich probably served this purpose at a later stage. While the oldest known attempt to embank and in consequence connect this marshland area with the main land is known from the 14th century, the construction of a dike surrounding the Horsbüllsharde was only successful in 1465. This first dike line, known as Golden Ring, is still visible and partially extant. Former mound villages like those of Emmelsbüll or Rodenäs were integrated into the embankment. The oldest churches of Romanesque style like those of Aventoft and Neukirchen are known from the 13th century; these are often associated with a separate, later belfry as at Rodenäs.

3.2 Early Modern Times

East of this new polder the land was boggy and swampy and under the constant influence of the sea. In order to finally connect the new island of Horsbüllsharde to the mainland, the embankment of this area was achieved in the 16th century by the construction of two dike lines in the north and south. The resulting Gotteskoog polder was shared by Wiedingharde, Bökingharde and Karrharde, the three administration units involved, but was, because of its low and wet ground, for the main part unsuitable for agriculture. Frequent dike breeches in the following centuries and the draining waters from the surrounding areas led to extended inundations for much of the year. The sparse settlement in this area was only possible on high dwelling mounds, giving those farms a Hallig-like appearance, as places like Großhallig

or Hattersbüllhallig still demonstrate. The numerous disastrous floods left their marks in the form of ponds from dike breeches, like the one near Norderhof at the Gotteskoogdeich or like the Hülltofter Tief. The whole parish of Rickelsbüll west of the old polder even drowned in the waves of 1615. Repeated endeavours to drain the inland water of the Gotteskoog failed but left the large draining ditches of Rollwagenzug and Gräslandzug of the 17th century and Neuer Sielzug and Gotteskoogstrom as reminders of the attempt to lead the water around the polder in the 18th century. The first pumping mills were applied in this time, witnessed by names like Westermühlenhaus near the Bundesgaarder See.

The farmsteads were of the Uthlande type, elongated brick-built houses with thatched hip roofs, usually east-west orientated with the entrance at the side. Buildings of the Geesthardenhaus type, originating from the higher Geest, are rarer. These were originally used as stock-breeding barns, extensions were added to the original structure with the increasing arable cultivation of the land for farming resulting in three- to four-sided buildings with internal courtyards and five- or seven-shaped, angular structures, visible today in places like Charlottenhof. Farm buildings were either closely built due to the little space on dwelling mounds or arranged in parallel estates on either side of the roads. Types like the Haubarg are absent in this area as modern Frisian immigration, like in Eiderstedt or Dithmarschen, has not taken place on a large scale.

3.3 Modern Times

The area became isolated from its former administrative centre Tondern in Denmark after the First World War, when the Wiedingharde voted to remain within the Deutsches Reich, whereas the areas in the north chose to belong to Denmark. This promoted the improvement of traffic infrastructure to Niebüll and massive development programs for the Gotteskoog. During the 20th century the drainage situation in the Gotteskoog polder changed dramatically with the introduction of engine powered pumps. From the 1930s onwards pumping stations like Schöpfwerk Verlath, built in 1933 and out of use since 1977, lowered the water level considerably and prepared, in connection with measurements for soil improvement, the land for agricultural use. During the Nazi period the first roads were built and new farms founded. However, only the vast interventions in connection with the Programm Nord since the 1960s have given the Gotteskoog the modern appearance of a farmland area with straight roads and a few planned farmsteads. These have left little visual reminder of a past of almost constant inundation and the subsistence on small scale animal breeding and reed cutting. Only small parts of the former lakes of Gotteskoog, Aventoft and Ruttebüll have survived, re-naturalized since the 1980s in order to retain at least part of the former landscape. The Programm Nord and modern industrialised agriculture have also changed the appearance of the traditionally small scale fields and pastures into larger, uniform looking structures, now usually intensively cultivated in comparison to former extensive life stock breeding. The difference can be measured with a look across the border onto the Danish Tönder marsh, which has retained its historic appearance to a much greater extent.

In 1927 the railway line to the Hindenburgdamm was constructed from Niebüll to Sylt, this cut right through the Wiedingharde and connected it eventually to the modern transport network. In the 1930s the famous local painter Emil Nolde built his home on a dwelling mound in Seebüll, which has later become a highly frequented museum. A few small polders, like the Alte Friedrichenkoog, now in Denmark, were added after the Gotteskoog polder, when in 1954 a new, large polder was embanked in the west due to accretions of marsh land along the Hindenburgdamm. This so-called Friedrich-Wilhelm-Lübcke-Koog reflects the planned structures of the Programm Nord in its uniform appearance of fields and farm houses, the latter being designed in a competition. The new land was equally divided between locals and war-immigrants from the former German eastern provinces and is still intensively used for farming. The last polder to be built was the Rückelsbüller Koog in 1982 together with the Danish Margarethenkoog north of the Hindenburgdamm as coastal protection measurement, solely used as nature and bird sanctuary.

4. Modern development and planning

4.1 Land use

The Programm Nord and modern industrialised agriculture have changed the appearance of the traditionally small scale fields and pastures into larger, uniform-looking fields, now usually intensively cultivated in comparison to former extensive stock-breeding. The difference can be measured with a look across the border onto the Danish Tönder marsh, which has retained its historic appearance to a much larger extent. However, soil quality is rather poor in comparison to other marshland areas. A degree of restoration of the former wetland aspect in the Gotteskoog has taken place since the 1980s. One project aims to restore parts of the historic wetland landscape, mostly by contract-based nature protection and co-operation with organisations for water regulation. Forests, which are uncharacteristic in the area, were planted on the Kopshallig in the Gotteskoog Lake and near Aventoft. Some municipalities like Niebüll and Klanxbüll plan for forested areas of different sizes in the marshland close to the villages. These are not meant to be windbreaks, unlike earlier trees planted in the marshes.

4.2 Settlement development

Some settlements, like Neukirchen or Klanxbüll have spread far beyond their original confines due to the demand for new houses by the inhabitants and for second homes by tourists owing to the boom in prices for estates on Sylt.

4.3 Industry and energy

Wind turbines have been erected during recent decades, especially in the Friedrich-Wilhelm-Lübcke-Koog and near Bosbüll. The areas around Emmelsbüll and Klanxbüll are designated as future areas for wind power generators while the land north of the railroad track is protected against the construction of wind power generators. However, local planning is applying for new wind turbines in the north-eastern corner of the Gotteskoog. A mussel de-sanding facility at Emmersbüll is the largest facility of its kind in the region.

4.4 Infrastructure

The area has a network of roads mostly based on historic routes and connections between settlements and often built on top of former sea walls. Most roads in the Gotteskoog are modern. The railway track to Sylt crosses the area, connecting Klanxbüll to Westerland.

5. Legal and spatial planning aspects

The northern parts of the former Gotteskoog area fulfil the requirements for a landscape protection area. The western parts of Alter Wiedingharder Koog are regarded as structurally rich landscape. The area north of the railroad track is recognised as typical landscape for the region. However, no new protection areas are planned in North Frisia. Nature protection aims at further integrating agriculture and promoting extensive stock breeding and contract based nature protection in the old polders, like the area of the former Gotteskoogsee and Ruttebüller See. Furthermore, it aims to improve the number of typical landscape elements and to integrate existing elements into the network of biotopes and protection areas, like Rickelsbüller Koog. The landscape plan supports the integration of historic settlement structures into planning. The tourism concept for North Frisia promotes a sustainable development in this sector. An improvement of landscape related tourism together with riding, cycling and hiking is suggested by landscape planning.

6. Vulnerabilities

6.1 Spatial Planning

Actions resulting from the environmental objectives of the Water Framework Directive leading to a change of artificial waterways into natural water bodies could affect the cultural landscape severely. No new landscape protection areas are planned in North Frisia.

6.2 Settlement

Strong demand for new residential areas and second homes for tourists will increase the demand for real estate and increase the level of landscape change around areas such as Klanxbüll and Neukirchen, which have already been severely affected by the spread of new housing developments. New buildings can also fail to harmonise with historical structures and alter the form of, for instance, the traditional linear settlements along the lines of old dykes.

6.3 Agriculture

Traditional field structures and, in the Gotteskoog, the whole system of subsistence have been substantially altered by re-structuring under the Programm Nord, and unprotected monuments are still subject to being dug away or levelled as a result of agricultural 'improvement'. Old farms buildings are often redundant and overshadowed by numerous and dominant modern agricultural buildings.

6.4 Industry and energy

Proposals to construct new wind turbines in sensitive landscape areas of small-scale historic structures will have a significant visual impact on the historic landscape of the areas as well and have the potential to impact on buried archaeological remains.

6.5 Nature conservation

Proposals to establish further forested areas in the marshland of municipalities such as Niebüll and Klanxbüll have the potential to impact negatively on buried archaeological remains and will have a significant visual impact on the wider, traditionally open landscape. Archaeological remains of settlements in historic marshland areas could be vulnerable to landscape enhancements e.g. reconstruction of water bodies for the purposes of nature conservation.

7. Potentials

7.1 Spatial planning

The landscape plan for the area supports the integration of historic settlement structures into planning and the development of landscape related tourism.

7.2 Settlement

Areas of new development are largely confined to a few, already noticeably altered villages like Klanxbüll and Neukirchen.

7.3 Management of the cultural heritage

As one of the oldest marshland areas in Northern Frisia, the area of Wiedingharder Alter Koog, still strongly reflects the layout of the different stages of medieval settlement and land reclamation. The Gotteskoog polder is an amazing example of the variety of landscape in the Wadden Sea Area as its former inland Hallig landscape is unrivalled. It also underlines, in a most drastic way, the rapid changes modern techniques brought about in the area. The project "Noldes Landschaftsplanung" in connection with the museum and the adjoining Danish municipalities is attempting to reconstruct parts of the historical landscape of the beginning of the 20th century in the Gotteskoog. Co-operation between the area and the bordering Danish area in this respect is increasing.

7.4 Nature conservation

Nature sanctuaries exist on a large scale in the Rickelsbüll polder and in low, unfertile areas of the Gotteskoog polder and further restoration of wetland along the canal Schmale and low lying areas in the Gotteskoog polder are planned. These provide the opportunity to integrate nature conservation management with the cultural heritage in order to derive enhancement and positive management of both.

7.5 Tourism

Wiedingharde is rated as a tourist and recreational area and tourism plays an increasingly important role in the area's income. In addition to the famous Emil-Nolde-Museum in Seebüll, an information centre in Klanxbüll and a small open-air dike museum at Neukirchen are available for visitors' information and as attractions. There is the potential to further exploit the areas cultural heritage for tourism and amenity use by local residents in a sustainable manner. The network of existing roads is mainly based on historic routes and the connections between settlements and there is the potential to enhance this network for riding, cycling and hiking.

7.6 Industry and energy

The northern parts of the entity are relatively unaffected by wind turbines and certain areas are protected against their construction.

8. Sources

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General literature:

- Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.
- Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.
- Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum V. Kiel 2002.
- Kunz, H. & Panten, A. 1997. Die Köge Nordfrieslands. Bredstedt.
- Bantelmann, Landschaft und Besiedlung Nordfrieslands in vorgeschichtlicher Zeit (Husum 1992)
- Bantelmann, A. (ed.) 2000. Das große Nordfrieslandbuch. Bredstedt.
- Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart.
- Beseler, Kunst-Topographie Schleswig-Holstein (Neumünster 1969)
- Braun, Strehl (eds.), Langhaus und Winkelbau. Uthlandfriesische Bauformen im 18. und 19. Jahrhundert (Bredstedt 1989)
- Vogel, Der nordfriesische Geestrand, die Entwicklung seiner ländlichen Siedlungen und ihrer Flurformen (Bräist/Bredstedt 1996)
- Fahrenkrug et. al. Regionales Entwicklungskonzept Nordfriesland (unpublished, 2003)
- Gottburgsen, M., Hassenpflug, W.. Der Gotteskoog (Bad Honnef 1991)
- Segschneider, M. Die Marschen der Insel Föhr und der Wiedingharde, Kreis Nordfriesland. PhD thesis Kiel 2004

Maps:

- Archaeological monument record of Schleswig-Holstein and gis mapping
Lancewad data base and gis maps
Royal Prussian ordnance survey of 1879
Map of H. du Plat of 1804/05

Bökingharde, SH

1. Overview

Name:	Bökingharde
Delimitation:	Mainland marshes encompassed by the Pleistocene Geest around Leck in the east, the marshland area of the Wiedingharde, north of Niebüll and Alter-Christian-Albrechtskoog, in the north, the Nordergosharde with the rivers of Lecker and Soholmer Au in the south, the Wadden Sea with the Hallig islands in the west.
Size:	Ca. 13 km from south to north, ca. 16 km from east to west
Location – map:	Marsh land area south-west of Niebüll, North Frisia, Schleswig-Holstein, Germany
Origin of name:	The name originates in the traditional appellation for the smallest Danish administration units.
Relationship/similarities with other cultural entities:	Former salt marsh islands with dwelling mounds and fieldscape like Hallig islands; early modern dikes; modern, geometric polder like Nordergosharde, Süderdithmarschen; nature reserve polder like Wiedingharde, Nordergosharde, Südergosharde, Nordstrand, Dithmarschen; Farm buildings like other entities of North Frisia, Haubarg style farmhouses like Eiderstedt
Characteristic elements and ensembles:	Detached farm mounds and village mounds with surrounding fieldscape and ring dikes; row of mounds and villages lined up along edge of Risummoor; dike village of Holländerdeich; dikes built up in early modern time; churches with detached belfry, large Uthlande style farmhouses of that time; ponds and other water bodies and vestiges from dike breeches

2. Geology and geography

2.1 General

The marshland area has developed due to repeated erosion of the Ice Age moraines and sands in the area and subsequent deposition by the advancing sea during the Holocene. This has created bog and marsh areas, repeatedly flooded and intersected by tidal inlets. In the north-east, close to the Saale Ice Age moraines of the Geest around Leck, bogs have developed south of Niebüll, on top of an island of remaining moraine debris called Risummoor. The southern and western parts were covered by marshland and bogs. A sand barrier in the west of the Wadden Sea area of North Frisia kept maritime influences at bay until the high Middle Ages, when the North Sea broke down the natural sea walls and advanced far inland. The old marshes came increasingly under threat, tidal inlets formed and the land was eventually washed away during the devastating floods of medieval and early modern times, notably the 1362 flood. Following this, the marsh land in the western half of the cultural entity remained as Hallig islands, pieces of elevated salt marshes, frequently inundated and dispersed across the mud flats of the Bökingharde area.

2.2 Present landscape

The Bökingharde consists of low marshland, barely above high tide level and the slightly more elevated former bog area of Risummoor. The latter is marked by a ring of settlements along its edge with the more urban area of Nibeüll to the north, while the centre remains almost free of settlement. The fieldscape here is of small, rectangular enclosures, often lined by hedges or trees. Villages on Risummoor and at Holländerdeich are lined up along a central road, whereas in the south, small villages and detached farmsteads are located on dwelling mounds, surrounded by roads and dikes, which indicate the former shape of the Hallig islands. Here fields are small, irregular enclosures, arranged around the mound villages or along former tidal creeks. Polders in the north-west are more spacious with rectilinear and large-scale fields and detached farms on low mounds along a central, perpendicular network of roads, whereas the field system in the eastern marshes consists of patches of rectilinear, co-axial fields, irregularly oriented towards sinuous ditches. Trees have been planted around farms and within villages as windbreaks and are more frequent in Risummoor. Taller constructions include the churches, granaries as well as a few wind turbines in the east and around Dagebüll. The marshland in the south is mostly used for grazing, while in the north-west arable agriculture dominates the land use. The marshes are delimited by the embanked rivers of Lecker and Scholmer Au in the south with the adjacent lake of Bottschlotter See. A national road and a railway line as well as a power line traverse the cultural entity in the east. Modern residential areas have spread, notably into the surrounding around Niebüll and, to a smaller extent, in the villages around Risummoor and in Dagebüll. Houses are usually one to two storeys high and often built in traditional style, while buildings in Niebüll can be slightly higher. The large, detached farmsteads are often historic in origin.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Artefacts around Lindholm-Klockries indicate the presence of at least temporary settlements in the Neolithic and Iron Age periods. The area has permanently been occupied by settlers from the 12th century onwards, if not earlier, probably by Frisians from the region or from the modern Netherlands, and Danes. Salt was probably extracted from peat in the area around Dagebüll, where a temporary intrusion of the sea must have caused the development of salt peat along a line leading from Hooge into the Bökingharde. The extension of settlement into the old salt marshes is not known, as this landscape was destroyed by storm surges especially in the 14th century. However, the rising water level probably forced the settlements to retreat to the higher bogs on the glacial moraines of Risummoor, which were then cultivated and turned into agricultural land. Risummoor and some patches of salt marshes, like Fahretoft, remained as islands surrounded by mud flats and tidal inlets. In order to use the adjacent marshland areas for grazing, villages and farmsteads were arranged along the edge of Risummoor. Its delimitation is therefore still marked by villages like Maasbüll, Risum-Lindholm and Klockries, a pattern that is typical for all medieval settlements along the edge of the Geest in the area, going hand in hand with the erection of dwelling mounds, in this case, owing to the comparatively low situation and the increasing water level. The connection of Risummoor to the mainland nearby was achieved again only in the late 15th century with the enclosing of the polders of Klixbüller Koog and Großer Kohldammer Koog. Earlier ring dikes, which protected parts of the island, were combined into a surrounding embankment in the 16th century. The island became the Kornkoog polder after the Gotteskoog dike connected the Horsbüllsharde in the north-west to the mainland. The influence of the sea on the island, which was now impeded, increased substantially as Risummoor was partially incorporated in the dike. In contrast, a number of larger Hallig islands like Dagebüll, Fahretoft and Waygaard existed in the west, between the former island of Horsbüllsharde and the Hallig of Oland, which remained unprotected till the 18th century. Comparable to modern Hallig islands like Hooge and Gröde, people here erected their farms and villages on protective mounds encircled by stretches of salt marshes. Other such Hallig

islands, situated more eastward, can only be derived from names like Hasenhallig or Schäferhallig and from old maps, which show the area, not open as in the modern Wadden Sea with their Hallig islands, but rather as salt marshes frequently intersected by tidal inlets, of which the lake Bottschlotter See is a remnant. The early modern field structure of irregular shaped fields surrounding mounds, oriented along the course of tidal creeks, is still especially well preserved around Fahretoft and Süderwaygaard.

The earliest, surviving buildings are churches dating from the 13th century, like the originally Romanesque building of Deezbüll, extended and refurbished in later times. A Gallows mound can still be seen in Risum-Lindholm. New polders south of Risummoor and the Lecker Au were embanked in the 15th and 16th century, like the Störtewerker Koog, shifting the line of the outer sea walls further west. The neighbouring island of Waygaard was the first of the Hallig islands to be surrounded by a dike.

3.2 Early Modern Times

The beginning of the end of the open Hallig landscape of the Bökingharde came in the 17th century, when a Dutch investor tried to close the dike line between Waygaard and the Wiedingharde with the Holländerdeich, cutting the Hallig island of Fahretoft in two and thereby damming up the deep tidal inlet of the Bottschlotter Tief. The attempt failed and the severe flood of 1634 broke down most of the dikes but parts of the Holländerdeich survived. A new embankment project, connecting Fahretoft and Maasbüll on Risummoor with the so-called Moordeich, finally managed to dam up the tidal inlet, parts of which have remained within the polder as Bottschlotter See. Fahretoft was secured by dikes some years later and in the 18th century Dagebüll was eventually connected to the mainland. Around this date new land was reclaimed from the polders of Kornkoog, Gotteskoog and Wiedingharder Alter Koog in the north-west, which were also in need of further protection by an additional dike line. These new polders, like the Kleiseer Koog and Alter Christian-Albrechts-Koog, were systematically planned, as land reclamation was now financed by private investors or the nobility (Oktroi). The internal fieldscape therefore consists of rectilinear, elongated fields orientated towards farmsteads on low mounds, lined up along central roads. The Alter-Christian-Albrechts-Koog, the oldest of these polders, still retains much of this early modern pattern with less rectilinear field boundaries and many old farmsteads, typically surrounded by ditches for clay extraction (Graften). The fertile new marshland brought wealth to the farmers, which is represented in abundance by large farmsteads of the Uthlande type, usually extended into four-sided farms with inner courtyard, like the Hof Gottesberg situated in the Kleiseer Koog, or angular structures shaped like a five or a seven. The Nahnhof in the Neuer-Christian-Albrechts-Koog is now a hotel. About this time, new settlers from the Netherlands, whose expertise was needed for dike construction, introduced large farm building types as Haubarg, Gulfhaus and Bargscheune built around massive central posts, like the Königsteiner Haubarg, as well as their technically advanced windmills. New, simple, brick-built churches with Baroque interiors replaced the former, small Hallig churches, as at Dagebüll or Fahretoft. The still unprotected island of Galmsbüll had to be eventually abandoned and a new church wasn't raised until the end of the 19th century, further inland, as a representative, neo-gothic building. The reclamation of the Marienkoog in 1798 finished the historic development of the coast line of the Bökingharde, which had turned an open area of mixed and ever changing mud flats, marsh islands and tidal inlets into a part of the mainland marshes.

3.3 Modern Times

Large parts of the early, low lying polders, like Störtewerker Koog, Herrenkoog and Klixbüller Koog were regularly inundated by inland water, although separated from the seasonal influence of the sea. Frequent storm floods during the cold seasons and the silting of the canals outside the dikes prevented proper drainage of the fresh water from the Geest into the North Sea. The course of Soholmer Au River was consequently straightened and embanked with the construction of the Bongsieler Kanal in the 19th century, leaving the meanderings of its old bed as still existing ditches. A large number of polder mills were built to drain the

adjacent land. The Lecker Au was also eventually embanked and led through a straight canal across the Störtewerker Koog. The drainage situation however remained rather poor. Even the usage of the Bottschlotter See as water reservoir at a later stage could not substantially improve the situation until after World War Two.

The village of Niebüll along the rim of the former island of Risummoor already had a central function for the area and further developed into an increasingly urban centre, following its connection to the railway system at the end of the 19th century and even more since the railway dam to the island of Sylt was built in 1927. Only a few buildings of earlier times have remained in Niebüll, like the austere, 18th century Baroque brick church, two portals to the cemetery of around the same time and the vicarage of mid 19th century origin, together with an ensemble of dwelling houses in Deezbüll, a village that is now incorporated into Niebüll.

According to a doctrine during the National Socialist regime, new land had to be gained. Two small polders were therefore reclaimed for the first time in over a hundred years. The Galmsbüllkoog and the Osewoldter Koog display a geometric field system arranged, together with farmsteads in a pseudo traditional style, along a central road. The Hauke-Haien-Koog was mostly embanked for coastal protection reasons as a polder in 1959, and is divided in two parts. The easternmost half is used for agriculture by a few new farms, while the seaward part is a nature sanctuary and reservoir for the inland water. The new harbour of Schlüttsiel on the sea dike of the polder, where the Bongsiel canal flows into the Wadden Sea, serves today as a connection to the Hallig islands and for fishing vessels. The often inundated, low lying inland polders have been drained with increasing success from the 1930s onwards, especially since the Hauke-Haien-Koog was reclaimed. New farmsteads have been built systematically afterwards, like in the Störtewerker Koog, and land could be used for agriculture, which led to a very modern appearance of these old polders. Likewise, the Programm Nord and modern industrialised agriculture have changed the appearance of the traditionally small scale fields and pastures in many parts of the area considerably since the 1960's into larger, more uniform structures. Ditches were either straightened or filled up as modern, intensive cultivation required larger and more rectilinear fields. Many farms, which now had to cater for their larger estates, were in further need of additional farm buildings, leading to ensembles of modern barns and stalls, dwarfing and hiding the older buildings. Other farms were abandoned or turned into apartments for tourists. This development is still in progress.

Industrial estates and new housing areas have spread the town area of Niebüll outwards in recent decades, for example into the Gotteskoog. Many new houses have also been built in Dagebüll, the major port to the islands. Together with the international ferry port, this has increasingly obscured its origin as a Hallig Island.

4. Modern development and planning

4.1 Land use

The Programm Nord and modern, industrialised agriculture have changed the appearance of the traditionally small-scale fields in many parts of the area considerably, into larger, uniform looking structures with less and straighter ditches since the 1960s. Some farms have added extra agricultural buildings in order to cater for their larger estates, leading to ensembles of modern barns and stalls, dwarfing and hiding older buildings, while others were abandoned or turned into apartments for tourists. The western part of Hauke-Haien-Koog is a nature sanctuary and reservoir for the inland water.

4.2 Settlement development

The industrial estates and new housing areas have increased the town area of Niebüll extensively. New residential areas have also been built in Dagebüll, which is now a focal area for tourism. The whole of the entity of Bökingharde is rated as a tourist and recreational area. The realisation of the regional plan therefore restricts further planning for tourism related buildings and infrastructure. Developing areas around Niebüll as a centre of regional

development are likely to increase further in the near future. However, the population of the area is expected to decrease in the long term.

4.3 Industry and energy

Wind turbines have been erected during the last decades, mostly in polders of early modern or modern origin. These areas are still designated as suitable for wind turbines, whereas the Hauke-Haien-Koog, Langenhorner Koog and Störtewerker Koog as well as the lowland along the Soholmer Au River are to be kept free from wind power systems.

4.4 Infrastructure

Roads are mostly based on historic routeways and connections between settlements and are often built on top of former sea walls. The harbour of Dagebüll is the major port to the moraine islands. A narrow gauge railway connects the Hallig islands of Langeness and Oland to Dagebüll, but can only be used during low tide.

5. Legal and spatial planning aspects

The whole cultural entity is a planning area with special interest for tourism and recreation. Parts of the landscape are recognized as characteristic and typical for the area, like the polders of Störtewerker and Langenhorner Koog as well as the flood plains along the Soholmer Au. The Hauke-Haien-Koog, marshes around Fahretoft, Langehorn and the Bottschlotter See fulfil requirements for nature protection areas. The area around Fahretoft, Langehorn and Ockholm is suitable for landscape protection. The town of Niebüll is already a focus area for monument protection. Several ponds caused by dike breeches are listed as geologically important. However, no new protection areas are planned to be implemented in North Frisia. Nature protection rather aims at further integrating agriculture and promoting extensive stock breeding and contract based nature protection, as has been done in the Hauke-Haien-Koog. Furthermore, it is proposed to raise the number of so-called typical landscape elements and to integrate the existing elements into the network of biotopes and protection areas, as in the Bottschlotter Tief. The landscape plan supports the integration of historic settlement structures into planning. The tourism concept for North Frisia promotes a sustainable development in this sector. An improvement of landscape related tourism together with riding, cycling and hiking is suggested by landscape planning.

6. Vulnerabilities

6.1 Settlement

Industrial estates and new housing areas will continue to increase the level of landscape change around areas such as Niebüll and Dagebüll. New buildings and modern extensions can also fail to harmonise with historical structures and alter the form of, for instance, the traditional ring of settlements around Risummoor and along the Holländerdeich.

6.2 Agriculture

Agriculture is economically still very strong, as is common for the area, with a focus on dairy products and cultivation for feed stuffs. The farms are of fairly large size with no specialisation, which would be advantageous for the historically small-scale field structure. Further plans for consolidation of farming, especially new agrarian roads and enlargement of fields, could affect the landscape character in a negative way. Many farms have collections of large, modern agricultural buildings which hide the traditional older buildings.

6.3 Nature conservation

The creation of a nature-related habitat by TEN (Transnational Ecological Network) could alienate structures from their original, artificial character.

6.4 Tourism

As the train gateway to Sylt, Niebüll suffers from seasonal car traffic predominantly caused by short-term visitors to the island.

6.5 Infrastructure

The harbour of Dagebüll has turned into a ferry port with expansive parking areas and up-to-date facilities and buildings. These have no relation to the traditional harbour structure and, in combination with the modern residential areas, increasingly hide Dagebüll's origin as a Hallig island.

7. Potentials

7.1 Settlement

With the exception of Niebüll, the original settlement structure is largely intact and the landscape plan for the area supports the integration of historic settlement structures into planning and the development of landscape related tourism.

7.2 Tourism

The area is especially suited for cycling. Long term recreational tourism and especially landscape related offers for tourists could be strengthened by the integration of cultural landscape assets, taking into account the unique situation of numerous former Hallig islands being integrated into the mainland marshes. More traditional farmsteads, not used for their original purpose, could be utilised as tourist and recreational facilities.

7.3 Nature conservation

The creation and enhancement of nature reserves and characteristic landscape elements provide the opportunity to integrate nature conservation management with the cultural heritage in order to derive enhancement and positive management of both.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum V. Kiel 2002.

Kunz, H. & Panten, A. 1997. Die Köge Nordfrieslands. Bredstedt.

Bantelmann, Landschaft und Besiedlung Nordfrieslands in vorgeschichtlicher Zeit (Husum 1992)

Bantelmann, A. (ed.) 2000. Das große Nordfrieslandbuch. Bredstedt.

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart.

Beseler, Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Braun, Strehl (eds.), Langhaus und Winkelbau. Uthlandfriesische Bauformen im 18. und 19. Jahrhundert (Bredstedt 1989)

Vogel, Der nordfriesische Geestrand, die Entwicklung seiner ländlichen Siedlungen und ihrer Flurformen (Bräist/Bredstedt 1996)

Fahrenkrug et. al. Regionales Entwicklungskonzept Nordfriesland (unpublished, 2003)

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Map of H. du Plat of 1804/05

Nordergosharde, SH

1. Overview

Name:	Nordergosharde
Delimitation:	The marshland area of the Nordergosharde is situated between the rivers of Soholmer Au in the North and Arlau in the south, running along the Geest of the Bedstedt bight in a narrow strip. Entities of Bökingharde in the north, Südergosharde in the south, Halligen in the west
Size:	Strip of marsh land parallel to coast, ca. 13 km wide at its widest and about 4 km at its narrowest part, about 16 km long, ca. 13km from south to north, ca. 16 km from east to west
Location – map:	Marsh land area west and north-west of Bredstedt, North Frisia, Schleswig-Holstein, Germany
Origin of name:	The name originates in the traditional appellation for the smallest Danish administration units.
Relationship/similarities with other cultural entities:	Former salt marsh islands with dwelling mounds and fieldscape like Hallig islands and Bökingharde; early modern dikes; modern, geometric polder like Bökingharde, Nordergosharde; Süderdithmarschen, nature reserve polder like Wiedingharde, Südergosharde, Nordstrand, Dithmarschen; farm buildings like other entities of North Frisia
Characteristic elements and ensembles:	Detached farm mounds and village mounds with surrounding fieldscape and ring dikes; church with detached belfry; large Uthlande style farmhouses; ponds and other water bodies and vestiges from dike breeches; characteristically designed farmsteads of Sönke-Nissen-Koog

2. Geology and geography

2.1 General

The marshland area has developed since the end of the last Ice Age due to the repeated erosion of Ice Age moraines and sand in the area and subsequent sedimentation by the advancing sea during the Holocene. This created bog and marsh areas, which were repeatedly flooded and intersected by tidal inlets. Most of it was lost during the late Middle Ages, a time of increasing influence by the open sea. The old marshes were eroded, tidal inlets formed and the land was eventually submerged and washed away during devastating floods, notably the one in 1362. What was left were pieces of elevated salt marshes, the Hallig islands, which were frequently inundated and dispersed across the mud flats of the north-western Nordergosharde area, and a very narrow strip of marshland just in front of the higher grounds of the Geest of Bredstedt.

2.2 Present landscape

The Nordergosharde consists of low marshland barely above high tide level. The northern part of the cultural entity contains older remains of marshland as well as low, wet land along the rivers, while the southern part is narrower in its east-west extension and of newly embanked, high and fertile marshland. It is among the latest and least extensive land in the whole of the Wadden Sea coast of Schleswig-Holstein. Hamlets and detached farmsteads in the north-west of the entity are located on dwelling mounds, surrounded by roads and dikes, which indicate the former shape of the Hallig islands. The fields comprise small and irregular

enclosures, arranged around the mound villages or along former tidal inlets. The polders in the rest of the area are spacious, with rectilinear and large-scale fields and detached farms on low mounds along a central, perpendicular network of roads, whereas the field system in the north-eastern and eastern marshes consists of patches of rectilinear, co-axial fields, oriented towards the linear village of Langenhorn or towards the rim of the Geest. Trees are only planted around farms and within villages as windbreaks. Tall constructions comprise numerous wind power generators in the modern polders of Reußenköge. The marshland in the north is used for grazing and farming, while in the south farming dominates the land use. Houses are usually one to two storeys high and often built in traditional style or are large, detached farmsteads in the modern polders.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The earliest settlement, as usual, took place on the Geest in the Neolithic Stone Age, whilst the surviving villages along the edge of the high ground were founded in the Middle Ages. During this early time most of the forest on the Geest was already cleared, and agriculture led to soil depletion and the development of widespread heathland areas. The extension of settlement in the old salt marshes during early and high medieval times is unknown as this landscape was destroyed by storm surges, especially in the 14th century. After the destruction of the old marshland in front of the coast in 1362, the Wadden Sea almost reached up to the villages on the edge of the Geest, which, just behind the village of Breklum, rises up to 44m. The narrow belt of old marshland, that remained, was used again by the villages for extensive grazing. This old marshland area, which has never been occupied by farms, and the low marshes which reached more inland along the banks of the Soholmer and Lecker Au, was embanked by the three adjacent villages of Bordelum, Breklum and Bredstedt and by Langenhorn in the 15th century. The area of the Langenhorner Alter Koog could only be poorly drained and used to be inundated for long periods of the year. The site of an old farm, protected by low ramparts, at Wester-Bordelum, is a remnant of a medieval settlement at the very verge of the Geest which was called "Fru Mettjens Hof", after which the later Frau-Metten-Koog was named.

The marshland around the dwelling mounds of Ockholm kept its appearance as Hallig island until it was eventually reclaimed and connected to the mainland in 1515. The old mounds, which are unique in the Nordergosharde, still exist, as do parts of the old sea dikes and most of the medieval irregular and small fields, which were solely used for grazing. The Baroque brick-church was built as simply as all the churches on Hallig islands with a detached bell frame. It was allegedly the third that had to be built at Ockholm after the catastrophic floods of 1362 and 1634. There are large ponds, as a result of dike breaches caused by those floods, along the southern dike.

3.2 Early Modern Times

The closing of the dike line between the polders at Bredstedt and the Langenhorner Alter Koog in the 16th century was made impossible for a long time due to frequent severe storm floods and was only achieved in the late 17th century. The shifting of the dike line further west, which was supposed to dam a large tidal inlet threatening the old embankments, was ventured gradually in the 18th century. The first polders were imposed by the Danish king and financed by rich private investors, who in return gained many privileges concerning the use of the new land and tax relief for a period. These new polders were only reclaimed after the marshland had accumulated considerably in height, resulting in extremely fertile soil. This new land was protected by dikes designed, in accordance with new designs from the Netherlands, with very moderate slopes. The fertile marshes were usually sold to local farmers, here important differences could be observed regarding farming practices. Whilst the people in the Luise-Reußen-Koog suffered from bad harvests and were compelled to sell their land, the farmers in the Sophien-Magdalenen-Koog and Desmerciereskoog switched

from arable cultivation to ox breeding and then, in modern times, back to arable, following the markets and turning to the most profitable trend. Only a few farmsteads were erected along central roads with large, rectangular adjacent fields. The farmsteads in the wealthier polders were usually large and representative and made of brick with slated roofs, often surrounded by ditches, like the impressive Müllerhaus in the Desmerciereskoog, a farm of the Geesthardenhaus type from the late 18th century but with a thatched roof. One farmstead in Luise-Reußen-Koog was more oriented towards the traditional Uthlande style houses, also brick built, but supported by an internal timber structure. Farmsteads in the Reußenkoog were especially scarce as the relatively small-scale fields were cultivated by farmers based on the Geest. The Bredstedter Werk, the reclamation of the Bredstedt Bight, started with the Sophien-Magdalenen-Koog in 1741 and was successfully finished in 1799 with the Luise-Reussen-Koog. The join between the modern, smoothly-sloped dike and the medieval, more vertical dike in the southern part of the Desmerciereskoog allegedly inspired the famous local writer Theodor Storm to write his novel about dike construction and storm flood "Der Schimmelreiter". The consolidation of farming in the end of the 18th century divided the common marsh land along the edge of the Geest into long and narrow strips of fields, perpendicularly oriented towards the Geest.

3.3 Modern Times

The drainage situation in the low northern polders south of the Soholmer Au improved when the canal of Bongsiel was built in the 19th century. This provided Ockholm with the still extant harbour of Bongsiel, used for trade and fishery till 1959, when the canal was led through the new Hauke-Haien-Koog further north. Remains of the old course of the Soholmer Au can still be traced as meandering ditches in the Neuer-Störtewerker-Koog. A dam connected the tiny Hallig-island of Hamburger Hallig from 1826 onwards, after a first attempt was destroyed in the disastrous flood of 1825. The now quickly accumulating marshland along the dam fostered the construction of the first new polder after more than a hundred years. The heathland on the Geest was only cultivated again in the late 19th and in the 20th century with the use of fertilising marl of Pleistocene origin in the area, as the marl pits near Dörpum indicate. New forests were also planted from this time on. The salt marshes in front of the sea walls were used for grazing cattle, which were supplied by fresh water from embanked pools, as in the Cecilienkoog, in order to protect them from the sea water. In 1905, the government of the then recently constituted Schleswig-Holstein, began the embankment of the Cecilienkoog north of the polders of Hattstetter Marsch and the land was soon bought by farmers from Dithmarschen in the south.

In the early 1920s Sönke Nissen, an inhabitant of the region who had made his fortune with diamonds in Africa, invested parts of it into a new, large polder, which had not only the systematical structure of the other polders, but also an encompassing architectural conception for all of its farmsteads. These are unique in their open concept of arrangement, whilst still retaining a distinctive style of traditional elements and modern aspects, like green tin roofs, derived from south-west African colonial style. The land use has switched in the course of time from animal breeding to arable agriculture.

The greatest change for centuries was brought about by the Programm Nord, in order to strengthen the agrarian subsistence and improve the quality of rural life, infrastructure and drainage situation as well as the coastal protection. New roads were constructed where accessibility had always been a problem and agriculture became eventually possible in the low lying, wet marsh areas around the Soholmer Au due to the improved draining of the inland water. Despite the impact of the program, in the Ockholmer Koog the old, irregular block structure of the early fields around the former Hallig-mounds are still visible, as are the courses of ancient, meandering tidal inlets. Only two new and small development areas have been added at Süderdeichsweg and few farmsteads have moved to more spacious areas in the east of the polder or to the new polder of Hauke-Haien-Koog. The town of Bredstedt on the Geest has developed into a regional centre and started to sprawl into the marshland with a large new development area west of the historical centre. The controversial polder of

Beltringharder Koog strengthened the existing connection between the island of Nordstrand and the mainland in the 1980s. This enormous area serves, besides its main purpose of coastal protection, solely as a water reservoir and nature sanctuary. Since the 1990s wind power generators have become common in most of the polders of Nordergosharde, forming a distinct element on the flat and almost treeless landscape, leading to an additional means of income for the local farmers.

4. Modern development and planning

4.1 Land use

The agriculture is mostly based on intensive cultivation and stock breeding in the Reußenköge and the eastern part of Hauke-Haien-Koog, while the northern marshland of Nordergosharde is predominantly used for grazing, due to its inferior soil quality. Many farms have added modern farm buildings to their historic farmsteads. The western part of Hauke-Haien-Koog and Beltringharder Koog are nature sanctuaries and reservoirs for the inland water. The salt marshes in front of the outer sea walls with the island of Hamburger Hallig belong to the Wadden Sea National Park. Smaller nature protection areas are located in Bredstedter Koog and along the Soholmer Au.

4.2 Settlement development

The settlements consist mostly of single farmsteads in the south and single farms and hamlets on mounds in the north. The town of Bredstedt on the Geest outside the area of the entity has developed into a regional centre and sprawled into the marshland with a large residential area west of the historical centre. The edge of the Geest is now regarded as limit for further development. Only two small residential areas have been added at Süderdeichsweg in Ockholmer Koog and a few farmsteads have moved to more spacious areas in the east of the polder or to the new polder of Hauke-Haien-Koog. The whole of the entity of Nordergosharde is rated as tourist and recreational area. Centring on the nature experience area of Stollberg north of Bredstedt, a variety of cycling tracks with information on cultural landscape and nature have been implemented throughout the entity.

4.3 Industry and energy

Wind turbines are concentrated in the early modern and modern polders of Reußenköge. The northern marshes south of the Soholmer Au are free of such systems. Most of the turbines of the first generation have now been substituted by larger 2 MW systems. Solar panels have been introduced in the Reußenköge as well. Many farms are fitted with panels on their roofs, which has caused a conflict with monument protection at Sönke-Nissen-Koog. A solar panel field was implemented recently.

4.4 Infrastructure

The roads are mostly based on historic routes and connections between settlements and are sometimes built on top of former sea walls in the north. The modern harbour of Schlüttsiel in Hauke-Haien-Koog is the main connection to the Hallig islands. A private road connects the Hamburger Hallig to the mainland. The Hallig island of Nordstrandischmoor is connected via a narrow gauge railway to Cecilienkoog.

5. Legal and spatial planning aspects

The area of the Hauke-Haien-Koog, Langenhorner and Störtewerker-Koog, as well as the marshes around the river Soholmer Au are recognised by spatial planning as especially characteristic landscapes. The vicinity of Ockholm, Fahretoft and Langenhorn holds the prerequisites for a nature protection area, whereas the polder of Beltringharder Koog is an international nature sanctuary according to RAMSAR. Agricultural production is especially diversified. The Hauke-Haien-Koog and marshes around Ockholm fulfil requirements for

nature protection areas. The marshes around Fahretoft, Langenhorn and Ockholm are suitable for landscape protection. However, no new protection areas are planned to be implemented in North Frisia. Instead, nature protection aims to further integrate agriculture and promote extensive stock breeding and contract based nature protection, as it is done in the Hauke-Haien-Koog. Furthermore, it is suggested to increase the number of so-called typical landscape elements and to integrate existing elements into the network of biotopes and protection areas. The landscape plan supports the integration of historic settlement structures into planning. The tourism concept for North Frisia promotes a sustainable development in this sector. An improvement of landscape related tourism together with riding, cycling and hiking is suggested by landscape planning.

6. Vulnerabilities

6.1 Settlement

Many of the old buildings, dating back to the embankment of the older polders, have been substituted by modern structures, historic farmsteads have been altered by the addition of modern agricultural buildings and urban sprawl threatens the marshland around the town of Bredstedt on the Geest.

6.2 Agriculture

Intensive agriculture can result in damage to buried archaeological sites and economic pressure could lead to further alteration and destruction of historic landscape elements and the traditional fieldscape.

6.2 Nature conservation

The cultural heritage and wider historic landscape is vulnerable to changes in connection with the implementation and enhancement of nature reserves, like the creation of new landscape elements or the alteration of existing features.

6.3 Industry and energy

Whilst strengthening the economic situation of farmers, wind turbines can damage below ground archaeological remains and have a negative impact on the wider historic landscape of the area, particularly in the more enclosed landscapes like the north of the entity around Ockholm or Hattstedtermarsch. Installation of solar panels on historic buildings can lead to conflicts over monument protection as at Sönke-Nissen-Koog. There is no model or strategy outlining how this should be dealt with in the future.

7. Potentials

7.1 Spatial planning

The landscape plan for the area supports the integration of historic settlement structures into planning and the development of landscape related tourism and the areas of the Hauke-Haien-Koog, Langenhorner and Störtewerker-Koog, as well as the marshes around the river Soholmer Au are identified in spatial plans as particularly characteristic landscapes.

7.2 Settlement

The historic settlement is generally intact with only a few residential areas added to existing settlement areas and the relocation of a number of farmsteads to the new polder of Hauke-Haien-Koog.

7.3 Agriculture

The historic field structure in the planned polders in the south and in Ockholmer Koog is generally intact and has been altered comparatively little by the measures that have led to

consolidation of farming elsewhere. Promotion of extensive stock breeding could help support the intact field systems.

7.4 Nature conservation

Conflicts between nature conservation and the cultural heritage could be avoided or mitigated through the development and implementation of local landscape and cultural heritage models or strategies and integrated management planning.

7.5 Tourism

The whole of the entity of Nordesgoharde is rated as a tourist and recreational area. Centring on the nature experience area of Stollberg north of Bredstedt, a variety of cycling tracks with information on cultural landscape and nature have been implemented throughout the entity. The information centre of Amsinck-Haus gives insight into the landscape development and along with sign posted routes helps to communicate landscape values to tourists and inhabitants. There is the potential to further integrate the cultural heritage through enhanced information and interpretation particularly of the older marshland areas. The old harbour of Bongsiel could be revitalised and used for tourist and recreational purposes.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum V. Kiel 2002.

Kunz, H. & Panten, A. 1997. Die Köge Nordfrieslands. Bredstedt.

Bantelmann, Landschaft und Besiedlung Nordfrieslands in vorgeschichtlicher Zeit (Husum 1992)

Bantelmann, A. (ed.) 2000. Das große Nordfrieslandbuch. Bredstedt.

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart.

Beseler, Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Braun, Strehl (eds.), Langhaus und Winkelbau. Uthlandfriesische Bauformen im 18. und 19. Jahrhundert (Bredstedt 1989)

Vogel, Der nordfriesische Geestrand, die Entwicklung seiner ländlichen Siedlungen und ihrer Flurformen (Bräist/Bredstedt 1996)

Fahrenkrug et. al. Regionales Entwicklungskonzept Nordfriesland (unpublished, 2003)

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Map of H. du Plat of 1804/05

Föhr, SH

1. Overview

Name:	Föhr
Delimitation:	Island in North Frisia, neighbouring entities Amrum, Sylt, Halligen and Bökingharde on the mainland
Size:	82 km ² , 12 km from south to north, 6.8 km from east to west
Location – map:	Island in the centre of the Wadden Sea of North Frisia, Schleswig-Holstein, Germany
Origin of name:	The name is probably derived from “fahren” and describes a place where people travel to
Relationship/similarities with other cultural entities:	Clustered villages like on Sylt and moraine mainland, also a similar built heritage (farmhouses, churches, residential houses, lighthouses), field enclosures with low banks and hedgerows as in Südergosharde, heath land, burial mounds and megalithic tombs as on Sylt, Amrum and mainland moraines, spa architecture as on Amrum, and at Westerland on Sylt
Characteristic elements and ensembles:	Clustered villages with irregular fields enclosed by low banks, Uthlande style farmhouses with Frisian walls, medieval churches, spa buildings, heath land, burial mounds and megalithic tombs

2. Geology and geography

2.1 General

The island of Föhr is, together with Sylt and Amrum, one of the three geest islands of the Wadden Sea coast of Schleswig-Holstein. The southern part of the island consists of remains of moraines from Saalian ice age glaciers. This moraine core extends about 12 km from east to west. As it stands up to 13m above the average high tide level, it is not as severely affected by storm floods as the marshland areas, in addition it is protected by the frontline islands of Sylt and Amrum. There is, however, a certain loss of land caused by the wave erosion in the west and south of the island, which often unveils traces of old settlements from the Roman period. This causes the creation of low cliffs, of which Goting Kliff is the most remarkable, today secured by sand replenishment at the seaside. Unlike the other two geest islands in Schleswig-Holstein, the major part of Föhr consists of marshland which has developed north of the moraine core since early medieval times. Dunes play only a minor role on the southern shores of Föhr, in contrast to the extended sandy beaches in the west of Sylt and Amrum.

2.2 Present landscape

The island of Föhr is divided into two very different landscapes. The north of the island consists of low, flat marshland, irregularly divided by ditches and canals and cut by a road which runs parallel to the edge of the moraines in the south and other, perpendicular roads. The marshland area is enclosed by a dike and an outer sea wall, the latter forms a highly-visible element in this open, almost treeless landscape. A few new farmsteads and some duck-decoys, both surrounded by trees, are scattered across the marshes. Some tall and highly visible wind power generators were installed in the north-east. The geest in the south has more relief and as a consequence all of the villages and the town of Wyk are sited there. Modern Wyk covers the majority of the eastern corner of the moraine portion of the island. The core of the town is densely built, with some multi-storey buildings, whilst the suburbs are

more spacious, with single-storey residential areas with many trees. A park-like golf course and an airfield mark the western border of Wyk. The villages are either clustered or aligned parallel to the marshland. The buildings are usually in a low, traditional style, and the historic windmills and churches stand out as landmarks. A few single farmsteads are sited between the villages. The agricultural land in the west is divided by earthen banks into irregular enclosures. Small forests in the east and west of the moraine geest interrupt an otherwise open view. The Godel creek forms a small lowland area in the south-west of the geest, which is only separated from the sea by a narrow ridge.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The oldest evidence for settlement in the area consists of megalithic tombs and Bronze Age burial mounds. Settlement appears to have continued throughout the Bronze and Iron Ages to the early medieval period, as demonstrated by old fields and burial mounds, which often form highly visible landmarks like the mounds of Tribergem.

The Lembecksburg is a circular earthen fortification dating from the early medieval period. In addition there were once probably hundreds of burial mounds, most of which have levelled over the following millennia, particularly by ploughing in recent decades.

Remnants of settlement from Roman and Viking times are also found on the marshy part of the island, demonstrating it to be among the oldest surviving marshland areas in North Frisia, having survived the catastrophic floods of the earlier centuries. The oldest buildings of brick and tuff construction are the so-called Frisian Cathedral of St. Johannes in Nieblum and two other simple Romanesque churches of 12th and 13th century origin in Wyk-Boldixum and Süderende. In the medieval period land use and the removal of top soil turned former agricultural land into unfertile heath land, covering large parts of the island until modern times. Vestiges of this are still extant at Toftum.

3.2 Early Modern Times

The relatively elevated position of the island may be the reason why the marshland was only enclosed in the 16th century, although earlier ring dikes, like around Ackerum, probably existed. Many ponds along the dikes testify to the building of the embankments and their frequent repair, because a law required the material to be obtained from inside the marshland. As the level of the tides increased in the late medieval period and salt marsh areas, especially in the north, were destroyed by storm surges, settlement dating from the 16th century onwards was almost exclusively sited on the more elevated geest land. Here farms were sited on narrow strips of land, oriented towards the marshland, connected by two roads running in parallel lines along the edge of the geest. In villages like Midlum, Oevenum and Toftum, this landscape is still impressively well preserved. Other settlements like Nieblum, which were not directly connected to the marshland, were arranged as clustered villages. Many of the typical Frisian houses are still visible, either as intact or restored buildings dating back to the 17th century, or as modern copies in the traditional style. Some especially rich farm houses of the Uthlande style were built by Frisian seafarers who invested their fortunes, gained abroad, here. These houses were often extended by annexe buildings to form angular or square structures. Almost all have been converted into holiday apartments, with only two farmsteads in Utersum and Midlum still used for the original, agrarian purposes. Five Dutch windmills of the 18th and 19th century have survived, originally each village would have had one. Herring fishing brought moderate income to Föhr, but when the shoals declined by the end of the 16th century, a new means of subsistence was found on whaling ships of Hamburg and Dutch ownership bound for Greenland and Svalbard. The grave slabs around the historic churches sometimes tell the complete life stories of the dead. Agriculture, which had decreased in importance, was maintained mainly by the women and the elderly people. Whaling was eventually replaced by even more profitable employment on trading ships, which led to a short economic boom furnishing the

more splendid sitting rooms. This was ended abruptly by the Napoleonic continental blockade. The Common land was enclosed and divided among the farmers at the end of the 18th century by order of the Danish administration, which was only responsible for the western part of the island. This is the only part of the island where characteristic low banks (Friesenwälle), used for separating the fields, can still be found. The eastern part of the island belonged to the Duchy of Schleswig, whereas the village of Wyk, which had grown considerably after the great storm surges of 1634, gained a certain judicial independence in the beginning of the 18th century. The use of languages today still mirrors the historic administrative situation. While people in the east still frequently speak a Frisian dialect, islanders in the west apply a local German idiom.

3.3 Modern Times

The last major dike breach on the island followed the storm surge of 1825 which flooded the entire marshland area and left many inhabitants from the Hallig islands as refugees especially in Wyk. In 1819 a seaside resort was added to the existing maritime village of Wyk. This was the first such resort in Schleswig-Holstein and is still an important economic factor and tourist attraction for the island. Föhr thus has a unique tradition of tourism as well as agriculture and fishery. Modern Wyk is the urban centre of both Föhr and neighbouring Amrum, and contains more than half the population of the island within its town boundaries and those of the formerly independent village of Boldixum. The size of Wyk has increased notably during the last few decades, particularly with the addition of second homes. The growing number of the latter also promoted a price boom for realty, which has made it increasingly difficult for islanders to obtain reasonable building ground. Further growth of the settlement area is now mostly prohibited by spatial planning regulations.

Agriculture has become more profitable through the application of artificial fertilisers and modern agricultural techniques on the geest as well as intensive drainage in the marshland, rendering it the major source of income for much of the 19th and 20th century. The Dr.-Carl-Haeberlin Frisian museum has served as the island museum for natural history, history and archaeology since the early 20th century. The marshes of Föhr are the only surviving old marshland areas in Schleswig-Holstein which have been virtually uninhabited from the post-medieval period onwards. Except for the 19th century Ackerumhof, settlement has only gained ground here again since the 1960s, when farmsteads moved out from the confines of the villages to the more spacious marshes. This relocation was triggered by the Programm Nord which also restructured farm land and pastures on the island in order to combine dispersed, small field parts into functioning units. Several duck decoys, the earliest example at Alt-Oevenum dating from the early 18th century, are still extant in the marshes. These are highly visible due to their enclosing woodland and visually demonstrate the influence of the Dutch traditions brought in by local seafarers. A few wind power generators have been erected, although this form of development is currently at a standstill.

4. Modern development and planning

4.1 Land use

Agriculture is still rather important, in comparison to the other tourist islands in the area. Development will, however, lead to the enlargement of ever fewer farms and additional tourist pressure. The marshland has never been intensively used for cropping on a large scale, due to soil quality and traditional land use. The tendency is therefore towards the set-aside of agricultural land, for contract based nature protection and for better quality production like organic farming. Rural structural development has been central for politics in the past decades, resulting in the land consolidation of Programm Nord in the 1960's, which led to enlargement of fields and a better infrastructure of roads, but also to heavy landscape changes, especially in the marshes. Only small areas, besides the national park of Wadden Sea outside the outer sea walls, are under nature protection, like the flatland around the Godel Creek. Many activities are undertaken on a more informal level by local nature

protection groups. One example is the turning of the land at the outer dike in Oevenum into biotopes. A local product label was introduced on Föhr in order to promote local agricultural production lines.

4.2 Settlement development

The island is a focal area for tourism. The realisation of the regional plan therefore restricts further assignment of new housing and camping ground developments. Exceptions are made for islanders in order to ensure reasonably priced accommodation for locals. Houses outside Wyk usually have no more than two floors. New buildings are usually integrated well into the local context. Tourism has a major economic importance throughout the island, focused on Wyk as a spa. Further construction in this sector is restricted and it is supposed to integrate into the landscape, but there is no clear specification as to how this will be achieved. An extension with artificial heath land is planned for a golf course. The Frisian museum in Wyk gives visitors an insight into local natural and cultural history, whereas a new art museum in Alkersum displays works of local artists.

4.3 Industry and energy

There is no industry on Föhr, and there are only a few wind power stations located on the outer sea wall in the municipality of Oevenum. There are no plans for expansion.

4.4 Infrastructure

The island can only be reached by ferry or via a small airstrip at Wyk. The harbour of Wyk provides a tide-independent connection to Dagebüll in Bökingharde. Roads are mostly narrow and need to be used by cars, cyclists and hikers together. New roads in the marshes were built in the 1960s.

5. Legal and spatial planning aspects

The mud flats of the Wadden Sea around Föhr are designated protection areas, and form part of the Wadden Sea National Park. They are wetlands of international importance, pursuant to the Ramsar Convention since 1991 and a designated Natural 2000 area, pursuant to the EU Wild Birds Directive and Flora-Fauna-Habitat Directive since 1996. All of the biotypes that occur are protected under national law (Art.30 Federal Nature Conservation Act, Art. 15 Nature Conservation Act of the State of Schleswig-Holstein, National Park Act). Nature protection on the island aims at further integrating agriculture and promoting extensive stock breeding and contract based nature protection. It is also intended to increase the number of 'typical' landscape elements and to integrate existing elements, like the flatland around the Godel Creek, into the network of biotopes and protection areas.

The modernised marshland is regarded as a structurally rich landscape and large parts of the island fulfil the requirements for landscape protection areas. Landscape Planning promotes an improvement of landscape related tourism together with riding, cycling and hiking and the tourism concept for North Frisia promotes sustainable development in this sector. Goting-Kliff is listed as geological important area.

6. Vulnerabilities

6.1 Settlement

The character of the formerly uninhabited marshland has been radically changed by the development of modern farmsteads since the 1960's and the development of tourism on the island over the last three decades. The process of farm relocation resulted in changes in building use in the geest edge villages, with replacement of historic structures and the conversion of historic farm houses to holiday homes leading to a breakdown of their tightly knit character. Tourism development has transformed the main village of Wyk into a small

town and modern buildings there often far exceed the height of traditional houses on the island. The villages of Boldixum and Wrixum adjacent to Wyk have also been transformed as have the villages of Ultersum on the east of the island and parts of Nieblum.

6.2 Agriculture

The historic, irregular fieldscape, which once characterised the Föhr marshland has largely disappeared since the 1960's as a result of boundary loss, straightening of watercourses and re-structuring of farmland for intensive agricultural production. This process has also resulted in the loss of structures and intensification of agriculture has destroyed many earthworks, in particular prehistoric burial mounds, through levelling and ploughing. Cultivation continues to place buried archaeological remains at risk. Many historic landscape features such as field boundary banks are threatened by modern agricultural land-use and others, such as the mounds of Monklembergem near Süderende, no longer contribute to the visual richness and diversity of the historic landscape as they are neglected and are now overgrown and hidden by vegetation. Nature conservation management through agricultural schemes can also have a negative impact on the historic landscape of the island as areas chosen for set-aside and biodiversity measures aimed at recreating natural habitats can fail to take into account historic land-uses and associated landscape features.

6.3 Management of cultural heritage

Information on the landscape and cultural heritage assets of the island is scarce and lacks detail. Landscape management of the area is still primarily focussed on the natural environment and fails to integrate cultural assets into its aims, recommendations and measures. Those recommendations that do exist, such as the integration of buildings into the landscape, are not supported by sufficient guidance. Neglect of surviving archaeological earthworks is also an issue with significant upstanding archaeological sites overgrown, leading to damage from natural processes such as animal burrowing and root growth, and a reduction in their amenity value due to a lack of visual clarity of the monument forms. In extreme cases, like the earthwork mounds near **Hedehusum**, monuments have become completely inaccessible.

6.4 Nature conservation

Nature conservation measures, such as the creation of biotopes by local nature protection groups, can conflict with existing landscape and cultural heritage values.

6.5 Tourism

Exploitation of the cultural heritage on the island for the benefit of tourism and local recreational use is hampered by wider access issues, with no delineated routes for pedestrians or cyclists, and no pedestrian or cycle paths along the narrow roads. There is still a potential threat to the cultural heritage from development areas for the construction of second homes and tourism associated developments such as a proposed golf course extension.

6.6 Natural Erosion

Coastal erosion is an issue in the west and south of the island, leading to the exposure and destruction of Roman period settlements.

6.7 Language

The dialect of the North Friesland language (Fering) spoken in the east of Föhr is endangered.

7. Potentials

7.1 Settlement

With the exception of the town of Wyk, and modern farmsteads in the marshes, the historic settlement pattern on the island is mostly intact and the important connection between villages and the marshland survives. The original structure of some of the villages, such as Oldsum, Midlum, Toftum, Klingum and Oevenum has also been well preserved, as has much of Nieblum, and buildings often present a harmonious picture of traditional housing. Even the old parts of Wyk still preserve characteristic elements of a 19th century seaside resort and Wrixum retains the characteristic layout of the geest edge settlements.

7.2 Agriculture

Changes in agriculture away from production to environmental protection, together with nature conservation efforts by private organisations also offer opportunities to integrate conservation of the natural environment and historic landscape to provide further attractions to cyclists, walkers and riders.

7.3 Management of cultural heritage

Föhr has a rich archaeological heritage, particularly from the prehistoric period, but also including traces of settlement from the Roman period and early middle ages in the marsh areas on the north of the island, which is some of the oldest marshland in North Frisia. The diversity and quantity of the island's archaeological heritage is almost unparalleled in the rest of the Wadden Sea region, important monuments are protected and many of the earthworks and other historic features, such as duck decoys, are highly visible in the landscape.

7.4 Tourism

Wyk has a long history as a beach and health resort, which provides the island with a constant influx of visitors, seeking the wholesome climate of the North Sea at all times of the year. The island's heritage is ripe for exploitation for tourism and amenity use by the island's residents and could be used to offer an additional dimension to the attractiveness of the island for its health facilities and for recreational tourism. The Dr-Carl-Haeberlin Frisian museum and historic buildings such as the Frisian Cathedral of St Johannes could be used as focal points for tourist information, providing interpretive material such as guided routes around Föhr's cultural and natural landscapes. These could include surviving historic landscape elements, such as the islands remnant heathland, historic landmarks like the circular ramparts of Lembecksburg and, potentially, re-constructions of historic marshland structures, as well as existing 'cultural landmarks' intended to attract tourists to the area. The island's cultural heritage is well-suited for increasing the local resident's sense-of-place and for strengthening Föhr's image for marketing purposes.

7.5 Nature conservation

There is the opportunity to integrate nature conservation management with the cultural heritage in order to derive enhancement and positive management of both.

7.6 Natural erosion

Coastal erosion provides opportunities for the discovery, recording and understanding of Roman settlement.

7.7 Language

Children now use Frisian in school and young parents are increasingly speaking Frisian with their children on the western part of Föhr.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum V. Kiel 2002.

Kunz, H. & Panten, A. 1997. Die Köge Nordfrieslands. Bredstedt.

Bantelmann, Landschaft und Besiedlung Nordfrieslands in vorgeschichtlicher Zeit (Husum 1992)

Bantelmann, A. (ed.) 2000. Das große Nordfrieslandbuch. Bredstedt.

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart.

Beseler, Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Braun, Strehl (eds.), Langhaus und Winkelbau. Uthlandfriesische Bauformen im 18. und 19. Jahrhundert (Bredstedt 1989)

Vogel, Der nordfriesische Geestrand, die Entwicklung seiner ländlichen Siedlungen und ihrer Flurformen (Bräist/Bredstedt 1996)

Fohrbeck, Schikotanz. Die Region „Uthlande“ Ein Regionales Entwicklungskonzept (unpublished)

Fahrenkrug et. al. Regionales Entwicklungskonzept Nordfriesland (unpublished, 2003)

Maps:

Archaeological monument record of Schleswig-Holstein and GIS mapping

Lancewad data base and GIS maps

Royal Prussian ordnance survey of 1879

Map of H. du Plat of 1804/05

Map of J. Mejer, 1648

Map of J Meier, 1648, Reconstruction of landscape in 1240

Amrum, SH

1. Overview

Name:	Amrum
Delimitation:	Island in North Frisia, neighbouring entities Sylt, Föhr and Hallig islands
Size:	20.5 km ² , 9.8 km from south to north, 6.5 km from east to west
Location – map:	Island in the very north-west of North Frisia, Schleswig-Holstein, Germany
Origin of name:	Not known
Relationship/similarities with other cultural entities:	Clustered villages like on Föhr and moraine mainland, built heritage like farmhouses, churches, residential houses, field enclosures with low banks as on Föhr, heath land, burial mounds and megalithic tombs as on Föhr, Sylt and mainland moraines, spa architecture as on Sylt, Wyk on Föhr
Characteristic elements and ensembles:	Clustered villages with irregular fields enclosed by hedgerows, Uthlande style farmhouses with Frisian walls, medieval churches, spa buildings, heath land, burial mounds and megalithic tombs, prehistoric and early historic remains underneath dunes

2. Geology and geography

2.1 General

The island of Amrum is the smallest of the three Geest islands of Sylt, Amrum and Föhr in the Wadden Sea of Schleswig-Holstein. Sited to the south of Sylt, both islands form the westernmost border of the Wadden Sea area of Northern Frisia, their western shores indicating an early, former coastline which survived until medieval times. Amrum's moraine core, stretching in a crescent shape from north to south, is a remnant of the Saale glaciation and forms the largest part of the actual island, apart from the extensive dunes in the west and small areas of marshland east of the northern tip and in the south. Over 150 years the sandbank of Kniepsand, originally located in the Wadden Sea to the west of the Island, has gradually merged with Amrum's dunes, providing the island with one of the widest beaches in Europe. This huge, desert-like area with dunes up to 32m high, constantly changes under the influence of wind and the sea and gradually moved eastwards, covering a wealth of prehistoric settlements and burials until grass and woodland plantations halted the motion.

2.2 Present landscape

Four different landscape zones, roughly following the crescent shape of the island, can be distinguished on Amrum. The western and southern area adjacent to the North Sea is marked by the wide and uninhabited sandy beach of Kniepsand. A unique variety of different types of dunes follows to the east, mixed with swampy depressions in low lying areas, often inundated during the cold seasons and covered with vegetation for the most parts, giving it the appearance of green hillocks. A belt of forest, planted on former heath land, limits the dunes extension to the east and reaches out into the dunes at some places. The inhabited part of the island lies in the east with some clustered villages and open land, mostly used as paddocks, and some agriculture. The mostly treeless fieldscape is characterized by co-axial, rectilinear strips in an east-west arrangement in the north and irregular, often sinuous fields to the south of Nebel. Around the villages of Nebel in the centre of the island and Norddorf in the north are larger areas of modern residential buildings, reaching into the forest. Wittdün

and Süddorf are more loosely built. All built-up areas are tree-lined. The buildings are usually in a low, traditional style, whilst the historic windmills and churches stand out as landmarks. Wittdün has some multi-storey buildings. There are a few single farmsteads and some larger building complexes like sanatoriums situated between the villages or in the dunes. Burial mounds are highly visible in these parts. The small, open and treeless marshland areas are intersected by rectilinear drainage ditches and winding vestiges of tidal inlets. As another landscape type, the island is accompanied by extensive mud flats in the east connecting it to Föhr.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The earliest settlements can be traced back to the late Stone Age, represented by megalithic tombs and followed by ample mounds, cemeteries, field systems and other vestiges of prehistoric settlement of later periods and medieval fields, often preserved under the dunes, like the Iron Age site of Düwdeal with traces of fields, burials and parts of an embankment near Norddorf. The numerous mounds like those of Klafhugh near Süddorf, Eesehugh near Steenodde and Heeshugh near Nebel, often form highly visible landmarks. Drifting sand from the dune belt had turned agricultural land and some eastern dune areas into heath land which subsequently covered large parts of the island. Removal of top soil for fertiliser in these areas and extensive grazing preserved this landscape type for centuries. Villages and farms frequently had to be moved further east due to erosion along the west coast and the advancing dunes, as in Sylt. Most interesting are parts of embankments of unknown date like the Krümwal near Süddorf, the Hiadwall south of Norddorf or the probable dike Auergruftswall north of Norddorf. In comparison, few medieval remnants are known, the most impressive one being the Romanesque church, St. Clemens in Nebel, built in the 13th century and only extended, by a detached, solid belfry, in 1908. Nowadays, the original settlement pattern of few villages, loosely built around a centre like in Nebel, is only partially visible. Herring fishing around Helgoland brought a moderate income to Amrum in the 15th and 16th century, whilst agriculture decreased in importance and had to be maintained mainly by the women of the seafarers and elderly people.

3.2 Early Modern Times

During the 17th and 18th century many islanders served on whaling and trading vessels from Hamburg or engaged illegally as wreckers. With their acquired wealth they invested in traditional houses in the Uthlande style. A fair number of these survive, particularly in Nebel and Süddorf. The captain's house "Öömrang Hüs" in Nebel, built in 1736, is used as a museum today. Coastal trade with small local vessels and oyster fishing, which was undertaken in Stenodde until 1910, were other sources of income. Many grave slabs of seafarers of this so-called Golden Age can still be found on the cemeteries. The oldest Dutch windmill in North Frisia is found in Nebel. It was built in the 18th century, together with another, still surviving example in Süddorf, and serves as a museum today. The constant eastward movement of the extensive dunes has been halted since the end of the 18th century when the Danish administration began planting tree plantations on the dunes. At around the same time, the traditional, common use of land for grazing ended, when all the commons were divided among the farmers, which promoted the intensification of agriculture in the following decades.

3.3 Modern Times

Since the island became part of Prussia and consequently of the new German state in the late 19th century, and especially after World War II, most of the heath land has been turned into agricultural land or tree plantations. The forest belt separating the dunes from the rest of the island is the result of these planned activities. Many typical dwelling houses of these decades, brick built and with thatched roofs according to the traditional style, can be found in Norddorf and Wittün, which itself was founded in 1890 as a spa. Health resorts of this kind

were already particularly popular on Föhr and Sylt at that time. The catching of birds was enhanced to a larger scale by duck decoys, artificial pools, of which one in the south and one in the west of the island are still to be seen. The lighthouse of 1875 finally filled a gap in navigation points in the Wadden Sea. The modern children sanatorium at Satteldüne was, like other facilities of the kind on the island, originally built for pensioners of the Prussian cavalry. A train connection between the villages existed for a short time in the first half of the 20th century, beginning with a track between Wittün and the Kniepsand sandbank in 1893, before the increasing importance of new roads, built in the 1930's, put an end to it. A gap within the protecting dune belt at Risum, north of Norddorf, leading to frequent marine inundations, was closed with a dam in 1917. The accumulated marshland east of this dam was embanked about 15 years later, creating the only polder on Amrum. During the later part of the 20th century the number of houses, especially second homes, increased dramatically leading to untypical widespread settlement structures in Westerheide and south of Norddorf. The dunes are nowadays mostly nature related but intersected by wooden trackways.

4. Modern development and planning

4.1 Land use

Agriculture plays, as with Sylt, a minor role in the island's economy due to the small areas of available arable land and the comparatively poor soil quality, coupled with only very small stretches of marsh in the east. It is further declining and it is probable that more land will be set-aside or used for more nature protection related purposes. Fishery scarcely exists anymore, with only one fisherman left out of a once important local business. More important is nature protection, as the island boasts extensive dunes, the largest sand bank in the region and parts of remaining heathland and modern forests. Amrum has a high density of biotopes and protection areas. There is a discussion about a golf course between Nebel and Stenodde. Land is often used as paddock for ponies. Cropping and animal breeding has recently intensified again. There are plans to use the salt marshes for grazing.

4.2 Settlement development

The traditional settlement structure is heavily blurred by new settlement areas. Being a focal area for tourism, new building activities can only be implemented within restricted areas and have to be co-ordinated with other measures affecting aspects relevant to tourism, like landscape. The island's economy depends on tourism to a larger degree than most other parts of Schleswig-Holstein. Tourism here is, however, in decline and guests for sanatoriums are not regarded as an appropriate substitute.

4.3 Industry and energy

There is no industry and there are no wind power stations on Amrum.

4.4 Infrastructure

The island can only be reached by ferry. The harbour of Wittdün provides a tide-independent connection to Dagebüll in Bökingharde via Wyk. The few roads are narrow and need to be used by cars and cyclists. Walkers have some foot-paths for their own use. High parking fees in Dagebüll promote the increasing transfer of cars to the island.

5. Legal and spatial planning aspects

All important monuments are protected. The island has two large natural reserves (dunes and northern tip) and a landscape protection area between Norddorf and Wittün across the island. Other areas like the heathland or the beach meadows bear the prerequisites for protection. The primary dunes are regarded as international important wetland according to the RAMSAR convention. The Kniepsand or the cliff near Stenodde, are listed as geological important areas. Many of the areas between the settlements have a landscape protection status. Nature protection aims at further integrating agriculture and promoting extensive stock breeding and contract based nature protection. The tourism concept for North Frisia promotes a sustainable development in this sector. An improvement of landscape related tourism together with riding, cycling and hiking is suggested by landscape planning.

6. Vulnerabilities

6.1 Settlement

The traditional settlement pattern has been heavily blurred by new settlement areas, many constructed due to the requirements of the tourist industry. Demand for further tourist buildings, second homes and new housing for the inhabitants of the island creates pressure on the already rather built-up landscape.

6.2 Agriculture

Since the late 19th century, and especially after World War II, most of the heath land and common land used for grazing was turned into agricultural land or plantations with the result that many prehistoric monuments, especially mounds, have been levelled and are no longer visible or have been completely destroyed. Cultivation continues to place buried archaeological remains at risk.

6.3 Management of cultural heritage

Landscape management of the area is still primarily focussed on the natural environment and fails to integrate cultural assets into its aims, recommendations and measures.

6.4 Nature conservation

Modern nature conservation measures, such as the creation of biotopes, can conflict with existing landscape and cultural heritage values.

6.5 Tourism

Tourism on the island is in decline, which could have a negative effect on the island's economy with a subsequent effect on the upkeep of its cultural heritage. Exploitation of the cultural heritage on the island for the benefit of tourism and local recreational use is hampered by wider access issues, with no delineated routes for cyclists, and no pedestrian or cycle paths along the few, narrow roads. Cars are increasingly being brought to the island by tourists, due to high car parking charges in Dagebüll. There is still a potential threat to the island's cultural heritage from development areas for the construction of second homes and tourism associated developments such as the proposed golf course between Nebel and Stenodde.

7. Potentials

7.1 Settlement:

It is still possible to recognise the island's historical settlement structure i.e. the relatively widely spaced villages in clusters or in a linear pattern on the geest, as well as a few individual buildings, particularly on the side facing the mud flats. Many old buildings of the 17th to 18th century are still extant and largely original in appearance. Traditional houses in

the Uthlande style survive, particularly in Nebel and Süddorf and could be used to promote the cultural heritage of the island, linked with the museum at the captain's house "Öömrang Hüs" in Nebel. Later dwelling houses of the 19th century, traditionally brick built with thatch roofs survive, and can be found in Nordorf and Wittün, which was itself founded in 1890 as a spa.

7.2 Agriculture

Changes in agriculture away from production to environmental protection and set aside, offer opportunities to integrate conservation of the natural environment and historic landscape to provide further attractions to cyclists, walkers and riders. More extensive land use lessens the impact on the islands prehistoric monuments and supports more traditional landscape scenery, also beneficial for tourism.

7.3 Tourism

There are plans to improve the appearance of Wittdün as the entrance to Amrum; its status as a health resort and spa promotes a more constant number of visitors all year around. The museum at the captain's house "Öömrang Hüs", the Dutch windmill museum in Nebel, and historic buildings such as the Romanesque church, St.Clemens could be used as focal points for tourist information, providing interpretive material such as guided routes around Amrum's cultural and natural landscapes. If accessibility is improved to many parts of the island by foot or cycle, there is potential for the creation of cultural heritage routes or integrated cultural heritage and natural environment trails, which would promote the islands cultural heritage. Nature related activities like hiking, riding and cycling could be combined with historic landscape routes. The archaeological richness of the island, especially the prehistoric values, and its later history of fishing, whaling, wrecking and trading could be integrated into tourism on a much larger scale. The islands heritage is ripe for exploitation for tourism and amenity use by the island's residents and could be used to offer an additional dimension to the attractiveness of the island for its health facilities and for recreational tourism. The islands cultural heritage is also well-suited for strengthening Amrum's image for marketing purposes.

7.4 Management of cultural heritage

Amrum has a rich archaeological heritage, especially from the prehistoric period and early middle ages. Important monuments are protected and many of the earthworks and other historic features, such as burial mounds like those of Klafhugh near Süddorf and undated embankments like the probable dike Auergruftswall north of Nordorf, are highly visible in the landscape. The promotion and management of these monuments could be tied into the improvement of tourism on the island as well as the management plans for the nature reserves.

7.5 Nature conservation

The forest belt gives Amrum a singular appearance and feature among the islands of Schleswig-Holstein. Due to large areas being protected for the natural and geological heritage there is the opportunity to integrate nature conservation management with the cultural heritage in order to derive enhancement and positive management of both.

7.6 Natural processes

The movement of Amrum's sand dunes has preserved a wealth of settlements and burials from various periods of history. These are occasionally revealed by the blowing sands providing the opportunity for discovery, recording, understanding and presentation of past settlement on the island.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum V. Kiel 2002.

Kunz, H. & Panten, A. 1997. Die Köge Nordfrieslands. Bredstedt.

Bantelmann, Landschaft und Besiedlung Nordfrieslands in vorgeschichtlicher Zeit (Husum 1992)

Bantelmann, A. (ed.) 2000. Das große Nordfrieslandbuch. Bredstedt.

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart. Beseler, Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Braun, Strehl (eds.), Langhaus und Winkelbau. Uthlandfriesische Bauformen im 18. und 19. Jahrhundert (Bredstedt 1989)

Vogel, Der nordfriesische Geestrand, die Entwicklung seiner ländlichen Siedlungen und ihrer Flurformen (Bräist/Bredstedt 1996)

Fohrbeck, Schikotanz. Die Region „Uthlande“ Ein Regionales Entwicklungskonzept (unpublished)

Segschneider, M. Die Marschen der Insel Föhr und der Wiedingharde, Kreis Nordfriesland. PhD thesis Kiel 2004

Hansen, M, Hansen, N, (ed). Amrum. Geschichte und Gestalt einer Insel. 1992 Amrum. Landschaft, Geschichte, Natur, 1991

Fahrenkrug et. al. Regionales Entwicklungskonzept Nordfriesland. unpublished, 2003

C. Heinze, S. Matusek, L. Rättig, A. Struckmeyer, Amrum – Landschaftsplan. unpublished, Kiel 2006

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Map of H. du Plat of 1804/05

Map of J. Mejer, 1648

Map of J Meier, 1648, Reconstruction of landscape in 1240

Halligen, SH

1. Overview

Name:	Halligen
Delimitation:	Salt marsh islands, neighbouring entities Pellworm, Nordstrand, Südergosharde, Nordergosharde, Bökingharde, Amrum, Föhr
Size:	The surviving 11 Hallig islands vary from 7 ha (Habel) to 956 ha (Langeness), the overall salt marsh area is 2,274 ha, spread over a mud flat area of roughly 20 x 30 km, this also contains the cultural entity of Pellworm.
Location – map:	Wadden Sea Area of North Frisia, Schleswig-Holstein, Germany
Origin of name:	Frisian name for salt marsh and later, salt marsh islands without embankments with early modern origin. The origin of the names of single islands is known, like Hooge from high land, Langeness from long nose or Oland from old land
Relationship/similarities with other cultural entities:	Dwelling mounds on salt marshes were in use everywhere along the Wadden Sea coast, but separate, other inhabited salt marsh islands (Ockholm, Galmsbüll, Fahretoft, etc.) only existed in the Bökingharde and the northern part of the Nordergosharde
Characteristic elements and ensembles:	Remains of medieval settlement in adjacent mud flats, dwelling mounds and ring banks, artificial freshwater pools and canals, Uthlande style farm houses, salt-marsh, small harbours, dams connecting islands to mainland, narrow gauge railways

2. Geology and geography

2.1 General

The Pleistocene moraine base of the area was eroded by the transgression of the North Sea following the end of the ice age, and was subsequently topped by layers of sediments and peat. Marsh land and bogs covered the area in early and high medieval times. A barrier of sand banks and islands in the west separated this land from the open North Sea. This protection was gradually destroyed from the 11th century onwards. Insular salt marshes occupying large parts of the area were known as Strand from the end of the 12th century on. The Hallig islands consisted of salt marshes which were formed by continuous deposition and erosion over the centuries on top of remaining bits of older salt marshes, which survived the catastrophic storm surge of 1362. The remains of the moraine core protrude higher underneath the Hallig and the marsh islands than below the adjacent mud flats and tidal inlets providing a stable base. The layers of peat underneath the medieval marsh surface ranged in thickness from tens of centimetres in the west to several meters in the east. Most of it was cut away by humans during medieval times. Only the salt marsh of Nordstrandischmoor has developed on top of the remains of these ancient bogs.

2.2 Present landscape

Today, the large tidal inlets of Norderaue, Süderaue, Norderhever and Heverstrom, together with numerous smaller tidal canals, intersect a vast space of mud flats, scattered with the partially dry lands of the Hallig islands and the embanked marsh island of Pellworm. The largest of the tidal inlets cut more than 20m deep into the ground whereas the salt marshes rise to 2m high. The landscape of the Hallig islands is dominated by the dwelling mounds

with houses and a few protective trees on top, which can be seen from afar. Smaller tidal inlets and often artificial canals intersect the surface. Modern, straight and asphalted roads connect the mounds. Small harbours at the shore side provide the connection to the main land. Today, all of the Hallig islands are protected against further erosion by stone enforcements along the edges, yet are still subject to frequent and regular flooding. Dams connect Nordstrandischmoor, Hamburger Hallig, Oland and Langeness to the main land. Habel, Südfall, Norderoog are not inhabited anymore and are part of the Wadden Sea national park. Their surface is still very uneven and much more intersected by tidal inlets. The newly gained salt marshes, especially at the western side of Oland, differ notably from the irregular old salt marshes by its regular canals, dividing the new land into square fields intersected by parallel ditches. The whole of the Hamburger Hallig has a similar appearance.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The first human settlement in the area is demonstrated by a number of finds dating to the Neolithic, around 2300 BC. However, continuity of settlement on the islands can only be demonstrated from the Viking Age onwards. Traces of settlement west of Hooge are dated as early as the 8th century. The North Frisian Wadden Sea of this time consisted of a large expanse of marshes and bogs, cut off from the direct influence of the North Sea by sand barriers further west than the modern sand banks. A temporary intrusion of the sea must have caused the development of salt peat along a line leading from Hooge along Nordmarsch-Langeness and Oland into the Bökingharde. Pits, dug for the exploitation of salt peat, can still be seen along this strip in the mud flats. Other parallel ditches in the mud flats and underneath the Hallig surface display the common practice of peat-cutting in order to reach the underlying fertile clay. The peat was then disposed of in the ditches. These structures were formed into rectangular areas by low embankments dotted with dwelling mounds for the farms. Other mounds were larger, or several single mounds were combined into a village mound. The mud flats north of Habel in particular bear ample signs of this high medieval landscape. These dwelling mounds were only raised from the late 12th century on as a reaction against an increasing influence from the open sea as the protective sand barriers eroded. These settlements were orientated along tidal inlets, which seemed to distribute them rather randomly. It was only then the legendary settlement of Rungholt south-west of Südfall became inhabited. At this time the expansive marshland area was already intersected into islands by tidal inlets, the largest of which was called the island of Strand, covering most of the area of the Hallig and the marsh islands, while the locations of others remain unknown.

The first embankments to protect against the rising sea can also be assigned to the 12th century, proving that the early dwelling mounds in the area were already protected by dikes, unlike today. When in 1362 the catastrophic storm-flood of the Grode Mandtränke hit the area, it destroyed Rungholt and large parts of the embanked marsh land, leaving behind a multitude of Hallig islands and remnants of the older marshes.

Following this disaster the salt marshes of the Hallig islands were raised on top of the destroyed cultivated land by deposition processes resulting from frequent flooding. Other areas, like the island of Alt-Nordstrand or Strand were embanked again. The continuing loss of unprotected land often required mounds to be re-built more inland. Most of the mounds on the Hallig islands thus have physically moved with a newly heaped mound replacing the older mound which was left to the waves. This process can still be tracked today as vestiges of predecessors of some of the existing mounds still show in the adjacent mud flats. The land use of the time is similar to that of today, being mostly restricted to mowing, cattle and sheep breeding due to the recurrent flooding. However, some small agricultural polders of probably late medieval origin, still exist on Hooge and Langeness adjacent to dwelling mounds like Hanswarft, these are now largely buried under the clay brought in throughout the centuries.

The land was used as common, which was divided each spring anew among the inhabitants in order to make up for the loss of salt marshes during the cold season, and thus remained undivided by ditches.

3.2 Early Modern Times

The storm surge of 1634 marked another important event in the landscape history of the Wadden Sea area of North Frisia. The old island of Alt-Nordstrand was lost to the waves and only a few remaining bits of the marshland were embanked again in the ensuing years. Besides the marsh islands of Pellworm and Nordstrand, it was a vestige of medieval raised bogs that survived, heightened by accumulated clay, as Hallig island of Nordstrandischmoor. The belfry of the church, which survived the catastrophe, crumbled later, but the remarkable cemetery with its horizontal tombstones still survives. During the following centuries, the small islands further decreased in size by the constant break up of salt marshes along the unprotected edges. Further dwelling mounds, erected on the comparatively high soil along the edges of the Halligen, had to be abandoned and rebuilt farther inland. The same procedure even applied to churches, like the one on Gröde of late 18th century origin, which is allegedly the 7th reconstruction. Therefore, the churches were simple hall constructions without belfries, which were often added as detached frames, examples are still to be seen on Oland and Langeness. The farms were built in the style typical for the region, threatened by storm surges, the so-called Uthlande style. Due to the numerous heavy floods, even in modern times, only a few have survived, especially on Langeness, like Haus Tadsen from the 18th century hosting a museum today.

The number of Halligen of those times was much greater than today. The Beenshallig, for instance, south of Gröde, had disappeared by the end of the 19th century. As well as decreasing in size, the shape of the Hallig islands had changed considerably. At the end of the 18th century, Gröde and Appelland, today unified, were then two totally separate islands, the latter already uninhabited, but with a still extant dwelling mound. Two older mounds were visible in the mud flats west of Neuwarft on Gröde. Wide tidal canals separated the Halligen of Nordmarsch, Langeness and Butwehl, which are still extant, even though much narrower than before. The connection to the mainland was provided by boats fastened to small moles at the side of the larger tidal creeks and close to the dwelling mounds piled up on the high banks.

Settlement, as before, was only possible on dwelling mounds and fresh water had to be obtained from deep pools dug into the mounds, the Fethinge, and embanked areas at the foot of the mounds, Scheetels, connected to the Fethinge. The Fethinge in particular have survived modernisation in comparatively large numbers, like on the abandoned Pohnswarft on Hooge, but also between modern houses as on Ketelswarft on Langeness, where also traces of Scheetels remained. Pools protected by ring dikes provided fresh water even outside the dwelling mounds, some still survive, especially on Hooge. Farms were connected by footpaths on the higher banks of tidal canals or the edges of the islands, which crossed the numerous tidal inlets via movable wooden bridges. These features have totally disappeared today.

A considerable wealth was gained from the early 17th till the end of the 18th century by some of the inhabitants through seafaring and whaling, with their wives remaining on the islands in order to care for the animals. Some splendid vestiges like the Königspesel on Hooge, a richly ornamented room for special occasions, tell of these times. Others fell into poverty as the constant loss of land bereft them of their share of the land, which was not equally divided amongst the islanders. The collection of wild plants and birds eggs used to be, besides fishing and stock breeding, an important means of subsistence for many of the inhabitants up into the 20th century.

3.3 Modern Times

Another storm tide marked the beginning of modern time in the Halligen area. The Hallig-flood of 1825 destroyed 90% of the old farmsteads on their mounds, leaving Südfall, where everyone died, uninhabited, except for the short episode of the so-called Hallig duchess in the early 20th century. It was around that time when the importance of the slowly vanishing Hallig islands as wave breakers in front of the mainland marshes received recognition. It took until the end of the century, when the area belonged to the new German state, that the protection of the Hallig shores with stones began. This measure finally managed to stop the loss of salt marshes but at the same time brought an end to the characteristic transitional zone between mud flats and salt marshes, where both had merged gradually into each other. Since then the size of the Hallig islands has more or less stayed the same. The wide mouths of large tidal canals, which cut through the patches of salt marshes, were blocked by sluices during the following decades, leading to sedimentation in the tidal creeks, some now are not more than meandering ditches. Thus, the small harbours belonging to each dwelling mound before had to be replaced by common harbours behind the new sluices, as on Gröde, or in small, protected bays, as on Oland. From around 1900, Oland and Langeness, and later Hamburger Hallig and Nordstrandischmoor, were connected to the mainland by dams on which narrow gauge railways have run since the 1920s. This offered better accessibility and has also led to further accumulation of salt marshes. The secured shoreline also completed a process during which some of the Hallig islands had gradually grown together. Langeness, Nordmarsch and Buthwehl, which were originally separated by rather wide canals, were combined into one large island, as well as Gröde and the salt marshes of Appelland.

The 1930s also saw an end to the traditional method of annually distributing the island land between the inhabitants. As the size of the islands had ceased to decline any further, the annual land distribution no longer seemed necessary. Many ditches were dug on Hooge using massive support of labour under the early Nazi regime in order to divide the land, whereas on the other islands these structures remained scarce, as the shift to land division took place later. Only on Gröde has the traditional land use been retained until today. Land reclamation measures around the islands have in some places, such as Oland and Nordstrandischmoor, led to new salt marshes in the west. This land is characterised by its regular structure, originating in groynes, parallel fences and embankments reaching into the mud flats and made in order to promote sedimentation, as well as the parallel ditches dug into the new salt marshes to accelerate drainage.

4. Modern development and planning

4.1 Land use

The focus of land use has shifted very much from cattle breeding to nature and coastal protection in recent decades. All of the small and uninhabited Hallig islands, like Südfall, Hamburger Hallig and Norderoog are bird sanctuaries with only an observation ward, inhabited during the summer season. Süderoog is used for organic agriculture, even though it is also part of the national park.

The decline of local agriculture is mostly due to high costs of transport and the good income gained by tourism. The extensive stock breeding had always depended on animals from the mainland, which are brought to the Hallig islands for grazing during the summer. This is still the case, with varying ratios of self-owned to externally-owned cattle between the islands. Damage by birds and storm floods to the pastures are reimbursed to the farmers. Fishery for self supply is still possible on limited scale. Land owners also receive money as contractors to nature protection for pastures left unused.

During the last 150 years the importance of the Hallig islands for coastal protection has increased steadily. They are important as a vanguard for the mainland in order to lessen the impact of storm surges. Therefore many islanders are at least partially employed by the state

for coastal protection work like maintaining the concrete protection of the shores and land reclamation measures. Summer dikes around the whole islands have reduced the number of times the islands are flooded annually, e.g. to 2-3 times on Hooge due to its high embankment. Since 1976, the dwelling mounds have been extended and surrounded by a ring dike for protection against the increasing flood level, which has risen because of large embankment projects like Beltringharder Koog in front of the mainland marshes. Traditional heightening of the mounds is no longer possible without disassembling the houses. This process hasn't been finished yet and the mound of Mittelritt/Lorenzwarft on Hooge is currently under construction.

The unique traces of medieval and early modern settlement in the mud flats, which have been revealed over the last decades are now being buried again by increasing sedimentation in these areas.

4.2 Settlement development

The storm surge of 1962 has left many houses, especially on Hooge, in ruins. They had to be replaced by specially designed modern constructions, which have a central, supporting frame of concrete and a storm-shelter in the attic. The islands have received fresh water and power connections with the mainland only in the years after 1953. The space for building is restricted to the dwelling mounds and cannot be extended. Those buildings, which have not been replaced by modern ones, have often been altered significantly and adapted to recent requirements. The actual building structures are mostly influenced by tourism and, protection against storm floods. Three small museums exist on Langeness, while Hooge has two, together with a cinema, which provides impressions of storm surges. The focus of tourism differs strongly from island to island. Hooge is the most touristic of all Hallig islands with the highest rate of daily visitors, while Langeness, the largest of these islands, has put more emphasis on long term tourism.

4.3 Industry and energy

Wind power generators are not allowed in this entity. No industry has ever taken place on the Hallig islands up to now nor is it planned that it will do so, in the future.

4.4 Infrastructure

The traffic between the Hallig islands and the mainland is either by ferry, most from the harbours of Schlüttsiel and Dagebüll, or via narrow gauge railways to those islands that are connected by a dam. The marine connection to the larger Hallig islands like Langeness and Hooge is tide independent due to long moles reaching out to tidal canals, while the other islands can only be reached at high tide. The railways are only accessible at low tide. New roads had to be built to cope with the use of cars, now paved and fitted with fixed bridges.

5. Legal and spatial planning aspects

The Wadden Sea area around the Halligen and all of the uninhabited Halligen and Süderoog are part of the Wadden Sea national park of Schleswig-Holstein, which, in principle, aims for a natural landscape without man-made aspects. The major part of the mud flats around the Hallig islands is an archaeological protection area. The Hallig islands of Hooge, Langeness and Oland are also focal areas for tourism, requiring specific co-ordination of tourist building measures with the aim of retaining the existing free spaces on the dwelling mounds. Furthermore, Hamburger Hallig is a nature protection area, Nordstrandischmoor, Gröde, Hooge, Langeneß and Oland are also areas of international significance for bird protection according to the Ramsar convention and Natura 2000. Hooge is rated suitable as a landscape protection area. A recent discussion about the extension of the biospheric reservation of the Wadden Sea to the Hallig islands has led to a common application of the islanders for this extension, which is remarkable considering the resistance and reluctance of many inhabitants. A model of the landscape framework plan for the Hallig islands is strongly focused on the natural aspects of landscape, whilst calling it a cultural landscape.

6. Vulnerabilities

6.1 Spatial planning

No integrated development and tourism concept for the islands exists. An important attempt in the 1980's to produce an integrated development and tourism plan which also integrated the cultural heritage and which included, for instance, proposals for adapting modern buildings with little effort to traditional styles, was unfortunately dumped.

6.2 Settlement

Development pressure, especially during the last decades has resulted in the loss of major parts of the island's traditional cultural heritage. Thus, at the Hanswarft on Hooge, one of the rare freshwater collection systems (Scheetels), vanished only recently due to an extension of the mound. Elements of the local heritage such as this are in competition with buildings and infrastructure for the limited space on the dwelling mounds and are in danger of destruction. In addition, modern buildings are influenced by the needs of tourism and protection against storm floods, and fail to take account of the historic character of settlements.

6.3 Nature conservation

Historic landscape elements within the area of the Wadden Sea National Park may be threatened by measures to create a purely natural environment.

6.4 Tourism

Tourism has changed the landscape with infrastructural measures, especially on Hooge, the island with the highest rate of daily visitors. In addition, historic buildings have often been significantly altered to meet the needs of tourism. These tourism-oriented actions, even if integrating cultural aspects, are often not sufficiently co-ordinated between the respective experts. Cultural heritage still has only a relatively low priority on the Halligen, in comparison with the importance of tourism. Increasing levels of day tripper's could deter longer term visitors looking for tranquillity.

6.5 Infrastructure

New roads run straight across the islands, disregarding the traditional courses on high banks, which often leaves them submerged in the cold seasons.

6.6 Coastal protection

Much of the unique situation of the Hallig islands with their shifting and soft borders between salt marsh and mud flats and their large, intersecting tidal creeks have been lost through the modernisation of coastal defences.

7. Potentials

7.1 Spatial planning

The major part of the mud flats around the Hallig islands is an archaeological protection area. The Hallig foundation was constituted in 1990 in order to promote local cultural heritage and is therefore important for integrated plans. The idea of a political association to co-ordinate local development can help further this process.

7.2 Agriculture

The use of local products, e.g. in gastronomy, and their commercialisation has the potential for growth and can strengthen traditional forms of land use, which are important for the management of the local landscape.

7.3 Tourism

The Hallig islands with their repeatedly flooded salt marshes are still an area with a unique and impressive cultural landscape. The difficult accessibility via water, track or, sometimes, mud flats, are seen as positive by those visitors seeking secluded recreation and relaxation. Thus, the Hallig islands, especially the smaller ones, already have a high percentage of regular visitors. This should naturally lead to more sustainable, integrated forms of tourism, partially already practised, as the limit for the growth of sustainable tourism has already been reached. Integrated plans, taking account of the cultural heritage assets of the area as part of high quality tourist offers, are therefore needed, as underlined by a study published in 2004. Besides nature trails, a culture trail, developed with the involvement of experts, could strongly contribute to the understanding and appreciation of the landscape.

7.4 Natural processes

Traces of medieval and early modern settlements in the mud flats, which have been revealed during recent decades, are now being buried again through the accretion of sediments, preserving them for future generations to understand and appreciate.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.) 2002. Landschaftsrahmenplan für den Planungsraum V. Kiel.

Kunz, Panten. Die Köge Nordfrieslands (Bredstedt 1997)

Bantelmann, A, et. al. (ed.). Das große Nordfrieslandbuch (Bredstedt 2000)

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart.

M. Müller-Wille, B. Higelke, etc. (eds.), Norderhever-Projekt, Offa 66 (Neumünster 1988)

Albert Bantelmann, Rolf Kuschert, Albert Panten, Thomas Steensen. Geschichte Nordfrieslands. (Heide 1996)

Albert Bantelmann: Nordfriesland in vorgeschichtlicher Zeit. (Bräist/Bredstedt 2003))

Chamber of agriculture Schleswig-Holstein, Machbarkeitsstudie zur Entwicklung der Halliglandwirtschaft für die Halligen Gröde, Hooge, Langeneß, Nordstrandischmoor und Oland (2002)

Katrin Augsburg, B. Eisenstein, Max Triphaus. Weiterentwicklung der touristischen Organisationsstrukturen der Nordfriesischen Halligen (Study ordered by Stiftung Nordfriesische Halligen) (2004)

U. Harth. Der Untergang der Halligen (Hamburg 1992)

M. Petersen. Die Halligen (Neumünster 1981)

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Pellworm, SH

1. Overview

Name:	Pellworm
Delimitation:	Island, neighbouring entities Nordstrand, Hallig islands, Eiderstedt
Size:	37 km ² , 6 km from south to north, 7 km from east to west
Location – map:	Wadden Sea Area of North Frisia, Schleswig-Holstein, Germany
Origin of name:	The name is derived from a former administrative unit (Harde) of the lost island of Strand.
Relationship/similarities with other cultural entities:	Pellworm was connected with Nordstrand until the early modern time and, like Nordstrand, is a marsh island; some modern polders like Nordergosharde, Dithmarschen; farm buildings like Nordstrand, North Frisia; duck decoys like Netherlands, Föhr, Nordstrand
Characteristic elements and ensembles:	Early medieval, single, dispersed dwelling mounds and vestiges of settlements on level ground, parts of medieval dikes, remains of medieval settlement in adjacent mud flats, early modern polders, dikes built up in early modern and modern time, farmhouses of that time, ponds and other water bodies as vestiges from dike breeches, clay extraction pits, duck decoy, lighthouse, traditional farm houses

2. Geology and geography

2.1 General

The marsh island of Pellworm is sited in the Wadden Sea of North Frisia in an area of elevated Pleistocene sediment which provides a stable base for the layers of mud and peat which have accumulated here in the millennia of rising sea level after the end of the last ice age. Its oldest marsh areas are remnants of the medieval island of Strand and, later, Alt-Nordstrand. Large areas of the modern mud flats were covered by salt marshes and bogs, intersected by tidal inlets and protected from the open North Sea by barrier sandbanks in the west. The salt marshes of Pellworm have been frequently flooded and severely altered and destroyed in two disastrous floods in the past and only after the second in 1634 did it gain its modern aspect of embanked polders encircled by mud flats that still bear traces of medieval settlement.

2.2 Present landscape

Pellworm is surrounded by the Hallig islands, of which the majority are located to the north of the island. The deep tidal inlet of Norderhever, which cut the medieval island of Strand gradually in half, separates Pellworm from the other remnants of that period, Nordstrand and Nordstrandischmoor in the east, which are today connected to the mainland marshes around the county town of Husum and the polders of the Südergosharde. The peninsula of Eiderstedt delimits the Wadden Sea area of North Frisia to the south of Pellworm.

The marshes of Pellworm are barely above sea level. They have very little relief and are structured by winding roads along the courses of, or on, old dikes and irregular drainage canals. Fields are divided by rectilinear, parallel ditches into narrow strips in the south and east, orientated towards the linear settlements on dikes, and larger, rectilinear enclosures with single farmsteads in the latest polders in the north-east. Fields in the old polders in the centre and the north-west are irregular, small scale enclosures, intersected by sinuous

ditches. The marshland is mostly used as pasture and, to a lesser degree, for arable farming. Settlements are arranged in rows on old sea walls, whereas as single farmsteads on mounds are dispersed within the polders. Tammensiel, together with Ostersiel, is the only village where buildings have spread notably into the marshland, especially some small modern residential areas with detached houses. Houses are low and often built in traditional style. A few two to three storey buildings are situated around the harbour. Deserted mounds can frequently be observed within the fields. Only a few trees have been planted along some of the roads and around houses as windbreaks. Taller constructions comprise the churches, an old windmill and a few wind power generators.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The western and central polders are remnants of marshes that have survived the devastating waves of the flood of 1634 and were embanked again shortly afterwards in order to secure what was left. Large parts of the former marshes have been inundated and subsequently eroded, revealing even older, high medieval traces, like the courses of parallel ditches, which are relics of measures for soil melioration to the north of the modern polder of Bupheverkoog. The earliest settlements of early medieval origin were still on level ground, reflecting the low water level at the time, and can be dated back to the 9th century. They can sometimes be tracked as very low mounds, e.g. to the east of the new church. Following the end of the 12th century it became necessary to raise dwelling mounds, like the Thiessenwarfft, as protection from the rising sea. This rather late date emphasises the protection provided by a closed line of sandbanks in the west, which were finally eroded by the North Sea at that time, leading to a significantly increased maritime influence on the area. The population grew around the same time, probably due to new Frisian settlers from the area of the modern Netherlands, which were proficient in building sea walls. Today, dwelling mounds are still scattered all over the old polders in what seems a random distribution, but which is at least partially oriented along former tidal inlets, the typical settlement pattern of early occupation. Some of these inlets have survived until today, mostly as irregular ditches and field boundaries. The Waldhusener Tief, a still extensive water body in the Große Koog, is the remnant of a large tidal inlet, which forced its way inland in the late middle ages. Many of the mounds were erected after the flood of 1362, which killed thousands of people, devastated large areas of the marshes and drowned the famous trading settlement of Rungholt to the east of modern Pellworm. The whole of the medieval marshes in the area were lowered by cutting peat, which formed a thin layer beneath the surface of the marsh soil. Salt could not be extracted from the peat underneath Pellworm, in comparison to the Halligen where it contributed considerably to the economy. The only building of the time that has survived is the Alte Kirche, a Romanesque church from the 13th or 14th century with its remarkable, ruined belfry, sited close behind the modern sea dike in the Alter Koog and used as landmark for ships into the modern period. The typical irregular, sinuous field system of the time, when the marshland was mostly used as common for grazing cattle, is still easy to discern and has suffered comparatively small changes up to the present day. Even some relics of dikes from before 1634 can be detected near the school and in Tüterland, where the bank is accompanied by a pit, dug in order to obtain material for dike building.

3.2 Early Modern Times

Vestiges of late medieval and early modern settlement, originating in the time after the big flood of 1362 and washed away again in 1634, can barely be seen in the surrounding mud flats as these higher layers of marshland have been mostly eroded. A new and quick embankment of some areas was fostered by Dutch support. A farmhouse, built by the end of the 16th century, survives at Nordermitteldeich, as well as the Neue Kirche, erected in 1528. Stock breeding was again the predominant land use, but arable agriculture was practised. The cultivation of rape was introduced in the late 17th century. The harbour was at the time located near Tilli until the marshland there was reclaimed. These new polders, like the

Ütermarkerkoog, were regained in quick succession to the south and east of the Großer Koog during the 17th century, almost achieving the modern appearance of Pellworm by 1700. As new clay accumulated on the destroyed marshes, older structures were overlaid by more modern and regular field systems, although these were still very different in appearance from the systematic layout of the imposed polders elsewhere.

Only a few new single farmsteads belonging to rich farmers were built in these polders on mounds, usually surrounded by ditches, while other islanders erected their houses in rows on older embankments, like at Südermitteleich, Ostertilli and Schardeich, which now provided safe, elevated ground. The vicarage of the new church dates back to the beginning of the 18th century, whilst a dwelling house on Südermitteleich and a four-sided farmstead at Moordamm are even older. Traditional fishery, as an additional form of subsistence, is still represented by some old fishermen's houses as on Klostermitteleich or Südermitteleich which date to the 18th and even 17th century. Most modern roads stem from this time, originating either as roads built on top of dikes or as linking paths between mounds, like Alte-Kirch-Chaussee and Tüterland. Some even remained gravel paths, for example the connection between Westerschütting and Südermitteleich and the footpath between Seegarden and the Neue Kirche. Numerous pools tell of dike breeches after 1634, like at Südermitteleich from before 1770 or at Westerkoog dated to 1825. Sea walls had to be built anew several times behind the old, destroyed dike line. Agriculture has therefore suffered from the frequent inundations which spoiled the harvest and the fresh water and also promoted diseases and enhanced mortality above the birth-rate. Only constant immigration of people from the mainland could make up for the loss. The deplorable condition of the sea walls was mostly due to the system of private maintenance, in which the adjacent land owners themselves had to care for the preservation of the sea-walls. This was replaced by the end of the 18th century by a system of communal maintenance, which improved the situation, but nevertheless made it necessary to again put back the dike line in the north and west due to severe damages after a storm surge.

3.3 Modern Times

In spite of the fertile soil, many inhabitants were impoverished by the heavy costs of dike maintenance and were forced to sell the land to their creditors at the beginning of the 19th century. The situation improved only after the state of Denmark took over the maintenance of the sea walls in order to keep the island as embanked breakwater in front of the mainland instead of turning it into a Hallig island. The dikes were reinforced by berms of stone at the base of those sea dikes without protecting salt marshes in front. Numerous, water-filled pits, formed by the extraction of clay, can still be seen near the Alte Kirche, Hooger Fähre or in the north-west and north-east, behind the outer bank. The Dutch introduced modern methods of milling into Pellworm, as a couple of extant buildings demonstrate, like the ones at Nordermühle or Ostertilli. Most of the still surviving, traditional farmhouses stem from the 19th century. These are elongated, thatched brick buildings with entrance and gables at the side, often surrounded by ditches. The drainage was improved by a new sluice in the first half of the 20th century and eventually by the pumping station at Tammensiel. Larger water bodies, mostly former dike breeches, still serve as reservoir for the inland water, like the Waldhusener Tief for the northern polders and the Süderkoogtief for the south. The impressive lighthouse and a duck decoy for large-scale bird catching, which are, in North Frisia, only found on the islands, were built around 1900. Many residential houses in traditional, elongated brick-style of the late 19th and early 20th century are still in use. The embankment of the Bupheverkoog during the time of the National Socialist regime was the first and last new polder to be built after over 200 years and, contrasts with the older polders by its strictly geometrical, planned appearance. It was mainly designed as a dam intended to connect the island to the mainland. Many inhabitants left Pellworm during the 19th century in order to emigrate, especially to America. Until the 1970s livestock farming predominated in the agricultural economy. Arable cultivation has since become more common, with an increasing rate of organic farming in recent years. Together with the land consolidation of the

60s this led to a considerable change of field structure and enlargement of field size, although much of the irregular field system is still intact.

4. Modern development and planning

4.1 Land use

Agriculture is still an important economic factor, in comparison to the other tourist islands. Development will, however, lead to the enlargement of ever fewer farms and additional tourist offers from farmers. The tendency is therefore strong for set-aside of agricultural land, for contract-based nature protection and for higher quality production like organic farming. As demand increases for renewable energy, farmers also look to the possibility of cultivating energy crops. The island already has a high level of about 10% of organic agriculture which only disturbs existing landscape structures to a small degree or even helps in preserving them. Some areas, like the old dike breach of Waldhusener Tief, are designated for nature protection.

4.2 Settlement development

The island is focal area for tourism, which is nowadays the major source of income for its inhabitants. The realisation of the regional plan therefore restricts further assignment of new areas for houses and camping grounds. The few houses of Tammensiel and Ostersiel that have developed since the 1960s into a central village with a residential area in the north of Tammensiel and a spa in Ostersiel, reflect the increasing importance of tourism. Although the number of inhabitants has almost halved since the 19th century and a large number of dwelling mounds now lie deserted, many new houses have been built on former sea dikes and along the roads.

4.3 Industry and energy

Only a few wind turbines have been erected in the north-east of the island and these are not likely to extend further, due to restrictions by regional planning. However, the island has one of the largest power plants combining solar and wind power.

4.4 Infrastructure

The connection to the mainland at Strucklahnungshörn on Nordstrand is provided by the harbour of Tammensiel. In 1992 the old sluice harbour was supplemented by a long mole reaching out to the Norderhever in order to provide a tide independent access.

5. Legal and spatial planning aspects

The island fulfils the requirements for a landscape protection area. It is also rated as structurally rich landscape and is, as a focal area for tourism, with restrictions regarding new structures and buildings connected with tourism. The mud flats are an archaeological protection area. Nature protection aims at further integrating agriculture and promoting extensive stock breeding and contract based nature protection in the old polders. Furthermore, it is proposed to increase the number of so-called typical landscape elements and to integrate the existing elements into the network of biotopes and protection areas, like the Waldhusener Tief. The landscape plan supports the integration of historic settlement structures into planning. The tourism concept for North Frisia promotes sustainable development in this sector. An improvement of landscape related tourism together with riding, cycling and hiking is suggested by landscape planning.

6. Vulnerabilities

6.1 Spatial planning

No special areas are designated as landscape protection areas or as suitable for that status.

6.2 Settlement

Planned new development areas at Bupheverweg and Seegarden are not necessarily coherent with the island's characteristic settlement structure.

6.3 Agriculture

The modernisation of farming activities on the island has significantly altered the appearance of built-up areas as well as a number of stretches of land and the process of re-structuring with fewer and larger farms is set to continue, exacerbated by the decreasing number of inhabitants on the island.

6.4 Tourism

Tourism is only taking advantage of landscape and cultural assets to a very limited degree and the decreasing number of inhabitants on the island could result in methods of subsistence such as daily tourism and more tourism facilities that are not sustainable.

6.5 Infrastructure

A dam connecting the island to the mainland would invariably influence the unique island situation. A further deepening of the waterway between Pellworm and Nordstrand is liable to destroy valuable landscape structures in the mud flats and may endanger the outer sea wall by the widening of Norderhever. Roads are narrow and need to be used by cars, cyclists and hikers together. Few tracks exist solely for cyclists and hikers.

7. Potentials

7.1 Settlement

Much of the medieval and early modern settlement structure and traditional farm buildings have remained unchanged and many of the island's modern buildings share the same orientation as existing structures. A recent village renovation program has helped to bring back much of the traditional appearance of old houses.

7.2 Agriculture

Much of the medieval and early modern field structure has remained unchanged. An increase in the levels of organic agriculture on the island could support development and use of the historic landscape. A combination of agriculture with farm holidays could produce synergies. Marketing and local use of local quality products can strengthen landscape compatible forms of agriculture and local subsistence.

7.3 Tourism

The island is appointed as a spa which supports more regular and long-term tourism all year round. Further decentralisation of tourist facilities, a reduction in daily tourism and caravans in favour of family oriented, long-term stays and offers for experiencing landscape and cultural heritage, as recommended by the landscape plan, will strengthen the value of landscape elements and support their positive management and retention. Integration of cultural and landscape issues in maps and recommendations for routes and a network of revived historic paths exclusively for walking, hiking and riding can reach visitors not specifically interested in these aspects; most of the roads on the island already existed by the 19th century. The history of dyke building on Pellworm is one of the most eventful and revealing stories of using, securing, losing and regaining profitable marshland in the Wadden Sea Region and the process involved can still be reconstructed from historical features of the landscape, with the characteristics of individual polders being visibly different and even parts

of medieval dikes still visible. Especially remarkable are the vestiges of a submerged landscape in the mud flats.

7.4 Coastal protection

Rebuilding former outer dikes as a second line for coastal protection could further emphasise the islands historic landscape characteristics. They are also well suited for strengthening the local image for marketing purposes.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum V. Kiel 2002.

Kunz, H. & Panten, A. 1997. Die Köge Nordfrieslands. Bredstedt.

Bantelmann, Landschaft und Besiedlung Nordfrieslands in vorgeschichtlicher Zeit (Husum 1992)

Bantelmann, A. (ed.) 2000. Das große Nordfrieslandbuch. Bredstedt.

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart.

Beseler, Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Braun, Strehl (eds.), Langhaus und Winkelbau. Uthlandfriesische Bauformen im 18. und 19. Jahrhundert (Bredstedt 1989)

Vogel, Der nordfriesische Geestrand, die Entwicklung seiner ländlichen Siedlungen und ihrer Flurformen (Bräist/Bredstedt 1996)

Fohrbeck, Schikotanz. Die Region „Uthlande“ Ein Regionales Entwicklungskonzept (unpublished)

Fahrenkrug et. al. Regionales Entwicklungskonzept Nordfriesland (unpublished, 2003)

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Map of H. du Plat of 1804/05

Südergosharde, SH

1. Overview

Name of entity:	Südergosharde
Delimitation:	Arlau river, entity Nordergosharde in the north, Mühlenau river, entity Eiderstedt in the south, Beltringharderkoog as connection to entity Nordstrand in the northwest, Wadden Sea in the southwest, eastern border of municipality of Husum, Schobüll, Wobbenbüll
Size:	ca. 11 x 10 km
Origin of name:	Name of former Danish political unit, entity comprises only western parts of the area
Relationship/similarities with other cultural entities:	Single dwelling mounds and few village mounds like Wiedingharde
Characteristic elements and ensembles:	Irregular medieval and early modern enclosure; high medieval farm mounds and groups of mounds, some on dunes; dike mounds; farm houses within large medieval polder; uninhabited small-scale polders; historic old centre of Husum with medieval layout, Renaissance and Baroque houses, castle, classicistic building in adjacent areas; late 19 th century forests; villages with large modern residential areas; small-scale fields divided by hedgerows.

2. Geology and geography

2.1 General

Pleistocene moraines from the Saale ice age form the high Geest of North Frisia where the town of Husum and the Geest of Schobüll is situated, the latter rises to a height of more than 30m. In the Südergosharde, the moraines of the mainland reach the coast and slope directly down to the mud flats of the Wadden Sea without any salt marshes in front, a situation rare in the Wadden Sea area. Small marshland areas have accumulated north and south of this around the rivers of Arlau and Husumer Mühlenau, these originated from glacial rivers of the ice age. The repeated rising and lowering of the sea level during the centuries had also produced layers of peat under the modern marshland as well as some dunes, which were later incorporated into the developing salt marshes. During the medieval period these probably belonged to a much larger salt marsh area which was largely destroyed by severe storm tides from the 14th century onwards.

2.2 Present landscape

Northern Südergosharde comprises the marshland area of Hattstedtermarsch south of the Arlau River. This area was in existence by the medieval period, and is characterised by irregular, small-scale enclosures mostly used for animal breeding and only a few, scattered farmsteads on mounds, mostly in the western part. The polder is cut by the coast road and a railway line which also extends southward, across the Geest at Hattstedt, till Husum. Trees are lined up along roads and planted around the farmsteads. The high moraine Geest, with its relief sloping up to the hill at Schobüll, is quite densely settled, with expanding villages along the edges to the marshland. It has some forested areas in the hinterland, while much of the land outside the villages is divided into small fields by hedgerows, mostly used for agriculture. The city of Husum dominates the southern part of this area with its historic centre and the vast modern residential and development areas, especially in the northwest. The

mostly uninhabited polders west of Husum, delimited by the Mühlenau River to the south, are small and consist of irregular fields used for grazing.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

There are finds from the late Mesolithic period in the harbour of Husum, which are exceptionally early for the Wadden Sea Area and very rare. There are Neolithic settlements and burials on the edge of the glacial moraine, as well as Neolithic remains in the dunes in the Hattstedtermarsch. The burial mounds and urn cemeteries on the moraine area usually date to the Bronze Age. Extensive salt marshes and bogs probably existed in the area from the Iron Age on, but these were mostly destroyed in the late medieval period. The marshland in the east of the Hattstedtermarsch originates in this period and was used for grazing by farmers settled on the adjacent high land. Some villages, like Bohmstedt and Ahrenshöft, still demonstrate the typical layout of settlements along the edge of the Geest using the salt marshes for animal breeding; whilst others, like Hattstedt and Horstedt, have a more clustered layout. Intensive land use in the medieval period had turned much of the land on the Geest into heath land and had made inroads into the early forests. The oldest building in the area is the church of Olderup, a simple hall church, probably 12th century in date, with a later detached belfry. The entrance on the side is also typical of those used in farm houses of the area. The village of Husum is medieval in origin. It flourished after a flood in 1362 which had destroyed large parts of the former salt marshes and changed the course of the tidal inlet of Heverstrom, connecting Husum to the open sea.

The western parts of the Hattstedtermarsch were higher and more fertile than those in the east but also more under the direct influence of the sea and therefore sub-divided by tidal inlets. Settlement here started in the 12th century on dunes like Sterdebüll or Herstum, which were subsequently raised artificially to form mounds or groups of mounds, like the mounds of Ellerbüll. The old late medieval course of the River Arlau can still be traced as this is now the route taken by the Jelstrom canal. However, when the salt marshes along the Arlau were embanked in the late 15th century, the river then followed more or less its modern course. The small scale fieldscape of the Hattstedtermarsch polder has not changed substantially through the ensuing centuries, and can still be regarded as basically medieval in origin. The small area of low salt marshes in front of Husum was embanked in the late 15th century and has stayed almost uninhabited till today. It was only used for animal breeding and for mowing, as it was wet and prone to frequent floods. Although land reclamation has provided much new marsh land, large areas like the area of Warfthusen in front of the Hattstedtermarsch, have also been lost to the sea.

3.2 Early Modern Times

The economy of Husum boomed in the early modern period due to its role as an important harbour in the grain-trade from the region. This resulted in an abundance of rich buildings, erected in the 16th and 17th century. These include the home of the writer Theodor Storm, some buildings in the Hanseatic style and the town hall of 1601, in the old town centre. The duke's castle in the Dutch Renaissance style was erected outside the confines of the city at this time. North of the harbour the layout of Husum was orientated towards the mouth of the Husumer Au, which had been dammed in the 15th century, and along the westward roads to Flensburg and Schleswig and the northward road to Niebüll. In the following centuries further residential buildings were erected around this centre, particularly between the old town and the castle. The town was granted city rights in 1603. A severe flood in 1634 led to decreasing trade. This, in addition to increased sediment in the harbour area, led to an economic decline during the 17th and 18th centuries. The damming of streams around Husum by a couple of water mills, notably the Mühlenau, led to the creation of a large pool. The outline of this can still be traced in the layout of streets and as a slope to the west of the harbour. Consolidation of farming in the 18th century divided the commons among the farmers, using banks with

hedgerows (Knicks) to sub-divide the commons into small scale fields used for mixed farming. This system is still visible to-day, e.g. near Wobbenbüll. Around the large Halbmondwehle pond south of the Mühlenau River, the result of a dike breach in the late 15th century, several fortifications were built. These were however destroyed again, leaving little trace.

3.3 Modern Times

A railway track to Niebüll in the north was built in the middle of the 19th century, cutting the marsh land area of Hattstedtermarsch in half. It was later extended to Hamburg in the south. The heath land on the moraines was turned into agricultural land in several places, helped by improved fertilising technique. Also forest was planted according to a new governmental programme of reforestation. Examples include the woods behind Schobüll, east of Wobbenbüll or at Osterhusum. Marl for neutralising acidic soil was exploited in pits like on the Mauseberg hill in Husum, now a park outside the city. The classical style Marienkirche was built around 1830, resembling the cella of an antique temple. Whilst Husum had not extended much beyond its confines by the end of the 19th century, it grew rapidly after the German-Danish war. The layout was changed to include more spacious roads, flanked by many classical buildings dating to the turn of the 20th century. The old medieval centre has however largely retained its historic appearance. By the end of World War II, the area of the town had doubled and has continued to grow. The former independent village of Rödemis, south of Husum, has been incorporated into the town. Around 1900, the station moved to a larger area in the north of the city together with another goods station, but returned to its original site later.

4. Modern development and planning

4.1 Land use

The course of the Arlau River was straightened and embanked in the 1950s in order to provide better drainage and protection from flooding by freshwater. Modern pumping stations, such as the Arlauschöpfwerk, were also installed to help solve the century old problem of flooding by freshwater which could not be drained into the Wadden Sea during storm tides. The new reservoir of Jelstromstaubecken is used in addition to store the surplus water. The Hattstedtermarsch was eventually separated from the Wadden Sea in 1987 following construction of the water reservoir and nature sanctuary of Beltringharderkoog. These drainage measures opened the low lying marsh areas for agriculture, but changed its appearance considerably. However most of the land there is still used for livestock breeding. In contrast, consolidation under the farming scheme of Programm Nord has had little impact on the ancient fieldscape of the Hattstedtermarsch. Nowadays many low areas are designated by spatial planning as being suitable for reversion to wetland, underlining the increased importance of nature protection. The marshland areas in front of Husum have also retained their old enclosure pattern of parallel drainage ditches. Approximately a third of the area of Husum is used for agriculture, with farming mostly on the moraine fields and stock breeding usually on the marsh land.

More recently, as agriculture has become less profitable in the Hattstedtermarsch, many fields have been taken out of agricultural use (set-aside), and receive financial support for this from the state. The cultivation of renewable bio-mass energy, like short-rotation coppice, which are cut every three years, has become popular, but has a considerable impact on the appearance and management of the landscape. Straightened watercourses are increasingly returned into a more natural state. Even the artificial canals in the Porrenkoog have been assigned for this purpose, due to the obligation for naturalisation of water courses according to the Water Framework Directive.

4.2 Settlement development

Only a few farmsteads have been added to the dispersed settlement pattern present in the Hattstedtermarsch during the last decades, these are primarily located in the formerly low and wet eastern part. The situation on the moraine high land is dramatically different. Small villages like Schobüll, Wobbenbüll and Hattstedt have multiplied in size in recent decades without much regard to the historic plan. The coastline of the Geest is almost entirely settled, and this has even partially spread into the marshes. There is a similar situation in Husum, with many new residential areas, particularly single, residential houses, in the north of the old centre and a new and large development area for industry and business along the regional road B5.

4.3 Industry and energy

Husum has recently developed into a centre for the wind power industry, and requires a larger and deeper outer harbour for further growth in connection with planned off-shore wind parks. The German army also occupies large areas for two garrisons and a military training area, north-east of the town. Only a very few wind turbines exist in the west of Hattstedtermarsch and in the polders along the Mühlau River. In the former further construction is prohibited.

4.4 Infrastructure

The old road north to Niebüll has been extended, forming a by-pass around Husum. This extension has especially influenced the area of Hattstedtermarsch which is now virtually cut in two by the regional road and the railway tracks. The modern outer harbour was built and extended to cater for the need of the growing industry, at the same time helping the old harbour to retain its historical appearance.

5. Legal and spatial planning aspects

The landscape framework plan identifies many low areas as suitable for returning to a marshland habitat. Extensive areas within the cultural entity of Südergotharde, such as Hattstedtermarsch, Porrenkoog, Dockkoog, and around Hattstedt, Wobbenbüll and Horstedt, as well as the coast at Schobüll, are designated as possible landscape protection areas. The adjacent Beltringharderkoog is a nature protection area. The Hattstedtermarsch, together with the lowlands around the Arlau River, are considered to be particularly significant landscape areas. The Schobüller Berg is a designated landscape protection area.

Some residential estates already exist in the marsh land, as in the Porrenkoog polder, but regional spatial planning has finally recognized the Geest-marsh land border as an important area for settlement development. A shift in the way of thinking can also be seen in the planning for Wobbenbüll, which confines further settlement development to the current built-up area. The green spaces between Husum and Mildstedt, and between Husum and Schobüll, are to be kept free from development.

6. Vulnerabilities

6.1 Settlement

The area has been particularly affected by settlement development around Husum during the past decades, which has substantially altered the landscape. This is perhaps most notable along the moraine coast around Schobüll where the buildings now constitute an almost closed line to the suburbs of Husum. A number of small villages have multiplied in size in recent decades with little regard to their historic plan. New development areas are still being designated which will inevitably lead to further impacts on the surviving historic landscape features and archaeological sites.

6.2 Agriculture

Nature conservation management through agricultural schemes can have a negative impact on the historic landscape as areas chosen for set-aside and biodiversity measures aimed at recreating natural habitats can fail to take account of historic land-uses and associated landscape features. As an alternative to arable production, the cultivation of energy crops like short-rotation coppice has become popular. Unfortunately this crop can have a profound impact on the landscape and can also affect buried archaeological remains through root growth and the dessication of waterlogged deposits.

6.3 Tourism

Concepts for the tourist development of the polder in front of Husum have not been elaborated yet, but its potential as a recreational area has been recognized by the landscape plan which has recommended sustainable tourism development. As detailed guidelines and objectives to ensure this are missing, it could lead to tourism infrastructure which diminishes the cultural landscape assets of the area.

6.4 Nature conservation

Nature conservation measures such as re-creation of wetland areas, can sometimes conflict with existing landscape values.

6.5 Industry and energy

The development of industrial parks has had an even bigger impact than settlement by extending the area of Husum, well beyond the confines of the residential and mixed areas. The tendency to allow the development of bigger shops and malls in these new estates drain income from the industries and shops within the city centre, leaving them increasingly dependent on the rather seasonal tourist trade.

Even though wind power industries are very important for the economy of the town and region, they are in stark contrast to the traditional characteristics of the marsh landscapes and can impact on buried archaeological remains.

6.6 Infrastructure

Further enhancement of the harbour at Husum represents many threats to the landscape and especially the archaeological heritage, so that it is vital to integrate cultural heritage thoroughly into the spatial planning process.

7. Potentials

7.1 Settlement

Some villages like Bohmstedt and Ahrenshöft, still retain the typical structure of geest edge settlements. Only a few farmsteads have been added to the dispersed houses in the Hattstedtermarsch during the last decades, especially in the formerly low and wet eastern part, such that it retains an essentially medieval landscape. In the western part there are characteristic farmsteads located on their dwelling mounds. Further residential estates in the marshland in front of Husum are restricted.

7.2 Agriculture

The historic fieldscape of the Hattstedtermarsch polder survives well, marshland areas in front of Husum have retained their characteristic enclosure by parallel drainage ditches and the small scale fields enclosed by banks and hedgerows which resulted from enclosure of the commons for mixed farming in the 18th century can also still be seen, for example near Wobbenbüll. Changes in agriculture away from production to environmental protection offer opportunities to integrate conservation of the natural environment and historic landscape of these areas, to provide further attractions for walkers, cyclists and riders.

7.3 Tourism

The old harbour of Husum is under little economic pressure due to the construction of a new harbour closer to the sea and thus still retains much of its historic character. This, combined with the small scale layout of the impressive and well kept old town of Husum and its historic buildings, is very attractive for tourism. Contrasting positively to the densely built area of Husum and coast at Schobull, the sparsely settled open marshland areas of Dockkoog and Porrenkoog in front of the town and especially the larger Hattstedtermarsch are impressively well persevered historic landscapes, little altered by land consolidation programs. These zones have substantial potential, not only for tourism, but also as recreational areas for the residents of Husum and its hinterland. As the narrow, winding roads usually do not allow the use of larger coaches, an extension of opportunities for cycling, walking or guided tours with small buses for elderly people will be important. Like all marsh landscapes, good quality information and interpretation for visitors is also required to enable proper appreciation.

7.4 Nature conservation

There is the opportunity to integrate nature conservation management with the cultural heritage in order to derive positive management of both.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.) 2002. Landschaftsrahmenplan für den Planungsraum V. Kiel.

Gemeinde Husum. Landschaftsplan. not published.

Gemeinde Hattstedtermarsch. Landschaftsplan. not published.

Kunz, Panten. Die Köge Nordfrieslands (Bredstedt 1997)

Bantelmann, A, et. al. (ed.). Das große Nordfrieslandbuch (Bredstedt 2000)

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart. Arbeitsgemeinschaft Chronik der Hattstedtermarsch (Eds.). Chronik der Hattstedtermarsch (1985 Bredstedt)

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Nordstrand, SH

1. Overview

Name:	Nordstrand
Delimitation:	Island, neighbouring entities Pellworm, Hallig islands, Südergosharde, Eiderstedt
Size:	c. 50 km ²
Location – map:	Wadden Sea Area of North Frisia, Schleswig-Holstein, Germany
Origin of name:	The name derives from the former 16 th century island – and translates as Nord (north) and Strand (beach).
Relationship/similarities with other cultural entities:	Nordstrand was connected to the marsh island Pellworm until early modern times; it has late medieval rows of dwelling mounds comparable to those at Dithmarschen and Wiedingharde; modern polders like those at Nordergosharde and Dithmarschen; farm buildings comparable to examples in Pellworm and North Frisia; duck decoys comparable to examples in the Netherlands, Föhr and Pellworm.
Characteristic elements and ensembles:	Remains of medieval settlement in adjacent mud flats, early modern polders, dikes built up in early modern and modern time, farmhouses of that time, rows of medieval dwelling mounds with some vestiges of contemporary embankments

2. Geology and geography

2.1 General

The marsh polders of Nordstrand form, together with Pellworm, the remains of a much larger marsh area, which used to be the island of Strand and, later, Nordstrand, from which the modern name is derived. The majority of Nordstrand had been destroyed by severe storm tides by the middle of the 17th century. Although the present Nordstrand, like Pellworm, is situated on a higher Pleistocene basis than the surrounding mud flats, the area around the pre-17th century Nordstrand had thick layers of raised bog underneath the marsh surface which had been excavated by the end of the medieval period. Nordstrand is surrounded by other islands; the Hallig islands of Nordstrandischmoor to the north, Südfall to the west and the peninsula of Eiderstedt to the south. The deep tidal inlet of Norderhever, which gradually cut the medieval island of Strand in half, separates Nordstrand from Pellworm. Nordstrand is now connected to the mainland marshes around the county town of Husum and the polders of the Südergosharde by a long sea dike and a road embankment.

2.2 Present landscape

The c.50 square kilometres of marshes of Nordstrand are flat and open, with little relief above sea level. There are a few trees along the roads and around farmsteads, these, and the many dikes and mounds and a couple of modern wind turbines, form the principal vertical elements which dominate and limit the view, as well as the mostly single storey buildings, the three churches and the modern spa buildings. The polders are small scale, of irregular shape and roughly about the same size, with the exception of the larger Beltringharder Koog, which is a nature sanctuary and water reservoir between the mainland and the island. The marshland is divided by ditches into mostly small-scale, rectangular fields. It is used for arable agriculture and stock breeding, with isolated dispersed farmsteads and houses lined up along the dikes and roads. Apart from the main road connecting the harbour of

Strucklahnungshörn and the mainland, there are only few narrow roads, sited either on former dikes or straight across the polders.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The pattern of settlement from late medieval times, which is still visible today, is a result of the patterns of peat extraction in the past. It was a well organised occupation, comparable to other settlements in raised bog areas, as in Dithmarschen, which resulted in long lines of dwelling mounds originally erected on parallel, narrow strips of land, along which the turf was cut. Much of this fieldscape disappeared in the storm flood of 1634, which destroyed the much larger ancestor of modern Nordstrand. The rows of dwelling mounds with single farmsteads, like in the Alter Koog at Odenbüll and at Mitteldeich, used to reach much further north and south, into the area of current mud flats. Other monuments dating to before 1634 can still be seen. These include vestiges of the medieval dikes, as well as the course of many tidal inlets, as at Trendermarscherkoog and Alter Koog. The mud flats north and west of Nordstrand contain much evidence of medieval occupation. To the west and south of the Hallig of Südfall, there are traces of groups of dwelling mounds, which are ascribed to the legendary settlement of Rungholt, destroyed in the storm surge of 1362. The church of Odenbüll, first mentioned in the 13th century, is the only surviving medieval building. It has been altered several times during the ensuing centuries.

3.2 Early Modern Times

The old marshes had repeatedly been covered with new marine sediments after the storm surge of 1634. 20 years later a Dutchman, based on authorisation by the Danish king, eventually succeeded in securing the remains of the earlier marshes, the Alte Koog, with a surrounding ring dike. This fostered further sedimentation and soon other polders south and east of the Alte Koog were reclaimed by foreign investors during the 17th century. The Trendermarschkoog still comprises irregular enclosures, revealing the course of old dikes and tidal inlets. The regular field structure of the later Elisabeth-Sophien-Koog demonstrates the well organised and planned nature of land reclamation of the time and also its close resemblance to other polders in the area, especially some of the polders of the Reußenköge, which even shared the same financier.

Parts of the early modern infrastructure, such as the many connection paths (Grüner Weg and Armenhausstieg), between the dwelling mounds have survived. The settlement of this time took advantage of the existing features, and houses and farmsteads were built on the former outer dikes, like Osterdeich, Herrendeich or Hamburgerdeich. The Hallig island of Südfall, situated in the mud flats, contains evidence of human settlement to the west of Nordstrand; it was formed in the years after 1362 and was later inhabited by a couple of farms on mounds. They were later destroyed by the flood of 1825, leaving the island uninhabited till the early 20th century. The oldest secular buildings on Nordstrand date back to the end of the 17th century, like the Uhlande style farmhouse of In der Velden at Herrendeich. It is surrounded by a ditch, a feature typical for this island, used as clay-pits from which the clay for the dwelling-mound was obtained. The church of St. Theresia was built by Dutch immigrants, engaged in dike construction, soon after the re-embankment of the first polders. Today it hosts one of the few old-catholic parishes in Germany.

3.3 Modern Times

Nordstrand was served by a few small harbours, situated on the outer dike, like Norderhafen, which is today equipped with a mole, or at a sluice of a tidal inlet, like Engländerdeich, which ceased to function by the end of the 19th century when it was cut off from the sea by a new polder. Süderhafen was founded as a new harbour, and is still in use for yachts today. The new polder was embanked to the east of the island, enclosing rather uneven marshes, which were initially mainly used as pasture. Outside the embankments, further to the east of the

island, a small Hallig island, the Pohnshallig, survived into this period. It contained a farmhouse with fresh water pool and a detached pool protected by a ring dike. These structures were eventually incorporated into the dike line in the early 20th century after World War One. The outline of this former Hallig island is still visible within the polder's structure.

During the 19th century farming became more intensified and most of the historic farmhouses, like Hof Omlandia in Morsumkoog, date from this time. Usually they were surrounded by ditches and accompanied by gardens, of which many are still extant today, as at Pynakers Hof. While most of the 18th and 19th century farmhouses are of the Geesthardenhaus type, there are also few houses of the Uthlande style, more common in the northern parts of North Frisia till around 1800, like Pynakers Hof. There are two duck decoys behind the western outer dike dating to the early 20th century; these were a common bird catching method with its origins in the Netherlands. The neo-gothic church of St. Knud is the most remarkable built monument from around the turn of the century.

Early in the 20th century an attempt was made to block a tidal river between the island and the mainland, but it wasn't until 1936 that a dam was successfully completed, marking the beginning of the end of the situation of Nordstrand as an island. Evidence survives of the continuous dike reinforcement and the extension of the old road system, adapting to more car traffic in the 20th century, in the form of clay pits (Pütten), especially in the western part of the Trendermarschkoog, and in the gates in old dikes (Stöpen), allowing them be closed again in case of flooding.

4. Modern development and planning

4.1 Land use

The gradual development of Nordstrand into a peninsula was completed with the embankment of the Beltringharder Koog in 1987, speeding up landscape change. This change reflects the recent shift of embankment policy from land reclamation to coastal protection. The interior of the polder is used as water reservoir and nature sanctuary, in line with an increased awareness concerning natural assets. The Hallig of Südfall has also been declared as nature protection area and incorporated in the national park of the Wadden Sea area of Schleswig-Holstein. The landscape framework plan, also a product of this altered thinking, has identified the Trendermarschkoog as suitable for a landscape protection area. An increasing awareness towards cultural landscape assets can be tracked by the designation of the surrounding mud flats as an archaeological protection area. Rural structural development has also been central in politics in the past decades, resulting in the land consolidation of Programm Nord in the 1960s, which led to enlargement of fields and a better infrastructure of roads.

4.2 Settlement development

While the increasing importance of tourism improved the subsistence situation for the island's inhabitants, it also changed the landscape considerably. Many new houses, especially second homes, gave some settlements a more village-like, densely built appearance, like along the central road L30, and at Osterdeich, Süden or Süderdeich. The spa complex of buildings introduced a modern, totally untypical architecture to the place, whilst at the same time enriching the offers of health-orientated, long term and all-year tourism. The rather uncontrolled building boom has fostered the identification of the area as a focus area for tourism in the regional spatial plan, restricting new tourist building measures considerably.

4.3 Industry and energy

As is typical for many coastal regions, wind-power generators have been erected during the 1990s in the polders in the north-east, with a larger wind-park in the Morsumkloog and Elisabeth-Sophien-Koog and a few wind mills at Dreisprung.

4.4 Infrastructure

The connection to the mainland resulted in a strong central road axis and consequent rise in the number of day trippers due to improved accessibility. The new ferry harbour of Strucklahnungshörn in the north-west corner of Nordstrand with a large parking lot serves as the main connection between Pellworm and the mainland and has led to additional traffic.

5. Legal and spatial planning aspects

According to the landscape framework plan, the Beltringharder Koog polder and Hallig of Südfall are nature protection areas. The Trendermarschkoog polder is also suitable as a landscape protection area. The mud flats are an archaeological protection area.

According to the regional spatial plan the Elisabeth-Sophien-Koog and the island in general are designated as spas. They are a focus area for tourism; therefore further tourist infrastructure is restricted. New wind-power generators are only allowed at existing locations (re-powering). Dyke re-enforcement is planned at Osterkoog and Alter Koog. Only 3 archaeological sites (mounds) and 3 built monuments (churches, windmill) of the many important historic elements present are registered on the monument list.

6. Vulnerabilities

6.1 Spatial planning

Even though further growth of tourist buildings and wind farms are now restricted, planning towards more sustainable tourism and solutions concerning daily tourism and transit traffic are still needed. These problems are likely to detract from the attractiveness of the region in the future. Enhanced building activities on old embankments are likely to reduce the open view into the polders and the recognition of the dikes themselves. Many of the former outer dikes are partially dug away and there is an increasing trend for to have roads and houses built on top of old dykes which cover a much larger and wider area than the original dyke.

6.2 Settlement

The increase in tourism has resulted in the construction of new houses, especially along the central road, which has altered the former dispersed settlement pattern significantly. The exceptional character of the island has been almost completely lost. The spa buildings give a significantly alienating impression, due to their impact on the surrounding landscape.

6.3 Agriculture

Old tidal inlets can often only be discerned by the pattern of enclosures and field boundaries within the 20th century agricultural intensification programme, for example the Schlosswarft.

6.4 Management of cultural heritage

Most of the cultural heritage monuments are not protected by law and are therefore especially prone to alteration or destruction. As an example the old dykes are being dug away in places and damaged by modern development in others.

6.5 Tourism

The increase in tourism has resulted in traffic congestion especially due to the road connection to the ferry terminal at Pellworm. The spa attractions have not followed the architectural heritage of the island and as such do not fit in with the historic landscape.

7. Potentials

7.1 Spatial planning

Spatial planning needs to take the opportunity to exploit the cultural landscape within its sustainable tourism. Tourism can take further advantage of landscape and cultural assets, e.g. via an additional cultural landscape studies trail and integration with its existing trails.

More long term tourism and better public transport would help lessen the environmental and landscape impact of transit traffic and short term stays.

7.2 Settlement

The historic settlement pattern is mostly intact and the important connection between villages and the marshland survives. It is important to ensure that new developments try wherever possible to fit in with the historic settlement pattern and architectural style of the area.

7.3 Agriculture

Changes in agriculture away from production to environmental protection, together with nature conservation efforts by private organisations also offer opportunities to integrate conservation of the natural environment and historic landscape to provide further attractions to cyclists, walkers and riders. The islands cultural heritage is well-suited for increasing the local resident's sense-of-place and for strengthening Nordstrand's image for marketing purposes.

7.4 Management of cultural heritage

Some areas such as the Trendermarschkoog and the Alter Koog still retain many historic landscape features, like fields systems, dike settlements with historic houses and connecting paths. These areas should be targeted to protect the cultural heritage assets within local planning.

7.5 Tourism

The islands cultural heritage is ripe for exploitation for tourism and amenity use by the island's residents and could be used to offer an additional dimension to the attractiveness of the island for its health facilities and for recreational tourism. There is the potential to further promote the Cultural Heritage through historic cycle routes, walking routes etc. A trail across the mud flats to Südfall gives the opportunity to experience the sunken landscape and cultural remnants in the Wadden Sea. The Elisabeth-Sophien-Koog and the peninsular in general are designated as spa. A nature studies trail enhances the visitor's awareness of landscape assets and there is the potential for cultural heritage assets to be added to this. The reconstruction of old connection paths has significant potential to increase the promotion and understanding of the historic landscape and its recreational values for tourist and inhabitants. A mixed construction of bicycle lane and road, as identified in the local landscape plan, requires less space and hence serves to protect the old dike structure.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.) 2002. Landschaftsrahmenplan für den Planungsraum V. Kiel.

Gemeinde Nordstrand. Landschaftsplan. not published.

Kunz, H. & Panten, A. 1997. Die Köge Nordfrieslands. Bredstedt.

Bantelmann, A. (ed.) 2000. Das große Nordfrieslandbuch. Bredstedt.

Johannsen, C.I. 1992. Eine reiche Hauslandschaft in ‚Nordfriesland‘, no. 97. Bredstedt.

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart.

Maps:

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Royal Prussian ordnance survey of 1879

Eiderstedt, SH

1. Overview

Name:	Eiderstedt
Delimitation:	Marsh land peninsula in the south of the county of North Frisia, bordering entities of Südergosharde in the north-east, Norderdithmarschen in the south and Pellworm, Nordstrand and Halligen in the north, the mainland moraines between Rantrum and Schwabstedt and the rivers of Treene and Eider delimit the entity in the east
Size:	About 30x15 km
Location – map:	Marsh land peninsula in the south of the county of North Frisia, Schleswig-Holstein, Germany
Origin of name:	Eiderstedt was the name of the easternmost of the three administration units in the area of modern Eiderstedt in medieval times
Relationship/similarities with other cultural entities:	Rows of mounds with adjacent strips of fields like in Haseldorfer Marsch and Dithmarschen, medieval fieldscape like in Hattstedtermarsch, small scale medieval and early modern polders and dikes like on Pellworm, dispersed mound settlements like in Wiedingharde, Bökingharde, Dithmarschen, Pellworm
Characteristic elements and ensembles:	High medieval ring dikes with block-like enclosures and irregularly dispersed farm mounds or village mounds, small scale medieval and early modern polders and dikes, rows of mounds or farms with adjacent strips of fields, Haubarg style farmhouses with gardens, artificial canals for transportation, watercourses as remains of tidal inlets

2. Geology and geography

2.1 General

The transgression of the North Sea after the end of the last Ice Age formed a system of east-west and north-south orientated sand banks and dunes in the area of Eiderstedt. These served as a southern barrier for the Wadden Sea area of North Frisia against the sea water. Marshes and bogs formed to the north of these protective sand banks. The area subsequently was inundated as the sand barriers were gradually eroded in the first centuries AD. A patchwork landscape of island-like salt marshes intersected by tidal inlets formed behind the sand banks. The influence of the North Sea increased further with the loss of the protective sand banks to the west of the modern islands of North Frisia in the 11th century. During the Middle Ages, the area of today's Eiderstedt comprised several salt marsh islands, bordered by the winding course of the Eider River to the south and the large tidal inlet of Hever to the north. These were gradually reclaimed and connected with dikes during the following centuries.

2.2 Present landscape

The low marshland of the Eiderstedt peninsula lies below high tide level in the eastern polders, adjacent to the mainland, and reaches a maximum height of 2m above sea level along the river banks of the Eider. The central dunes are no longer visible and indeed hardly exceed this height. Only the dunes in front of St. Peter-Ording reach over 10m. Dwelling mounds, which form the basis of almost all settlements, reach a height of up to 4m. The area is intersected by an irregular system of old dikes and roads running along the course of

former embankments, these are largely on a small-scale in the easternmost and westernmost parts of the entity. Some large canals and an abundance of small watercourses, as sinuous as the embankments, break up the marshland further into small enclosures, usually for pasture and occasionally for arable. Pastures commonly display an internal system of alternating low parallel ridges and ditches. Along the southern coast and in the west, the fieldscape consists of irregular block-like enclosures around dispersed single farmsteads, hamlets or villages. From the centre of Eiderstedt, south of Garding, to the east, forming a ribbon across the landscape, is an area of pastures divided into long strips adjacent to lines of farmsteads. To the north enclosures are larger and single farms are more regularly arranged. Trees are planted along the roads and around farms, but only form forests on the dunes of St. Peter-Ording. Buildings are usually low with one or two storeys, with only a few higher examples in larger villages and in the towns of Tönning, Garding and St. Peter-Ording. Apartment blocks and other multi-storey constructions are almost exclusively confined to St. Peter-Ording. Groups of wind farms are sited in the area south of Husum. A central road and railway line runs the length of the peninsula from the east to the west. A major regional road runs north-south in the east at Tönning. Large sandbanks are sited in front of the western polders, whilst extensive areas of salt marshes can be found predominantly in the Tümlauer Bucht, south of St. Peter-Ording and along the northern coast.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

A few traces of Stone and Bronze Age occupation have been found on the sand ridge between Garding and Tating. Settlements dating to the 1st and 2nd century AD have been found on the higher salt marshes which had built up along the banks of the Eider River. Here people, who kept livestock on the surrounding fertile, lower salt marshes, erected their houses on low mounds. These single farm mounds were combined in to large village mounds in the following decades and centuries, and raised in height in order to protect the inhabitants against the increasing flood level. These settlements were eventually abandoned in the 5th century AD. Some of these dwelling mounds, like Tofting, Pernör or Tönning, are still extant, as are enclosures that still clearly delineate the former loop of the Eider River. The central areas of the Eiderstedt were largely covered by bogs and only a few traces of short-lived settlements on the higher areas can be found.

New settlements, from the 8th century onwards, are usually connected with the immigration of Frisians. Once more, people used the elevated banks of the Eider River for settlement, although this time they extended more to the west, as the village mounds of Elisenhof, Welt and Olversum demonstrate. The island-like salt marshes of Utholm, Westerhever, Osterhever and around Poppenbüll were only occupied in the 11th and 12th century with single farm mounds, like Ehst and Medehop to the south and east of Tating. These soon merged into larger hamlets or villages, just like the deserted mound of Hundorf south of Poppenbüll. They were also located alongside tidal inlets and on higher sandbanks, which makes their present distribution appear rather haphazard. The first low ring dikes, which often incorporated earlier mounds, as at St. Johanniskoog, Westerhever and Utholm soon accompanied these settlements. The salt marshes were however often inundated, a situation today only known from the Hallig islands. The earliest, still standing Romanesque churches date to the 12th century, like the simple churches partly made of tuff from the Rhineland on the mounds of Tating and Tönning. The low, wet parts of the marshes were only used for grazing, as is still common today. The rich grass on more elevated marshland was mowed for winter storage. Irregular enclosures with an internal structure of parallel ditches originate from that time. Some arable activity took place on the sandy ridges. The oldest routes which are still extant were constructed as elevated paths, linking villages and farms. The Heerstraße, for instance, clearly overlays the earlier field division in Westerhever. Rows of low farm mounds in the east of Eiderstedt, as Witzwort or Oldenswort, belong to a later

stage, probably the late medieval times, when people were able to apply better drainage techniques to the marshes. The narrow and elongated strips of fields which lie at right angles to the farms, divided by parallel ditches, are still typical for these areas (Marschhufen). This system overlies the older block-like fields around Die Wisch, south of Katharinenherd.

The islands of Utholm and Everschop were connected by reclamation of small scale polders and by damming up the intersecting tidal inlets during the late 14th and 15th century, as a consequence of improved dike building techniques. At the time, the large tidal inlet of Nordereider between Eiderstedt and the moraine mainland at Rantrum in the east was blocked by a succession of small polders after a long dike around the Südermarsch, parallel to the mainland coast, had narrowed the gap. The low wetlands in the east remained uninhabited until modern times. The catastrophic storm tide of 1362 destroyed large areas of marsh land east of Poppenbüll, which were reclaimed gradually during the 15th century. This development led to a multitude of small-scale polders in-between the former islands as well as to the north of Everschop and to the west of Eiderstedt. These can still be identified by the remains of medieval embankments and the still small-scale, but more rectangular system of drainage ditches. The remains of the former tidal inlets survive as irregular ditches within the low marsh areas in these polders, there are examples to the east and west of St. Johanniskoog and in the northern part of Südermarsch and Eiderstedt.

3.2 Early Modern Times

The late 15th and 16th centuries saw fundamental changes in land reclamation policy and technique when new polders were initiated by the duke of Schleswig. He also introduced settlers from Holland for this purpose and sold the land to private financiers. The polders were increasingly planned in form, and this is reflected in their straight dike lines and more rectangular inner structure of large land parcels with evenly arranged single farmsteads, as at Altaugustenkoog. However, these new polders merely filled bays left by former tidal inlets, which separated the islands, like those to the southeast of Utholm and between Eiderstedt and the mainland moraines. Others reclaimed land, which had been previously lost to storm tides, like Adolfskoog or Sieversfleetherkoog. These polders, however, never attained the perfection of systematic arrangement which is typical for the imposed polders in the Nordergosharde. The ducal influence can be best observed in the manor of Hoyersworth, built by the local representative in the 16th century. There was a ducal castle in Tönning, which was dismantled by the 18th century, only a park on the site survives. The immigrant Dutch helped construct a drainage system with straight ditches, low banks dividing different drainage areas, as to the south of Garding, and the artificial canals for transport. The Süderbootsfahrt is one of these waterways, connecting Garding to Katingsiel. The predecessor of a new type of farm building, the Haubarg, which is regarded as typical for Eiderstedt, is also an introduction from Holland. These central post constructions with huge internal barns and cattle stalls were ideally suited to animal breeding, the predominant means of subsistence in Eiderstedt, but also proved useful for arable agriculture. The earliest examples are known to date from the beginning of the 17th century. The ducal Rote Haubarg in the Adolfskoog, was built some decades later, and the Rosenhof on Westerhever is of 18th century origin, it includes a park and an artificial ruin. In the beginning of the 17th century, the mound villages of Tönning and Garding received German town law as they had developed significantly due to their central role in the grain trade and the trade in dairy products from the area. The harbour of Tönning, built in 1612, has remained the only harbour in the area until today. The combination of improved drainage, increasing yield, and canal-transport brought considerable wealth to the region, best reflected in the characteristic Haubarg buildings with their gardens. In the northeast of the Eiderstedt peninsula, a succession of storm tides destroyed the parish of Lundenbergharde in the 1600s, which had to be gradually reclaimed in the centuries afterwards. Impressive ponds as remains of dike breeches are still visible at Porrendeich. The cultural heritage, and in particular the buildings, were destroyed or damaged by a succession of wars in the 17th and 18th century beginning with the Thirty Years War.

3.3 Modern Times

Only a few new polders have added land to Eiderstedt in the 19th century. The Wilhelminenkoog southeast of Utholm, for instance, further closed the bay which stemmed from the former tidal inlet of Süderhever. The system of perpendicular ditches and roads of the earlier two centuries was improved for the newly reclaimed land. The accessibility by road within and to Eiderstedt was improved after 1840. The first railway from Flensburg to Tönning followed in the middle of the century. Large numbers of trees were planted around farmsteads and along roads as windbreaks. The opening of the Kiel Canal in Süderdithmarschen and a ban on the cattle trade to England at the end of the 19th century triggered the decline of Tönning as the most important harbour of Eiderstedt. Cattle breeding had reached a climax in the preceding decades, as did arable agriculture. This led to the construction of many new farm buildings with detached stables and slightly sloping tin roofs, this form remained in construction into the 1960s, whilst increasing numbers of the older Haubarge were dismantled. Tourism began in Eiderstedt in the second half of the 19th century, when in St. Peter, due to its excellent situation behind a sandbank and dunes, a spa was set up. A few new buildings, such as a hotel on the dunes, were erected. The area between the dike and the dunes was still wetland, while the offshore sandbank could only be reached by boat until the construction of a bridge in the 1920s. Post-supported buildings on the sandbank were built in the early 20th century. The village expanded, particularly after it was linked to the railway system in the 1930s. During the 20th century, new polders were reclaimed in the 1930s, in accordance with a National Socialist regime programme. New marshland areas in Norderheverkoog and Tümlauer Koog have a typical layout of large land parcels along a central road with single farmsteads. The Finkhaushalligkoog in the northeast incorporated two small, uninhabited Hallig islands. Since the Second World War only small areas of new land have been reclaimed. A coastal protection programme in the 1960s and 1970s enforced the outer dikes and blocked the Eider River with a large flood barrier. The salt marshes behind it were surrounded by a dike shortly after, but have been almost exclusively used for nature conservation, as it became popular at the time. Meanwhile, St. Peter has lost its village structure, due to the spread of new housing areas and multi-storey buildings and has merged with surrounding villages, such as Ording.

4. Modern development and planning

4.1 Land use

The area is economically underdeveloped and still relies to a large degree on agriculture. Most of the land used for agriculture is pasture with old fieldscapes and enclosures still largely intact. However, arable agriculture is increasing in the area. Only a few conservation areas exist, and there is traditionally strong resistance against most nature conservation measures. A particular issue is the requirement of an EU regulation to assign FFH and bird protection areas. Regional planning, however, acknowledges much of the landscape of Eiderstedt as environmentally important and recommends the set-aside of much of the low and wet marshes around former tidal inlets and their turning into biotopes. Salt marshes and mud flats surrounding the peninsula belong to the National Park of Wadden Sea, which, in principle, aims at a natural landscape without man made elements.

4.2 Settlement development

Some villages and towns have large development areas around their centre, as at Tating and Garding. The former mound villages of St. Peter and Tönning have also spread far beyond their earlier confines. The road villages, like Oldenswort and Witzwort, have increasingly had their original structure changed beyond recognition, becoming more clustered in form. Garding and Tönning have central functions and can further assign new areas for development. St. Peter-Ording is a focus area for tourism and, as the centre for tourism in Eiderstedt, has further adapted its tourist facilities. It also intends to promote public transport, especially cycle routes to the beach. Tourism at St. Peter-Ording and its hinterland accounts for more than 50% of local income, as well as in Tönning, where the Multimar, a tourist

information centre for the Wadden Sea, attracts a large number of visitors. Other local museums are situated in the Rote Haubarg and St. Peter-Ording.

4.3 Industry and energy

Eiderstedt is mostly free from wind turbines, except for the area between Uelvesbüll and Witzwort, where an increase is possible. Three larger industrial companies are located in Tönning.

4.4 Infrastructure

The peninsula has a mesh of small roads but is cut by one major traffic route in the east, connecting Husum to Hamburg and an east-west road from Tönning to St. Peter-Ording. It is intended to enlarge the north-south route to four lanes. By-passes are planned for Garding and Tating. A small airfield is located near St. Peter-Ording.

5. Legal aspects and spatial planning

Regional spatial planning considers Eiderstedt to be an important cultural area with a large number of elements worth protecting. Oldenswort, in particular, is regarded as a historically important settlement. A nature experience area is also suggested for the area. The regional landscape plan requires the listing, mapping and evaluation of historic landscape elements. All the larger waterways are protected from new adjacent developments. The few nature conservation areas, according to RAMSAR and natura 2000, are mostly confined to Katinger Watt and parts of the Eider River and the dunes and the beach in St. Peter-Ording. Some of the pools in St. Peter-Ording, which originated as clay extraction pits, are considered suitable as protection areas. The development concept for the county of North Frisia recognizes the decline of agriculture and the large difficulties between the sectors of agriculture and nature conservation. It acknowledges a strong potential of cultural landscape for tourism and regards its utilisation as basis for further action.

6. Vulnerabilities

6.1 Spatial planning

The regional landscape plan gives only a brief description of the cultural landscape and a list of the historic elements, but only mentions the Haubarge as an important building type. In addition it only regards the northern part as a structurally rich landscape and landscape models used for spatial planning currently consider the cultural aspects in only a very limited manner. Plans for bird protection areas in central Eiderstedt do not include cultural landscape aspects and may not meet EU requirements. Re-naturalisation of watercourses required by the Water Framework Directive lacks the appropriate involvement of historic landscape issues, while the integration of archaeological aspects is under discussion.

6.2 Settlement

The historic settlement pattern of many towns and villages has changed significantly, and a number have large development areas around their centre which further threatens buried archaeology and local character.

6.3 Agriculture

The increasing use of industrialised arable farming threatens old, small-scale drainage systems and parallel ridge structures of fields of pasture. It is becoming increasingly difficult to identify the latter as an original system of parallel ditches, as they are often filled in as part of drainage improvements.

6.4 Nature conservation

Some historic landscape elements within the national park Wadden Sea could be threatened by destruction during attempts to create a purely natural environment. Actions resulting from

the environmental objectives of the Water Framework Directive leading to a change of artificial waterways into natural water bodies could affect the cultural landscape severely.

6.5 Tourism

Unsustainable tourism could continue to have a negative affect on areas such as Westerhever, where increasing numbers of second homes have led to a decrease in the population and subsequent loss of local facilities.

6.6 Industry and energy

A potential increase in the number of wind turbines in the area between Uelvesbüll and Witzwort could lead to destruction of buried archaeological remains and a negative visual impact on the wider historic landscape.

6.7 Infrastructure

Cultural aspects have not been sufficiently included in the current environmental impact assessment for the extension of the national road at Tönning. New by-passes at Garding and Tating will also impact on the cultural heritage.

7. Potentials

7.1 Spatial planning

Existing regional development plans recognize the importance of cultural heritage and landscape for local development although this insight still hasn't been implemented. Alternative management strategies for landscape development have a reasonable chance of being accepted by the broader population as long as they are not based on a regulation and protection regime.

7.2 Settlement

The Eiderstedt peninsula can be divided into three regions, each with its own historic pattern of settlement of great individual significance which still characterise the landscape.

7.3 Agriculture

The historic fieldscape is well preserved and the area still relies to a large degree on agriculture. Integration of nature conservation efforts with farming such as the set-aside of low and wet marshes around former tidal inlets may provide opportunities to enhance management of historic landscape features.

7.4 Management of the cultural heritage

Eiderstedt is a region in which the historic landscape is of exceptional diversity, character and beauty which has succeeded in preserving its cultural heritage to the present day, with only a few exceptions. Traces of settlements with village mounds up to 2000 years old still characterise the scenery of the area and archaeological investigation of sites such as Tofting has the potential to illuminate the stories of centuries of settlement in the area for visitors and local residents alike.

7.5 Nature conservation

The proposed creation of new biotopes and historic and wildlife values of existing features such as pools which originated as clay extraction pits could provide opportunities to manage the cultural heritage alongside the natural environment through integrated management plans.

7.6 Tourism

The exceptionally well preserved historic landscape provides opportunities for an increase in sustainable, cultural heritage and natural environment related tourism, exploiting the historic mesh of small roads for cycling, riding and hiking routes which consider significant cultural

landmarks such as the dwelling mounds, dykes, Hauberg farm buildings and historic fieldscape.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

Innenministerium des Landes Schleswig-Holstein (eds.) 2004. Regionalplan für den Planungsraum V, Amendment File.

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.) 2002. Landschaftsrahmenplan für den Planungsraum V. Kiel.

Kunz, Panten. Die Köge Nordfrieslands (Bredstedt 1997)

Bantelmann, A, et. al. (ed.). Das große Nordfrieslandbuch (Bredstedt 2000)

Gemeinsames Wattenmeer Sekretariat (ed.) 2005. Das Wattenmeer. Theiss Verlag Stuttgart.

D. Meier, Landschaftsentwicklung und Siedlungsgeschichte des Eiderstedter und Dithmarscher Küstengebietes als Teilregionen des Nordseeküstenraumes (Bonn 2001)

Beseler, Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Braun, Strehl (eds.), Langhaus und Winkelbau. Uthlandfriesische Bauformen im 18. und 19. Jahrhundert (Bredstedt 1989)

Fahrenkrug et. al. Regionales Entwicklungskonzept Nordfriesland (unpublished, 2003)

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Map of H. du Plat of 1804/05

Map of J. Mejer, 1648

Norderdithmarschen, SH

1. Overview

Name:	Norderdithmarschen
Delimitation:	Marshland at the Wadden Sea coast of Schleswig-Holstein, river of Eider in the north, Meldorf bight in the south, which separates the two parts of Norderdithmarschen and Süderdithmarschen, mainland moraines and dunes in the east, bordered by entity of Kremper Marsch and Wilster Marsch with the Kiel Canal as border line in the south-east and the moraine Geest, dune ridges and bogs in the east
Size:	Max. extent 30 by 15km
Location – map:	Marshes of county of Dithmarschen, Schleswig-Holstein, Germany
Origin of name:	The name is derived from the Saxon name Thiatmaresgaho from around 800, which can be interpreted as 'land of the large bogs/waters'.
Relationship/similarities with other cultural entities:	Structures of wetland colonisation like Kremper and Wister Marsch and the Netherlands
Characteristic elements and ensembles:	Rows of medieval dwelling mounds with adjacent elongated strips of land, intersected by parallel drainage ditches (Marschhufendöfer), irregular, medieval dike lines with dike mounds and canals, shipwrecks, Haubarg farm houses, Gulphaus buildings, Dwer houses, 'Gründerzeit'-style houses.

2. Geology and geography

2.1 General

The marshes of the Dithmarschen on the Wadden Sea coast of Schleswig-Holstein are delimited by the rivers of Eider in the north and Elbe in the south, whilst the Meldorf bight separates the two parts of Norderdithmarschen and Süderdithmarschen. The moraines of the former mainland in the east are bordered by a north-south line of dunes marking an earlier coastline before the marshland accumulated to the west in the last centuries before Christ. The land in-between, which was low-lying and cut off from the sea, developed into bogs, like near Lunden and Krempel. The marshland area west of the moraine Geest and the line of dunes can be divided into parallel zones of former raised bogs and wetland (Sietland), more elevated old marshes and comparatively high, young marshes, only embanked since early modern times. The last remains of the extensive bogs along the edge of the Geest, which have been largely drained since the Middle Ages, can be found in the Weißes Moor near Hemme. The area of modern Büsum contains the vestiges of a former Wadden Sea island in front of the old marshes of Norderdithmarschen, which was connected to the mainland in the 16th century.

2.2 Present landscape

The marshes of Norderdithmarschen have very little relief and are structured by winding lines of coast and parallel medieval and early modern dikes, roughly north-south and east-west running roads and drainage canals. The partly forested Geest forms a significant edge to the mostly treeless, level marshes. Fields in the old marshes to the east of Wesselburen are mostly divided by long and parallel ditches, orientated towards lines of farmsteads built on

top of medieval dikes, with subsequent heavy boundary loss into rectangular, often irregular enclosures. The fieldscape in the adjacent younger marshes consist of irregular enclosures, delimited by courses of former tidal inlets. The most recent polders in the west are characterised by more square and large scale fields orientated along a system of perpendicular roads within the polders. Former tidal inlets have survived in few places and are visible as drainage canals with sinuous courses. Trees are only planted along roads and around settlements and significantly limit an unrestricted view across the marshes. Tall, vertical constructions comprise churches, a few buildings in the villages, power lines and wind farms with turbines up to 100m height. The huge petrochemical plant near Wöhrden is especially significant as a landscape element.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The first settlements on the edge of the moraine mainland and on the sand ridge of Lunden can be traced back to the late Stone Age, as evidenced by the megalithic tombs. The earliest traces of settlement on the marshes date to the early Roman period, and comprise two long rows of low mounds parallel to the coast and farmsteads on level ground in Tibensee. Mud and manure was packed between turf-walls in order to raise the height of the settlement above the rising sea level. These settlements had to be abandoned by the end of the 3rd century AD because of further rises in the sea level. When the sea withdrew again in the mid 7th century, Saxonian settlers erected new farms on top of the earlier ones. Single, low farm mounds, similar to their predecessors in the Roman period, were later constructed and interconnected. These large mounds on the high banks of tidal inlets in the old marshes provided enough space for villages, as at a mound near Wellinghusen which was abandoned again in the 14th century. Village mounds were also erected in the lower marsh areas from the 9th century onwards, as near Hassenbüttel. Farm houses of the time have a similar construction as in the Roman period with turf-walls. The subsistence economy was mainly based on extensive stock breeding on the often inundated marshes and fishing while arable agriculture could only be undertaken on a very limited scale. The Stellerburg near Weddingstedt is a circular embankment constructed as fortification for the northern part of Dithmarschen in the 9th century, when it was part of the empire of Charles the Great. Some villages like Wesselburen and Wöhrden still display their medieval, circular layout or were built in a rectangular pattern like Büsumer Deichhausen.

In the 12th century Saxonian clans started to embank the old marshes with sea walls parallel to the coast, rather than creating the small, circular polders characteristic of Eiderstedt and North Frisia. Remains of these dikes still exist near Schülpe or like the Schweinedeich in Büsum. Fishing remained an important part of the economy until the new polders pushed the coastline further west, enabling arable agriculture to be undertaken. Fields were privately owned, whilst pastures were used as commons, mostly sited along roads, in low, wet areas and in front of the outer dikes. The bogs of the so-called Sietland between the moraine edge and the fertile old marshland was drained and settled by the 15th century, with two long rows of dwelling mounds using the same patterns and locations used in early Roman Times (Marschufendörfer). The elongated strips of fields and meadows, delimited by drainage ditches, were orientated along the linear clan settlements, like Jarrenwisch, and can still be seen today. Most of the settlements founded at that time still exist, like the village of Neuenkirchen, first mentioned in the 14th century and sited along an east-west road connecting two rows of mounds. Old roads in former bogs, like the Lundener Moorweg, originate in this period, and the bogs east of Lunden and Krempel were also increasingly drained and cultivated. Part of a Romanesque tower in the church of Wesselburen and the gothic church of Hemme from the 14th century represent the many new churches built in the course of parish formation after the 12th century. During the late Middle Ages, Dithmarschen achieved growing independency from extraterritorial powers like the archbishop of Bremen by accumulating more and more privileges, especially for the leading families.

3.2 Early Modern Times

The division of Dithmarschen into the two areas of Norderdithmarschen and Süderdithmarschen occurred in 1559, after the end of a short period of total independency as a farmer's republic. The northern half was assigned to the Duke of Gottorf. The mausoleums in the cemetery of Lunden, the Swyn-Haus built in 1568 and the storehouse in the Hafenstraße in Wöhrden, built in 1519, are evidence of the wealth of the marshland farmers and this period of independence. Pools protected by dikes, like the ones in the Wesselburener Koog and Preiler Koog, provided fresh water for cattle on the unprotected young marshes in the west, before they were embanked in the following centuries. Settlement was located on level ground in the new, fertile polders, as a result of higher dike construction.

The modern town of Büsum originated in the village mound of Nordorp. Two other villages were lost to the sea that took away the southern part of the island before it was connected to the mainland marsh by a dam, the Wahrdamm, in 1585. The connection was completely closed by new polders in the 17th and 18th century, which were built and financed by private investors or the nobility. This development marked a distinctive change of the habit of cooperative dike construction. Some of these new, 'imposed' polders (oktroierte Köge), like the Hedwigenkoog and the Friedrichsgabekoog, still reflect the original landscape of the time with many irregular tidal inlets, alongside which the mounds were built prior to embankment construction. These polders have suffered frequent dike breeches prior to the 20th century, the most notable example being the seven dike breeches near Westerdeichstrich. The new embankments cut off villages like Wöhrden and Schülpe from their direct access to the sea and made it necessary to build new harbours for the shipping of grain, as names like Schülperaltensiel and Schülperneuensiel indicate. The representative farm house type of Haubarg was introduced into Norderdithmarschen by East and West Frisian settlers from the 17th century onwards. They also introduced their advanced dike construction technique and later the Gulfhaus building form. Many barns were also erected with four to six central posts. Dwer houses, like the one near Epenwöhrden, were derived from earlier, Saxon bay houses and were common in the area from the 16th to the 19th century.

3.3 Modern Times

Whilst most of the marshland was used for arable agriculture, the remaining common pasturage was enclosed at the end of the 18th century by new drainage ditches and became the property of individual farmers. The agricultural situation changed considerably in the second half of the 19th century, particularly after the constitution of the Deutsches Reich of 1871 when a remarkable economic boom brought new wealth to the area. This economic development led to larger farmsteads. Traditional house types were abandoned for brick built and tile-covered buildings of 'Gründerzeit'-style as in Tiebensee, Wennemannswisch and Jarrenwisch. This 'green', farming industry led to the establishment of the first factories in the area like the sugar factory in Wesselburen, which is still in use today for events, and the introduction of the cultivation of coleslaw. Others factories for matches and wooden shoes were built in the town of Heide, whose origins during the 16th century were as a new central meeting point in Norderdithmarschen. The village of Büsum, originally solely used for freight transport, flourished after the establishment of a spa around 150 years ago and after the rather late introduction of a fishery in 1881. Trawlers, especially for shrimp, still leave today from the old harbour of 1905/06. The town hall, built in 1905/16 in a neo Baroque style, demonstrates the prosperity of that time. The new harbour with sea locks is tide-independent. Shipwrecks can still be found in the deep waters of the Süderpiep. One was even detected blocking a dike breach caused by a serious flood in 1696. The bridge in Neuensiel is a reminder of the time when the railroad first connected the area with Hamburg in the late 19th century. The changing coastline and the creation of new polders came to an end with the straightening of the dike line and the embankment of the extensive Speicherkoog in the Meldorf bight for coastal protection in the late 20th century, and the

construction of the impressive flood barrier that cut off the river of Eider in 1973. The Speicherkoog is now mostly used as a water reserve and a nature sanctuary.

4. Modern development and planning

4.1 Land use

Agriculture still has a strong economic role in the area, aided by intensive cultivation, a specialisation in vegetables, and the good quality soil. More than half of all the vegetables in Schleswig-Holstein are produced in Dithmarschen. The shrimp fishery based in the harbour of Büsum still works in a traditional manner and therefore on a sustainable basis. Wöhrden has fish-processing industries. Besides the mud flat area and the large polder of Speicherkoog, there are only a few areas, especially along the Eider River and along the dunes at Lunden, that are under nature protection or are of specific importance for nature. Nature conservation is largely aimed towards the promotion of more extensively used pasturage in areas of small-scale enclosure, which only exist to a small extent within the area. Few dike reinforcement measures are envisaged.

4.2 Settlement development

Norderdithmarschen is a mostly underdeveloped rural area, close to the urban area of Hamburg with around two million people and part of its metropolitan region with around four million inhabitants. Büsum and Wesselburen have central functions and the former in particular is surrounded by large modern residential areas with multi-storey apartment blocks. Developing areas will continue to be focused around these towns with their function as centres of regional development, but are less likely to increase strongly as population is expected to decrease in the long term. Tourism is focused around Büsum. Facilities like a new storm-tide display centre indicate the increasing emphasis on short-term visitors.

4.3 Industry and energy

A petrochemical plant is sited near Wöhrden, and is a highly visible element in the landscape. Wind power generators are mainly dispersed in small groups all over the area and are subject to further upgrading within these confines.

4.4 Infrastructure

The national road from Heide to Husum runs through the old marshes in front of the Geest. It is planned to be upgraded to four lanes. A bypass for a national road is planned around Büsum. A railway connects Büsum to Heide. The promotion and extension of public transport and of a network of cycle tracks is envisaged.

5. Legal and spatial planning aspects

The landscape framework plan characterises the landscape on a general basis and lists important landscape elements like settlement structures but not comprehensively. Focal areas for nature conservation are mostly at the edge of the area, whereas the largest part of the entity, particularly the old marshes, is mapped as historic landscape and area of historic fieldscape. The cultural landscape has only minor importance in landscape models of the framework plan, but development goals take into account the structurally diverse landscapes. Recommendations for protection of the historic landscape include nature protection policies, integration into spatial planning on a municipal level and the promotion of extensive stock breeding. In addition, it is proposed to raise the number of 'typical' landscape elements and to integrate the existing elements into the network of biotopes and protection areas. Regional planning confirms the high potential of cultural heritage as a unique selling point in connection with tourism mission statements. The western part of the marshland is of specific interest for tourism with restricted possibilities for new development areas.

6. Vulnerabilities

6.1 Spatial planning

Except for an un-comprehensive list of characteristic landscape elements, cultural heritage issues and values are not clearly defined and related in spatial planning.

6.2 Settlement

Most traditional farmhouses have been destroyed or have been modernized with modern materials. Large, modern farm buildings strongly affect the character and appearance of older groups of characteristic farm buildings.

6.3 Agriculture

Further intensification of agriculture could threaten the remains of historic field structures and cause cultivation damage to buried archaeological sites.

6.4 Tourism

Tourism is currently centred in the modern polders in the west of the area, where historic landscape assets are much harder to exploit and promote for tourism.

6.5 Industry and energy

The petrochemical plant near Wöhrden and numerous wind farms scattered across the area are highly visible from afar displacing the village mounds and their churches as the principal features of the landscape and diminishing the impression of a horizontal landscape.

6.6 Infrastructure

Plans to upgrade the main road from Heide to Husum and to develop a by-pass around Büsum could result in destruction of buried archaeology and the wider historic landscape without careful planning and appropriate mitigation measures.

7. Potentials

7.1 Spatial planning

Characteristic village settlements, polders and fieldsapes are considered worthy of protection by the regional plan. Guiding principles for spatial planning include aspects by which landscape and cultural heritage can be promoted and utilised, such as the strengthening of regional identity or sustainable tourism.

7.2 Settlement

Norderdithmarschen remains an undeveloped rural area and future development is likely to focus around towns such as Büsum and Wesselburen reducing the impact on the historic village settlements.

7.3 Agriculture

The promotion of extensive grazing in areas of small scale enclosure is likely to benefit historic landscape elements.

7.4 Nature conservation

Historic and wildlife values of existing features such as pools, which originated as clay extraction pits, like those in Wesselburener Koog and Preiler Koog, could provide opportunities to manage the cultural heritage alongside the natural environment through integrated management plans.

7.5 Tourism

Certain historical structures, especially lines of mounds, village mounds and medieval dike lines are still visible and strongly influence the appearance of today's landscape.

Development of long term and recreational tourism, especially around Wesselburen, can promote and preserve existing historic landscape features and cultural heritage landmarks. In this way, historical landscapes like that of the Friedrichgabetoog with its fossilised tidal inlets and dwelling mounds can be integrated into a plan for sustainable tourism. Unpaved agricultural roads have the potential to be adapted into a network of routes for riding, hiking and cycling, which allow daily visitors and local residents to explore the historic landscape of the area through recreational activities.

7.6 Industry and energy

The traditional and sustainable shrimp fishing industry provides opportunities to market the area through its local produce.

8. Sources

Author: Matthias Maluck

General literature:

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

D. Meier, Landschaftsentwicklung und Siedlungsgeschichte des Eiderstedter und Dithmarscher Küstengebietes als Teilregionen des Nordseeküstenraumes, 1999

M. Gietzelt (ed.), Geschichte Dithmarschens, Heide 2000

Ministerium für Umwelt, Naturschutz und Landwirtschaft des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum IV – Kreise Dithmarschen und Steinburg Amendment File (Kiel 2005)

Innenministerium des Landes Schleswig-Holstein (eds.). Regionalplan für den Planungsraum V, Amendment File (Kiel 1998).

V. Arnold, U. Drenkhahn, D. Meier (eds.). Frühe Siedler an der Küste. Küstenarchäologie in Dithmarschen und Steinburg (Heide 1991)

Landesamt für Denkmalpflege S-H (eds.), Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Monika Waluga, Heinz Walter Kierchhoff. Regionales Entwicklungskonzept Kreis Dithmarschen. Endbericht. Bremen 2001 unpublished

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Topographisch Militärische Charte des Herzogtums Holstein (1789-1796)

Süderdithmarschen, SH

1. Overview

Name:	Süderdithmarschen
Delimitation:	Marshland at the Wadden Sea coast of Schleswig-Holstein, river of Elbe in the south and Kiel Canal as border line in the south-east, Meldorf bight in the north, which separates the two parts of Norderdithmarschen and Süderdithmarschen, mainland moraines and dunes in the east, bordered by entity of Kremper Marsch and Wilster Marsch and the moraine Geest, dune ridges and bogs in the east
Size:	Max. extent 30 x 9 km
Location – map:	Marshes of county of Dithmarschen, Schleswig-Holstein, Germany
Origin of name:	The name is derived from the Saxon name Thiatmaresgaho from around 800, which can be interpreted as 'land of the large bogs/waters'.
Relationship/similarities with other cultural entities:	Structures of wetland colonisation like Kremper and Wister Marsch and the Netherlands.
Characteristic elements and ensembles:	Rows of medieval dwelling mounds with adjacent elongated strips of land, intersected by parallel drainage ditches (Marschhufendöfer), irregular, medieval dike lines with dike mounds and canals, Bargscheunen, Gulphaus farmhouses, Haubarg houses in the Dieksanderkoog

2. Geology and geography

2.1 General

The mainland Geest moraines to the east are up to 40m high between St. Michaelisdonn and Burg. They are bordered by a north-south line of sand dunes belonging to an earlier coastline before the marshland accumulated to the west in the last centuries before Christ. The marshland area to the west and south-west of the mainland cliff is divided into parallel zones of former boggy, low land adjacent to the line of dunes, higher ancient marshes and high, young marshes, embanked since early modern times in the west.

2.2 Present landscape

The marshes of Süderdithmarschen have very little relief and are structured by winding lines of parallel medieval and early modern dikes which run parallel to the coast, roughly north-south and east-west running roads and drainage canals. The partly forested Geest forms a distinct edge to the mostly treeless, level marshes. Fields in the old marshes to the east of Marne are mostly divided by long and parallel ditches, orientated towards lines of farmsteads built on top of medieval dikes. Subsequent heavy boundary loss has turned these into rectangular, often irregular enclosures. The fieldscape in the western marshes is characterised by squarer and large-scale fields orientated along a system of perpendicular roads within the polders. Former tidal inlets have only survived in a few places and are visible as drainage canals with sinuous courses. Trees are planted along roads and around settlements and significantly limit an unrestricted view across the marshes. Tall, vertical constructions include churches, a few buildings in the villages, power lines and wind power stations with up to 100m height.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The first settlements on the edge of the moraine mainland can be traced back to the late Stone Age, and are represented by megalithic tombs. The earliest traces of settlement on the marshes date to the early Roman period, and comprise two long rows of low mounds parallel to the coast, as well as settlement on the high marsh alongside tidal inlets as at Eddelak. Because of rising sea levels these settlements, were abandoned by the end of the 3rd century AD, as at Süderbusenwurt. As the sea again regressed in the mid 7th century and the marshes dried once again, Saxon settlers erected new farms on top of the earlier ones. Large mounds on the high banks of tidal inlets in the old marshes provided enough space for villages like Lütjenbüttel. The Bökelnburg in Burg is a circular embankment on the very fringe of the high Geest, designed as a fortification for the northern part of Dithmarschen in the 9th century, when it was part of the empire of Charles the Great. It now contains a cemetery.

The old marshes were embanked with a long dike line parallel to the coast, probably from the 12th century onwards, rather than the creation of small, circular polders as in the Eiderstedt and Northern Frisia. This protected earlier village mounds like Marne, Darenwurt, Trennewurt and Busenwurt. Other remains of possible medieval sea walls, like the Donndiek near Averlak, indicate even earlier embankments. The bogs of the Sietland between the moraine edge and the fertile old marshland were subsequently drained and settled in the 15th century with two long rows of dwelling mounds and, in order to protect against the inland water, used the same patterns and locations as those used in the early Roman period. The village-mounds, as in Barlt, were directly connected to typical, parallel field strips, separated by ditches (Marschhufendörfer). The co-axial and rectilinear structures still survive around Barlt despite considerable boundary loss. Fishery also formed a part of the local economy until new polders pushed the coastline further west. With the embankment of the marshes, agriculture became possible. Fields were privately owned, while pastures were used as commons, mostly sited along roads, in low, wet areas and in front of the outer dikes. The representative gothic church of St. Johannes in Meldorf was erected in the last half of the 13th century, although the first church in Dithmarschen was probably built even before 826. It is still the most important and largest church on the west coast of Schleswig-Holstein. The church was located in the centre of one of the first parishes, which were only formed at around that time. Meldorf, sited on the fringe of the Pleistocene moraines and the central village of medieval Dithmarschen, gained municipal status as the first settlement in the area and hosted the only monastery in Süderdithmarschen, with remains at the modern Klosterhof. There are numerous other historic, bourgeois buildings, like the vicarage of 1601, surviving which enrich the cultural history of the town. During the late Middle Ages, Dithmarschen achieved growing independence from extra-territorial powers, like the archbishop of Bremen, by accumulating more and more privileges, particularly for the leading families.

3.2 Early Modern Times

The division of Dithmarschen into the two areas of Norderdithmarschen and Süderdithmarschen occurred in 1559, after the end of a short period of total independence as a farmer's republic. Süderdithmarschen, the area south of Heide was assigned to the King of Denmark. A monument, commemorating a famous local victory for independence against Danish and German troops in 1500, can be visited in Dehling.

Only a few new polders, hardly more than narrow strips parallel to the old sea dike like the Hafenkoog in front of Marne, were embanked as co-operative task by the inhabitants of the adjacent marshes. These shifted the medieval dike line in the 16th and 17th century a little further west. While the marshes in the west suffered little from the heavy storm-floods of early modern times, the area around modern Brunsbüttel, which was much more under

pressure from the shifting course of the Elbe River, had to endure a substantial loss of land in the 16th and 17th century.

Süderdithmarschen gained considerable wealth by the cultivation of wheat on the fertile marsh soil in the 15th and 16th century. Dairy farming was introduced on a larger scale in the 16th century. The oldest means of subsistence was still traditional stock breeding, which was then mostly confined to salt marshes in front of the outer sea walls, where arable agriculture was impossible. The Bargscheunen, barns built around four central posts, are still typical for the area. The traditional Dwer houses were derived from earlier, Saxon bay houses and were in use in the area from the 16th to the 19th century. New salt marshes were at the time reclaimed only by the King of Denmark as new master of Süderdithmarschen. The Kronprinzenkoog was the only large polder created at the end of the 18th century by the King of Denmark, and then sold to east Frisian settlers who introduced the farmhouse type 'Gulfhaus' into the southern part of Dithmarschen. One of the handful of surviving Dutch windmills of that period can be visited in St. Michaelisdonn-Hopen.

3.3 Modern Times

Unlike the north of Dithmarschen, the embanked marshes in the south only started to encroach substantially further into the Wadden Sea from the 18th century. This process began with the Kronprinzenkoog, and it was not until the enclosure of the Friedrichskoog on the sand bank of Dieksand in 1854 that it reached its modern extent. A ring dike pool is still extant in the polder as well as the harbour which was constructed at the end of a tidal inlet with an 80m long mole in order to provide tide-independent accessibility. The economic boom after the war of 1871 and the proclamation of the Deutsches Reich has also left marks in Süderdithmarschen, with the altering of agriculture to more industrialized structures with larger farms and more representative buildings in a style typical for the time in Germany (Gründerzeit). An example is the town hall of Marne, built in 1914/15 in a neo-baroque style. The most remarkable monument of this time in the area is the impressive Kiel Canal, which connected the North and Baltic Seas, and which was built in 1895 between Kiel-Holtenau and the polder of Brunsbütteler Koog, where the first floodgate still exists. The town of Brunsbüttel in particular developed in the succeeding years, as did Marne. In 1948 Brunsbüttel was given town rights and today it is the urban centre of Süderdithmarschen and the largest industrial agglomeration along the Wadden Sea coast of Schleswig-Holstein with a chemical and petrol industry and an atomic power plant. Massive financial support from the government of the new state of Schleswig-Holstein from the 1950-1970s promoted this development. One of the last embankment projects was the Dieksanderkoog, built in 1933-35 as Adolf-Hitler-Koog. It still displays the typical layout of farms and land of that time. The buildings cite the traditional Frisian house type of the Haubarg with the Nordlandhalle, as most renowned example. The first wind power generator of 1926 can still be seen in Süderwisch.

The changing of the coastline and the creation of new polders ended with the straightening of the dike line by the embankment of the extensive southern Speicherkoog in the Meldorf bight for coastal protection in the late 20th century. This area is now mostly used as a water reserve, nature sanctuary and for military tests. The island of Trischen in the Wadden Sea west of Süderdithmarschen is scarcely more than a large sand dune with a small marshland area in the east, which was embanked in the 1920s for a short time before the dunes moved across the polder and left its vestiges in the mud flats.

4. Modern development and planning

4.1 Land use

Agriculture has a strong economic role in the area, aided by intensive cultivation, a specialisation in vegetables, and the good quality soil. More than half of all vegetables in Schleswig-Holstein are produced here. The shrimp fishery based in the harbour of Friedrichskoog still works in a traditional manner and on a sustainable basis. Marne has fish-processing industries. Besides the mud flat area and the large polder of Speicherkoog only a few areas, especially along the Pleistocene edge, are under nature protection or are of specific importance for nature. The aims of nature conservation are directed towards more extensively used pasturage in small-scale structured areas, which only exist to a small extent in the area. Few dike reinforcement measures are envisaged.

4.2 Settlement development

Süderdithmarschen is a mostly underdeveloped rural area, close to the urban area of Hamburg with around two million people and part of its metropolitan region with around four million inhabitants. Brunsbüttel is the urban centre while the town of Marne has central functions, both with modern residential areas. Developing areas will focus further around the towns with their function as centres of regional development, but are less likely to increase strongly as population is expected to decrease in the long term. Tourism is focused in Friedrichskoog and the spa provides for a basic amount of long-term tourists all year long.

4.3 Industry and energy

Brunsbüttel is one of the major industrial areas of Schleswig-Holstein with a chemical and petrochemical industry and a nuclear power plant. Wind energy industry is also of growing importance for the town. Wind power generators are mainly dispersed in small groups in the modern polders and are subject to further upgrading within their confines. Oil is produced in the mud flats with an oil rig and in Dieksanderkoog.

4.4 Infrastructure

A by-pass for a national road is planned for Marne. A network of cycle routes is planned which will integrate unpaved agricultural roads. The industrial harbour of Brunsbüttel is of trans-regional importance and the Kiel Canal is the waterway with the world's highest volume of traffic. Railways connect Marne and Brunsbüttel to Heide and Meldorf. The promotion and extension of public transport is planned.

5. Legal and spatial planning aspects

The landscape framework plan characterises the landscape on a general basis and lists, not comprehensively, important landscape elements like settlement structures. Focus areas for nature conservation are located at the edge of the area, whereas the old marshes are mapped as historic landscape and areas of historic fieldscape are around Elpersbüttel and Bart. The cultural landscape has only minor importance in the landscape models of the framework plan but development goals take account of the structurally diverse landscapes, which are also mapped. Recommendations for the protection of the historic landscape include nature conservation policies, integration into spatial planning on municipal level and the promotion of extensive stock breeding. Furthermore, it is suggested to raise the number of so-called typical landscape elements and to integrate existing elements into the network of biotopes and protection areas. Regional planning confirms the high potential of cultural heritage as a unique selling proposition in connection with tourist mission statements. However, except for a list of characteristic landscape elements, cultural heritage issues are not an integrated part of the regional plan. The coast line, the canal and parts of the verge between Geest and marshland are areas of specific interest for tourism with very restricted possibilities for new development areas.

6. Vulnerabilities

6.1 Spatial planning

Except for an un-comprehensive list of characteristic landscape elements, cultural heritage issues and values are not clearly defined and related in spatial planning.

6.2 Settlement

Most traditional farmhouses have been destroyed or have been modernized with modern materials. Large, modern farm buildings strongly affect the character and appearance of older groups of characteristic farm buildings.

6.3 Agriculture

Further intensification of agriculture could threaten the remains of historic field structures and cause cultivation damage to buried archaeological sites.

6.4 Tourism

Tourism is currently centred in the modern polders in the west of the area, where historic landscape assets are much harder to exploit and promote for tourism. Modernisation of the harbour of Friedrichskoog for short term tourism instead of emphasising existing cultural heritage assets could diminish its historic value.

6.5 Industry and energy

Brunsbüttel is the largest industrial centre along the Wadden Sea coast of Schleswig Holstein with petrochemical industries and a nuclear power plant. Together with numerous wind farms scattered across the area, they are highly visible from afar displacing the village mounds and their churches as the principal features of the landscape and diminishing the impression of a horizontal landscape.

6.6 Infrastructure

Plans to develop by-passes for national roads around Marne could result in destruction of buried archaeology and the wider historic landscape without careful planning and appropriate mitigation measures.

7. Potentials

7.1 Spatial planning

Characteristic village settlements, polders and fieldsapes are considered worthy of protection by the regional plan. Guiding principles for spatial planning include aspects by which landscape and cultural heritage can be promoted and utilised, such as the strengthening of regional identity or sustainable tourism.

7.2 Settlement

Süderdithmarschen remains an undeveloped rural area and future development is likely to focus around towns such as Brunsbüttel and Marne, reducing the impact on the historic village settlements.

7.3 Agriculture

The promotion of extensive grazing in areas of small scale enclosure is likely to benefit historic landscape elements.

7.4 Nature conservation

Nature conservation measures could provide opportunities to manage the cultural heritage alongside the natural environment through integrated management plans.

7.5 Tourism

Certain historical structures, especially lines of mounds, village mounds and medieval dike lines are still visible and strongly influence the appearance of today's landscape. The spa at Friedrichskoog generates a basic amount of long-term tourists all year long. Further development of long term and recreational tourism can promote and preserve existing historic landscape features and cultural heritage landmarks. In this way, historical landscapes like the old marsh areas in the hinterland with their fossilised tidal inlets and dwelling mounds can be integrated into a plan for sustainable tourism. Unpaved agricultural roads have the potential to be adapted into a network of routes for riding, hiking and cycling, which will allow daily visitors and local residents to explore the historic landscape of the area through recreational activities.

7.6 Industry and energy

The traditional and sustainable shrimp fishing industry provides opportunities to market the area through its local produce.

7.7 Infrastructure

Plans for the promotion and extension of public transport and a network of cycle paths will improve the accessibility of the area's historic landscape to visitors and residents.

8. Sources

Author: Matthias Maluck

Vollmer, et. al. (eds.) 2001. Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. Wadden Sea Ecosystem No. 12. Common Wadden Sea Secretariat. Wilhelmshaven, Germany.

D. Meier, Landschaftsentwicklung und Siedlungsgeschichte des Eiderstedter und Dithmarscher Küstengebietes als Teilregionen des Nordseeküstenraumes, 1999

M. Gietzelt (ed.), Geschichte Dithmarschens, Heide 2000

Ministerium für Umwelt, Naturschutz und Landwirtschaft des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum IV – Kreise Dithmarschen und Steinburg Amendment File (Kiel 2005)

Innenministerium des Landes Schleswig-Holstein (eds.). Regionalplan für den Planungsraum V, Amendment File (Kiel 1998).

V. Arnold, U. Drenkhahn, D. Meier (eds.). Frühe Siedler an der Küste. Küstenarchäologie in Dithmarschen und Steinburg (Heide 1991)

Landesamt für Denkmalpflege S-H (eds.), Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Monika Waluga, Heinz Walter Kierchhoff. Regionales Entwicklungskonzept Kreis Dithmarschen. Endbericht. Bremen 2001 unpublished

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Topographisch Militärische Charte des Herzogtums Holstein (1789-1796)

Map of Dithmarschen from Johannes Mejer of 1651

Kremper Marsch and Wilster Marsch, SH

1. Overview

Name:	Kremper Marsch and Wilster Marsch, Störmarsch
Delimitation:	River marshes of the county of Steinburg, bordered by entity of Süderdithmarschen with Kiel Canal as border line in the north-west and entity of Haseldorfer Marsch with Krückau River in the south-east, Elbe River in south-west, moraine Geest and bogs further inland in north-east
Size:	34 km southeast-northwest, 14 km northeast-southwest
Location – map:	Elbe River marshes of county of Steinburg, Schleswig-Holstein, Germany
Origin of name:	From towns of Wilster and Krempe, name of Wilster, probably derived from the river
Relationship/similarities with other cultural entities:	Structures of wetland colonisation like Dithmarschen and The Netherlands.
Characteristic elements and ensembles:	Rows of medieval dwelling mounds with adjacent elongated strips of land, intersected by parallel drainage ditches (Marschhufendöfer), irregular, medieval dike lines and canals, earthwork castles, Barghus and Husmannshus type farmhouses, drainage system with independent canals for fresh water and bog water

2. Geology and geography

2.1 General

The geological basis of the area is formed by the high moraines of the Geest of Saalian Ice Age origin. During the last ice age, it was levelled and cut by the estuary of the early Elbe River, covered by sand and debris deposited by the ice sheets in the east. The advancing North Sea formed, together with sediments from the Elbe River, a boggy zone in front of the higher moraines, which was increasingly cut off by high marshland banks along the river created by recurrent flooding. This led to the formation of large bog areas along the steep moraine edge which merged with wetland areas further in the hinterland where the glacial deposits were lowest. The marshes between the bogs and the elevated banks along the rivers remained under water-saturated conditions. The protection from the coast by parallel sand ridges in Dithmarschen resulted in less compact, water-soaked soil in the western Wilster Marsch, which after drainage began to shrink and therefore to lower the ground level. This process continues today, making this area the lowest in Germany, with some parts up to 3m below sea level (NN). The soil is less fertile than other areas and therefore more suitable for stock breeding, whereas the soil in the south-eastern Kremper Marsch is of a high quality and suitable for tillage. During the last centuries, the marine influence has generally withdrawn further towards the mouth of the Elbe River leaving only freshwater marshes along the Elbe River today.

2.2 Present landscape

The Wilster Marsch between Kiel Canal and Stör River and the Kremper Marsch between Stör and Krückau River are either at sea-level or below it. They have very little relief and are structured by winding roads along the courses of former dikes and irregular drainage canals.

Fields are divided by rectilinear, parallel ditches into long, narrow strips or larger, elongated blocks, orientated towards lines of farmsteads. Some fields along the river banks of Stör and Krückkau are more irregular, small scale enclosures. Whilst most of the low marshes of Wilster Marsch are pasture, arable farming is dominant in the area of Kremper Marsch. Many pastures contain a system of alternating parallel low ridges and ditches. Villages are also mostly arranged along roads but are densely built in the centre with adjacent new residential areas. The areas of Glückstadt, Krempe and Wilster are surrounded by modern residential areas with single houses, whereas in the historic centre urban houses dominate. A few trees have been planted along roads and ditches and around settlements as windbreaks. Taller constructions, besides churches and town houses, include power lines, wind power generators and large industrial facilities like the nuclear power plant in Brokdorf.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Settlement began in the 1st and 2nd century AD, when sufficiently high salt marshes had built up along the banks of the Elbe and Stör River. Here people, who lived on stock breeding on the adjacent lower salt marshes and on tillage on the elevated ridges, erected their houses on bases or low mounds of clay. The inland areas were largely covered by bogs and wetlands. These single farm mounds were later raised in height in order to protect against the increasing flood levels. Some of these dwelling mounds, like Ivenfleth or Fiefhusen, are still extant alongside old irregular enclosures. The settlements were, however, eventually abandoned by the 5th century AD, as with all the marshland areas along the Wadden Sea coast of Schleswig-Holstein. At this date the high river banks largely eroded in the Wilster Marsch. Occupation of the marshes began again, along the high banks of the Stör River in the 7th century in Ivenfleth as farmsteads at ground level, which were raised to dwelling mounds from the 9th century on. Stock-breeding was once again the predominant means of subsistence, probably followed by trade when the marshes became part of the Frankish kingdom. There are visible remains of this period of occupation in the form of several castles, consisting of earthworks on the Geest. Farmsteads were also later erected on the higher ground of former tidal inlets, that had been filled in by compact sediments whilst the soft marshland of the Wilster Marsch sank down around them (Inversionsrücken). High banks of tidal inlets were preferred in the Kremper Marsch. Some of these early and high medieval settlements like Wilster or Beidenfleth have remained occupied until today, but many remain unknown. Many of the watercourses, like the Kremper Au and Kampritt, which intersected the marshland, were turned into drainage canals in later centuries and have retained much of their irregular, winding course until today. Large areas of the low wetlands were covered by shallow lakes, as at Ecklack and Flethsee. The Count of Schauenburg and the Bishop of Oldenburg introduced Dutch colonists in order to drain and cultivate the land in the 12th century. They constructed a system of dikes starting from the river banks in the Wilster Marsch, which nowadays can only be traced by the sinuous course of some roads, built on top of these embankments, and village names like Dörferdeich near Brokdorf, Dammfleth and Krummdiek. The colonies were rows of low, single farm mounds with perpendicular narrow strips of fields, usually going off from either side of the farm (Marschhufendöfer). Often these farms were not built along embankments or canals, as Wetterndorf near Nortorf. Other, low embankments (Sietwenden), like Landscheide west of Beidenfleth, and former tidal inlets, served as boundaries between drainage systems and often also between parishes. This led to an irregularly arranged system of allotments around villages with their adjacent rectilinear enclosures (Gewannflure). Bogs in front of the moraine high lands were also shut off by separate embankments like Büttler Moordeich. Systematic occupation in the Kremper Marsch did not start earlier than the 13th century. Settlement structures are therefore more regular here. Drainage canals were created from extended tidal inlets or artificially dug with the spoil used as material for dwelling mounds. The ensuing villages were located along canals or on dikes and are more densely built than the farm rows in the Wilster Marsch. Krempe and Wilster are typical villages of this kind, built along a canal, and received

town privileges in the 13th century due to their importance as harbours for agricultural products. A monastery in Ivenfleth of the same date was largely destroyed by the changing course of the Stör River. The earliest churches are, like in Beidenfleth, of a simple, late Romanesque type. The flooding after a storm tide in the 15th century resulted in the construction of a river flood barrier for the Wilsterau and new drainage canals.

3.2 Early Modern Times

Krempe became fortified in the 16th century and the town houses of Krempe and Wilster were the earliest secular buildings in the area to be built in the Renaissance style. A new wave of colonists from the Netherlands arrived at this time, triggered by refugees from conflicts following the Reformation. Dairies were introduced as a new means of subsistence. Land reclamation reached a climax with a complex system of straight artificial canals, separating fresh water from bog water, and the employment of windmill powered pumps, which enabled the drainage of low wetland into higher situated, embanked canals (Wettern), especially in the Wilster Marsch. Two indigenous types of farm houses of the Wilster Marsch emerged in this period. The Barghus construction, like the Haubarg in Eiderstedt, developed from Dutch predecessors, with a focus on cattle breeding, whereas the Husmannshus was a design based on two central rows of posts, best suited for arable agriculture. Both, however, often share common features like a barn or stables attached at right angles to the living quarters and a thatched roof. Well preserved specimens can still be found at Beidenfleth or Dammfleth. Farm houses in the Kremper Marsch were based on the Saxon bay hall house, like examples in Kolmar or Moorhufen.

The new system of peatland cultivation which was introduced from the Netherlands, where it was very common to Lower Saxony, arrived in a limited way at the Kremper Marsch in the 17th century (Fehnkultur). The extensive bog areas in Wilster Marsch and Kremper Marsch were still, however, mostly uncultivated. Some villages in the bogs in the south-east, like Moorhusen, are probably of this type, whilst other bogs were cultivated from the Geest at an even later period. The bogs west of Eklack were only cultivated in the 18th century. In the Vaaler Moor patches of bog still exist. The Danish King and the Duke of Schleswig and Holstein founded the town of Glückstadt, sited in front of the then outer dikes, as a trading port in competition with Hamburg in the early 17th century. The layout was based on Renaissance model of a polygonal fortification with radial streets from the central market place. The Baroque church and several representative and bourgeoisie buildings of the time have survived a catastrophic storm tide, the Thirty Years War and other conflicts in the following decades, which otherwise destroyed large parts of both the city and the remainder of the area. The fortifications in Krempe and Glückstadt were dismantled and it is only the parks, as well as the Mühlenberg, that survive as remnants of the fortification. Storm-tides also caused severe dike breeches and even inundated the whole marshland area due to the destruction of unused old dikes. Some marsh areas along the river, like the area of today's Brunsbüttel had to be abandoned during the 17th and 18th centuries. The marshes in front of St. Margarethen have remained under tidal influence since that episode.

3.3 Modern Times

The road system between the villages was improved during the 19th century, when many new roads connecting farmsteads and older tracks were extended. A number of farmsteads in the Wilster Marsch were also abandoned, leaving only single farms where there were rows of farms before. Many of the long and narrow field strips in the west of the Wilster Marsch were also divided and combined to more block-like fields. Land consolidation resulting in even larger, rectangular enclosures in the rest of the area was deployed during the 1900s. The ensuing boundary loss has blurred much of the originally strict arrangement of narrow field strips. A large number of half-timbered houses of 19th century origin have remained in the towns of Glückstadt, Krempe and Wilster, which have never been severely influenced by industrialisation. A nice example of a late classical church is located in Krempe. The area was connected to the railway system in the middle of the century with two different tracks, one to Glückstadt, the other one leading to Brunsbüttel via Krempe. The construction of the

Kiel Canal in 1895 had a severe impact on the Wilster Marsch, which was cut off from a part which now belongs to Süderdithmarschen. The town of Brunsbüttel was founded as a harbour and entrance to the canal and thrived, especially in the 20th century when it became the largest industrial agglomeration along the Wadden Sea coast of Schleswig-Holstein with a chemical and petrol industry and even a nuclear power plant. The industrial areas in particular occupy marshland on the side of the Wilster Marsch. Another nuclear power plant was built a decade later in Brokdorf. New large scale residential areas began to spread after World War II, especially around Glückstadt, Krempe and Wilster, when many refugees from German areas in present day Poland settled. Infrastructure was further improved with new national roads and a motorway near Itzehoe, which traverse the area without connection to the historic structures. The last severe storm tide in 1962 triggered the enforcement of the outer dikes, a new polder for a residential area and the ferry harbour in the north of Glückstadt, and the construction of a river flood barrier at the mouth of the Stör River.

4. Modern development and planning

4.1 Land use

Most parts of the Wilster Marsch are used for grazing due to its inferior soil quality, while the major part of the Kremper Marsch is arable land. Vegetables and fruit are grown predominantly in the vicinity of Glückstadt. Only a few areas, notably outside the dikes along the Elbe River, are under nature protection or have priority status, although much, if not all, of the area is regarded as important landscape. Nowadays many low areas of former bogs and peat cutting are designated by spatial planning as suitable for reversion to wetland, underlining the growing awareness of nature protection. Nature protection aims at integrating agriculture further into sustainable landscape management through instruments such as set-aside and contract-based nature protection. Some areas are being purchased for nature protection purposes. Few dike reinforcement measures are envisaged.

4.2 Settlement development

The area is flanked by the three larger cities of Itzehoe and Elmshorn on the moraine hinterland and Brunsbüttel on the Dithmarschen side of the Kiel Canal and belongs, as a rural area, to the metropolitan region of Hamburg. An extensive industrial estate in the south-west of Wilster Marsch is part of Brunsbüttel and the county of Dithmarschen. Glückstadt, Wilster and Krempe are towns with extensive residential and business areas. Further extensions are expected in the east of Krempe. Many small new residential estates are in, or adjacent to villages, often condensing the existing settlement structure. Developing areas around the towns with their function as centres of regional development are likely to further increase in the near future, as a result of the tendency towards sub-urbanisation. However, population in the area is expected to decrease in the long term. Tourism is of low economic importance, except for Glückstadt, but has potential for development, especially in the sectors of day tripper's and recreation. Tourism development is planned which has a low impact on the landscape and integration of landscape assets is widely recommended.

4.3 Industry and energy

The area has two major industrial sites, the chemical industry in Brunsbüttel and a nuclear power plant in Brokdorf. Wind turbines are dispersed in some small groups across the area and are subject to further upgrading within their confines. Major power lines originating from the atomic power plants of Brokdorf and Brunsbüttel cross the area. A new business area is planned on the moraine edge at Lägerdorf. Small-scale shipbuilding exists in Wewelsfleth.

4.4 Infrastructure

There are major road construction plans concerning a new motorway across the marshland from the A23 south of Itzehoe to east of Glückstadt, where it will descend into a tunnel underneath the Elbe River. By-passes for the national roads are planned for St. Margarethen, Glückstadt and Brokdorf. Archaeological investigations along possible routes

for the motorway are under way. Other surveys concerning the cultural landscape and the impact on cultural issues are not envisaged. The motorway will have a considerable impact on the landscape, which is only comparable with the construction of the Kiel Canal over a hundred years before.

5. Legal and spatial planning aspects

The landscape framework plan characterises the landscape on a general basis and lists, not comprehensively, important landscape elements like settlement structures, farmhouse types and former areas of peat cutting. A map gives a broad idea of historic landscapes, defined as areas of historic fieldscape. The importance of the canal and drainage system is emphasised. Areas under different regimes of nature protection are the island of Pagens and the Elbe River banks and wetlands, remaining bogs at Vaaler Moor and Herrenmoor and the drainage system around Kollmar. Vaaler Moor also fulfills the requirements for landscape protection. Cultural landscape has only a minor importance in landscape models of the framework plan but development goals take account of structurally diverse landscapes, which are also mapped. Recommendations for the protection of historic landscape include nature protection instruments, integration into spatial planning at the municipal level and the promotion of extensive stock breeding. Furthermore, it is proposed to raise the number of typical landscape elements and to integrate existing elements into the network of biotopes and protection areas. Regional planning confirms the high potential of cultural heritage as a unique selling point in connection with tourism mission statements. However, except for a list of characteristic landscape elements, cultural heritage issues are not an integrated part of the regional plan.

6. Vulnerabilities

6.1 Spatial planning

Except for an un-comprehensive list of characteristic landscape elements, cultural heritage issues and values are not clearly defined and related in spatial planning.

6.2 Settlement

The historic settlement patterns of villages could be further condensed by the extension of new residential areas, in or adjacent to them.

6.3 Agriculture

Further intensification of arable agriculture beyond the area of Kremper Marsch, and vegetables and fruit outside the vicinity of Glückstadt could threaten the remains of historic field structures and cause cultivation damage to buried archaeological sites.

6.4 Nature conservation

Nature protection instruments which lead, for example, to the re-creation of wetland biotopes can have a strong visual impact on historic landscapes and even destroy archaeological sites and historic elements if not used carefully.

6.5 Industry and energy

Brunsbüttel is the largest industrial centre along the Wadden Sea coast of Schleswig Holstein with petro-chemical industries and a nuclear power plant. Together with the nuclear power plant at Brokdorf and its associated power lines, and numerous wind farms scattered across the area, they are highly visible from afar displacing the village mounds as the principal features of the landscape and diminishing the impression of a horizontal landscape. New industrial development can destroy buried archaeological remains and further reduce the landscape value of an area.

6.6 Infrastructure

Plans to develop a new motorway across the marshland and by-passes for national roads will result in destruction of historic landscape features and a significant visual impact on the wider historic landscape.

7. Potentials

7.1 Spatial planning

Landscape and cultural heritage issues are already recognized as important in landscape and regional planning. Further integration, especially in practical recommendations and instruments, is important to improve the sustainable development of landscape. The input of specialist knowledge and expertise is needed to deal appropriately with heritage issues in spatial planning instruments like landscape framework plans and regional plans.

7.2 Agriculture

The promotion of sustainable land management instruments such as set-aside and contract based nature protection in an integrated manner and with specialist advice, has the potential to benefit buried archaeological sites and historic landscape features.

7.3 Nature conservation

The purchase of land for nature reserves and wide nature conservation measures could provide opportunities to manage the cultural heritage alongside the natural environment through an integrated management planning approach.

7.4 Tourism

There is high potential in the area for the development of tourism, using the historic landscape as an asset. The improvement of cycling routes or careful utilisation of the surviving canal system for canoeing could be important factors in this respect. Existing information centres are well suited for the interpretation of landscape development to visitors and local residents.

8. Sources

Author: Matthias Maluck

General literature:

Angelin Isabell Piepke, Archäologisch-siedlungshistorische Landesaufnahme der Störmarsch im Kreis Steinburg, Schleswig-Holstein. Unpublished diploma thesis, Kiel 2004

Werner Prange, Die Bedeichungsgeschichte der Marschen in Schleswig-Holstein. In: Probleme der Küstenforschung im südlichen Nordseegebiet 16. (Hildesheim 1986) p.1-55

Claus Ahrens. Vorgeschichte des Kreises Pinneberg und der Insel Helgoland. (Neumünster 1966)

Innenministerium des Landes Schleswig-Holstein (eds.). Regionalplan für den Planungsraum V, Amendment File (Kiel 1998).

Ministerium für Umwelt Naturschutz und Landwirtschaft des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum IV, Amendment file (Kiel 2005)

J. Ohl. Hausformen in der Marsch. Steinburger Jahrbuch 1989, 139-150

R. Naudiet, et. al. Atlas des Kreises Steinburg. Innenansichten einer Region (Hamburg 1995)

Zeitschrift: Archiv für Agrargeschichte der holsteinischen Elbmarschen

V. Arnold, U. Drenkhahn, D. Meier (eds.). Frühe Siedler an der Küste. Küstenarchäologie in Dithmarschen und Steinburg (Heide 1991)

Landesamt für Denkmalpflege S-H (eds.), Kunst-Topographie Schleswig-Holstein (Neumünster 1969)

Gebietsbezogenes integriertes Entwicklungskonzept für die LAG Steinburg. Bewerbung zur Aufnahme in die Gemeinschaftsinitiative LEADER+ (unpublished 2002)

Haseldorfer Marsch, SH

1. Overview

Name:	Seestermüher and Haseldorfer Marsch or solely Haseldorfer Marsch for the whole area
Delimitation:	River marshes of county of Pinneberg, separated by Krückau River from neighbouring entity Kremper Marsch and Wilster Marsch in the north; southern border is marked by Pleistocene cliff at Wedel, divided by Pinnau River into Seestermüher Marsch and Haseldorfer Marsch
Size:	ca 7.5 km ²
Location – map:	Elbe River marshes of county of Pinneberg, Schleswig-Holstein, Germany
Origin of name:	Derived from the former name of river of Krückau (Seester) and village Haseldorf in the marshland area
Relationship/similarities with other cultural entities:	Structures of wetland colonisation like Dithmarschen, Wilster Marsch and Kremper Marsch
Characteristic elements and ensembles:	Rows of medieval dwelling mounds with adjacent elongated strips of land intersected by parallel drainage ditches; irregular, medieval dike lines and canals; block fields cut by river inlets in polders close to the Elbe River; drainage facilities like sluices and pumping stations; German bay hall houses; village churches; moated manor sites

2. Geology and geography

2.1 General

The geological basis of the area is formed by the high moraines of the Geest of Saalian Ice Age origin, levelled and cut by the valley of the Elbe River during the last glaciation. A dune ridge formed in post-glacial times parallel to the moraines, which probably stretched from Wedel to Kollmar in the north. This barrier and the higher marshland along the river banks kept the river and North Sea water largely at bay, fostering the emergence of bogs in the hinterland between the dunes and moraines until it was eventually eroded during medieval times when the Elbe River shifted its course eastwards. Only a few remains of the dunes, as at Bishorst or Hetlingen, have survived. Marshland formed on top of the bogs but stayed low and wet, when high river banks and also man-made embankments formed a new barrier to flooding and sedimentation. At this time the river marshes in this area were already mostly under the influence of the Elbe River in contrast to the downstream entity of Kremper Marsch and Wilster Marsch, which has remained under more marine conditions.

2.2 Present landscape

The small area of the Seestermüher Marsch between Krückau River and Pinnau River and Haseldorfer Marsch between Pinnau River and the high moraines at Wedel are hardly above sea level (NN), have very little relief and are structured by winding lines of medieval and early modern dikes, roads along the courses of former dikes and irregular drainage canals. The fields are mostly divided by long and parallel ditches, orientated towards lines of farmsteads built on top of medieval dikes. Villages in the western part towards the river are more clustered, with few small development areas. Land, especially in the western polders, is divided into irregular but large scale blocks, while the polders south of Haseldorf consist of small scale blocks of pasture. The polders next to the Elbe River in particular, are still largely

intersected by former tidal inlets, which continue into the marshland in front of the dikes, formed by river inlets, marshes and sand banks, partially colonised with trees. Many fields are bordered by low, parallel drainage ditches. Trees form vertical elements along roads and around settlements. The only taller constructions are churches, some taller buildings like manors and power lines.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The first traces of settlement comprise a few Stone Age finds as well as some relics of the Roman period on the remaining dunes like Bishorst and Hetlinger Schanze and from the Elbe River itself. The location of human occupation of the area during the late Roman Time, the Migration Period and the early Middle Ages is not actually known, but it is considered that settlement probably continued at least on the higher dunes and river banks and even on some early dwelling mounds in early medieval times. Only from the 12th century onwards, do we have knowledge of places like the castle of Haseldorf. Early embankments, probably ring dikes around villages close to the river, are also recorded from this time. The ample traces of dikes north-east of Haseldorf or the Sonnendeich in the Seestermüher Marsch may well belong to this stage and indicate the embankment of the wetland between high river banks and Geest. The Saxon settlers began to raise dwelling mounds for their farms and villages. The early settlements with their irregular fields, which were mostly sited on the elevated grounds towards the Elbe River, became severely threatened by the shift of the river's course in direction to the Haseldorfer Marsch, gradually eroding the dune barrier and the high river banks. The village of Ichhorst, probably located close to modern Eckhorst, had already been lost in this way by 1200. Other villages like the predecessor of Seestermühe and Bishorst followed by the end of the 15th century.

The mostly unprotected marshes towards the Pleistocene Geest were low and often inundated, with a few permanent lakes. The rather irregular courses of the canals derive from the natural watercourses and river inlets which intersected the wetland. The courses of the rivers Krückau and Pinnau moved and appear to have run further to the south, as their courses can still be traced in the canals leading from Klostersand towards the mouth of the Pinnau. Vestiges of the early field systems may be seen in the irregular block patterns of the marshes east of Hetlingen. During the 12th century, the Counts of Schauenburg started to introduce settlers from the area of the modern Netherlands in order to drain and cultivate the low wetlands. At this time the latest of a closed line of dikes must have protected the marshland from the river water. Unlike the situation in Dithmarschen, settlements were erected on lines of mounds following existing watercourses and older dikes, as in Schadendorf, Seester, Neuendeich and Kamperrege. Ditches were dug to separate and drain long strips of land. Their water drained into canals based on former watercourses which continued into the rivers. This structure has remained until today. New embankments protected against the water from the bogs adjacent to the Geest, as the road west of Kurzenmoor still indicates.

The oldest surviving buildings are the late Romanesque church of Haseldorf, and the Gothic churches of Haselau, Seester and Seestermühe, the latter erected on a mound in the 15th century that was sited further inland after the old village of Seestermühe perished in the waves. The moat encircled sites of the manors of Seestermühe, Haselau and Haseldorf also date back to medieval times.

3.2 Early Modern Times

The Elbe River changed its course again during the 1500s, this time moving away from the shores of Seestermüher Marsch and Haseldorfer Marsch. In the Seestermüher Marsch attempts were made to regain marshland lost to the river in the previous century. The Altenfeldsdeich at Seestermühe was thus already finished by 1420, presumably a prerequisite for the village being rebuilt successfully. The Neunfeldsdeich followed at the end

of the century and with the projecting polder of Esch, a second line of dikes was re-established before the high medieval embankments, nine decades later. A comparable development has not taken place in Haseldorfer Marsch. Drainage of the remaining bogs between the former wetlands and the Geest from the end of the 16th century on, as at Kurzenmoor, completed the reclamation of the area. Newly introduced windmills further improved the drainage situation. This was important as the narrowing of the Elbe River through embankments from both riversides and the rising of the high tide level led to further flood pressure on dikes and the hinterland. The embankments failed repeatedly, especially in 1634 and in 1717/20, when the whole of the marshland area became inundated. The dikes resisted the waters well into the 19th century, being heightened and enforced by stones and berms and additionally protected by the growing marshland in front of them.

The Thirty Years' War brought considerable devastation to the place and left many buildings destroyed and dikes and ditches in bad repair. Consequently, most of the still extant farmhouses originated in the time following the war. The construction of the North German bay hall house with wooden frame and thatched roof had been predominant in the area until the 19th century, as examples like Hof Detjens, Am Altenfeldsdeich, and several others around Seestermühe demonstrate. Smaller cottages for landless workers also survived, like the Bandreißerkate in Haseldorf. They were usually built at the foot of a dike, as this land often belonged to the squires. A special development in farmhouse construction from the 18th well into the 19th century, were extensions crossways to the main building, sometimes at both ends, which were reserved for use by parents. Far more representative is the manor of Seestermühe of 18th century origin.

In front of the polders, islands like Julsand and Pagensand had developed in the Elbe River, which changed size and position constantly. Both these islands were reportedly inhabited until the 19th century and were mainly used for mowing reed. A fortification stood on the island of Hetlinger Schanze, which was named accordingly.

3.3 Modern Times

The flood of 1825 did relatively little harm to the embankments, but they were raised again in response and more protection was gained by the planting of rows of willows in front of the dikes. This was important as larger ships required deepening of the navigation channel of the Elbe River resulting in an increased water level. Dredged material was dumped on the foreland and the Sandberg on Pagensand. The classicistic Manor of Haseldorf was erected at the beginning of the century. Industrialization also led to structural changes in agriculture, especially with new and larger brick-built farmsteads. The construction of the drawbridge at Neuendeich dates back to the end of the century. The northern part of the island of Pagensand was inhabited by a farmstead on a mound at the time. Parts of a dam towards the southern part of the island and embankments are still visible. Electric pumping stations and brick built sluices, like the Mühlendeichschleuse at Seesteraudeich, were introduced and deepening and widening of canals further improved the drainage situation.

The manor of Seestermühe embanked the large foreland in front of the dike in the early 20th century with a low dike, providing protection against most floods during the year. Irregular ditches drained the water into parallel canals, and then into the Elbe River. The Schallenhäuser still tells of the extensive use for reed cutting of the wetland in front of the new polder, the Eschschallen, which had already developed during the 19th century. Further drainage measures after the Second World War deepened the canals again and fitted many fields with pipes. The Lohkuhle, which may be an old dike breach, collects the water for further transport via a new canal to a modern pumping station at Seesteraudeich. Other canals, like the one from Lauenrothsweg to Im Felde, were filled up.

4. Modern development and planning

4.1 Land use

The catastrophic floods of 1953 and 1962 promoted further enforcement of the outer dikes and eventually the dike line was considerably straightened and shortened, totally cutting off the marshland in front of Seestermühe from the influence of the river. In the same way, large areas of foreland, sandbanks and even inlets of the Elbe River were incorporated into a new large polder in front of the old dikes of the Haseldorfer Marsch by the end of the 1970s. In addition, river barriers blocked the rivers of Krückau and Pinnau. While the new polder at Seestermühe has since been used intensively by agriculture, the newly embanked area at Hetlingen was designated as nature protection area. The shift in perception concerning nature and environment protection within this short period of 10 years is best documented by the different uses. Most of the area of Haseldorfer Marsch, with over 75% of the newly embanked parts in the south, is pasture, while the predominant land use in Seestermüher Marsch is arable farming. Soil quality, which is superior in the northern part of the entity, strongly influences the agricultural land use.

4.2 Settlement development

The settled area has more or less remained in its historic confines along dikes and roads, with the exception of some modern development areas like in Mühlenwurth, Bei der Feldmühle, Haseldorf or in Hetlingen. However, modern installations like the waterworks of Hetlinger Schanze, sport fields and the golf course in Haselau have moved into previously uninhabited marshland. A building of the Manor of Haseldorf is now used as nature information centre.

4.3 Industry and energy

No wind power generators exist or are planned in the area. The only larger industrial facilities are spacious waterworks on Hetlinger Schanze.

4.4 Infrastructure

No larger road construction project has cut the marshland, other than the already existing routes, though the roads have been modernized during the last decades. Small modern yacht harbours can be found near Hetlinger Schanze as well as behind the river barriers of the Krückau and Pinnau and along the Pinnau. A yacht harbour in front of the marshland of Wedel is exceptionally large in comparison to the others.

5. Legal and spatial planning aspects

The whole entity is designated as open space between strips of increased urban development radiating from the city of Hamburg. The area is also a landscape protection area, with most of it identified as especially suitable for recreation. All of the marshland in front of the outer dikes as well as most parts of the late polders in Haseldorfer Marsch are nature protection areas, are designated as suitable for the purpose, or have priority for connecting biotopes. An area of the entity is planned as a water protection reservoir. The Krückau River is regarded as ecologically valuable and has to be kept free from building activities. Parts of the marshes south of this river are also a recreational area. The landscape plan already provides a general model of the typical landscape of the entity, regarding the rivers with adjacent marshland as characteristic spaces and characterising the landscape of the entity as “nature-orientated”. The conservation of historical landscapes is seen as the aim for nature protection and landscape conservation with many important landscape elements being listed.

6. Vulnerabilities

6.1 Spatial planning

Only a few monuments are included on the monument list which may result in them being vulnerable to inappropriate change or destruction. The emphasis in spatial plans on the naturalness of the landscape may result in inappropriate change or neglect of historic elements.

6.2 Settlement

The pressure exerted by the huge population of the city of Hamburg to identify new development areas may lead to further development that is not coherent with the traditional settlement structure. The construction of modern housing will also have a direct physical impact on the cultural heritage such as the old embankments where development will result in further levelling of these increasingly rare but important landscape elements.

6.3 Tourism

Certain areas, for example the Wedeler Elbmarsch, a small area of marshland adjacent to the Geest at Wedel in the south of the entity, are being stressed by ever increasing numbers of people from Hamburg seeking recreational opportunities. Damage to the cultural heritage could result if the development of cycling and walking paths is not co-ordinated with nature protection, sports, recreation and landscape conservation.

7. Potentials

7.1 Spatial planning

In general, the historic structures and other landscape assets are reasonably well protected by the entity's status as a landscape protection area, in comparison to other places. Integration of landscape and cultural heritage development in recent county development planning could reduce and channel the pressure of further urbanisation which is still present.

7.2 Nature conservation

Creation of nature reserves and enhancement of existing biotopes provide the opportunity to integrate nature conservation management with the cultural heritage in order to derive enhancement and positive management of both. An example is the solution of a conflict between nature conservation and residents concerning the use of the unprotected foreland of the Seestermüher Marsch, which will help restore aspects of the historic landscape, whilst providing room for rare species of plants and animals.

7.3 Tourism

There are opportunities to exploit the cultural heritage for tourism and recreational use; a new landscape trail around the village of Neuendeich emphasises historic landscape assets of the area and can increase the potential for recreation and information for visitors and residents alike. Existing and new information centres can be utilised as focal points for information and interpretation of both the historic landscape and natural environment and offer the opportunity for re-use of historic buildings.

8. Sources

Author: Matthias Maluck

General literature:

Claus Ahrens. Vorgeschichte des Kreises Pinneberg und der Insel Helgoland. (Neumünster 1966)

Werner Prange, Die Bedeichungsgeschichte der Marschen in Schleswig-Holstein. In: Probleme der Küstenforschung im südlichen Nordseegebiet 16. (Hildesheim 1986) p.1-55

Otto Fischer. Landgewinnung und Landerhaltung in Schleswig-Holstein (Berlin 1957)

Angelin Isabell Piepke, Archäologisch-siedlungshistorische Landesaufnahme der Störmarsch im Kreis Steinburg, Schleswig-Holstein. Unpublished diploma thesis, Kiel 2004

Ministerium für Umwelt, Natur und Forsten des Landes Schleswig-Holstein (eds.). Landschaftsrahmenplan für den Planungsraum I. (Kiel 1998)

Innenministerium des Landes Schleswig-Holstein (eds.). Regionalplan für den Planungsraum V, Amendment File (Kiel 1998).

R. Tribbe, Neuendeich (Neuendeich 2000)

Danker-Carstensen, Dorfgeschichte Seestermühe (Seestermühe 2002)

Maps:

Archaeological monument record of Schleswig-Holstein and gis mapping

Lancewad data base and gis maps

Royal Prussian ordnance survey of 1879

Topographisch Militärische Charte des Herzogtums Holstein (1789-1796)

Neuwerk, Hamburg

1. Overview

- Name:** Neuwerk
- Delimitation:** The island of Neuwerk lies in the mudflat area of Hamburg. The administrative border is defined by the line of the Average High Tide (Line des Mittleren Tidehochwassers: MThw). The surrounding mudflats belong to the national park Hamburgisches Wattenmeer.
- Size:** The dyked core island comprises an area of ca. 1,2 km² including the area of the dykes, the areas outside of the dykes lie in the North and East with an area of ca. 1,8 km². Neuwerk therefore has an overall size of about three square kilometres.
- Location – map:** The island of Neuwerk is situated in the mouth of the river Elbe and is the only inhabited island in the national park Hamburgisches Wattenmeer. It lies about eight km north of Cuxhaven and 105 km northwest of Hamburg.
- Origin of name:** The first document mentioning the Island Neuwerk dates back to the year 1286. During this time the still un-named isle is called “O”, respectively “Nige O”, which is the Frisian word for island. After the construction of the defence tower at the beginning of the 14th century the Frisians called the sandy island “Dat Werk” or “Nige Werk”. Finally the name “Neuwerk” prevails for the island belonging to Hamburg.
- Relationship/similarities with other cultural entities:**
Neuwerk has little in common with other cultural landscape entities. Place names and building forms of the Frisian neighbours were not adopted. The building-style on the island is rather functional, the buildings are characterised by the simplicity of their forms. A similarity to other cultural landscape entities can only be seen in the ditch built around the tower dwelling mound which can be compared to the ditches of the farmsteads in Hadeln. The defensive tower was built in the style of a Norman tower house.
- Characteristic elements and ensembles:**
Characteristic features of Neuwerk are the highly visible brick tower dominating the picture of the landscape, as well as the ring dyke of the 16th century which encloses the tower dwelling mound and the original farmsteads, including much of their farmland. The nature and its unimpeded development within the national park Hamburgisches Wattenmeer are also special characteristics of Neuwerk.

2. Geology and geography

2.1 General

There has been considerable debate about the origin of Neuwerk. Neuwerk, unlike the neighbouring East Frisian Islands, cannot be a barrier island because the tidal range in this area reaches about three metres and therefore forms a strong dynamic current. This makes the development of a barrier island quite unlikely.

A programme of ground probing has taken place in an attempt to establish its origin. These have shown the following composition: in a depth of about 20 to 24 metres there are layers from the last ice age. Above those there is a thin layer of peat and several layers of clay which are up to 2.8 metres thick and therefore only give evidence for a short period of marsh

formation. On top of these there are marine sedimentations which prove that Neuwerk has not developed in the course of the sea genesis nor was separated by the mainland by erosion. The core samples rather show that the isle consists of a sandy island which had built up during the younger Holocene. It developed during the alternation of storm tides and dry periods by the formation of dunes and sediment deposition, gradually moving out of the reach of the daily tidal range.

2.2 Present landscape

Since its origin, the outline of Neuwerk has changed completely. After the building of the defence tower in 1310 AD the island kept losing ground to the medieval storm tides. The construction of the first dyke during the middle of the 16th century made the island inhabitable and farmable all year round but later storm tides caused repeating dyke breaks. Today's outline of Neuwerk is mainly the result of the shoreline stabilisation which began at the end of the 18th century and extended until the 1930s. Since then the care and maintenance of the installations is part of the flood control of the island.

Neuwerk can only be reached by boat or over the mudflat path from Cuxhaven.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Geologically speaking, Neuwerk is a rather young island which only developed during the younger Holocene around the 1st century BC. Today's coast line only gradually developed at the end of the last ice age. With wide areas of the present North Sea dry land until 5500 B.C. it can be assumed that prehistoric foraging groups would have frequented this region. However, any archaeological sites relating to this phase would be buried beneath meter-high sediments.

The island of Neuwerk has been used as a fish transshipment point since the 13th century and probably even earlier and is seen as the predecessor of the fish market of Cuxhaven. The use of Neuwerk as summer pasture is also documented. In this context the Island „O“ which belonged to the country of Hadeln was first mentioned in a document of 1286 A.D.. Hadeln was subject to the sovereignty of the Dukes of Sachsen-Lauenburg, who in 1299 granted Hamburg the right to build a fortification on the island of „O“ to secure the mouth of the river Elbe. After a 10 year construction period the square stone tower was completed, and was manned in 1310 by a 10 men guard detail from Hamburg. The tower not only grew to be an important daytime navigation mark but the guard also collected duties from the passing ships for the maintenance of the tower. The tower, which in its basic structure has remained almost unchanged, is the oldest building along the coasts of the trilateral Wadden Sea.

There is no evidence for an island harbour at this date, but it is likely that smaller ships bringing commodities for daily use to the island had access via a tideway leading from the east up to the tower.

3.2 Early Modern Times

Until the building of the dykes in the 16th century, people could live all year round only in the defensive tower, because winter storm tides and high tides temporarily flooded the remainder of the island. After the completion of the dyke, the dyked areas could be inhabited all year round and were leased to three farmer families. In order to cultivate the dyked-in Binnengroden (inner ground) the first tenants built drainage channels, so-called Grüppen, which can still be seen in the present landscape. Two houses for fishermen and their families were also built. The island reeve and his sentry continued to live in the defence tower. The new inhabitants of the island were not just farmers, they also worked as pilots and were responsible for the maintenance and repair of the dykes which were seriously damaged during storm tides in 1625, 1717 and 1825.

In the middle of the 17th century a navigational light was lit for the first time. A Blüsenfeuer (which used hard coal) was tended by four Blüseners who moved to the island.

At the end of the 18th century the tenants of Neuwerk were finally allowed to purchase their farms. The buildings of these farmsteads were built in a strictly functional style with hardly any decorative elements. One reason for this plain style might have been the frequent damage caused by storm tides which could have made a more elaborate building style seem rather pointless.

3.3 Modern Times

In 1814 the defence tower was converted to a lighthouse. The lamp fire, which since 1971 has been remote-controlled by Cuxhaven, became visible for miles due to a system of parabolic mirrors.

From a tourist point of view Neuwerk was still barely known at the end of the 19th century but registered an upswing when holidays at the seaside became fashionable. Thus the first hotel on the island opened in 1905, in 1920 a school hostel opened up and as early as 1924 the tower was listed as a protected monument. Farming, which used to be the main source of income, started to lose its importance.

Neuwerk did not always belong to Hamburg. In the course of the Groß-Hamburg act Prussia traded the areas of Altona, Harburg and Wandsbek with Hamburg amongst others for Cuxhaven and Neuwerk. During the break-up of the country of Prussia after the Second World War the Prussian rights, and thus Neuwerk, passed to Lower Saxony. In the beginning of the 1960s, however, Neuwerk became the focus of Hamburgian interests again. A deepwater harbour in the area of Scharhörn was supposed to improve the harbour economy of Hamburg. Hamburg and Lower Saxony began negotiations and in 1969 Neuwerk was transferred back to Hamburg according to a treaty with Lower Saxony. The planning phase and the pilot surveys for a deepwater harbour offshore of Scharhörn took up most of the 1960s and 70s but in 1981 the senate shelved their plans for the time being. Instead, most of the area was placed under protection and eight years later the national park of Hamburgisches Wattenmeer was founded. Today the complete Wadden Sea area of Hamburg is protected. The Nationalpark-Haus, an information and administrative centre for environmental protection and nature conservation was opened in 2004 on the tower dwelling mound.

Next to the defence tower, which still dominates the landscape, there are three farms, ten gastronomic businesses, one school, two school hostels, two youth campgrounds, one bath, two landing stages and a pleasure craft harbour. There is also one island shop, one fire station and a sewage plant.

The island dwellers whose numbers hardly ever reach more than 50 are mainly making a living out of tourism. Agriculture has seriously declined and is only continued non-intensively. The main source of income today is tourism. On days with convenient low tide hours more than 2000 tourists come to the island. All in all 100-120.000 daily visitors and overnight stays can be counted in one season.

4. Modern development and planning

4.1 Land use

Neuwerk, as the only inhabited island in the 137.5 km² big national park Hamburger Wattenmeer, has adapted its land use to the goals and plans of the national park. For the protected areas special requirements have to be observed.

Agriculture used to be the sole source of income but today it is run only extensively. The last fields went out of use in 2005. The traditional focus continues to lie with animal husbandry. Horses and cattle are grazed on areas which have been included in the extensification contracts of the program for nature conservation in the cultural landscape of Hamburg. Another distinctive feature is the specialisation of one business in the rehabilitation of sports and riding horses in the mudflats as well as the care and healing of horses with lung diseases.

4.2 Settlement development

The law for nature conservation includes a general building ban. Exceptions have to be approved both by the building laws as well as by the nature conservation law of Hamburg. On Neuwerk special emphasis is placed on preserving the dominance of the tower and the tower dwelling mound. Also no so-far undeveloped areas are to be built on and new buildings are avoided in favour of extensions of existing ones. There is also a limitation to the heights of buildings and regulations to construct saddle roofs and to use of weather-proof material such as red bricks.

By following these regulations attempts have been made to preserve the village character of the settlement on Neuwerk. Nevertheless the historic picture of the island has already been impaired by small tourist-based family businesses, by areas used for logistics and maintenance and by the radar tower built for the navigation on the Elbe.

Another goal within the national park program is the consolidation of economic interests with the ecological requirements of nature conservation. A program promoting alternative energies, e.g. solar panels, the encouragement of non-intensive agriculture and the promotion of gentle tourism with overnight stays as well as the problem of providing for the tourists who are only coming for the day are parts of this project.

4.3 Industry and energy

There is no industry on Neuwerk, neither existing nor planned.

Although in the area of Neuwerk there is an emphasis on regenerative energies, there are no wind energy plants allowed due to the national park laws, the regulations of the building laws, the political agreements of the Trilateral Wadden Sea Plan (1997) and especially because of the goal to preserve the visual dominance of the tower. The only exception has been the 54 metre-high radar tower which was built just offshore in 1988. It has an important function in the traffic safety of the mouth of the Elbe.

4.4 Infrastructure

The car-free island of Neuwerk can be reached by ferry from Cuxhaven. The crossing takes about 1.5 hours and operates daily from April to October. A second means of reaching the island is the tidal dependant mudflat path. The pedestrian path from Sahlenburg takes about 2.5 hours to walk. From Duhnen it is a walk of about 3 hours. The 9 kilometres long way is also used by horse carts as well as by supply carts drawn by tractors.

On Neuwerk the road network only consists of footpaths and bike paths since there are no cars on the island. Only the paths which are necessary for the flood protection, like the circular way along the dyke and the middle path leading to the tower dwelling mound, have interlocking concrete paving. The landing stages do not have any infra structure.

5. Legal and spatial planning aspects

Neuwerk is divided into two protective zones. The dyked-in core island and a large part of the land north of the dyke belong to Zone II. The rest of the area comprises Zone I and is subject to special protection.

In view of the land use planning Neuwerk is mainly subject to the laws of the national park Hamburgisches Wattenmeer as well as to the nature conservational laws of Hamburg and all other superior laws.

6. Vulnerabilities

6.1 Settlement

The historic settlement pattern on the island has been impacted upon by small tourist-based family businesses, by areas used for logistics and maintenance and by the radar tower built for the navigation on the Elbe.

6.2 Agriculture

Agriculture has seriously declined and is only continued non-intensively. Although the non intensification of agriculture will help preserve heritage cultural landscape features the increasing loss of the traditional agricultural use will have an effect on traditional farming practices.

6.3 Tourism

The main source of income on Neuwerk is tourism. A decline of tourism would cause significant stress on Neuwerk, however, the goals of the national park would still have to rank higher. The increase in tourism, especially day tourists increases the infrastructure needed to deal with these visitors, especially in the case of drinking water. There is the potential of a new water pipe from the mainland which could be detrimental to the archaeological deposits.

6.4 Natural Erosion

There is also the danger of natural forces. The installations for flood protection have to be controlled, fixed and improved on a regular basis so that in the long run the island will not erode and can withstand the heavy storm tides.

7. Potentials

7.1 Settlement

Regulations have attempted to preserve the village character of the settlement on Neuwerk with considerable success. Any future development should be carefully planned to both respect and add to the cultural and natural heritage of the island.

7.2 Tourism

The promotion of the national park has a great impact on the rising number of tourists. Visitors coming to stay just for the day or overnight show a great interest in the nature and landscape and their behaviour and attitude towards environmental protection and nature conservation can be influenced by providing targeted information and organising events. There is potential for the management and promotion of the cultural heritage to be integrated with the environmental and nature protection.

8. Sources

Dannmeyer, F. et al. (Hrsg.; 1952): Ein Turm und seine Insel, Monographie der Nordseeinsel Neuwerk. Cuxhaven.

Höpke, W. (1952): Die Bevölkerung der Insel Neuwerk. In: F. Dannmeyer, Ein Turm und seine Insel, Monographie der Nordseeinsel Neuwerk. Cuxhaven, 99–112.

Linke, G. (2001): Die Entstehung der Insel Neuwerk - unter Berücksichtigung der Verhältnisse bei Scharhörn. In: Probleme der Küstenforschung im südlichen Nordseegebiet 27. Oldenburg, 11–37.

Meier, D. (2006): Die Nordseeküste. Geschichte einer Landschaft. Heide.

Müller, H.-O. (1984): Die Leuchtfeuer von Cuxhaven und Neuwerk. Herford.

Neß, O. (2001): Zu Besuch auf Neuwerk. Hamburg.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler (Hrsg.), Archäologie der ältesten Kultur in Deutschland. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Uhl, J. (1952): Wasserbauten und Deiche. In: F. Dannmeyer, Ein Turm und seine Insel, Monographie der Nordseeinsel Neuwerk. Cuxhaven, 75–86.

Umweltbehörde Hamburg (Hrsg.; 2001): Nationalpark-Atlas Hamburgisches Wattenmeer, Nationalparkplan: Teil 1. Schriftenreihe der Umweltbehörde Heft Nr. 50, Hamburg.

Altes Land, LS

1. Overview

Name:	Altes Land
Delimitation:	River Elbe, river Schwinge, geest border, neighbouring entity Land Kehdingen
Size:	Approximately 264km ²
Location:	Tidal river marsh of Lower Saxony and the federal state of Hamburg, Lower Saxony and Hamburg, Germany
Origin of name:	'Old Land'
Relationship/similarities with other cultural entities:	Plantation landscape, rural house form, aligned settlement, parcel of land of the traditional Dutch cope size, swan-shaped gables as an architectural feature point to northern Flanders, brick works in the Elbe marshes
Characteristic elements and ensembles:	Marshland and Geest edge landscape, yardland settlement, brickworks, fruit-growing

2. Geology and geography

2.1 General

The Alte Land ("the Old Land") is an approximately 33 km long and up to 8 km wide marsh strip south of the lower Elbe. The cities of Stade on the Schwinge, Horneburg on the Lühe and Buxtehude on the Este are located on its borders. Historically the area was divided between the Lower Saxony and Hamburg territories.

The First Mile lies between the rivers Schwinge and Lühe, the Second Mile comprises the area east of it between the Este and Süderelbe.

The area is characterised by the Elbe marshes. These alluviums were created following the end of the ice age in the glacial valley of the Elbe. The southern border of this is formed by moor land which was not settled until the late 19th century and which lies as a broad border strip in front of the geest, the latter rises up to 40 m in some places.

2.2 Present landscape

Today the Altes Land is a smoothly relieved plantation landscape which owes its fertility to the alluvial marsh lands. The modern landscape is still dominated by its marsh yardland villages and the straight-lined drainage ditches. This historic pattern of land use with a settlement emphasis along the strongly meandering rivers Lühe and Este has hardly changed.

Geomorphologically the alluvial marsh land is enclosed by the Geest to the south. Along the Geest edge, through the Altes Land there used to run an important trade route leading from Stade/Hamburg over Hanover, Frankfurt to Basel, the course of which is now followed by the federal road B 73. Roughly parallel to it the Altes Land is crossed from the north-west to the south-east by the road leading from Stade to Moorburg. From this, roads branch off nearly at right angles, forming a north-south axis.

Important features of the Altes Land are the parallel running, straight-lined drainage ditches. They enclose the yardland estates which usually are positioned at right angle to the banks following the courses of the rivers. If there was enough room then each settlement entity comprised a 2,25 km long and 150m wide yardland estate which again was divided up by drainage ditches into ca. 20 m wide strips. The long narrow parcels in the area between

Stade and the Lüche are orientated towards the Elbe. In the area of the Lüche and the Este however they are orientated towards the river bank.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The wide-ranging study of the Northern German Wadden Sea is much advanced, not least due to the efforts made by the Institute for Historical Coastal Research and by communal and district archaeologists. As a comparatively young geological landscape the Elbe-Weser region is dominated by quaternary alluvials. Contrary to the Geest bordering on the Altes Land, the river marshes of the Altes Land and the peatlands which used to border the Altes Land towards the Geest are basically still growing.

Archaeologically speaking, the exact date of settlement in the Altes Land has only been indirectly documented. On the basis of comparison with the surrounding regions it can be assumed that the Altes Land has been occupied since the prehistoric period.

At the beginning of the Holocene today's southern North Sea coast was firm land and the North Sea coast lay in the area of the Doggerbank. It can be presumed that the former river marshes of the Altes Land would have been frequented by Mesolithic foragers. Neolithic settlement in the area is demonstrated by two flint daggers. It is possible that the river marshes contain sites of this period, and this possibility should be considered when dealing with future maintenance works in the rivers. In particular it is possible that when extending or dredging waterways, occupation layers could be cut into and thus could erode without being noticed.

The Bronze Age in the Elbe-Weser region is represented by various sites, such as burial mounds and urn-cemeteries. Similar forms of evidence survive from the Roman Iron Age and the following Migration Period. Between the early 6th to the late 7th century reforestation appears to have taken place and former cultivated areas were given up.

In medieval times the area was resettled. The First Mile was dyked first and settled after 1140. The dyking of the Second Mile was completed at the end of the 12th century and that of the Third Mile was completed only towards the end of the 15th century, since the area was very much endangered by storm tides.

As an example of the resettlement of the First Mile, the parish of Hollern can be cited. It lies in the lower hinterland, the Sietland, which was systematically cultivated in the 12th century. From the place names such as Ditterskop, which has already been documented for the year 1140, the presence of settlers from the Netherlands can be deduced. The name Hollern only became common in the 17th century. The settlement of Hollern consists of a marsh yardland settlement, approximately four kilometres in length, which today is characterised by an unusually uniform impression of the combined dwelling and farming buildings. In Hollern itself, the church tower, is of probable 12th century date and is perhaps the oldest surviving building in the Altes Land.

The parish of Jork is sited within the Second Mile. It is first documented in the year 1221. The settlement was constructed systematically along a routeway, the present country road 140. Originally most of the farmsteads lay on the southern side of the road, with the settlement centre at the junction of the east-western road and Jork's main drainage system (Hauptwetter) which flowed northwards. The church lay to the south-east and the double yardland of the manor on the north-eastern side of the junction. On the western side lay the farmstead of the Andreas monastery, the "Verdener Farmstead", also consisting of two yardlands. This village centre was to be subsequently further consolidated around the church with the addition of craftsmen, shippers and traders' dwellings and businesses.

3.2 Early Modern Times

At the beginning of the early modern period, under Archbishop Christoph (1511-1558), the autonomy of the Altes Land ended with the introduction of the archiepiscopal county order. The associated privileges of self-administration remained in place into the 19th century.

The various military occupations of the area during the Thirty Year's War put the region under a lot of pressure and the period after the Westphalian Peace of 1648 brought further impoverishment upon the population. The Swedish occupants built their seat of government in Agathenburg and strengthened Stade's fortifications. In 1712 the Swedish sovereignty was replaced by the Danish dominion and 1715 the Danes sold the region to the electorate of Hanover.

From an economic point of view the Altes Land was largely agriculturally based. This was due to the fact that the Elbe marshes provided the agricultural goods for the markets along the coastal road. Decreasing crops and the competition with overseas producers lowered the yields and caused numerous closing downs (= **farm closures**) (**?bankruptcies**). The population often didn't have another choice other than to emigrate. During this period there was a shift from arable production to pasture, particularly cattle and horse breeding, and the development of fruit production. In the 18th century it is known that the Altes Land was exporting fruit to the Netherlands.

3.3 Modern Times

The administrative reforms in the middle of the 19th century brought the institution of the Office of Jork with it, which was sited in the so-called Portau'schen Haus currently used as bibliotheca. In 1885 the Office was turned into the district of Jork, after the kingdom of Hanover had become a Prussian province. The political entity which had existed since the medieval land-taking ended in 1932, and the Altes Land became a part of the district of Stade. From the parish reform between 1969 and 1971 the Einheitsgemeinde (combined parish) of Jork and the joint community Lühe finally emerged.

The regional development of the Altes Land has long been influenced from the growth of the surrounding towns Stade, Buxtehude and especially of the free and Hanseatic city of Hamburg. This influence is notable in the architecture. Modern construction methods and house forms are spilling into the Altes Land from the Elbe riverside settlements Borstel and Grünendeich. This urban influence declines the further you move into the hinterland.

One important influential factor was the development of the brick making industry. This in the area of the Elbe marshes focussed on South Kehdingen, but it also influenced the historical development of the Altes Land in the 19th century. The principal requirements for this industry were the kley soils of the marshes used as **brickearth** and the proximity to the water courses. For a time brick production was the most significant part of the economy in the areas to the west of the Elbe. Production and demand was however dependent on the economic and building requirements of Hamburg. Demand was particularly high as a consequence of the rebuilding of Hamburg after the big fire of 1842. The foundation years and the joining of Hamburg to the German customs union with its associated building of the Speicherstadt (a quarter consisting only of storage buildings) in 1885 were also significant. During this period the number of brick works in the Altes Land rose from four to 32 workshops. However, by 1900 most of these sideline businesses had already vanished.

A further important branch of the economy was the spread of fruit-growing in the early 20th century. Fruit-growing in the Altes Land dates back as far as the 14th century and for the year 1657 there are 102 fruit farms documented which together covered some 51 ha. The Altes Land orchards expanded considerably following 1870, reaching their greatest extent in the 1960s. In effect, it completely displaced arable and stock agriculture, replacing it with a plantation landscape of fruit-trees and bushes grown in long straight lines. Together with the marsh yardland villages these orchards are the most dominant feature of the modern landscape. The growth of the orchards was accompanied by the foundation of the Jorker district fruit growing school in 1867, and of the fruit growing experimental station in 1935.

In addition to the rather poor road and path network, the waterways were the traditional means of transport and communication in the Altes Land. In 1863 the Altes Land was indirectly connected with the transport network by the Stade-Buxtehude (the present B 73) following the Geest ridge and in 1881 the railway line Hamburg Cuxhaven was also built on the Geest ridge. In 1893 the Moorburg-Jork-Stade road, which runs straight through the Altes Land, was built.

4. Modern development and planning

In its regional development report of 2005 the federal office for building and regional development attributes the Altes Land to the regions where the development of the population and employment is characterised by intense growth. This development is leading to an ever-growing demand for building land, and is accompanied by increased traffic volumes.

4.1 Land use

The Altes Land is a plantation landscape specialising in fruit-production. The northern areas in particular are characterised by rather unfavourable natural and business conditions of production. Some 9000 ha. of farmland are intensively farmed, and it is anticipated that this will expand further, impacting on other businesses. At present the percentage of employees in the agricultural sector lies below 14% and this could decrease even further.

The Altes Land also has a tourist role, largely based on the agricultural landscape of the area. In this context the historic field structures, agricultural buildings, dykes, drainage ditches as well as technological monuments such as sluices etc. are of particular importance.

4.2 Settlement development

The proximity of the Middle Order Center Stade and the High Order Center Hamburg has had a direct influence on the Altes Land. Since the beginning of the 1990s a steady population increase has been documented. In the Regional Report Northern Germany 2005 of the Institute for Economic Research of Lower Saxony this is mirrored in the intense rise in commuting from the Altes Land towards Stade and Hamburg. It can be anticipated that the extension of the A-26 is going to increase the commuting trend even further. In the long term this might pose the danger of the Altes Land turning into a mere residential area which could lead to a massive loss of identity currently based on economic traditions. Furthermore, continuing urban sprawl can be expected.

The Altes Land does not possess a district- or supra-regional museum. In Jork there are the regional museums Estebüggje illustrating the history of the Altes Land and the Museum Altes Land dealing with the technological history of the Altes Land. Then there are the Altländer Schiffahrts-Museum in Twielenfleth with its exhibition of ship models, and other attractions like the special event days offered by some farmsteads or public guided tours e.g. in Estebüggje, Hollern-Twielenfleth, Jork, and Steinkirchen. In the restored harbour of Steinkirchen the ferry „Lühe“ can be visited.

On the border of the Altes Land in Horneburg is the crafts' museum illustrating the history of the coaching inn, carriers and related crafts and trades of the 17th to 19th century. In Buxtehude there are two points of interests to be found. On the one hand the Buxtehude museum about the regional history and art and on the other hand the Marschtorzwinger/ Liebfrauenkirchhof with changing exhibitions. In Stade itself the Maumhausmuseum (Alt Stade), the artillery fort Fort Grauerort, the open-air museum, the museum of local history, the Kunsthaus Stade, the museum for the adopted town Goldap in Eastern Prussia, the Schwedenspeicher (Swedish storehouse), the technology and traffic museum Stade/Elbe as well as the Naturkundemuseum (museum for natural history) Stade are to be found.

4.3 Industry and energy

The Altes Land is situated between the higher ranking industrial sites of Hamburg, Buxtehude and Stade/Bützfleth with its main focus on petrochemistry. In the city of Stade there is a nuclear power plant and there is a transformer station in Rollern. The gas and crude oil pipelines, leading from Hamburg across the Altes Land, should also be mentioned. There are no wind farms in the Altes Land.

4.4 Infrastructure

The traditional means of integrated transport in the Altes Land has always been waterways and streets (the long-distance road Stade-Buxtehude), with the Elbe providing a means of communication into regional and national economics. By 1863 the indirect integration of the Altes Land into the road network of Lower Saxony took place with the construction of the road from Stade to Buxtehude (today B 73) following the geest ridge and 1893 with the building of the country road 140 running straight across the Altes Land and leading from Hamburg over Jork to Stade. Before then, the paths and roads were not surfaced. Hence the custom of walking on stilts developed in this region. The district road 26, which crosses the country road 26 at right angle, offers a north-south connection between the northern Elbe to the southern geest border.

The planned Autobahn A-26 will clearly increase the commuting radius from commuters from the surrounding region or from Hamburg. At present the Altes Land is still characterised by a rather poor access to the Autobahn A-1 respectively A7.

Considering the proximity of the Elbe, the rivers Schwinge, Lühe and Este serve as access routes to its important function as a federal waterway.

The train network of the Altes Land is connected by the town of Stade. The rails run parallel to the B 73 along the Geest ridge and parallel to the Altes Land.

5. Legal and spatial planning aspects

The Altes Land is historically divided into three parts of roughly equal size which are aligned with the rivers Schwinge, Lühe and Este. Today the Third Mile lies on Hamburgian territory. Since 1972 the part belonging to Lower Saxony consists of the Einheitsgemeinde (fused parish) of Jork and the joint community of Lühe with the parishes of Grünendeich, Guderhandviertel, Hollern-Twielenfleht, Mittelnkirchen, Neuenkirchen and Steinkirchen. Jork takes up all of the eastern part of the Altes Land which belongs to Lower Saxony. The parishes of the Old or Lower Saxony Land fall under the regional authority of Stade.

With regard to the spatial planning for the area, the parishes of the Altes Land are subject to the land-use regulation program of Lower Saxony, and to the landscape framework plans and land utilisation plans laid down by the parishes. In addition, the regional development plan for Hamburg and the land use regulation framework for the coastal area of Lower Saxony will have to be considered in any further development or management plans.

6. Vulnerabilities

6.1 Spatial planning

The intense growth in population and employment is creating an ever growing demand for building land which in turn creates increased traffic flow. The establishment of extensive industrial estates and business parks (e.g. Industriepark Untere Elbe), as seen in the example of Airbus on Hamburg territory, can seriously disrupt traditional small scale industries and have a significant impact on the landscape and buried archaeological deposits.

6.2 Settlement

The extension of the traffic network, with the construction of the Autobahn A-26 and possible extension of the A-22 will clearly increase the commuting radius, which could lead to an

influx of commuters into Altes Land. The Altes Land could turn into a mere dormitory town and the identification of the residents with the traditional income structures and local identity might get lost. The pressure to increase agricultural production has led to a significant decline in farmsteads in the Altes Land.

6.3 Agriculture

The change in agricultural production methods has meant that the Elbe marshes with its typical narrow long leas pose a problem because they are not designed to be farmed with large machines. The present landscape also makes it difficult to use the fruit production methods which are regulated by the EU (Ramsar-Convention). Consequently farms will have to increase their agricultural areas to remain competitive and there is the possibility of the Altes Land could change into an industrially farmed monoculture.

6.4 Tourism

The promotion of the Altes Land as a tourist centre could have two separate impacts. Firstly it could lead to an attempt to 'freeze' the region in its present state, thus preserving the entire cultural heritage, but with major economic problems probably arising as a result. Alternatively, it may lead to the abandonment of traditional buildings to adapt to the needs of modern mass tourism. The expansion of tourism infrastructure may threaten buried archaeological deposits.

7. Potentials

7.1 Spatial planning

The closeness of Hamburg brings economic wealth to the region, but it increases the demands for space, since the "Altes Land" offers high quality living in a rural setting. Spatial planning needs to take the opportunity to exploit the important surviving historic landscape within its sustainable tourism. The cultural identity of the area should be promoted via integrated strategic planning when developing new industrial and residential areas.

7.2 Settlement

The historic settlement pattern, as seen in the Marshhufendörfer (marsh yardland settlements) of the 12th century with their long narrow leas is mostly intact and the important connection between villages and the marshland survives. This provides an important resource to promote the cultural identity of the area both to the existing occupants and the increasing numbers of commuters relocating to the area.

7.3 Agriculture

Unlike many areas the historic landscape survives very well, characterised by the yardland settlements. This landscape and the settlements provide an important resource to base sustainable tourism on. The extensive orchard plantations are an important historical landscape and the industry could be promoted and protected in its present form.

7.4 Management of cultural heritage

Altes Land is characterised by a high density of surviving monuments especially in the region of the river marsh on both sides of the Lühe there are, early Neolithic deposits, combined residential and farming buildings which date from the 17th to the 20th century and the industrial brickworks of the 19th century.

7.5 Tourism

Altes Land is characterised by an important surviving historic landscape, numerous religious buildings and a network of historic road and path networks. There are numerous museums presenting the material culture and the history of the region. Tourism can take further advantage of landscape and cultural assets, e.g. via integrated tourism with the museums, nature conservation bodies and cycle/footpath routes.

7.6 Maritime history

The hamlet of Gründendeich, developed early into an important shipping centre on the lower Elbe thanks to its favourable situation on the Lühe estuary. The marine monuments (such as beacon, navigation school and shipyard) provide a source for potential promotion of the maritime history of the area.

8. Sources

Author: Ulf Ickerodt

Behre, K.-E. (1995): Kleine historische Landeskunde des Elbe-Weser-Raums. In: Geschichte des Landes zwischen Elbe und Weser I. Vor- und Frühgeschichte. Stade

Bundesamt für Bauwesen und Raumordnung (BBR;2005): Raumordnungsbericht 2005. Berichte 21, Bonn

Denkmaltopographie Bundesrepublik Deutschland (1997). Baudenkmale in Niedersachsen Landkreis Stade. 26.1. Landkreis Stade ohne die Städte Stade und Buxtehude, bearbeitet von Heike Albrecht. Hameln.

Ehrhardt, M. (2003): „Ein goldenes Band des Landes“. Zur Geschichte der Deiche im Alten Land. In: Schriftenreihe des Landschaftsverbandes der ehemaligen Herzogtümer Bremen und Verden 18. Geschichte der Deiche an Elbe und Weser 1. Stade.

Hoffmann, H.-C. (1986): Bremen, Bremerhaven und das nördliche Niedersachsen. Kultur, Geschichte, Landschaft zwischen Unterweser und Elbe. Köln.

Hofmeister, A. E. (1979): Besiedlung und Verfassung der Stader Elbmarschen im Mittelalter I. Dies Stader Elbmarschen vor der Kolonisation des 12. Jahrhunderts. Hildesheim.

Raumordnungskonzept für das niedersächsische Küstenmeer (2005). Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Röper, C. (Hrsg.; 1988): Bilder und Nachrichten aus dem Alten Land und seiner Umgebung. Bearbeitet von C. Röper, I. Carstens und L. Zupp. Bd. 1-3. Jork.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler [Hrsg.], Archäologie der ältesten Kultur in Deutschland. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Wendowski, M. (1992): Landschaftsentwicklung und Besiedlungsgeschichte im Alten Land. Methoden und Ergebnisse. Herausgegeben von der Gemeinde Jork. Jork.

Full catalogue of historic maps used, survey evidence etc

Historische Übersichtskarte des Alten Landes. Handzeichnung des Drost und Gräfen von der Decken aus dem Jahr 1781 (Ehrhardt 2003, 2-3)

Land Kehdingen, LS

1. Overview

Name:	Land Kehdingen
Delimitation:	River Elbe, River Oste, River Schwinge, neighbouring entities Altes Land, Land Hadeln and Ahlenmoor
Size:	Approx. 441 km ²
Location:	Tidal river marsh of Lower Saxony, Lower Saxony, Germany
Origin of name:	Not known
Relationship/similarities with other cultural entities:	Strip fields as in Land Hadeln, Kremper-Marsch, and Altes land, brickworks in the Elbe-marshes
Characteristic elements and ensembles:	Plantation landscape, rural house forms, linear settlements, brickworks in the Elbe-marshes, dwelling mounds, dykes, drainage ditches, lighthouses, strip fields

2. Geology and geography

2.1 General

The cultural entity of Land Kehdingen originally stretched as far as the mouth of the Oste in the north and in the south to the mouth of the Schwinge, which flows into the Elbe close to the town of Stade. To the east the River Elbe and to the west the River Oste form the natural boundaries.

Geologically this region can be subdivided into deposits derived from mud flats, brackish water areas, fluvial tides, as well as peat marsh and raised bog areas. The Kehdingen marsh areas developed after the end of the Ice Age due to silt gradually covering the gravels and sands deposited by the river Elbe. The fact that Land Kehdingen is located between the two parallel rivers, the Elbe and Oste, gives it its special character. Both rivers are tidal, which has led to the formation of a highland along its banks. As a consequence the drainage form the lower land in between the rivers is poor and this has led to the formation of the nearly 25 km long Kehdingen Moor. The land drops from about 2m above sea level in the area of the highland and the foreshore of the dyke to 1m below sea level on the border to the fen.

2.2 Present landscape

The Land Kehdingen is located in the administrative district of Stade and consists of the modern administrative areas North Kehdingen and the community of Drochtersen.

The present image of the Land Kehdingen is marked by the historic dyke-lines of the Elbe-dyke in the north and by the Oste-dyke, the so-called Süderdeich, in the east. The landscape of the north-westerly area is shaped by strips of land orientated according to the dyke, by scattered linear settlements on the dykes and by single farms, some built on dwelling mounds (settlement mounds).

Within the entire area, the appearance of the cultural landscape of the Land Kehdingen is dominated by strips of land, which are still clearly visible today, due to the unchanged settlement forms (here marshland settlements). Other elements of the cultural landscape which have been preserved are the dwelling mounds, the dykes along the rivers which separate the cultivated land (polders) against the marsh by means of the inner-dyke, Wettern (drainage ditches) and the "Doppelhallenhöfe", which are typical of Kehdingen. In comparison to the Altes Land, there is a greater variety of visible field- and settlement forms

in Kehdingen, due to the un-planned land development here since medieval times. In spite of some degree of superimposition and interference with the historic original, due to the modern settlement expansion in the 20th century, the situation regarding preservation is very good in comparison to other cultural landscapes of Lower Saxony. The area of Kehdingen has an outstanding position amongst other cultural landscapes in relation to the unity of its natural space.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The large scale investigation of the North German mud flats has progressed considerably, due to the efforts of the Institute of Historical Coastal Research and the municipal, regional and local archaeologists. As a relatively recent geological area the Elbe-Weser area is marked by quarternary deposits. The tidal river marshes of the Land Kehdingen and the fen, which used to mark Kehdingen's boundary with the geest, have developed from the end of the Ice Age until today.

Archaeologically, the exact date when the Land Kehdingen was settled can only be determined indirectly. On the basis of comparison with surrounding areas, it can be assumed that Kehdingen was affected by wider prehistoric developments. At the beginning of the post-Ice Age, today's southern North Sea coast was dry land and the North Sea coast was in the area of the Dogger Bank, and it can be presumed that Kehdingen's tidal river-marshes were frequented in the late Palaeolithic and the Mesolithic by hunter-gatherer groups. It is possible that evidence for this and later phases are located below the river marsh with its millennia of sediment deposits.

The subsequent Neolithic settlement of the area is well represented by the megalithic grave sited near Hammah, close to the road to Sternberg.

Numerous Bronze Age sites, such as tumuli and urn cemeteries, can be verified in the Elbe-Weser area. The same applies to the Roman imperial period and to the period of the migration of the people following it. However, from the 6th until the late 7th century, reforestation occurs and the earlier agricultural areas disappear.

Intensive development of land appears to have begun with the colonisation of marshes in the 12th century, during which the marshland-farmers were able to gain a far-reaching autonomy and self-government.

Due to the fusion of two parishes in both Elbe marshes, Kehdingen and Altes Land, regional communities developed in the 13th century, whose most important uniting aim was certainly the common dyke-protection and the preservation of political, social and economic rights. Political representation and administration consisted of seven Kehdingen leaders, who were elected on the Schinkelplatz till 1852, situated on the Hollerdeich in Oederquart on the border between North and South Kehdingen. The politically effective division of Kehdingen, within whose two parts separate court- and administrative districts developed, was still operating in Modern Times.

3.2 Early Modern Times

At the beginning of the modern era the autonomy of Kehdingen ended under Archbishop Christopher (1511-1558), due to the introduction of the archiepiscopal regional order. The privileges linked with it of self-government were preserved until the 19th century.

The Thirty Years War burdened the region greatly, due to its occupation by various armies, and the period after the Westphalian Peace of 1648 caused further impoverishment of the population. The Swedish occupying forces turned Agathenburg into their government-seat and Stade was turned into a fortress. In 1712 Swedish rule was replaced by Danish supremacy, and in 1715 the Danes sold the area to the electorate of Hanover.

The economy of the Land Kehdingen was based on agriculture with the Oste- and the Elbe marshes supplying agricultural products to the markets of the coastal towns. Declining yields and competition with producers from overseas led to further decline in profits and to numerous farms being abandoned. The population frequently had no other choice but to

emigrate. In this phase a changeover occurs from the production of grain to grassland-agriculture.

3.3 Modern Times

The administrative reforms of the mid-19th century saw the introduction of the administrative unit of Land Kehdingen. In 1885 the district of Land Kehdingen emerged from this administrative unit. This has been a part of the district of Stade since 1932. Between 1969 and 1971 community-reform took place, which produced the community of Drochtersen and the administrative unit of North Kehdingen.

For a long time, the regional development of the Land Kehdingen has been influenced by the growth of the towns in the vicinity, notably Stade and the independent and Hanseatic city of Hamburg. These close ties found expression in the architecture. Modern ways and forms of building found in Hamburg are also recorded in the Land Kehdingen, although this urban influence disappears the further you go into the hinterland.

The development of brick-making was an important economic influence in the area in the 19th century, with the focal point in the Elbe marshes being in South Kehdingen. An example of this is the monument Ziegelei Rusch dating to 1881 sited in Drochtersen-Ritsch. The preconditions for the brick industry were the clay soil of the marshes and transport waterways in immediate proximity. At times the production of bricks was the most important source of income of the areas west of the Elbe, but it also depended on economic and building developments in Hamburg. Re-construction after the burning of the city in 1842, the years of rapid industrial expansion (period of promoterism/ Gründerzeit) and the linking of Hamburg to the German Customs Union, which included the construction of the warehouses in Hamburg (from 1885) were particularly influential here. During that period the number of brickworks in Kehdingen rose from 92 to 103. However, by 1900, many of the businesses depending on part-time labours had disappeared.

A further important source of income was grain-growing, which was the dominant industry as late as the 19th century. North Kehdingen was the most important supplier of grain for the big coastal towns. However, when the demand declined, the arable land was converted into meadowland and horse breeding and cattle fattening gained importance again.

The Land Kehdingen (together with the Altes Land), had a rather bad road-network and transport was traditionally via the waterways. This explains the very early development of the profession of boatsman in South Kehdingen. Between 1899 and 1930 the railway-network in Kehdingen was expanded by the Kehdinger Kreisbahn (a narrow gauge railway), which had negative consequences for the waterways.

4. Modern development and planning

In its regional planning report for 2005, the Federal Office for Building and Regional Planning classifies the Land Kehdingen amongst those regions which are marked for a small increase in the development of the population and employment. This growth is encouraged by further infrastructure measures. The future of the Land Kehdingen will include further use of space for housing estates, which will be accompanied by a great increase in traffic (Suburbanization).

4.1 Land use

The Land Kehdingen is a plantation landscape, marked by unfavourable natural and economic conditions of production. In view of the intensive agricultural use of the marshy soils it can be assumed that farm enlargement will continue, to the disadvantage of other farms. At present the proportion of those working in agriculture is between 14 and 24%; due to further developments it will decrease even more. This development is to be seen in connection with the intensification of agriculture which will lead to the enlargement of farms in this sector and to the adaptation of the area used, to business constraints.

This is in contrast to the increase in tourism in Kehdingen, which is particularly based on the historic, agricultural landscape including: historic field structures, agricultural buildings, dykes, drainage-ditches and also technical monuments such as sluices.

4.2 Settlement development

In comparison to the average population-density of the administrative area of Stade, which in 2004 was roughly 154 inhabitants per square kilometre; the Land Kehdingen is much less densely populated. Thus the population-density in North Kehdingen is only 43 inhabitants per square kilometre. Today, the main agricultural areas are located off the arterial routes in the area of Stade, which are represented by the railway-line Hamburg-Stade-Cuxhaven and the B 73 (up to 26.674 cars per day) running from Hamburg via Stade to Cuxhaven. The only nationally important trans-regional road to be mentioned is the B 495, which forms the west to east connection to the ferry across the Elbe near Wischhafen. The most important secondary road for local traffic is the L 111 (Stade-Freiburg-Itzwörden) with 4.000 to 17.000 cars per day.

From a tourist point-of-view of the Land Kehdingen is part of the travel area of the Cuxhaven coast – Lower Elbe. Although the number of overnight-stays in this region is rather low in comparison to the coastal region, there were 1900 overnight stays per year in 1994.

4.3 Industry and energy

The Land Kehdingen has no important industrial locations of its own. It is located on the periphery of the significant industrial locations of Hamburg and Stade/ Bützfleht with their focus on petrochemistry. In addition there is the city of Stade in the south of Kehdingen as an energy-location with a nuclear power-plant and a transformer station in Rollern. The Land Kehdingen is not crossed by any pipelines.

In addition to the planned wind-farms in Land Kehdingen, there are already some to the south of Hörne, south of Balje-Wetterdeich, between Oederquart and Wischhafen and south-west of Drochtersen.

4.4 Infrastructure

Traditionally the traffic in Land Kehdingen was by water. Thus the direct proximity of the Elbe and the Oste always enabled a linkage to more important business routes.

At the beginning of the 19th century the Land Kehdingen was not linked to the national road system. This occurred indirectly in 1863 with the extension of today's B 73, on the eastern side of the Oste. In 1893 the linkage to the B 73 occurred via today's B 495, the only road of trans-regional importance, which provided access to the ferry Wischhafen – Glücksstadt. The secondary roads 111 and 113 are meant purely for regional traffic. At present the Land Kehdingen is not yet connected to the Federal motorway-network. This is to happen via the A 22 and A 26.

In 1899 the linking of the Land Kehdingen via Stade to the railway-network of those days took place. Today there is no direct railway-connection anymore. The connection is via the line Stade – Cuxhaven and then by share-a-ride taxi. The nearest airports are in Hamburg (international) and in Stade.

5. Legal and spatial planning aspects

The Land Kehdingen is a historical unit, which is bordered by three rivers: in the north and the east by the Elbe, in the west by the Oste and in the south by the Schwinge. Today it includes the administrative units of North Kehdingen and Himmelspforte.

In terms of regional planning, Kehdingen is subject to Lower Saxony's land planning programme as well as the regional area or land use planning programme put forward by the communities. Nationally Kehdingen is regarded as an especially weakly structured area. From the point-of-view of trans-regional planning instruments the region is one of the specific concerns of the Regional Development Concept for Hamburg as well as being part of the area to which the regional planning concept for the coastal waters of Lower Saxony applies. In addition, the region belongs to the Landschaftsverband (regional authority) of the administrative district of Stade.

6. Vulnerabilities

6.1 Spatial planning

The biggest problem for the preservation of the historical cultural landscape of the Land Kehdingen is likely to be changes in the use of space and growing claims on it, already evident, which might become more severe in the future as a result of infrastructure improvements and expansion of settlement from urban conurbations. Spatial planning needs to recognise the areas rich historic landscape and integrate the cultural heritage into future developments.

6.2 Settlement

The commuter-radius will clearly increase with the construction of the A 26 and the A 22. This could lead to the Land Kehdingen being further fused with the conurbation of Hamburg i.e. the Elbe crossing close to Drochtersen could make Kehdingen attractive as a dormitory town for the northern part of the Hamburg Metropolitan Region. The entire Land Kehdingen could develop into a dormitory town, thus destroying the inhabitants relationship with the traditional working-structures and thus also to the local identity would be lost. In addition a parallel movement away from the Land Kehdingen of businesses and educational institutes could develop which could increase the loss of identity still further. The addition of new inhabitants, with their own needs, could also result in changed demands on space, increasing this process even more. A "side effect" of the better linkage of Kehdingen will be an increase in population-figures in certain regions leading to the possibility of an expansion of new building areas and the establishment of big hypermarkets on the edges of places, which could lead to a ring-shaped enlargement of the present core-settlements and thus to an extensive urban sprawl. In addition, a shift in the population figures can be expected from the periphery of Kehdingen (for North Kehdingen a decline in population figures is expected) to better developed regions, which could also result in negative consequences for the image of the areas historical landscape.

6.3 Agriculture

Pressure from international competition, resulting from globalisation, to optimise agricultural land use will result in the intensification of agricultural production. At the same time, the use of measures to increase yields are limited by EU regulation (Ramsar agricultural guidelines) The result of these parallel processes are likely to be efforts by farm businesses to expand their farming area, in order to stay competitive. The historic fieldscape, such as the long strips of land typical of the Elbe marshes, and other landscape features would be threatened across a wide area as a result. Farm re-structuring will also lead to farms being abandoned and redundancy of historic farm buildings.

6.4 Tourism

Apart from the Altes Land, the rivers Elbe and Oste with their dyke footpaths, the Elbe Island Krautsand and the Land Kehdingen, the administrative district of Stade is a focal area for tourists. The sports boat harbours of the community of Drochtersen and the harbours in Freiburg and Wischhafen are of regional significance and Drochtersen-Krautsand is a recreation area with the special task of developing tourism. Although in the regional planning-programme (RROP 2004, 126ff) there is a reference to the expansion of tourism, the future of tourism and holiday traffic is likely to burden the community of Drochtersen considerably because of changes in traffic access.

6.5 Infrastructure

The planned development of infrastructure in the area will destroy the still largely existent unity of the historic landscape of Kehdingen. Proposed changes to the areas infrastructure, such as the extension of the road-linkage to the German motorway-network by the new motorway A 22 (Coastal Motorway) as a continuation of the A 20 and by the new motorway A 26, could have a serious impact on the cultural heritage. In addition to areas being cut through, which up to now have been little subdivided by traffic, the interchange planned near

Drochtersen and the further planned route of the A 22 as well as the A 26, threaten to destroy the Ritsch sea-dyke and the northern part of the Assel sea-dyke, which can both still be recognised in the countryside as levelled embankments, as well as the Hallenhäuser (typical farm housing) on the estate of Hohenblöcken. The clay-deposits available in the area of the planned motorways may be removed, which could also lead to the destruction of archaeological sites.

Further infrastructure changes include a possible extension of the existing harbour areas of Ruthenstrom (Drochtersen), Wischhafen and Freiburg / Elbe, an important precondition for which is the widening of the shipping channel. This signifies a potential danger, which is difficult to quantify, to the archaeological sites concealed in the marsh soil. The main threat in relation to this is the permanent dredging of the Elbe shipping-channels. This leads to an increase in the speed of the current in the Elbe shipping channel, and to quicker drainage of the water within the tidal cycle, which accelerates the erosion process on the banks of the river. It cannot yet be foreseen what consequences this will have for archaeological sites (shipwrecks, settlement layers) that may survive in the Elbe and in the area of the Elbe estuary. In the long term the harbour extension could also mean that other industrial areas will be extended.

6.6 Industry and energy

Mechanical peat-digging endangers surviving archaeological sites and palaeo-environmental evidence including pollen archives, which will be lost without record. The area of the Neuland Moor (peatland) has been designated as a digging-area and in autumn 2005 peat-digging was started there. Beside the Neuland Moor (peatland) commercial peat-digging also takes place on the Wolfsbruch Moor (peatland), as well as in the Aschhorn Moor (peatland) and on the Königsmoor (peatland). No more commercial digging is to be expected in the remaining areas; most of the Kehdingen Moor (peatland), formerly roughly 109 square kilometres in size, has been developed into agriculturally productive land.

The expansion of renewable energy-sources is a declared aim of regional and federal politics. Accordingly the expansion of wind farms in the marsh areas of Kehdingen is gaining in importance. Whilst the impact on the wider landscape is acknowledged e.g. in the regional planning-programme for the administrative district of Stade, the aim is to concentrate the wind turbines in a number of regions and to restrict the maximum height of the wind turbines to 100 m, to minimize the disturbance to the landscape as much as possible. Apart from the visual disturbance to the wider landscape, expansion of this industry would also cause considerable disturbances to the ground (setting up and dismantling of the wind turbines including anchoring them in the ground, cable trenches) and hence a threat to archaeological sites.

7. Potentials

7.1 Spatial planning

Land Kehdingen is of regional and trans-regional importance as a greenbelt area.

7.2 Settlement

The Land Kehdingen has maintained its historic pattern of settlement, which evolved in tune with life in the area of the Elbe marshes, to the greatest possible extent. Thus, the marshland villages of the 12th century with their long-narrow fields and houses with combined living and working areas, constructed from the 17th to the 20th century all survive well.

7.3 Management of the cultural heritage

In the future, North Kehdingen, located on the periphery of the area, seems to have a good chance of preserving something of the historical landscape of Kehdingen by its continuing association with its own heritage, which is shaped by agricultural use, coastal protection and fishing. In addition there are still numerous historic architectural monuments and field monuments (dwelling mounds, dykes, lighthouses, buildings connected with agriculture and

fishing). An important pre-condition for the maintenance of this historic landscape structure is its use by private individuals, agriculture and tourism. In all of this the biggest challenge is in the integration of the different claims on use and of the various administrative bodies involved, but also in the participation of people living in this area in these processes.

7.4 Tourism

The area has great potential for tourism as it has an interesting variety of cultural heritage features within a relatively confined space and the natural and human processes by which these landscapes, from the mud flats to the geest-scenery and the river marshes and moors, and their component parts such as the churches, fields and paths, have come into being is relatively clear and can be understood by visitors. The history of the Land Kehdingen can also be accessed via its numerous museums in which the material culture of the region is presented. Kehdingen offers numerous and many-faceted opportunities, by which the historical evolution of the plantation landscape can be highlighted and interpreted for both visitors and local residents.

8. Sources

Author: Ulf Ickerodt

Albrecht, H. (1997): Denkmaltopographie Bundesrepublik Deutschland. Baudenkmale in Niedersachsen Landkreis Stade. 26.1. Landkreis Stade ohne die Städte Stade und Buxtehude, bearbeitet von Heike Albrecht. Hameln.

Behre, K.-E. (1995): Kleine historische Landeskunde des Elbe-Weser-Raums. In: Geschichte des Landes zwischen Elbe und Weser I. Vor- und Frühgeschichte. Schriftenreihe des Landschaftsverbandes der ehemaligen Herzogtümer Bremen und Verden 7. Stade, 1–59.

Bundesamt für Bauwesen und Raumordnung (BBR; 2005): Raumordnungsbericht 2005. Berichte 21. Bonn.

Dannenberg, H.-E. & Schulze, H.-J. (1995): Geschichte des Landes zwischen Elbe und Weser I. Vor- und Frühgeschichte. Schriftenreihe des Landschaftsverbandes der ehemaligen Herzogtümer Bremen und Verden 7. Stade.

Hoffmann, H.-C. (1986): Bremen, Bremerhaven und das nördliche Niedersachsen. Kultur, Geschichte, Landschaft zwischen Unterweser und Elbe. Köln.

Hofmeister, A. E. (1979): Besiedlung und Verfassung der Stader Elbmarschen im Mittelalter I. Die Stader Elbmarschen vor der Kolonisation des 12. Jahrhunderts. Hildesheim.

Kahle, A. (1989): Bericht über die archäologischen Untersuchungen der Jahre 1984–1985 in Krummendeich-Stellenfleth. Stader Jahrbuch 1989, 7-21.

LANCEWAD (2001): Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. In: Common Wadden Sea Secretariat (Hrsg.), Wadden Sea Ecosystem. Wilhelmshaven.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Regionales Raumordnungsprogramm für den Landkreis Stade 2004.

Salesch, M. (1998): Der „Feldhof“ in Balje. Geologie und Besiedlung. In: Nordkehdingen. Tradition und Geschichte, 199-206.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler (Hrsg.), Archäologie der ältesten Kultur in Deutschland. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Land Hadeln, SH

1. Overview

Name:	Land Hadeln
Delimitation:	River Elbe, Geest ridges Hohe Lieth, Wingst, Westerberg, Geest border Bederkesa, neighbouring entities Land Wursten, Land Kehdingen
Size	Approx. 725 km ²
Location:	Tidal river marsh south of the Elbe estuary in Cuxhaven district, in Lower Saxony, Germany
Origin of name:	The name Hadeln is derived from the early Saxon "Gau" (province) Haduloha, which at that time referred to the entire territory between the Elbe and Weser estuaries. In this context, Land Hadeln is known as the elder brother of Land Wursten. The oldest documentary record of Haduloha goes back to Widukind von Corvey, who was an enemy of Charles the Great.
Relationship/similarities with other cultural entities:	Moor colonies Teufelsmoor (Devil's Moor) near Bremen, marsh farmland on the Dollart, terp-villages, Krummhörn, linear settlements near Aurich
Characteristic elements and ensembles:	Typical maritime character reflected by dykes and associated drainage-systems (ditches or canals) as well as strip fields, dwelling mounds, churches, farmsteads, pumping stations

2. Geology and geography

2.1 General

The Land Hadeln is a 22 km to 25 km broad marsh-area close to the estuary of the River Elbe near Cuxhaven on the North Sea. Embedded between the Hohe Lieth in the west, the Wingst and the Westerberg in the east, the Hadeln Marsh stretches about 25 km in a southerly direction as far as the Bederkesa Moor Geest. Hadeln Bay belongs to the sea-marsh area of the Elbe-Weser region, which formed due to marine conditions.

A distinction is made between the landscapes derived from the different sedimentation levels before the establishment of the dykes; that is between the highland with its sandy, chalky soil in a 5 km wide strip close to the coast and the lower lying land with its clayey soil. The main focus of settlement is on the highland which is on average about 15 m above sea level. The Hadeln low lying land which roughly begins in Neuenkirchen, goes down to less than 0.5 m under sea level and, due to the lack of drainage, is very marshy, especially on the Geest edges. This area is surrounded by a ring of lakes, such as the Flögel- and Bederkesa Lakes as well as the Balk Lake.

The geology of Hadeln includes areas of partial salt deposits dating from the Zechstein period. The sedimentations of the Eemian era beneath the Holocene deposits of the post-Ice Age are also geologically remarkable. Peats near Osterwanna provide information on climate and vegetation conditions during the Eemian interglacial era, and have become a European standard due to their completeness.

2.2 Present landscape

Essentially the Land Hadeln is limited to the marsh surrounded by dykes, south of the Elbe estuary. Here the prevailing agricultural land-use is traditional. In the highland part of the

fertile sea-marsh, tillage and fruit growing are undertaken. On the low lying land located behind it, predominantly dairy cattle are kept on extensive pasturage.

Only after extensive drainage-measures, could the low lying land be settled continuously. Parallel, straight drainage-ditches running side by side, divide the Land into strip-shaped fields. Nowadays the strip fields are an essential characteristic of the Land Hadeln. With the aid of extensive canal-systems and pumping stations it was possible, in the 19th and 20th centuries, to conduct the water against the natural incline through the highland of the Land Hadeln into the Medem (Hadeln Canal, Neuhaus-Bülkau Canal), which flows into the Elbe close to Otterndorf. The problem of draining the Hadeln low lying land, which is crossed by the Aue, Gösche, Mühe and Emelke, can be traced back to the year 1219 in documents.

Today the mire and raised bog areas in front of the Geest-ridges are designated as nature reserves. Amongst them is the roughly 40 km² large Ahlenmoor and smaller peatland-areas around Wanna, the only Geest-community in Land Hadeln. Like islands, the small sandbanks, up to 20 m high project from the low lying area of Ost- and Westertanna. Comparable with the "Hohen Lieth", the Westerberg, the Wingst and the Bederkesa Geest, they have developed in the course of the penultimate Ice Age. Some of these Geest areas have extensive woodland.

3. Landscape and settlement history

The Land Hadeln has a complex settlement history, in the marsh landscape man's continual struggle to gain and preserve his habitat can still be observed in the characteristic dykes and dwelling mounds.

3.1 Prehistoric and Medieval Times

The coast line of the North Sea has changed frequently in the course of the Earth's history. Towards the end of the Ice Age, roughly 10.000 years ago, another low-land bay existed on the southern Elbe estuary. Due to the rising sea level, tidal change led to the flooding of Hadeln Bay at high tide. At low tides the materials transported by the water were deposited, so that the marsh grew slowly higher over the course of millennia.

The first settlement traces go back to the Palaeolithic Age and are restricted to single finds of flint artefacts, like the flint found in Wanna and from the Wingst. They are assigned to the Upper Acheuléan period, chronologically to the end of the penultimate Ice Age, and are found in connection with Neanderthal man.

Unlike the Palaeolithic, a number of Mesolithic finds are known in the Elbe-Weser area. They are partially from the neighbouring regions of the Land Hadeln, for instance from Neuenwalde and Hemmoor-Westersode close to the Wingst.

With the beginning of the Neolithic period (roughly 3000 BC) the human impact on landscape in the Elbe-Weser area increases. One of the discernible changes in the natural landscape is the introduction by the humans of farming and livestock breeding. This phase of land settlement in North Germany is most obvious in the Elbe-Weser area of Flögeln, north-west of Bederkesa on the Geest. Pollen diagrams from kettle-hole bogs indicate the existence of grasses and heather in a clearing in the forest suggesting that grazing went on. Spelt and hull-less barley as well as some emmer were grown as cultivated plants. At the site of Flögeln there are the outlines of houses from the Neolithic Funnel Beaker culture (Trichterbecher Kultur; TRB), which provide information about the settlements of that time. Today the Neolithic burial places stand out in the landscape, and numerous examples were erected in the Land Hadeln. including those of Wanna and the Ahlenmoor. The burial places there were partially covered by the moor and are therefore well preserved. The cause of the growth of peatland at this time was the rise of the ground water level, which made the formation of the raised bogs possible.

For the Bronze Age there are many archaeological sites in the Elbe-Weser region. In particular tumuli and urn cemeteries, as well as some settlement traces, are worthy of

mention. Nevertheless, there has been a lack of major settlement excavations. The man-made landscape hardly changed in the pre-Roman Iron Age either. However, there is a considerable increase of settlement activity, which intensifies in the northern Elbe-Weser area in the following Roman Imperial/Migration Period. This is also apparent in the beginning of the terp (settlement mounds)-building in the marsh around Christ's Birth, as well as in the continued settlement in the Geest-areas, for instance, in Flögeln-Eekhöltjen. Up to that time the settlement of the marsh was subject to variations in the sea level. This also holds true for the first small Iron Age settlements on the sandy ridges, but only with the beginning of terp-building was permanent settlement possible in the flood-endangered areas.

There are large old village-terpen in the west of the highland of Hadeln between Lüdingworth and Döringworth, as well as on the Medem between Neuenkirchen and Otterndorf, and to the east of Otterndorf in Westerwörden. The terpen were settled until the 5th century and today they still rise above the surrounding areas by a few metres. They reflect the coastline of the North Sea or the shoreline in the tidal-area of the particular river-system during its settlement-phase.

An early medieval re-settlement, like the one which is documented for the neighbouring coastal land of Wursten, by a new terp-building phase in the 7th/8th century, can probably also be assumed for the Land Hadeln. Similarly, the question is still open, as to when the low lying land was cultivated for the first time. An indication of this is in the setting up of linear settlements, starting in the 12th/13th century on the north and east edge of the Ahlenmoor, from which the moor was cultivated bit by bit by peat-cutting.

With the medieval dyke-building the terpen lost their function as a protection from storm floods. It is assumed that the first medieval winter-dyke in Hadeln was set up parallel to the coast in the 12th century ("Hadler Seebanddeich"). It was presumably planned by Dutch colonists. A comparable development has been passed down to us for the Hamme-Wümme depression near Bremen in a document from 1113. Today there are still sections of old dykes, in separated sections, preserved near Otterndorf. However, they did not belong to the continuous winter-dyke, but where water divides between areas of different drainage direction.

It was only after 1469 that dykes were built at the mouth of the Medem. The church of Otterndorf, founded in the 12th century, was up to the middle of the 15th century in the area beyond the outer dyke. All in all there were 12 parishes in the Land Hadeln. The town of Otterndorf had a prominent position in the Elbe-Weser area for several centuries. In the core of the old town the original arrangement of the terp of Otterndorf is still recognizable.

3.2. Early Modern Times

The Reformation asserted itself in the Elbe-Weser area in the middle of the 16th century and found quicker acceptance in the Land Hadeln, which was under the supremacy of the Dukedom of Saxony-Lauenburg, than in the lands under archiepiscopal rule. After the losses of the Thirty Years' War the need rose for ecclesiastical furnishings, which in the 17th and 18th century often came from farmers' donations. The churches in Hadeln in particular reflect the economic prosperity of the large farmers, and this is also evident in the development of splendid buildings combining living and working quarters in the Hadeln highland. The churches of the Land are also called "farmers' domes" (Bauerndome).

In the second half of the 17th century, further settlements were built on the peatland edges, and the intensified deforestation of the Geest led to an increase in peat-cutting so that heating-fuel could be obtained. In this cultivation-phase Westerende, Mittelteil, Steinau-Westerseite and Medemstade came into being. The development of new land improvement techniques also ameliorated the conditions for agriculture in the low lying land. Suitable meadowland could now be transformed into farmland. While the settlements in the low lying land, such as Bülkau, Oppeln and Steinau, mainly represented the type of closed marshland village with relatively closely positioned houses, the linear settlements of the northern highland, such as Altenbruch and Lüdingworth, take the form of a loose structure of detached farms.

From the early Modern Times the Land Hadeln was regarded as a granary, which supplied grain to Hamburg in particular. An important upswing in agriculture was closely connected with cultivation of rape-seed from the middle of the 18th century. Today there are remnants of the former field-use left in the low lying land.

3.3 Modern Times

In the mid 19th century the Hadeln Canal and the Neuhaus-Bülkau Canal were extended, which not only made for better drainage of the low lying land, but also ensured transport inland via the waterways. The marsh-clay, which was obtained by digging and canal construction, was turned into bricks and shipped to many flourishing industrial towns.

A crisis in the marshland economy, caused by the fall in grain and oil prices, occurred in the second half of the 19th century. Despite a change in production to meadowland farming with livestock fattening, people emigrated from the region. Another possible reason for this was malaria, which was raging in the region. Between 1873 and 1892 roughly 10% of the population of Hadeln emigrated to America.

In 1881 the railway-line Cuxhaven-Hamburg was built and the extension of the Cuxhaven-Stade line via Otterndorf was progressing. Otterndorf, for centuries the economic, political and cultural centre of a farmers' republic in the Land Hadeln, was thus relegated to the level of a small country-town within a very few centuries due to the up-and-coming developments in neighbouring Cuxhaven.

From 1824 onwards horse-breeding played a role in the Land Hadeln, and it is still carried on today, for example in the traditional competitions in Am Dobrock in the Wingst show.

With the appearance of machine-driven pumping works it was finally possible to protect the low lying land against the permanent threat of flooding. Since the 20th century numerous pumping works are responsible for the artificial drainage of the Hadeln low lying land. In the 1960s the Oste dam was built. Here the course of the Oste had to be changed in this area. The old stream bed below the dam was filled in. Today the remaining old arm of the river has become a tourist facility for water-skiing.

4. Modern development and planning

4.1 Land use

The Hadeln highland is one of the few marshland arable farming areas in Germany. Due to the fertile ground, the annual harvests are rich in yield. In the low lying land with its marsh meadowland areas, dairy farming is undertaken. The region has remained an area of traditional farming land.

In the whole regional administrative area of Cuxhaven (the former areas of the Land Hadeln and Wesermünde; complete size: 201.000 inhabitants on 2072 km²) the number of workplaces in industry, including the processing industry, are below average. In agriculture the number of employees subject to compulsory social-insurance is twice as high as the average. In comparison to 1990 the numbers here decreased by 43%, whilst increasing by 38% in the service sector. Thanks to the fish processing industry in the city of Cuxhaven, the administrative district is one of the leading regions in German food production.

4.2 Settlement development

Over the last few decades the number of inhabitants in the region of Cuxhaven has been in decline. In general the Land Hadeln is thinly populated; the main settlement-areas are located on the highland. Today the town of Otterndorf, which is known for its 17.5 kilometre long beach, is a North Sea seaside resort and the seat of the administrative district of Hadeln. The approximately 10,000 inhabitants of the district live in a community with historically evolved central functions. Due to the variety of existing public institutions, the North Sea resort is a desirable place to live. Traditionally a great emphasis is put on culture. The communications-centre "Stadtscheune" with its museum of modern art, offers space for many events. Besides trade, business and agriculture, tourism has strongly developed during

the last few years. Holiday home estates with more than 150 living units, two camp-sites, sports and play grounds on a bathing lake, the "lawn-beach" and a salt water indoor swimming pool are at the visitors' disposal.

Fishermen can use the coast, rivers and lakes for their sport. The Hemmoor Kreidesee is a good example; it has also become important over the last decades for international scuba-diving. For recreational sailors too, the area on the Oste and the Elbe with its connection to the North Sea and many small and big harbours and ports (Cuxhaven) is interesting and much used.

Altogether, the administrative district of Cuxhaven has registered an exemplary upswing in tourism: the number of overnight stays rose in 1987 from 4.88 million to 5.87 million in 1998. 3 million overnight stays were in the town of Cuxhaven. Otterdorf and the medicinal bog spa Bad Bederkesa are among the successful North Sea bathing resorts. According to the information of the Integrated Rural Development Concept ILEK, the number of overnight stays in the Land Hadeln has stagnated recently.

It is not only in the administrative area of Hadeln that the cultural-managers are investing in cultural identity. Burg Bederkesa is a museum and the seat of the office for the archaeological preservation of historical monuments, Studio A - a museum known nationally for abstract art - and for the archives of the district Otterdorf are managed by specialists.

4.3 Industry and energy

The Land Hadeln is an area still largely untouched by industry; it has, however, got numerous wind turbines. Numerous industrial enterprises have located in neighbouring Cuxhaven. The fish-processing industry, the manufacturing of metal packaging, technical apparatus construction and machine factories for the pharmaceutical, cosmetics and food industries are of great importance for economic growth.

There are big deep freeze-depots for fish, meat and fruit in Cuxhaven/ Otterdorf. The production of mineral building materials and the concrete works are of national significance for the building industry. Poultry production and breeding are another main focus. In Cuxhaven, market-leading enterprises are represented in the areas of pharmacy and dental medicine, as well as in the environmental sector, such as in the area of wind-energy and ground rehabilitation, which are active nationally.

The net-company Ems-Elbe (Stade) is responsible for the electricity supply in the Elbe-Weser triangle. It provides the highest- and high-voltage overhead transmission-system with the levels of 380, 220 and 110 kV. A group-switch line, from which all means of production can be remote-controlled, belongs to the net-company.

4.4 Infrastructure

The motorway A 27 follows the north-south course of the westerly Geest ridge "Hohe Lieth", and separates the Land Hadeln from the Land Wursten on the North Sea coast. Via the A 27 the region is connected to Bremen, Hanover and the Ruhr Area and via the B 73 to Hamburg and the former East German Länder (federal states). The port of Cuxhaven only few kilometres away – nerve centre between the North Sea and the Baltic - has gained importance since the opening of the Amerikahafen in 1997. Since 1999 there has been a car-ferry connection on the Elbe to Brunsbüttel in Schleswig-Holstein. Furthermore Cuxhaven is also connected to Hamburg and the European inland waterways network via the river Elbe.

Otterdorf is linked to the railway-line from Cuxhaven to Hamburg. From Cuxhaven a railway line runs to Bremerhaven. From there a link exists to the ICE high speed train network of the Deutsche Bahn AG. The rail passenger-traffic from Cuxhaven to Hamburg is heavier than on the stretch from Cuxhaven to Bremerhaven. The nearest large airports are in Bremen and Hamburg. The airport Cuxhaven/Nordholz was originally a military installation and was only very recently opened to civilian freight traffic.

The administrative district of Cuxhaven has numerous developed industrial-zones and estates, some of which are sited close to the motorway and to the Nordholz Airport. The prices for trade- and residential properties in the administrative district of Cuxhaven are amongst the lowest in the Federal Republic.

5. Legal and spatial planning aspects

In historic times the boundaries of the Land Hadeln changed several times, and a county of Hadeln continued to exist into modern times. In 1972 the administrative district of Hadeln came out of the merger of five administrative areas: Hadeln with its seat in Otterndorf, Sietland with its seat in Ihlienworth, Am Dobrock with its seat in Cadenberge, Hemmor and Börde Lamstedt. In 1977 the administrative districts of Land Hadeln and Wesermünde were merged with the independent city of Cuxhaven into one administrative district with its seat in Cuxhaven.

Regional planning is subject to Lower Saxony's land planning programme as well as the regional area and land use planning programme put forward by the communities. The Regional Development-Concept for Hamburg as well as the regional structure concept for the coastal waters of Lower Saxony are integrated into this. Since 2006 an Integrated Rural Development-Concept ILEK task force is working in the Land Hadeln to develop systems to safeguard the future of the region. If suitable the implementation of the ideas can be supported by funding from the EC, the Federal Government and the Land (federal state).

6. Vulnerabilities

6.1 Settlement

There is a danger of the development of so-called dormitory villages which runs contrary to the intended stimulation of the town and village centres and the expansion of public services. Such dormitory villages will affect the historic settlement pattern of the area.

6.2 Agriculture

Pressure from international competition, resulting from globalisation, to optimise agricultural land use will result in the intensification of agricultural production and structural changes. In order to remain competitive, farm sizes will inevitably have to be increased. The historic fieldscape, including the long strips of land typical of the Elbe marshes, and other landscape features, would be threatened due to increases in the size of farm machinery. The expansion of production areas could lead to monocultures and could destroy the historically grown settlement pattern with redundancy of some farms.

6.3 Tourism

Due to the steady increase in population in the conurbations, there will be a danger of mass-tourism affecting the recreational areas of the rural greenbelt bringing pressure on the cultural heritage.

6.4 Industry and energy

The lack of big companies and industrial estates in the area could lead to a further population drain and, through commuter movements, daytime de-population which could result in negative consequences for the maintenance of the historic landscape.

6.5 Infrastructure

The German seaports such as Cuxhaven are demanding a significant improvement to their hinterland connections for the future. This demand would signify a further extension to the infrastructure of the area causing interference with the cultural landscape of Hadeln, with a negative 'knock-on' effect on tourism.

6.6 Natural Processes

There is an ongoing danger of flooding in the coastal areas as a result of continuing global warming.

7. Potentials

7.1 Settlement

There are ongoing efforts to revitalise village centres in the area to improve future quality of life for the residents. In the meantime Hemmoor has become one of the central focal points in the region, on which the town-rights were conferred in 1982. The Land Hadeln offers favourable real estate and has comparatively inexpensive building land and stable rents.

7.2 Agriculture

In the agricultural sector the identity of "Milkland" Hadeln could be marketed even further as a means of branding the area and its produce. A possible alternative for farm incomes would be the strengthening of the traditional local horse breeding and ownership.

7.3 Tourism

The Land Hadeln has retained its rural character to a great extent. The scenery and settlement forms still clearly reveal the old structures in many areas, including: old dyke structures, marshes, marshland villages, drainage channels, peatland colonies and many raised terpen and banks. The regional administration is aware that the potential of the areas natural and man-made resources such as dykes, drainage-channels, peatlands, lakes, Geest ridges, agricultural working areas and technical monuments (e.g., pumping stations) can be used increasingly for tourism and thus create workplaces in the service sector. Numerous church buildings and other cultural monuments, often with maritime character e.g. lighthouses are equally tourist attractions. The Natureum close to Neuhaus/ Balje with its didactically presented exhibition concept is especially suitable for school classes. Here the meaning of the natural landscape with its local animal and plant world is clearly conveyed to the visitor. The museums and other cultural institutions of the area are headed by experts and mediate up-to-date research-results with their exhibition concepts and/ or emphasize cultural and regional identity (e.g. local museum, farmhouse parlour). The situation of the highland at the mouth of the Elbe and on the North Sea area, and the historic watercourses in the low lying land provide areas for soft tourism. Overall tourism concepts and a sharper focus of the profile of the region could stimulate the development of tourism in future. The campaign "German Ferry Routes", which successfully demonstrates and markets the potentials of the maritime scenery of the Lower Elbe, is a positive start in this respect.

7.4 Industry and energy

The immediate proximity to the port of Cuxhaven is useful for trade and industrial estates. The varieties of trade and craft industries demonstrate strong medium-sized industrial activity. The strengths of the region in future will most certainly show in the quality of the location for the settlement of companies. The Land Hadeln has extremely low property-prices, has got sufficient land for industry and a favourable cost level for producing industry. There are attractive locations for the further expansion of wind energy and bio-energy.

7.5 Economy

With its expansion into a modern seaport, the harbour of Cuxhaven has triggered off a growth impulse which could affect the economic well being of its periphery in the future just as positively.

8. Sources

Author: Andrea Finck (Übers. Mai-Catherine Botheroyd)

Behne, A. (Hrsg.; 2000): Otterndorf, 600 Jahre Stadtgeschichte an der Nordsee. Otterndorf.

Behre, K.-E. (1995): Kleine historische Landeskunde des Elbe-Weser-Raums. In: Geschichte des Landes zwischen Elbe und Weser I. Vor- und Frühgeschichte. Stade

Bundesamt für Bauwesen und Raumordnung (BBR; 2005): Raumordnungsbericht 2005. Berichte 21, Bonn.

Böker, D. (1997): Denkmaltopographie Bundesrepublik Deutschland. Baudenkmale in Niedersachsen Landkreis Cuxhaven 19. Hameln.

Dannenberg, H.-E. & Schulze, H.-J. (1995): Geschichte des Landes zwischen Elbe und Weser I. Vor- und Frühgeschichte. Schriftenreihe des Landschaftsverbandes der ehemaligen Herzogtümer Bremen und Verden 7. Stade.

Elbe-Weser-Raum (1999): Auf den Weg ins 21. Jahrhundert. München.

Ergebnisillustration der „Zukunftswerkstatt“ ILEK Hadelner Region, erstellt: Dr. Greiser und Partner

LANCEWAD (2001): Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. In: Common Wadden Sea Secretariat (Hrsg.), Wadden Sea Ecosystem. Wilhelmshaven.

Lembcke, R. (Hrsg.; 1976): Kreis Land Hadeln. Geschichte und Gegenwart. Otterndorf.

Niedersächsisches Institut für Wirtschaftsforschung (NIW; 2005): Regionalbericht Norddeutschland 2005. Hannover.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Schumann, N. (Hrsg.; 1978): Hadeln und Wursten. Land hinterm Deich. Hamburg.

Seedorf, H. & Meyer, H.-H. (1996): Landeskunde Niedersachsen 2. Natur- und Kulturgeschichte eines Landes. Niedersachsen als Wirtschafts- und Kulturraum. Neumünster.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler (Hrsg.), Archäologie der ältesten Kultur in Deutschland. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Land Wursten, LS

1. Overview

- Name:** Land Wursten
- Delimitation:** Bordered to the north by the town of Cuxhaven, to the west by the Wadden Sea, to the south by the town of Bremerhaven and to the east by the Geest ridge "Hohe Lieth".
- Size:** Samtgemeinde (joint community) of Land Wursten: 117 km², 9730 inhabitants. Area under investigation: approx. 200-250 km².
- Location:** Part of the national park "Wurster Wattenmeer", Lower Saxony, Germany.
- Origin of name:** This name stems from the lower German word Wursaten or Wurtsasses meaning "people sitting on dwelling mounds".
- Relationship/similarities with other cultural landscape entities:** Zweiständerhaus (two pillared house), nucleated villages, Wurtendörfer (dwelling mound villages) (Emden, Jadebusen), marsh areas along the coast, Geest areas.
- Characteristic elements and ensembles:** Dwelling-mounds, stone churches, marsh landscape, dykes

2. Geology and geography

2.1 General

The cultural landscape of Land Wursten lies in the administrative district of Cuxhaven. It consists of the joint community of Land Wursten and a coastal strip which reaches from the town of Cuxhaven in the north to the town of Bremerhaven in the south. The joint community (formed 1974) itself consists of 7 communities: Cappel, Dorum, Midlum, Misselwarden, Mulsum, Padingbüttel and Wremen. The marsh landscape lies in the western part of the so-called Elbe-Weser triangle. The area has a length of ca. 30 km and a breadth of 4 to 9 km. To the west the area under investigation is bordered by the tidal flat, to the north by the North Sea coast and to the east by the Geest ridges "Hohe Lieth" and "Wurster Heide". They run parallel to the "green coastal road" which leads from Cuxhaven to Bremerhaven. In the south, the area around Bremerhaven forms the border.

The prominent end moraine "Hohe Lieth" developed during the penultimate cold stage (Saale-Kaltzeit) when the ice was pushing into Northern Germany. Today's coastal line developed about 5.500 B.C. during a general sea-level rise (the Flanders Transgression). Several advances and retreats of the sea (transgressions and regressions) followed, each of which left sedimentary deposits.

2.2 Present landscape

In the coastal area, the Neue Marsch (new marsh) is sited on the coast, with the Alte Marsch (old marsh) sited further inland. The Neue Marsch is higher than the Alte Marsch; the soils are sandier and therefore better for agriculture. The Alte Marsch is lower-lying, has a more clayey ground, is wetter and therefore less well suited for agriculture. Presently this area is thinly inhabited and used mainly for pasture. The whole area is sparsely wooded, only in the north and east can a few enclosed woodlands be found. In order to avoid the continuous flooding of the wet marsh land the 20 km long Grauwall channel was built.

In front of the Land Wursten lies the Wurster Watt, which is also part of the National park Niedersächsisches Wattenmeer. In total there are three national parks in the tidal flats; these were designated between 1985 and 1990, and are located in Schleswig Holstein, Lower Saxony and Hamburg. The protected area stretches from the East Frisian islands to Sylt.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Worsatia is mentioned for the first time in the year 1203. This name stems from the lower German word Wursaten or Wurtsasses which describes the inhabitants of the area as "people sitting on dwelling mounds".

The people of the Land Wursten had been using dwelling mounds since the Stone Age. There is ample archaeological evidence for Stone Age occupation: including the site of a camping ground near Nordholz, a stone tool production site near Midlum, the dense concentration of stone tools at the site of Neuenwalde, Neolithic settlements near Langen and Midlum as well as other finds. The sediments of the river marshes might further contain older Palaeolithic evidence. Between Imsum and Langen pottery sherds and flint tools of the late Bronze Age and early Iron Age have also been found.

The oldest recorded settlement sites in the marsh did not lie on the elevated ground but were level surface settlements (Alsum, Feddersen Wierde, Dorum, Mulsum and others). They were built during the time when the sea retreated from the coast around 100 B.C and existed until 100 A.D. The sea level subsequently rose again and the inhabitants of the first and second century A.D. responded to this environmental change by gradually raising the level of their dwelling places. They heaped up earth or dung and other waste, forming the Wurten or dwelling mounds. Over time these dwelling mounds got higher and higher and in some areas joined each other to create the Dorfwurten (villages on settlement mounds).

One of these dwelling mounds is the well known archaeological site of the Feddersen Wierde. Archaeological excavations here were able to shed light on the history of this settlement which lasted from the first century B.C until the 5th century A.D. In the overall area, in the course of the 4th and 5th century A.D, a decline in the numbers and size of settlements can be observed for the complete Elbe-Weser triangle.

Burials provide some information about the expectations of an afterlife for this period. An important site is the burial ground of Fallward with its numerous well preserved wooden finds such as the famous "marsh throne".

For the 7th and 8th century A.D. increased settlement activities are documented. The earliest settlements founded during this time were the Wurten Wremen, Misselwarden and Mulsumer Wierde. During the 9th and 10th centuries other areas of the new marsh were also settled, e.g. Cappel und Paddingbüttel. It is also known that in the 9th century ships were sailing from the Elbe and Weser to Scandinavia after Ansgar, the bishop of Bremen, began with the proselytisation of Scandinavia by 830 A.D.

During the 12th century the process of dyke construction began and the building of dwelling mounds lost its importance. The first dykes seem to have been summer dykes encircling the settlements and their agricultural areas. Some of these medieval dykes are still preserved. Only during the 17th century was the continuous process of change along the coast stopped by the construction of today's coastal dyke.

The churches with their massive stone walls provided yet further protection against both storm tides and enemies. The stones came from the nearby Geest, sandstone from the Weser or tuff from the Eifel was used as well. The parishes of the Land Wursten were prosperous and this is reflected in the development of their own architectural style. The well preserved church buildings from the 12th to the 14th century in Imsum (Ochsenturm), Wremen, Mulsum, Dorum, Spieka, Misselwarden, Paddingbüttel and Midlum are good examples for this.

3.2 Early Modern Times

Towards the end of the Hanseatic League, the long distance roads from Stade and Bremen, which ran east and south respectively, were in place. The south and west of the area could be easily reached by ship via the Elbe and the Weser.

Following the Christian proselytisation of the area, the Land Wursten used to be a self-governed Bauernrepublik (farmers' republic). For a long time there were conflicts with the archbishopric of Bremen until the Land Wursten lost its independence in 1525 and became part of Bremen.

During the Thirty Year's War (1618 - 1648) Wursten was occupied by Protestant and Imperial forces. Sweden became one of the most powerful political forces of the 17th century in the North Sea region and followed an aggressive conquest policy. Whilst the Thirty Year's War still raged, the Swedish moved into Wursten (1645). After the Treaty of Westphalia (1648), Hither Pomerania, to the east of the Oder, the districts of Poel and Neukloster, the town of Wismar as well as the monasteries of Bremen and Verden all belonged to Sweden. But Wursten was not to be part of Sweden for long. During the "Big Northern War" (1700 – 1721) for a short time the Land Wursten belonged to Denmark (1712 – 1715) and later to the electorate of Hanover.

The Land Wursten is largely dominated by closed Haufendörfer (nucleated or scattered villages) and more dispersed villages, as well as the Wurtendörfer (villages on dwelling mounds). Such Wurtendörfer are also typical for the northern part of Butjadingen, the Wangerland north of Wilhelmshaven and for the area north of Emden. The most common farming building is the Niederdeutsche Hallenhaus (lower German hall house) or Niedersachsenhaus (Lower Saxony house).

3.3 Modern Times

The beginning of the modern period in the Land Wursten is characterised by the so-called French Time (1807-1815), this was not however long-lasting. After the Congress of Vienna (1815) Wursten was assigned to the kingdom of Hanover. Since 1866 the territories of Hanover belonged to Prussia.

By 1812 there were still no paved roads in the Land Wursten. Only with the building of the Hannoversche Chaussee, the Braunschweigische Heerstraße as well as the Oldenburgische Staatsweg in 1863, was a connection between Cuxhaven and Bremerhaven achieved. Just 30 years later, other small country roads were added to the road network in the Land Wursten. Thus, when the road network of 1893 is compared with that of today, the only recent addition is the Autobahn.

The train connection from Bremerhaven to Bremen was opened in 1862, with other connections to Mecklenburg (1865) and the Netherlands (1865) following soon after. By 1881 Harburg, Buxtehude and Stade could be reached from Cuxhaven by train. Almost 50 years later (1896) the train route through the Land Wursten was opened. Soon after that Bremervörde (1898) and Bremerhaven (1899) were connected to the train network of Stade.

After the downfall of the Third Reich the Land Wursten was integrated into the former administrative district of Stade in the federal state of Lower Saxony. In 1978 the administrative district of Stade was fused with the old district of Lüneburg and became the administrative district of Lüneburg. The district government is also sited here. The districts were dissolved in 2005.

For a long time Cuxhaven was of considerable importance as the nation's main fishing centre. This situation changed during the last century, not least because of the International Maritime Law Conventions. The biggest economic importance in Cuxhaven and the Land Wursten now lies with agriculture, maritime industry and tourism.

4. Modern development and planning

The economic development in the Elbe-Weser region is strongly influenced by the two Main Order Centres of Bremen and Hamburg, the two biggest Hanseatic and port cities in Germany.

During the second half of this year the BBR (Bundesamt für Bauwesen und Raumordnung/ federal office for building and land use planning) has introduced three new models for the land use planning which were developed by the federal government after its comments on the land use report 2005. These models could also be of importance to Wursten. The first item is the "Contribution to the economic growth". Bordering on the Land Wursten there are two "Sites of metropolitan function" (Cuxhaven and Bremerhaven). These have potential for further growth which will be directly exploited. Another point of focus is the „taking precautions to secure existence". Considering the prognosis of population development until 2050, it is to be expected that the population in the rural areas will decrease while the metropolitan regions will continue to grow. Nevertheless the official Institutions and Services of General Interest should to be preserved or at least stay within reach. The third point is the "Management of land use" for which the regional planning will increasingly have to take over the design and development functions. In Wursten there are substantial ground water resources which need to be protected. The same goes for the agriculturally characterised historic cultural landscape.

In the Land Wursten there are several institutions which deal primarily with regional development, such as the Stadtplanungsamt (city planning council of) Bremerhaven, the Kreisentwicklungsreferat of the Landkreis or des Landkreises (regional development department of the district of) Cuxhaven, the information centre Nationalpark Dorum and others.

4.1 Land use

The agricultural landscapes of Lower Saxony can be divided into marsh lands, valley meadows, Geest areas, loess ground in the foothills and loess hills in the Oberharz Mountains. Most of the ground is taken up by valley meadows, peatland Geest and Geest flats.

In Wursten there are some arable marshes in the western area and valley meadows and peatland Geest in the most northern part of the area. But the main part of the area under investigation is made up of grazing marshes in the west and south and of Geest flats in the east and north.

Even though agriculture has declined in the area due to outside influences, it is still of considerable importance in the Land Wursten. In the marshes wheat, corn and rape are cultivated. On the Geest rye, corn, rape and triticale (a cross between wheat and rye) are grown. Rye thrives on the light sandy soils because it is hardy and undemanding. Rye as well as corn can be used in the production of biogas and bio- ethanol. It is hoped that future breeds may make it possible to reduce the use of pesticides in rye cultivation. Today's yields on the marshes already amount to approx. 85 cwt/hectare. The yields have increased strongly during the last years due to changes in fertilisation, modifications to arable practise and new breeds of plants. The yields from the grazing marshes, valley meadows and Geest are significantly lower. The grazing marshes largely support dairy cattle.

In Wursten the share of the population employed in agriculture is reciprocal to the population density. Thus in the less densely settled area in the west about 11% of the population are employed in agriculture, in the eastern part (around the Autobahn) less than 8% are in agriculture, in the northern part (Cuxhaven) less than 5 % and in the most densely settled area in and around Bremerhaven less than 2 % are employed in agriculture (figures for the year 1987).

4.2 Settlement development

The urban growth of Lower Saxony has been analysed for the years from 1871 up to the regional reformation of 1972 and then further on until 1993. In Bremen and Hamburg the

population has doubled between 1821 and 1871. In Cuxhaven on the other hand the population only increased by about 17%. Because of the situation of Cuxhaven, on the outskirts of the metropolitan regions the population is stagnating or even declining.

In the BBR's analysis of the trends of spatial development from June 2005 the Land Wursten belongs to the regions where the population and employment development are characterised by a slight decrease because of its location near the growth centre of Bremen.

According to the regional report for northern Germany 2005 (NIW) the population density in the western part of the Land Wursten is very sparse, with figures of between 50 and 100 people per km². Further to the east towards the Autobahn the density reaches 100 – 200 people/ km². In the south, in and around the town of Bremerhaven the density is highest with more than 500 people/ km², and in and around Cuxhaven the density goes up to 300-500 people/ km². In 2004 approximately 50% of the workers in Bremerhaven commuted to the town, the corresponding figure for Cuxhaven is between 10% and 25%..

In the Land Wursten it is possible to study at the national maritime academy or at the Hochschule Bremerhaven. Furthermore within the commuting radius there are the University of Hamburg, the technical colleges of Buxtehude (less than 1000 students), Elsfleth (less than 1000) and Oldenburg (1000-5000) as well as the state-approved FH Ottersberg (less than 1000). In the region in and around Cuxhaven and Bremerhaven there are 7 secondary schools.

In this rural area there is a large number of ecclesiastic and regional education centres. The cultural life is characterised by museums and local clubs. In Bremerhaven, Bremen and Hamburg there are several theatres, whilst in Cuxhaven there is a Niederdeutsche Bühne (lower German theatre). The nearest national theatres are situated west of the Weser, in Oldenburg and Wilhelmshaven.

Wursten belongs to the Association of Stade (Landschaftsverband Stade). It is part of the national park "Wurster Wattenmeer" on the coast of Cuxhaven and the lower Elbe.

The State Office of Lower Saxony for statistics did a survey on the booked beds for the years between 1984 and 1994. According to this survey the overnight stays have almost doubled within those 10 years (a rise of 95%). For the time between 1987 and 1998 another distinct rise in the numbers of overnight stays was observed. Therefore the Land Wursten occupies, together with the coast of Eastern Frisia and the Emsland/der Grafschaft Bentheim, one of the pole positions of German holiday regions.

One possible reason for this development is the large number of tourist attractions: the whole Elbe-Weser region is sporting over 100 museums, e.g. in Bremerhaven there is the Historical Museum, the Collection of School History, the Supplies' and Traffic Museum; in Cuxhaven the Castle Ritzebüttel; in Nordholz the Aeronauticum, in Neuenwalde the Museum for Local History and the monastery, the open air folklore museum Speckenbüttel, the prehistoric trail in Sievern, various archives, the lovely churches of Wremen, Mulsum, Dorum, Cappel as well as the Kurverwaltungen (health resort administrations of the) Land Wursten and of Cuxhaven.

Some of the museums and institutions deal explicitly with the characteristic local traits, e.g. the Museum for Fishing in the Tidal Flat in Wremen, the information centre Nationalpark Niedersächsisches Wattenmeer Land Wursten in Dorum and Cuxhaven, the Dike Museum of Lower Saxony in Dorum, the Sea Shell Museum in Nordholz, the Wreck Museum in Cuxhaven, the emigration exhibitions in Bremerhaven and Cuxhaven and in Bremerhaven die SSW Ferry and Specialised Ship Building Bremerhaven, the Alfred-Wegener Institute for Polar- and Marine Research, Schaufenster Fischereihafen (showcase fishing harbour), the Atlanticum Forum Fischbahnhof, the museum ship FMS Gera, the Hanseatic Cog Shipyard, the light house of Cuxhaven and the German Shipping Museum.

4.3 Industry and energy

In Lower Saxony there are numerous industrial plants which (except for the catchment areas of Hamburg and Bremen) are concentrated mainly in the south of the federal state. The Land

Wursten lies between the catchment areas of the principal industrial areas of Hamburg and Bremen and is not industrialised in itself.

Cuxhaven (5,000 employees) and Bremerhaven (15,000 employees) can be regarded as smaller industrial sites. The economy in the district of Cuxhaven consists of small and middle-sized businesses and the harbour economy. The Europakai in Cuxhaven has already been converted into a multi-purpose trans-shipment centre.

The Land Wursten is connected via the gas pipeline Cuxhaven-Bremerhaven-Osterholz-Scharmbeck with the subterranean gasholder of Bremen-Lesum. In the coastal region of the Elbe-Weser triangle the number of wind parks increases, like those of the SG Nordholz in the districts Cappel-Neufeld and Spieka-Neufeld.

4.4 Infrastructure

The Land Wursten is crossed by the Autobahn A-27 which links Cuxhaven and Bremen. Close to the Autobahn there is also the Grüne Küstenstraße (green coastal road) which follows a similar route but is more attractive for tourists and local traffic. The A-1 from Bremen towards Hamburg has already been completed between 1935 and 1941. There is no further Autobahn connection but the coastal Autobahn A-22 is already being planned.

In 1993 the first survey of the annual average number of vehicles using the Autobahn and federal roads on a daily basis was conducted with an average of about 10,000 vehicles per day. On the Autobahn between Bremen and Bremerhaven there were as many as 50,000 cars per day. Comparable numbers are found on the Autobahn A-1 from Bremen to Hamburg. Due to the low-levels of traffic, the other roads in the area have not been included in the survey. The business locations in the area (Cuxhaven and Bremerhaven) can easily be reached by the federal long distance roads.

Today the Cuxhaven-Bremerhaven railway line is a light railway which is still in regular service. The lines from Cuxhaven via Stade to Hamburg and those from Bremerhaven to Bremen towards Osnabrück or Hannover are busier.

In the area of the Land Wursten there are two big harbours (Bremerhaven and Cuxhaven). Two large federal waterways flow into the North Sea at Cuxhaven: the the Weser and the Elbe, the Oste and the Kiel Canal are branch off from the latter.

In the Land Wursten there is one airfield worth mentioning, the former military airfield of Nordholz-Spieka. Two international airports can be found at Bremen and Fuhlsbüttel.

5. Legal and spatial planning aspects

The joint community or Samtgemeinde of Land Wursten is subject to the spatial and land use program of the federal state of Lower Saxony and to the landscape frame plan and land use plan of that community.

In the Landes-Raumordnungsprogramm (regional planning program) of the Ministry of the federal state of Lower Saxony, the area between Cuxhaven and Bremerhaven was supposed to secure the further development of two main focus areas. Within this framework the town of Bremerhaven was designated as a High Order Centre with the town of Cuxhaven as a developing focus area.

In 1996 there was no regional cooperation between communal initiatives, nor any legal basis for regional cooperation. However, the Land Wursten was integrated into a system of double cooperation with neighbouring federal states. It was part of the Regional-Entwicklungskonzept (regional development concept) of Bremen and also within the Regional-Entwicklungskonzept mit erweitertem Betrachtungsraum (regional development concept with extended area of interest) of Hamburg.

6. Vulnerabilities

6.1 Agriculture

Due to an intensification of agriculture and the consolidation of farms during the last century (Hofsterben – farm dying), there has been a loss of smaller, less profitable farm businesses. This has been caused by a lack of opportunities for expansion by smaller businesses and/or the lack of successors. There is also the possibility of an increasing move towards monocultures for the purposes of bio ethanol which could have an impact on the landscape. The enlargement of the remaining farm structures might eventually result in the destruction of historic features and monocultures.

6.2 Tourism

In Cuxhaven as well as in the small picturesque coastal villages such as Dorum, there is a threat of mass tourism in the form of day trippers and short term holiday makers from the nearby congested areas.

6.3 Industry and energy

Further wind farm projects are planned for the Elbe-Weser triangle and these are likely to have a visual impact in the area as well as the potential to impact on buried archaeological remains.

6.4 Economy

Land Wursten is a rural area. According to the Statistikamt Nord the unemployment rate for the district of Cuxhaven (except Bremerhaven) amounted to 12,8% in 2005 and a further exodus of the population due to the economic situation of the area is to be expected. One problem is the coastal location of the Land Wursten meaning there is only development potential towards the south and the east into largely distributed markets. The number of industrial businesses in the Elbe-Weser area has been stagnating for years and the number of people employed in the manufacturing industry is steadily declining. This structural change frees more and more of the labour force but as the opportunity for the creation of new jobs is very slim in most cases the only option left for people losing their jobs is to commute or move to the nearest city. In this way there is a danger that the communities of the Land Wursten might develop into mere dormitory towns, and identification with the traditional employment structures of the region might be lost. In Cuxhaven, the decline in the fishing industry has meant that the related businesses have also declined. The exodus of labour force and the declining overseas traffic have decimated the tax yields of the town. This has led to economy measures and reduced the town's attractiveness.

7. Potentials

7.1 Settlement

Rural settlement in the Land Wursten is largely dominated by nucleated villages and more dispersed villages, as well as the Wurtendörfer (villages on dwelling mounds). The historic character of many rural villages survives. The most common agricultural building is the distinct Niederdeutsche Hallenhaus (lower German hall house) or Niedersachsenhaus (Lower Saxony house).

7.2 Management of the cultural heritage

The Land Wursten has a rich archaeological heritage, including the well known excavated site of the Feddersen Wierde. The sediments of the river marshes might contain Palaeolithic evidence and there is good potential for waterlogged prehistoric deposits. The dwelling mounds remained the focus for settlement until dyke construction began in the 12th century; some of the medieval dykes remain and both structures are highly visible features in the landscape. Well preserved churches in the Land Wursten parishes have their own distinct, architectural style and good examples from the 12th to 14th centuries survive.

7.3 Tourism

The biggest potential in this region can be seen in tourism since the Land Wursten is a versatile recreation area with a high density of monuments. The historic villages of Wurtendörfer Dorum, Mulsum and others are situated like beads on a string and demonstrate impressively the historical settlement development of the area. In the Land Wursten there are the seaside resorts of Dorum, Wremen, and Cuxhaven as well as the family-friendly holiday resorts of Cappel, Midlum, Misselwarden, Mulsum and Padingbüttel. Cuxhaven is the largest North Sea spa along the coast. Apart from museums, numerous historic churches and the monastery of Neuenwalde there are further institutions like dock yards or light houses which have a distinct maritime character and which can only be experienced here or in the neighbouring regions. Because the Land Wursten is situated near three conurbation centres (Hamburg, Bremerhaven, Bremen) it is especially important as recreational area for people coming for a short holiday. There is currently a growing demand for „Ferien auf dem Bauernhof“ (farm holidays) which might offer opportunities for preserving historic farming economies.

7.4 Infrastructure

The nearby seaport of Cuxhaven is of great interest not only to the residents of the surrounding rural areas but also as an attractive location to new industries.

7.5 Economy

For the Land Wursten there is development potential in the fields of tourism, agriculture, food production, biogas, offshore technology and logistics. The fish-processing industry is an important employer and recently the trade union „Nahrung, Genuß, Gaststätten“ (food, drink and tobacco, restaurants) held an experts' meeting about the future of the fishing industry in Cuxhaven. The question was what could be done to secure the existence of the local businesses and what were the roles of marketing and quality management. It was stated that Cuxhaven as well as Bremerhaven were both competitive but ought to rely more on shared strengths and cooperate with each other. It was assumed that the demand for fish is going to increase and that the customers will be willing to pay higher prices for better quality.

Modern ways of farming are well represented in the area: in Lower Saxony there is the highest number of biogas works to be found nationwide, presently about 500. According to the head of the Landvolk J. Heusmann an increase in the production of milk in the Elbe-Weser triangle can also to be expected. Next to agriculture there are other economic businesses providing employment in this region, e.g. industrial businesses (foundry, metal packaging, electro recycling) and energy businesses (Energie-Kontor-AG, refuse incineration heat and a power station, water supply works, sewage treatment plant). Due to the amount of space available, property for commercial use can be purchased at low prices.

8. Sources

Author: M. Riebau

Ahlers, J. –G. (2006): Niedersachsen stellt sich vor. In : Land und Forst Nr. 38, Landwirtschaft und Landleben in Niedersachsen. Zeitschrift, Hrsg. Landvolk Niedersachsen – Landesbauernverband e. V., Landwirtschaftskammer Niedersachsen.

Bohmbach, J. (Bearb. 1986): Kolloquium schwedischer und deutscher Historiker in Stade 1984. Die Bedeutung Norddeutschlands für die Großmacht Schweden im 17. Jh. Stade 1986

Dannenberg, H. – E. und Schulze, H. – J. (Hrsg.): Geschichte des Landes zwischen Elbe und Weser. Im Auftrag des Landschaftsverbandes der ehem. Herzogtümer Brmen und Verden. Band I. Vor- und Frühgeschichte. Stade 1995.

- Diekmann-Lennartz, (Ch. 2006): Perspektiven gar nicht so schlecht. In : Land und Forst Nr. 41, Landwirtschaft und Landleben in Niedersachsen. Zeitschrift, Hrsg. Landvolk Niedersachsen – Landesbauernverband e. V., Landwirtschaftskammer Niedersachsen.
- Eysholt, A. und Matzen, J. (2004): Zwischen Elbe und Weser. Vielfalt entdecken im grünen Dreieck. Hrsg. Ev. Bildungszentrum Bad Bederkesa. Bad Bederkesa 2004.
- Heimatverein Midlum und Umgebung e. V., (2002): Midlum, ein Dorf auf der Geest, umgeben von Marsch und Moor. Chronik. Midlum 2002.
- Homepages: SG Land Wursten; Information aus der Forschung des BBR (Bundesamt für Bauwesen und Raumordnung) Nr. 3 / Juni 2005; BBR Leitbilder und Konzepte/ Neue Leitbilder in der Raumentwicklung nach dem 30. Juni 2006.
- Kunstverlag Bühn Hrsg. (1999): Elbe-Weser-Raum auf dem Weg ins 21. Jh. München 1999.
- Labahn, K. (2006): Vor Ort im Elbe-Weser-Dreieck. In : Land und Forst Nr. 44, Landwirtschaft und Landleben in Niedersachsen. Zeitschrift, Hrsg. Landvolk Niedersachsen – Landesbauernverband e. V., Landwirtschaftskammer Niedersachsen.
- Lehrke, U. (2006): Auf leichten Böden viele Vorteile. In : Land und Forst Nr. 37, Landwirtschaft und Landleben in Niedersachsen. Zeitschrift, Hrsg. Landvolk Niedersachsen – Landesbauernverband e. V., Landwirtschaftskammer Niedersachsen.
- Niedersächsisches Institut für Wirtschaftsforschung, Regionalbericht Norddeutschland 2005. Hannover 2005.
- Niedersächsisches Landesarchiv (2006): 60 J. Niedersachsen. Hintergrundtexte zur Ausstellung. Textsammlung. O. O.
- Riebau, M. (2005): Die schwedische Matrikelkarte von Vorpommern und ihre Bedeutung für die Erforschung der Bodendenkmäler, dargestellt am Beispiel der Gebiete um Greifswald-Wusterhusen und der Insel Usedom. In: Beiträge zur Ur- und Frühgeschichte Mitteleuropas 41. Langenweißbach 2005.
- Römisch-Germanisches Zentralmuseum Mainz in Verbindung mit dem Nordwestdeutschen und dem West- und Süddeutschen Verband für Altertumforschung Hrsg. (1976): Führer zu vor- und frühgeschichtlichen Denkmälern. Band 29. Das Elbe-Weser-Dreieck I. Einführende Aufsätze. Mainz 1976.
- Römisch-Germanisches Zentralmuseum Mainz in Verbindung mit dem Nordwestdeutschen und dem West- und Süddeutschen Verband für Altertumforschung Hrsg. (1976): Führer zu vor- und frühgeschichtlichen Denkmälern. Band 30. Das Elbe-Weser-Dreieck II. Forschungsprobleme - Exkursionen. Mainz 1976.
- Schlüsselburg, B. & Schumann, N. (2000): Hadeln, Wursten und Kehdingen. Hamburg 2000.
- Schmidt, K. und Walter, R. (1990): Erdgeschichte. Berlin 1990.
- Schumann, N. (2003): Land Wursten, mit Fotos von B. Ulrich und B. Schlüsselburg. O.O. 2003.
- Seedorf, H. & Meyer, H. – H. (1996): Landeskunde Niedersachsen 2. Natur- und Kulturgeschichte eines Landes. Niedersachsen als Wirtschafts- und Kulturraum. Neumünster 1996.
- Zeitungsartikel: Sonntagsjournal der Nordsee-Zeitung vom 12. 11.2006, S. 22: Verzögerung sorgt für Minus; Elbe-Weser Aktuell vom 8. 11.2006, S. 4: „Chancen müssen genutzt werden“, S. 6: „Chancen brauchen Unterstützung“

Land Würden, LS

1. Overview

Name:	Land Würden (older descriptions: Landwürden, Land Wührden, Landwührden)
Delimitation:	River Weser, River Lune, Bremerhaven (State of Bremen) neighbouring entity, Osterstade
Size:	Approx. 30 km ²
Location:	tidal river marsh of Lower Saxony/ Germany, Western bank of the lower Elbe
Origin of name:	Not known
Relationship/similarities with other cultural entities:	Four-post hall house, building of the villages at first on the river embankment without dyke protection, river marshes of Osterstade, Stedingen, Stadland

Characteristic elements and ensembles:

Four-post hall houses, settlements on river embankments, dwelling mounds, brickworks, dykes

2. Geology and geography

2.1 General

The Land Würden is a flat marshland on the western bank of the river Weser. Next to the river is a slightly higher, 1km wide embankment with sandy, chalky soil. Between this and the Geest is the Sietland, low lying land, which is roughly 1 m lower than the embankment. The sediments here are finer and combined with their high water content, they provided the ideal conditions for the formation of peatbog. The region is drained by various artificial sluices, which channel the water into the River Weser. The mouth of the rivulet Lune was moved in 1985-87. It now flows into the Weser in the southern part of the Land Würden instead of to the north of it. In contrast to the low lying land, the embankment and the Geest border have a great number of trees and bushes.

The Land Würden owes its existence to an affiliation with the lords of Oldenburg. The area was mortgaged to Bremen citizens in the 14th century, belonged to Denmark (1667-1773) and came under the Napoleonic occupation. Only in 1974 was it added to the administrative district of Cuxhaven on the eastern side of the river. It is now a part of the administrative area of Loxstedt. However, the church still belongs to the diocese of Oldenburg. The division of the place of Büttel is a historical oddity: since the Middle Ages half of it has belonged to the Land Würden, and the other half to Osterstade.

The Land Würden has no settlement centre, but rather consists of numerous small settlements, of which Dedesdorf with its former ferry point and one of two churches is the principal one. The second church is located in Büttel and belongs to the diocese of Hanover. The largest place in the Land Würden is Eidewarden with 386 of the total of 1799 inhabitants. The other places are Maihausen, Overwarfe, Ueterlande, Wiemsdorf and Speckje.

2.2 Present landscape

The Land Würden is characterised by grazing land. It is a very flat marsh-landscape, from which only a few high trees, churches and a windmill project. In the north it borders directly on the industrial zones of Bremerhaven, so that there is a very harsh break between the rural landscape and the urban structures.

The majority of settlements are located on the embankment of the river Weser. Normally the houses are built on terpen. The pasture-forms are varied: there are Hammen and Strengen, which were set up at various times. Numerous paths, called Helmer, make the fields accessible.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

With the ending of the Ice Age the increase in sea-levels increase led to the deposition of sediments, formation of marshes and ultimately the growth of peat-bogs. Due to this process older archaeological layers are considerably below today's surfaces and are only encountered under special circumstances.

Therefore for the older periods it is necessary to consider the archaeological information from a wider area. The oldest finds from the Weser are from the Middle and Late Paleolithic period. The Neolithic period is represented more fully on the adjoining Geest. In particular the striking megalithic burial places demonstrate an intensive use of the land. Some settlement remains found in Loxstedt derive from this time too.

Numerous finds from the Bronze Age, axes, lances, swords, daggers, a rare ridge helmet, appear to have been deliberately deposited in the Weser. The discovery of the Late Bronze Age settlement of Rodenkirchen-Hahnenknopp mill was a sensational piece of luck. It originated in the 10th/9th century BC and was covered by massive sedimentation layers. It remained in use until the pre-Roman Iron Age. Despite periodic flooding the settlement appears to have survived for a long period, but continuing sea-level rises eventually led to its abandonment.

On the adjoining Geest, in the district of Loxstedt, a settlement was excavated which was continuously inhabited from the 1st to the 9th/10th century AD and is probably the direct precursor of today's village. On the same Geest island, so-called Celtic fields can be traced, an Iron Age field form which is wide-spread from Denmark via the Netherlands to Great Britain. Somewhat further to the south, settlement activity begins in the first centuries AD in the marsh as well. Whether the situation was similar in the Land Würden, or only the higher areas of land were used extensively cannot be determined at the moment.

After an interruption in settlement-building, new settlements apparently commenced in the early Middle Ages. In as far as place-name evidence and written sources enable us to make any statements, the settlers appear to have been Frisians. The road to the oldest church in the region in Barmstedt led from the west across the Weser through the Land Würden to the church on the Geest. Today this road is still called Freesenweg. On the Geest, too, there were villages with a Frisian population, as has been proven for Nesse (community of Loxstedt).

Dedesdorf and Eidewarden, too, used to lie the middle of parish land, but due to the loss of land to the Weser, they are now on the edge of their arable and grazing areas. The Land Würden, with its principal settlement at Dedesdorf, belonged to the Dukedom of Oldenburg from at least the 13th century AD. How this happened has not yet been clarified by scholars; according to legend it was mortgaged for a dowry and was not redeemed.

In the 11th century the building of dykes began in the Land Würden. At first these only served as a protection for farm land, because the settlements were built on mounds. Today's houses are also on mounds, some of which may have a medieval core.

There are no important castles in the area. The names Schwingenburg and the "Burg" (the Castle) close to Oldendorf have not been verified as referring to actual fortifications. The

building of castles, a characteristic of lordly rule, did not occur in this area of Oldenburg because of the powerful position of the town of Bremen, which feared for the loss of freedom of shipping on the Weser.

Based on the interpretation of written sources, Overwarfe is a somewhat younger settlement, the mound is high, (in 1717 and 1825 it was above the height of the floods), but 3m below the ground there was a clay floor, which according to Ramsauer testifies to a greater age for the settlement place.

The St. Laurentius Church of Dedesdorf is the oldest building in the region. In the written sources it was mentioned for the first time around 1150, the oldest surviving parts are from the second half of the 13th century. In 1838 the pulpit was renewed and in 1870 the church tower was replaced by a new one. The organ, which is a point of attraction for many people, was built by the well-known organ builder Arp Schnitger in 1697/98.

3.2 Early Modern Times

The storm floods which left their mark on the Land Würden were those of 1717 and 1825. Many houses on the old dwelling mounds survived above the floods, but those in low-lying areas flooded, the fields were salinated and the ground waterlogged. After the Christmas flood of 1717 the dykes were difficult to repair. A feature of dyke building is their constant increase in height. Despite this, on the western bank of the Weser, arable land was lost repeatedly and the hinterland became more intensively cultivated. The moorland of the Geest has been drained and cultivated since the 18th century.

The agriculture in the Land Würden changed in the 16th/17th century, with a decrease of tillage in favour of pasturage. Traders from Bremen bought cattle, for instance from Jutland, and had them graze in the marshes until they reached maturity for slaughter.

In the 18th century the changes to the route of the Weser began, from a freely meandering river with shallows into a waterway. By means of groynes (vertical structures diagonal to the banks) the flow of water was increased in the middle of the river and thus the silting-up of the waterway was prevented.

Since the 19th century there has been a step-by-step expansion of the Weser into a waterway with a depth of 14 m. Further deepening is planned.

There are only very few architectural remains from the early Modern Times surviving. Indiek 20 is an isolated farm belonging to Büttel which has an inner post-structure from 1599. As the house contains wood from trees felled in 1653 it could well have been rebuilt after a predecessor was destroyed in the Thirty Years War. Part of a house in Wiemersdorf dates to 1638. A rare decoration of fanlike rosettes, that is otherwise usual in the upper Weser area, decorates the gable. The two-storey storage house made of bricks in Büttel is completely without decoration. The ground plan and the angle of inclination of the saddle roof suggest that it is very old.

The tombstones in the churchyard of Dedesdorf form an important group of monuments. They were probably made in Bremen of non-local sandstone. Hence every dead person has got their own stone and virtually no additions were made. They are proof of the wealth of the inhabitants of the place at that time.

3.3 Modern Times

Today the Weser is dammed by the new Weser weir near Bremen. There the difference between the low and the high tide is 4m (0.19m prior to the expansion). Weirs near Hunte, Lesum und Ochtum prevent extreme water levels in the tributaries. The dyke-line is fixed and thus the land-water-border is constant.

The Lune Bank, which was surrounded by dykes in the 19th century, was not settled. However there was a shepherd's house there.

The Lower Weser Railway (Niederweserbahn), which linked the eastern marshland from 1911, was closed to passenger traffic in 1931. After the Second World War it was opened again before it was closed for good in 1964. This marked the end of this line.

In the 19th century numerous buildings were erected which today characterise the cultural landscape. They are built with four posts at the gable end, and the ground floor ceilings are

on the same level as the eaves. They have half hipped roofs with characteristic windows and have small round windows in the gable. A building of this type has been preserved in Ueterlande (2 Olderburger Strasse). The barns, too, were prestigiously built. Typically they are built parallel to the road with barns at right-angles to it.

Examples of the architecture of the mid 19th century are found in Overwarfe (25 and 50 Warftenstrasse) The house 5 Minneörterstrasse in Wiemsdorf is from the end of the 19th century.

The customs house from the period of the Napoleonic occupation is an architectural oddity. During the Continental System from 1811-1813 it served as a custom post in Dedesdorf. Later the house was dismantled and rebuilt behind the dyke. A further building without agricultural significance has also been preserved, the village-school of Büttel (around 1900). The school-system goes back to the 16th/17th century.

The windmill in Dedesdorf, actually situated in Oldendorf, is a lordly mill and was mentioned in 1650 for the first time. At that time it was leased and the people of the Land Würden were forced to grind their corn there. In 1847 the old post-mill was sold on the condition that a new mill was to be built. Today's mill from 1847 is a two-storey gallery windmill with tail and sail wings. The community of Loxstedt is attempting to sell the windmill complex.

In the 19th century there were a number of brickworks on the lower Weser. They supplied Bremen and the new harbour-town of Bremerhaven and the places which were there before it. There were also brickworks in Wiemsdorf, at the Overwarf sluice and at the Büttel sluice. The marshy soil (clay) served as a basic material and peat from the moor areas on the river Lune was used as fuel. The peat could be transported by ship to the flourishing towns at a reasonable price, just as could the bricks from the factory.

From 1885 a steam boat operated the ferry connection which had existed since the Middle Ages. In 2004 it was discontinued. The harbour of Dedesdorf was abandoned in the 1980s.

4. Modern development and planning

4.1 Land use

The region of the Land Würden is characterised by intensive meadowland-use. The decrease in the number of farms is echoed by an increase in size of the remaining examples. Fisheries on the Weser have fallen off and does not exist in the Land Würden any longer. The northern dyke foreland is protected as a bird sanctuary. Stotel Moor and Königsmoor close to Schwengen are nature reserves.

Since the early Modern Times the dyke-line has only changed a little. The bends in the old dyke which had originated from destroyed segments being altered have been straightened by modern dyke building-measures. The old steeper dyke-profile can still be seen in one segment at "Auf der Jührde" in Ueterlande. The rear dyke on the low lying land, called Landwehr, is no longer necessary due to today's continuous dyke line.

4.2 Settlement development

In 2006 1.799 people lived in the Land Würden (16.197 in the entire community of Loxstedt). The growth of the community is greatest on the Geest. There has been a town-to-country movement. A further expansion of the town of Bremerhaven has stopped at the moment at the borders of the federal states of Bremen and Lower Saxony. An expansion of housing and industrial areas is only relevant to the area on the Geest, but there too no further expansion is anticipated

The price of property in the Land Würden is very moderate. In the northern area the vicinity to the airport of Luneort in the city zone of Bremerhaven effects the area.

The flat countryside appeals greatly to bicycle tourists, and Dedesdorf still has a role as a centre of attraction in the Land Würden. The organ in the local church attracts visitors from afar, because it was made by Arp Schnittger, who is famous in the whole of North Germany. The organ was restored in 1998.

The society “Historic Centre Dedesdorf-Eidewarden” has established itself at the so-called “Hochzeitsmühle” (Wedding-Mill) in Dedesdorf. On the one hand the society consists of a network, on the other it organises events around the mill.

The part of the Lune Bank, which has been surrounded by dykes, is an EU-bird sanctuary. The offshore mud flat-surfaces are to be made nature conservation areas and offer restricted tourist facilities.

4.3 Industry and energy

In the Middle Ages only church towers projected above this level landscape with its open skies. In the early Modern Times windmills were added, although there was only one in the Land Würden. Nowadays there are many technical constructions which have altered the look of the entity. Beside the wind turbines close to Stotel, there are the high tension lines which run from north to south. Opposite the Land Würden there is the nuclear power station of Unterweser with its transformer station and further wind turbines. Loxstedt is planned as a location for harbour-orientated industrial estates. In the Land Würden only a small part of the Lune Bank (200 hectare) is included in the plan for it, the other part will remain a protected area.

4.4 Infrastructure

The use of the waterways in the Land Würden has largely come to a standstill. After the closing of the ferry-service Dedesdorf-Kleinensiel, the river Weser does not function as a connecting route any longer.

The Land Würden is connected by the motorway A 27 (Bremen-Bremerhaven) running along to the east and by the federal road B 437 running on its southern border and with the western bank of the Weser by the Weser-tunnel. This link, which has existed since 2004, has not yet led to an economic upswing in the region. However, the number of daily Weser crossings has increased, so that greater integration of the eastern and western bank of the Weser can be seen. Now the eastern bank has improved access to the cultural and commercial possibilities of the town of Bremerhaven. As far as the small region of the Land Würden is concerned the tunnel is a disadvantage. The Weser-tunnel attracts further transit-traffic. This effect will increase even more, if the motorway A 22 is built. It is planned as a relief for Greater Hamburg and Bremen and should at the same time assist the structurally weak regions of Cuxhaven, Bremerhaven/Bremen, Oldenburg and the Emsland by giving a better linkage to the major road-network.

Public transport is completely orientated towards the metropolis of Bremerhaven.

5. Legal and spatial planning aspects

In matters of regional planning the communities are subject to the Regional Planning Programme of Lower Saxony and the plans of the communities concerning town and country planning and use of land. In addition the regional development for Bremen-Bremerhaven and the regional development concept for the sea off Lower Saxony’s coast have to be taken into consideration.

Although the Land Würden is located on the developing axis Bremen-Bremerhaven, until now the region has suffered from negative consequences: the construction of the Weser-tunnel and as a result the closing of the ferry-service to Kleinsiel.

At present (2006) the project “Integrated Rural Development Concept – Wesermünde-South” is starting. Here people living in the communities Schiffdorf, Beversedt, Hagen and Loxstedt are to take part in the development of their region. They are also to be the drivers of this development. The Land Würden is a part of Loxstedt and thus part of its planning area. The new master plan for coastal protection has not been published yet.

Proceedings have recently begun to protect the mud-flats off the nature reserve of Lune Bank.

6. Vulnerabilities

6.1 Spatial planning

Spatial plans for the area could pose a danger for the cultural landscape unless they take historic structures and characteristic features into consideration and integrate them into future concepts.

6.2 Agriculture

The adoption of the changed production conditions in agriculture, resulting in the reduction of farm numbers and the re-parcelling of land which is planned for 2006 - 2010, will have significant consequences on the present fieldscape, farm buildings and their heritage value.

6.3 Tourism

In spite of its rural character, access to the Land Würden by car is simple but is more difficult by public transport. The closing of the ferry-service Kleinensiel-Dedesdorf has had a negative effect on Dedesdorf as a tourist attraction.

6.4 Industry and energy

The nuclear power station of Unterweser, electricity pylons and wind turbines have a considerable visual impact on the wider landscape.

6.5 Infrastructure

The area is surrounded by constructions associated with transport which have a negative visual impact on the wider landscape. The ship traffic on the Weser has probably the least disturbing effect in this respect but the motorway and the Weser-tunnel, which is to be developed into a motorway, is more problematic and Bremen airport, which is located on the Lune Bank, is a further cause of disturbance. Further planned deepening of the Weser could destroy archaeological remains in the marine environment.

6.6 Natural processes

The settlement of Crenesse close to Dedesdorf, which dates to the early Middle Ages and was abandoned during the Middle Ages, is endangered by erosion by the Weser.

7. Potentials

7.1 Spatial planning

The planning of the "Integrated Rural Development Concept" and the association Historic Centre Dedesdorf-Eidwarden represents a new type of public involvement with the cultural heritage although its potential remains to be seen.

7.2 Nature conservation

Management of land for nature conservation offers opportunities for the beneficial management of the cultural heritage through the adoption of an integrated management planning approach.

7.3 Tourism

The direct proximity of the Land Würden to Bremerhaven (116.000 inhabitants) offers numerous opportunities, for exploitation of the cultural landscape – including its agricultural use – for recreation close to the city. There are opportunities for establishing self-guided routes for cycling, hiking and riding which integrate the cultural heritage and natural environment. The Land Würden also has a name which can be developed into a brand to help market the area for tourism and to strengthen the sense of place. The location of Dedesdorf and Eidwarden directly on the Weser is attractive and the place continues to attract tourists, despite the closing of the ferry.

8. Sources

Author: Julian Subbert

AUST, 1976

Hans Aust, Forschungsgeschichte des westlichen Elbe-Weser-Dreiecks. Landkreis Wesermünde, Kreis Land Hadeln, Stadt Cuxhaven.

In: Führer zu vor- und frühgeschichtlichen Denkmälern. Bd. 29. Das Elbe-Weser-Dreieck I Einführende Aufsätze. 1976:9-29.

BAHRENBURG U. A., 1999

Gerhard Bahrenberg, Angela Hartrampf, Klaus-Martin Hesse und Gerd König, Zur sozioökonomischen Situation im Unterweserraum.

In: Michael Schirmer und Bastian Schuchardt (Hrsg.), Die Unterweserregion als Natur-Lebens- und Wirtschaftsraum. Eine querschnittsorientierte Zusammenfassung. Bremer Beiträge zur Geographie und Raumplanung, Heft 35, 1999:153-178.

BEHRE, 1995

Karl-Ernst Behre, Kleine historische Landeskunde des Elbe-Weser-Raumes. In: Hans-Eckhard Dannenberg und Heinz-Joachim Schulze (Hrsg.), Geschichte des Landes zwischen Elbe und Weser. Bd. I, Vor- und Frühgeschichte. 1995:1-59.

BICKELMANN, 1999

Hartmut Bickelmann, Bremerhaven und die Lune, Räumliche und wirtschaftliche Beziehungen zwischen Stadt und Umland im 19. und 20. Jahrhundert.

In: Jahrbuch der Männer vom Morgenstern 77/78, 1998/99:121-209.

BÖKER, 1997

Doris Böker, Landkreis Cuxhaven. Baudenkmale in Niedersachsen, Bd. 19, 1997.

HOFFMANN, 1986

Hans-Christoph Hoffmann, Bremen, Bremerhaven und das nördliche Niedersachsen. Kultur, Geschichte, Landschaft zwischen Unterweser und Elbe. DuMont-Kunstreiseführer. Köln: 1986.

LIEBERMAN & MAI, 1999

Nicole von Lieberman und Stephan Mai, Küstenschutz an der Unterweser vor dem Hintergrund von Naturraum und Nutzung.

In: Michael Schirmer und Bastian Schuchardt (Hrsg.), Die Unterweserregion als Natur-Lebens- und Wirtschaftsraum. Eine querschnittsorientierte Zusammenfassung. Bremer Beiträge zur Geographie und Raumplanung, Heft 35, 1999:109-127.

RAMSAUER, 1991

Daniel Ramsauer, Chronik von Landwürden und der Kirchengemeinde Dedesdorf. Um Bildmaterial erweiterte Neuauflage von 1925. Bremerhaven: 1991² (1925¹).

SCHMID, 1995

Peter Schmid, Archäologische Ergebnisse zur Siedlungs- und Wirtschaftsweise in der Marsch.

In: Hans-Eckhard Dannenberg und Heinz-Joachim Schulze (Hrsg.), Geschichte des Landes zwischen Elbe und Weser. Bd. I, Vor- und Frühgeschichte. 1995:221-250.

SINDOWSKI, 1979

Karl-Heinz Sindowski, Zwischen Jadebusen und Unterelbe. Sammlung geologische Führer, Bd. 66, 1979.

ZIMMERMANN, 2001

H. W. Zimmermann, Loxstedt.

In: Hoops Reallexikon der germanischen Altertumskunde, Bd. 18, 2001:629-633.

Osterstade, LS

1. Overview

Name:	Osterstade
Delimitation:	River Weser, River Lune, Geest border, Bremen (Federal state of Bremen) neighbouring entity Land Würden
Size:	Approx. 90 km ²
Origin of name:	
Location:	Tidal river marsh of Lower Saxony/ Germany, western bank of the lower river Weser
Relationship/similarities with other cultural entities:	River marshes of Land Würden, Stedingen, Stadland

Characteristic elements and ensembles:

River marsh, dyke villages, dwelling mounds, churches, windmills, dykes, rectangular field plots (Hämme) and strip fields, ditches and artificial channels, lighthouses/navigation lights, North German bay hall houses, brickworks

2. Geology and geography

2.1 General

Osterstade is a 4-5 km broad and 20 km long piece of marshland on the lower river Weser. The southern boundary is formed by the Geest and in the north there is a historically determined boundary with the neighbouring Land Würden. In the west, towards the Geest edge, there used to be a marshy depression, which delimited Osterstade. Two rivers flow into the Weser from the Osterstade: the Drepte on the Geest, still called the "Aue" (watermeadow), and since the shifting of the river-mouth in 1980, the Lune. Previously the Lune flowed into the Weser further north.

From a physical point of view the region is essentially marked by the river marsh of the Weser with its roughly 1 km wide embankment. To the east the Geest edge joins it. In between there is the Sietland, comprising low lying farmland. The embankment is about 1m higher than the Sietland and offers favourable conditions for farming as well as for settlement activity with its lime-rich, sandy soil. The marsh sediments of the Sietland are much more clayey, which together with the low levels and unfavourable drainage, have led to severe waterlogging and, on the Geest edge, to the emergence of peatland. Trees grow only in the villages and around individual farmyards.

Today Osterstade is split into two communities, belonging to two different administrative districts. Hagen belongs to the administrative district of Cuxhaven and Schwanewede to the administrative district of Osterholz. The population of both communities is largely located on the Geest, and the marsh settlements only represent a small percentage of land and people. Schwanewede was created in 1974 by the merging of a number of smaller communities. The island of Harriersand and parts of the foreshore had until then belonged to Oldenburg, and thus to the district on the other Weser shore.

2.2 Present landscape

Osterstade comprises an open marsh landscape with meadows, which are broken by large trees or groups of trees. Church-towers and mills function as landmarks. The Geest-edge here is very fragmented, appearing close to Hünnebeck and Meyenburg, as well as in Uthlede and Driftsethe. The areas where the Geest appears are separated by broad marshy channels. In the east the motorway connects the two major cities of Bremen and Bremerhaven (both in the Land of Bremen). Osterstade is located between these two centres, with their corresponding road systems and their economic, cultural and social requirements.

The old villages are arranged in a line along the banks of the river Weser. The houses are sited close to each other on artificially elevated dwelling-areas, so-called dwelling mounds. The dykes were built closer and closer together, until it was possible to strengthen the dyke-line against floods and erosion. The dyke-line has been stable since the 18th century. Today, the majority of villages are built directly behind the dykes, which are the most significant historic monuments of the region.

The marsh, spreading eastwards, has been used intensively since the 16th century for pasture, and is divided by ditches and channels into a fine-meshed net of rectangular plots, the so-called Hämme. However, the adjacent peatland to the east is made up of long narrow strips of land and there are virtually no farmsteads.

The boundary between Norderosterstade and Süderosterstade is at the Offenwälder Indiek, a canal surrounded by dykes. A storm flood in the 17th century hit the northern part of Osterstade very badly. Thereafter, the villages in the south decided to defend themselves against a similar occurrence by constructing their own dykes.

The villages in the north are: Büttel (a divided village, the other part belongs to Würden), Neunelande, Rechtenfleth and Sandstedt. The villages in the south are: Offenwarden, Wersabe, Rechtebe, Wurthfleth and Aschwarden. Uthlede and Hünnebecke are on the Geest border. The village of Rade and parts of Neuenkirchen are sited in the marsh. However, for historical reasons these do not count as belonging to Osterstade.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

After the last Ice Age the Geest was permanently settled. The tidal river marshes of the Weser are an outcome of the North Sea tides and have fluctuated considerably in extent and shape. However, well before the sea level reached its highest point after the last Ice Age, the Weser valley was used by humans. Today their remains are covered by marsh-sediments and partially by the peatlands on the Geest-border. During the excavation of the shipping-channel finds were regularly made, which suggest Stone Age activity in the area. Mesolithic stone-implements were discovered close to the Hünenberg at Uthlede, which indicate a settlement-place on the edge of the Weser lowlands. The peatlands on the edges of the Geest have only developed since the Neolithic period.

On the peatlands between Wersabe and Hagen there was a megalithic burial place, which was almost completely overgrown by the moor. From these two burial mounds of the Late Neolithic period, burials from the single-grave culture were recovered. Close to Uthlede, on the Geest, there were the remnants of a Bronze Age settlement as well as a number of burial mounds and urn cemeteries. The landscape of that time is not visible anymore and can only be reconstructed with the assistance of scientific investigations and archaeological excavations. As with other places in the Wadden Sea area, the rise in the sea level in the 3rd century BC forced the inhabitants to leave the marsh-settlements.

During the building of a new house on the village-mound of Sandtstedt ceramic sherds from the 1st century AD, as well as from the 3rd to 5th century BC were found. These settlements were built at ground-level. Finds of the Roman imperial period were also discovered close to

Wurthfleth and at the Hogenwurt in the vicinity of Aschwarden. Indications of settlements were also uncovered on the northern tip of the river-island Harriersand. Whether the mound-villages and mound-chains on the banks of the Weser are all from this early age has not yet been investigated. The villages were first mentioned in the early and high Middle Ages: Rechtenfleth in 860 and Sandtstedt in 1050. In 1072 three villages on the embankment facing the Weser were lost due to storm floods and this occurred again in the 15th century. Dung and clay were used to construct dwelling mounds of impressive dimensions for the settlements, as can be seen near Aschwerden.

Archaeologically the erection of dykes cannot have been started before the 11th century and the written sources mention dyke-building for the first time in a document of 1113.

The first half of the 12th century saw the beginning of systematic dyke-building around the marshes. This enabled people to use this area more intensively for settlement and farming. The Sietland was largely unoccupied as late as the 18th century, and only with the assistance of massive drainage were a few farmyards founded there. The characteristic rectangular drainage-ditches are relics of this time. Up to the present day, grazing land dominates the landscape of the Sietland.

Since the Middle Ages the history of the landscape was defined by the city of Bremen. Officially it belonged to the Archbishop of Bremen, hence to the church. However, the citizens of Bremen had a strong influence on the church and thus secured free use of the lower Weser. During the battles of the Stedinger war, Osterstade was hit badly. A crusading nobleman murdered a large number of the local population. The farmers retained some rights afterwards but there were a number of castles along the Geest-border which were used to keep the country under control. In Hagen the Bishops of Bremen had their own castle but otherwise they belonged to dependant noblemen and estate officials.

In Meyenburg on the edge of the marsh, there is a manor, formerly a castle surrounded by water, which was founded in 1375. It was built by noble knights of Wersabe. Today the place is an ensemble of church, castle, farm and trees. In the church there are a number of gravestones and inscriptions of family van Wersebe.

The castle buildings of Kassebruch from the 13th and the 16th centuries do not survive, apart from the watermill, which was converted into a residential building.

The castle of Hagen, a building belonging to the Bishops of Bremen, lies further away, and was also developed out of a lowland-castle. It is however nothing more than a solid house made of stone, built on an artificial hill. The present building was constructed in 1501, some of the paint from the 16th century still exists. This castle was the seat of the Bishops of Bremen, who also stayed there periodically. It is one of the rare secular buildings of the Archbishopric of Bremen.

In the Oberstad Marsh five old churches can be visited, Sandstedt, Büttel, Bruch, Wersabe and Uthlede. The churches are often the oldest buildings in the community, although they have undergone later changes. The present building in Sandstedt was erected from 1420 and forms part of the hall church built between 1609 and 1613. In this church the oldest wall paintings of the region have been preserved (the 15th century Stoning of St. Stephen, The Arrest of Jesus, The Holy Family, Mary as the Queen of Heaven). The tower of the Sandstedt church is slightly twisted due to a mistake in its construction. It dominates the landscape from a distance.

3.2 Early Modern Times

From pre-Napoleonic times there are only a small number of remains of rural secular buildings left. In Sandtstedt the churchyard and the gravestones are worth a visit; they illustrate the wealth of the marsh-farmers. A house in Sandtstedt (Osterstader Str. 28) has got an internal beam structure from the second half of the 17th century. According to its form, a warehouse built of brick, in Büttel, dates from the late Middle Ages or early modern times.

The construction of dykes along the western estuary of the Weser, the last was at Lockfleth in 1531, and the other reinforcements on the western Weser-banks were accompanied by heavy erosion on the eastern banks. Crenesse, Aligwarfen and other places were lost and, as in 1419, the church in Sandtstedt, was now beyond the dykes.

The Christmas flood of 1717 had catastrophic consequences. The watergates of Ashwarden and Offenwarden were destroyed and it was impossible to protect the land from regular spring tides for two years. The structural consequences in the case of Visbeck were clear: many non-local landlords, especially Bremen citizens, gave their land up because they could not, or were not, willing to bear the costs of dyke construction. The poorer people offered their labour and so were able to buy land.

The ditches were jumped across with the help of long sticks made from the ash-tree, called Kluwstock. The stick was 10 foot long and with the help of this a ditch of 10 feet broad plus the jumper's height could be crossed. In this fashion all areas of the property where accessible. This means of locomotion is also widely spread in Friesland.

By the 16th, 17th and 18th centuries a trans-regional division of agricultural labour existed. Cattle were brought to the marshes by livestock dealers from Bremen, the farmers bought piglets and lambs in the spring from the Geest and sold them in autumn. The fieldscapes of the agricultural land are varied. Many are the outcome of the so-called "Hammen," a re-parcelling of agricultural land in the 16th century.

3.3 Modern Times

The number of surviving historical monuments is small and these places are marked by continuous repairs and renewal of the buildings. The consequence is that houses with old cores have 19th and 20th century appearances and only experts can recognise the changes and extensions.

The typical building-form of the 17th and 18th century is the half-timbered "Zweiständer" hall-house with slanting or semi-slanting roofs on all four sides. In the 19th century houses with working quarters were more often built as "Vierständer" with saddle roofs. In the first half of the 19th century plain brick facades prevail. In the second half of the same century historicizing decorations are added to the gable facades. Most of the preserved buildings are from the late 19th or early 20th century and were partially remodelled externally.

In the street Deichstregge 11 in Sandstedt a so-called "Zweiständer" house from the 18th century still exists, the floor of which is made of stamped clay.

In the 19th century in particular there were brickworks in Osterstade. Some architectural remains belong to this industry, like a drying shed in Sandstedt. In Offenwarden there is a rare brick storehouse, which was built in 1820.

The mill in Aschwarden is a particularly dominant landscape feature. Its present form is quite new, built first in 1800 as a post-mill, it was changed into a windmill with a thatched roof in 1850. After a fire in 1896 the mill had to be largely re-built.

In the course of the first big Weser-correction (1887-1895) shipping-signals were set up, which are preserved in Sandtstedt (old tower light) and on the Herrierplate. They have a cylindrical basic form and are stabilised by means of three supports.

The Niederweserbahn (Lower Weser Railway), which opened up the marshland in 1911, closed its passenger-services in 1931 due to the Great Depression. The northern part of the line experienced a short post-war renaissance, however in 1964 freight traffic ended and the line was closed. In many places street names still exist which refer to the railway.

The storm floods of 1953 (Holland Flood) and 1962 (especially in the Elbe area) also led to extensive coastal protection-measures in Osterstade. The dike-line was slightly changed in position and straightened and the old dike was partially dismantled. The areas where building-material was taken from, especially near Sandstedt, are now full of water.

In Rechtenfleth there is a farm belonging to the local writer Hermann Allmers (1821-1902), which he had converted after a stay in Italy. He had an antique hall as well as a marsh hall

added, and a diagonal living area. The garden was arranged according to Roman models. The house has been open to visitors since that time. The Allmers family are a family with a long tradition in Rechtenfleth, as the gravestones in nearby Sandstedt bear witness.

4. Modern development and planning

4.1 Land use

The main source of income is traditionally farming. In southern Osterstade cabbage is still grown and delivered to the conurbations. Fishing on the Weser is minimal and no longer undertaken in Osterstade. The land is protected by a straight dyke-line against the Weser. The foreshore of the dykes and the island of Harriersand are secured by low summer-dykes against minor floods. Close to the banks of the river the flow is regulated by groynes and the land thus protected from erosion. Today the tidal range is roughly 3.5 m.

Since 1969 a pumping station on the estuary close to Rade drains the marsh- and moor areas, as the Geest water could not drain off satisfactorily. Further sluices are located close to Aschwarden (flood ditch), the Indiek-sluice and the Sandstedt sluice, as well as the Depte sluice and the sluice close to Nenelande in the north. In earlier times there were wooden sluices and one vault-sluice made of sandstone originating from 1797/98 still can be seen in the vicinity of Rechtenfleth.

Nature reserves have been set up mainly in the areas of the moors on the edges of the Geest and in the areas of the outer dykes. East of Sandstedt the meadows on the inner side of the dykes, and to the west of Rade the foreland of the dykes as well as the island Harriersand have been included in the "Wet Meadowland Protection Programme" of Lower Saxony. These areas may not be disturbed or influenced to any considerable degree either in their function as an ecosystem or as part of the landscape.

4.2 Settlement development

There has been no significant settlement expansion and there has only been a small increase in living area requirements. Property prices are moderate. The island of Herriersand is extolled as the "longest river-island in Europe" and has a number of holiday homes and bathing areas on the Weser. In Rechtenfleth and Sandstedt there are some camp-sites, which are located directly on the Weser, as well as a few small sports-boat harbours. As tourism mainly consists of day-visitors, it has had little influence on the building of settlements. Only Sandstedt has expanded to the northwest and south outside the historic settlement boundary. Cycling is marketed as a primary form of tourism and it is possible to take a bicycle on the buses through the Weser-tunnel.

4.3 Industry and energy

There are no big industrial estates in Osterstade. However, on the other shore of the Weser the industrial and harbour installations are visible. The harbours of Elsfleth, Brake and Nordenham as well as the nuclear power plant of Unterweser close to Esenshamm are particularly worthy of mention in this respect. There are wind parks in the vicinity of Uthlede and on the west shore of the Weser. Bigger estates are not planned at the moment. Power lines run through the extreme southeast of the area, and pipelines run from north to south through the Weser valley. While the old lighthouses of the 19th century only rise a little above the dykes, modern radar-stations mark the Weser as a traffic route for big ships. However the sky and the marshes still form the dominant landscape elements.

4.4 Infrastructure

Osterstade is accessible to motor traffic by a road running from the north to south connecting all the marsh-villages (K 50, K 49, K 2). Parallel to it the motorway Bremen to Bremerhaven runs in the hinterland. Osterstade has four points of access to this and so to the long-distance transport network.

The railway connection between Bremen and Bremerhaven is far away in the hinterland, and it only plays a minor role. As public transport is organised within the administrative districts, it is differently orientated: in the south towards Bremen and in the north towards Bremerhaven. Thus a journey from Sandstedt to Bremen in the south is only possible via Bremerhaven or via the other side of the Weser. All in all, the connections to both cities from the southern part are poor. At present the re-opening of the railway line to the most northerly edge of the city of Bremen is being planned, so that a public transport-connection would reach as far as the southern Osterstade. Reaching Bremen Airport by public transport takes a long time, but by car it takes only an hour.

The existence of the Weser ferry near Sandstedt is under threat, as the new Weser tunnel in the north of Osterstade offers a better linkage. Also the planned motorway A 22 will go through this tunnel, which is to link Hamburg with the Baltic area and northern Netherlands.

5. Legal and spatial planning aspects

As far as regional planning is concerned, the communities are subject to the regional planning programme of Lower Saxony, as well as a regional planning programme and utilisation-plans set up by the communities.

In addition the regions development concept Bremen-Bremerhaven and the regional planning concept for the coastal sea of Lower Saxony have to be considered.

The project "Integrated Rural Development Concept – Wesermünde-South" began in 2005. Here people of the communities Schiffdorf, Beverstedt, Hagen and Loxstedt are to take part in the development of their region. They are also to be the motors for this development. The new master plan for coastal protection has not been published yet.

The creation of reserve polders in the area of Osterstade has been suggested by scientists in view of the climatic change. There, in the case of a storm flood, surfaces could be flooded selectively in order to reduce the flood level in the area of the Weser.

6. Vulnerabilities

6.1 Spatial planning

Osterstade belongs to two administrative districts and is surrounded by the cities of Bremen and Bremerhaven, which form another federal Land. Under these circumstances, uniform planning is difficult.

6.2 Agriculture

The changed conditions of production in agriculture, particularly the amalgamation of holdings, which involves a re-parcelling of agricultural land, will have massive consequences for the present forms of the fields and their traditional landscape value. The planned re-organisation of widely spread holdings will be of importance to Driftsethe on the Geest and Wersabe in the marsh in 2006- 2010. In the past this led to thoughtless destruction of elements in the cultural landscape. Cultivation of vegetables and other crops could result in ongoing damage to buried archaeological sites of prehistoric settlements.

6.3 Tourism

The ferry near Sandstedt is a centre of attraction for tourism, especially for cyclists. If this were closed for economic reasons it would be a severe blow to the area as there are only a few other tourist attractions.

6.4 Infrastructure

Further dredging of the Weser could damage unrecorded archaeological deposits and coupled with climatic changes, could make it necessary to raise the height of the dykes, affecting the most outstanding historical monument in the landscape. Poor public transport connections to the cities mean that inhabitants and visitors to Osterstade are reliant on car use. The existence of the Weser ferry near Sandstedt is under threat. Trans-regional

interests are operating in the area, especially in case of the federal waterway Weser, which may influence local decisions. The planned motorway, the A 22, will only affect the periphery of Osterstade but will have an impact on the historic landscape and buried archaeological remains.

6.5 Economy

The economic context is problematical in this region. The unemployment rate in Bremen, Bremerhaven and also in Oldenburg is very high at approx. 20%.

7. Potentials

7.1 Settlement

The historic settlement pattern of the area is relatively unchanged, allowing the historic evolution of the area to be understood by visitors and local residents.

7.2 Nature conservation

The creation and management of nature reserves offers opportunities for the management of cultural heritage features and the wider historic landscape through an integrated management planning approach.

7.3 Agriculture

Contract nature protection by farmers offers the potential to preserve historic landscapes such as the wet meadowlands east of Standstedt.

7.4 Tourism

The area is close to towns and is situated near big nature reserves. There is good potential for visitors; although the marketing and exploitation of these qualities of the area for tourism has not really begun yet, the priority given to bicycle tourism seems to be an adequate means of marketing the area. The Allmers-House museum provides a focal point for information and interpretation in the marsh. The distance to both cities is suitable for day-visitors

8. Sources

Author: Julian Subbert

ALLMERS, 1858

Hermann Allmers, Marschenbuch. In Auswahl durchgesehen und mit Angaben aus dem Leben des Verfassers sowie mit Anmerkungen ausgestattet von Dr. Kurt Krause. Breslau: 1930. (1858¹).

AUST, 1976

Hans Aust, Die Steinzeit im westlichen Elbe-Weser-Dreieck. Landkreis Wesermünde, Kreis Land Hadeln.

In: Führer zu vor- und frühgeschichtlichen Denkmälern. Bd. 29. Das Elbe-Weser-Dreieck I Einführende Aufsätze. 1976:90-104.

BEHRE, 1995

Karl-Ernst Behre, Kleine historische Landeskunde des Elbe-Weser-Raumes.

In: Hans-Eckhard Dannenberg und Heinz-Joachim Schulze (Hrsg.), Geschichte des Landes zwischen Elbe und Weser. Bd. I, Vor- und Frühgeschichte. 1995:1-59.

BÖKER, 1997

Doris Böker, Landkreis Cuxhaven. Baudenkmale in Niedersachsen, Bd. 19, 1997.

ELMHÄUSER, 1995

Konrad Elmhäuser, Der werdende Territorialstaat der Erzbischöfe von Bremen (1236-1511)
I. Die Erzbischöfe als Landesherren.

In: Hans-Eckhard Dannenberg und Heinz-Joachim Schulze (Hrsg.), Geschichte des Landes zwischen Elbe und Weser. Bd. II, Mittelalter, 1995:159-194.

HOFMEISTER, 1995

Adolf E. Hofmeister, Der werdende Territorialstaat der Erzbischöfe von Bremen (1236-1511)
II. Adel, Bauern und Stände.

In: Hans-Eckhard Dannenberg und Heinz-Joachim Schulze (Hrsg.), Geschichte des Landes zwischen Elbe und Weser. Bd. II, Mittelalter, 1995:195-240.

HOFFMANN, 1986

Hans-Christoph Hoffmann, Bremen, Bremerhaven und das nördliche Niedersachsen. Kultur, Geschichte, Landschaft zwischen Unterweser und Elbe. DuMont Kunstreiseführer. Köln: 1986.

PIEKEN, 1964

Heinz A. Pieken, Der Beginn eines neuen Kapitel in der Geschichte des Osterstader Deiches.

In: Jahrbuch der Männer vom Morgenstern 45, 1964:319-334.

PIEKEN, 1991

Heinz A. Pieken, Die Osterstader Marsch. Werden und Wandel einer Kulturlandschaft. Bremen: 1991

SCHMID, 1995

Peter Schmid, Archäologische Ergebnisse zur Siedlungs- und Wirtschaftsweise in der Marsch.

In: Hans-Eckhard Dannenberg und Heinz-Joachim Schulze (Hrsg.), Geschichte des Landes zwischen Elbe und Weser. Bd. I, Vor- und Frühgeschichte. 1995:221-250.

SINDOWSKI, 1979

Karl-Heinz Sindowski, Zwischen Jadebusen und Unterelbe. Sammlung geologische Führer, Bd. 66, 1979.

STÖLTING, 1982

Wilhelm Stölting, Die Geschichte der Niederweserbahn. Die ehemalige Kleinbahn Farge-Wulsdorf im Dienste wirtschaftlicher Erschließung.

In: Jahrbuch der Männer vom Morgenstern 61, 1982:341-376.

VISBECK, 1798

Johann Gottlieb Visbeck, Die Nieder-Weser und Osterstade. Hannover: 1798. Unv. Nachdruck: Leer: 1978.

Butjadingen, LS

1. Overview

Name:	Butjadingen
Delimitation:	River Weser, Außenweser, Jadebusen, neighbouring entity Stadland
Size:	Approx. 216 km ²
Origin of name:	'Outside of the Jade', it was an island in the Middle Ages
Location:	Coastal marsh of Lower Saxony, Germany
Relationship/similarities with other cultural landscapes:	Grassland marshes like Krummhörn and Norderland; Dwelling mound villages like Krummhörn, Norderland and Wangerland/Jeverland; Kübbingshaus (timber-frame house) like the ones in the region of Friesischen Wehde, Osterstadt and Land Wursten; Jedutenhügel like in Stadland
Characteristic elements and ensembles:	Grassland marshes, dwelling mound villages, Kübbingshaus (timber-frame houses), Jedutenhügel mound

2. Geology and geography

2.1 General

Butjadingen is a peninsula in the very north of the rural district of Wesermarsch. The natural boundaries are formed in the north by the Außenweser, in the west and south-west by the Außenjade and in the east and north-east by the River Weser. The southern part of Butjadingen adjoins Stadland, at Eckwarderhörne–Norderham. Today the cultural landscape of Butjadingen comprises the community Butjadingen and large parts of the town of Nordenham.

The natural environment beside the river Weser is formed by brackish marshes, beside the Jade and along the estuary of the river Weser there are sea marshes. Inland Butjadingen has areas with brackish and sea marshes in different depths and states of development, which reflect its complex natural history. Two barrier beaches developed in the western area of Butjadingen, arching parallel to the coast-line. These were built by successive phases of sedimentation. The Weser-Uferwall (barrier beach) at the west bank of the Weser lies in a north-south direction.

2.2 Present landscape

Characteristic of this specific region are the large expanses of grassland-marshes and roads bordered by trees. This area is distinguished by its lack of forests. Therefore the farms on the dwelling mounds with their surrounding woods can be clearly identified. The only elevations are represented by dikes, street dams, dwelling mounds and other buildings. Particularly typical are the Langwurten (dwelling mounds in a linear shape) on top of the former barrier beaches, whose arched parallel alignment to the coast line they echo. The coast is dominated by the sea dike. An increase of agricultural land use can be observed in the area. Important water features include the Butjadinger Entwässerungskanal (drainage), the Butjadinger Kanal (canal) and the Eckwarder Sieltief (sluice). Nordenham is an industrial town with a harbour, corresponding infrastructure and distinctive buildings.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The date of the oldest settlement in Butjadingen has not yet been established by archaeological means. On the basis of comparison with neighbouring areas the first settlements should belong to the Neolithic period. It is probable that the finds for this period mostly lie underneath a thick layer of alluvial sediments and will only be found by systematic investigation or a deep dig. The oldest finds of the rural district of Wesermarsch date from the Mesolithic and Neolithic periods. Dredging-machines have found antler and stone axes in the Weser between Brake and Elsfleth.

A large number of ground-level settlements have been found on the barrier beaches in Butjadingen dating from the 1st century BC. Since the 1st century AD the rising sea levels have led to the building of dwelling mounds. In the 2nd century AD the settlements on the inner barrier beach were abandoned, because a new barrier beach had developed some 2.5km seawards. This brought economic deterioration to the mainland, because the water could not drain from the land-surface. Many further settlements were abandoned in the 5th century for reasons that are not yet clear. However the large linear dwellings mounds with their villages demonstrate that Butjadingen is an ideal location for answering some of these questions.

Butjadingen was colonized again in the 7th/8th centuries by settlers from the Frisian area of the Netherlands. These new settlements were built both on the earlier settlement sites as well as in the new areas which had developed on the seawards side of the entity. In late medieval times these outer settlements were lost to the great flood-tides and can now only be located by studying historic sources or by archaeological research in the mudflats.

In Niens, a dwelling mound from the 7th to the 12th century was excavated. The results show that, as in the preceding periods, the domestication of animals, with some tillage formed the economic basis of the area.

The rising sea levels and the increasing floods led in the 11th century to the erection of the oldest dikes. The first dikes were ring-dikes surrounding the settlements and the agrarian land for protection. The only scientifically dated ring dike was found near the village of the dwelling mound Sillens. It is important evidence for the early construction of dikes. In the following periods a complete line of dikes was constructed, which meant better protection from floods and led to an expansion of agrarian land as well as to a surplus in agricultural production. This put the rural upper classes into a position of adopting industrial activities to extend their social and economic position. As a consequence Langwarden developed into a central trading place in the early 12th century. This village is a typical early medieval craft and trading place built as a linear dwelling mound (Langwurtendorf).

The modern peninsula of Butjadingen was formed in medieval times by a range of great flood tides, which created the coast line. After the second Marcellus flood of 1362 AD, Butjadingen became temporarily an island, which gave this region its name. Marine sediments can be found inland in the area of the Ahne-Lockfleth-Durchbruch (sea dike cutting).

The Frisian Butjadingen was a free "farmers republic" (Bauernrepublik) until medieval times, and this has had an important effect on its modern identity. After a number of battles with high casualties ("Lever dod as sklav") they were conquered, first by East Frisians (Ostfriesen), then they belonged to Bremen and finally to Oldenburg. In medieval times the political constitution was characterized by egalitarian Frisian freedom ("Friesische Freiheit"), which ended in the middle of the 14th century, when the Frisian chiefs took over the political power. Because of disagreements amongst the Frisian chiefs, as well as conflict with the Archbishop of Bremen and the Earl of Oldenburg, Butjadingen found itself in a state of continuous conflict. Between 1514 and 1523 the region lost its independence and belonged to Oldenburg.

The complex history of the region is reflected in the architecture of the churches. The churches of Langenwarden, Tossens, Eckwarden, Abbehausen and Blexen have a clear defensive character. The church of St. Hyppolyt in Blexen is the oldest one of this region

and possesses a baroque altar made by Ludwig Münstermann. The missionary of the Frisians, Willehad died on the 8th November 789 here. The signification of Langwarden as an important trading place is demonstrated by a second church St. Laurentius, which was erected by local traders. It is build of tuff-stones from the Rhineland.

A monument type peculiar to Butjadingen and the Stadland is the “Jedutenhügel”. These are mounds of earth with a height of 5 m and 30 m in diameter. They could have been landmarks or even places for executions. One of these mounds can be seen near Volkers or Grebswarden.

3.2 Early Modern Times

Modern Butjadingen belonged in medieval times to the Frisian province of **Rüstringen**, which lost its territorial completeness during disastrous floods. Because of the formation of the Jadebusen, the western area of Rüstringen was separated from the eastern area, which were renamed Bovenjadingen and Butenjadingen. In the Lower German language Bovenjadingen means “on this side of the Jade” and Butenjadingen “outside of the Jade”. Butjadingen had become an island because of the Heete-Durchbruch (Heete cut). At the beginning of the 16th century the lost area was impoldered again, so Butjadingen was connected with Stadland, and once again became part of the mainland.

During this period Butjadingen suffered from many of the great floods. Numerous places and villages were destroyed by the water (Tedlens, Langemehne, Bär, Alt-Waddens, Aldessen or Oldersum). In 1687 Butjadingen belonged to the Danish government who allowed the dikes and their maintenance to become neglected. One of the most disastrous flood-tides came in 1717 around Christmas. Almost one third of the population died and the region suffered for a long period from the negative effects on the economy.

3.3 Modern Times

The development of the infrastructure demonstrates the economical development of the region. No roads are shown in Butjadingen on the road maps of 1812. Around 1863 the first road connection from Brake to Burhaven over Stollhamm is registered. A road map of around 1893 depicts roads in Butjadingen and Nordenham, these are still important (the L 858, L 860, B 212).

The first railway opened in 1875 from Brake to Nordenham, and was extended to the north in the direction of Blexen in 1905. The Butjadinger Railway, which runs through the northern part of the Wesermarsch, can still be visited today. Parts of the embankment, between Nordenham and Stollhamm are now in use as a bicycle trail. It is part of the wide range of the tourist facilities in Butjadingen. In many villages in this region the old railway station buildings survive and are sometimes used as pubs or restaurants.

The city of Nordenham developed from the community of Atens after the mid-19th century. The tradesman Wilhelm Müller had built a pier, the “ox-pier” (Ochsenpier), where cattle were transported to England via the Norddeutsche Lloyd (North-German Lloyd). The first industrial enterprise settled in Nordenham in 1899 producing sea cables (Norddeutsche Seekabelwerke AG). It was followed by the Frerichs-Dockyard in 1905 in a district of Nordenham called Einswarden. At that time the district belonged to the community of Blexen, which merged with Nordenham in 1933. In 1908 the metal industry of Unterweser AG started its production of NE-metals (nonferrous metals). It had been founded here so as to use the ore ballast from the ships coming from overseas to the lower Weser.

A logical consequence of the metallurgical work was the foundation of a factory for artificial manure Superphosphatfabrik (1906–1908). Here sulphuric acid derived from the metallurgical processes could be processed. It was closed down in 1988 because of a drastic crisis in the artificial manure industry.

The First World War put an end to the industrialization of this region. Because of the economic crisis the Frerichs-Dockyard had to close in 1935. Branches of the aircraft construction company Weser-Flugzeugbau GmbH from Bremen moved to the two dockyards Frerichs-Werft and Oldenburger Werft in 1935/36. Aircraft belonging to the Donier Junkers, Arado and Henkel companies were repaired here.

In 1956 the Einswarder Company "Weser-Flugzeugbau GmbH" was opened for the out-fitting of helicopters. After some re-organisation the company is now known world wide as "European Aeronautic Defence and Space Company N. V. (EADS). The centre of the EADS-family for fitting stressed-skin fuselage is in Nordenham. Of great importance had been the establishing of a branch of the titan producing company "Leverkusen" on the Blexer Groden opposite to Bremerhaven in 1969. The "Kronos Titan GmbH" produces the white pigment Titan-Dioxid in Nordenham and employees around 430 people.

The predominant rural settlement of the 19th century in most parts of Butjadingen was the villages with houses in a line (Reihensiedlungen), in contrast only a few single dwelling mounds are mentioned. Along the river Weser were mostly closed clustered villages (Hufendörfer). The most common rural house-type is the timber framed, two column constructions known as the Zweiständerhaus or Kübbingshaus.

Individual tourist developments have taken place in some seaside resorts, as at Tossens and Burhave.

4. Modern development and planning

The Federal Office for Building and Regional Planning mentioned Butjadingen in their report 2005 as a region where the employment rate as well as local development is slowly sinking.

4.1 Land use

The agrarian areas have a high potential of natural out-put, because of their geomorphologic history. The heavy soil, particularly in the marsh, support a typical grassland economy. Arable fields are scarce, though the proportion is slowly rising. In the year 2001 16.000 ha. were in arable use, of which 15.000 ha. had previously been grassland. Agriculture plays an important part in the preservation of the historic landscape and the suitability of the entity as a recreation area (RROP 2003). Wide areas are assigned for use as or developed as grassland. Changes to this practise would need to be considered most carefully, for the regional planning should guarantee an open landscape.

Meanwhile major work has been undertaken to strengthen the sea-dikes in order to counteract rising sea levels. Extensive removal of tidal mud deposits has taken place. This work has to be compensated elsewhere, which helps to preserve the originality of this region. In the planning permission hearings (Planfeststellungsverfahren) for the extension of the dikes, the preservation of ancient monuments will be taken into consideration. The office for the conservation of ancient monuments will be involved in the planning and realization of the compensation projects. The extension of the Jade-Weser-Port, which lies in Wangerland, has also made some compensation necessary. One of these projects will be the demolishing of a summer-dike near Eckwarden. Today compensation measures for nature protection are an important element of landscape planning as well as for the income of the local farmers in this low structured region.

Another economic factor, but of a lower degree, is shrimp fishing in the coastal area.

Of special importance for Butjadingen is its position close to the national park Niedersächsisches Wattenmeer. This biological reserve is protected for migrant and breeding birds according to the European references for plants and animals (FFH). Behind the dikes, birds find extended areas for resting as well as special refuges for all kinds of different species.

4.2 Settlement development

The history of the development of the settlement can be demonstrated by a simple statistic. In the community of Butjadingen there had been an increase of building areas from 303 ha. to 553 ha. within the years 1979 to 2005. The majority was for dwelling-houses. In Nordenham this development had not been so drastic. In the same period there had been an

increase from 837 ha. to 1.195 ha., here the majority was used for industrial areas. In Butjadingen a special increase can be recognized for recreation areas (2005: 64 ha., includes 28 ha. green land). In Nordenham there are 142 ha. for recreation, including 115 ha green land.

The community of Butjadingen proceeds with the idea of an individual development of the population according to the Cooperative Concept for Settlement and Free Space (2004), which is affected by its neighbourhood to Nordenham. In the long terms there will be a stagnation in population growth. A special problem will be the obsolescence of the society. With regards to the planning of settlement development, there are sufficient building plots within the community itself as well as in the smaller districts. The community is poorly connected with the public transport system, and this is expected to grow worse after the Weser-Tunnel had been finished.

The town of Nordenham has recognized according to the Cooperative Concept for Settlement and Free Space (2004), that there is a dependence between the development of the employment rate and the inquiries for lodgings, whilst there is no dependence between the employment rate and the inquiries for building land. There is some industry in Nordenham with local importance with a constant number of employees (Kronos-Titan, Metalleurop). There is also some industry close related to the conjuncture (Seekabelwerke, Airbus). From the view of Nordenham there is only a slight involvement with its surrounding communities (commuters). The town can not satisfy the inquiries for building land (140 applicants on the waiting list). Also there are increasing inquiries for single family-houses (or high-class freehold flats), while the inquiries for lodging in apartment houses are sinking. In consequence this will possibly mean an increase of empty flats.

The significance of tourism in Butjadingen is recommended in the Regional Program for Rural Planning of the rural district "Wesermarsch". Here they recommend several providence and priority areas. In the following schedule they are summarized with its special aims for recreation and tourism of each location or district according to the Regional Program for Rural Planning.

Tourism is an important part of the economy of the community of Butjadingen. Beside institutions and activities like yachting, surfing, camping, visiting health resorts and CenterParc, there are international events like the "Sand-Art-Festival" at Tossens.

The landscape and natural history of the region are of particular importance. The adjoining national park Niedersächsisches Wattenmeer, bird-watching and other areas offer a wide range of possibilities for nature tourism.

There is no university in either Nordenham or Butjadingen; in Elsfleth in the rural district of Wesermarsch there is a college for navigation, the Oldenburg/Ostfriesland/Wilhelmshaven. The community of Butjadingen and the town of Nordenham each have one school up to the 6th Form.

The regional museum of northern Wesermarsch in Nordenham displays the history of Frisian culture and the local history of the town and industry. The collection contains the famous picture of the "fraternal kiss" from H. Zieger (1910), depicting the decapitation of the sons of the Frisian chief, Didde and Gerold Lübben (around 1418). The last fully operating windmill of the Wesermarsch stands on the historic mill place in Moorsee. It is the centre of a specialised museum for the history of mills and milling. The substructure of the three storey high Gallerieholländer (a special type of windmill from Netherlands) with two wind roses was built in 1840. After a fire in 1904, the upper structure was restored in its present form. In the former granary the exhibition now shows some typical rural utensils, coaches and carriages. The mill contains an example of the working place of the miller, who erected the mill 90 years ago in Moorsee. The national park-house-museum in Butjadingen is in the fishery harbour in Fedderwardsiel, and has an extensive amount of information about the national park "Niedersächsisches Wattenmeer", the settlement history of Butjadingen, fishing, coastal protection and many more. There is also a Historical Trading House Abbehausen, which

contains about 3.000 articles from the daily life, ranging from wooden storm-clothes-pegs to sweets.

4.3 Industry and energy

A long-distance line of 110 kv crosses Butjadingen from east to west, and a second long-distance line of 220 kv passes west of Nordenham. Altogether there are four wind parks with the highest density of wind energy plants. Additional single power stations have also been installed. The waste deposal site close to Tettens is clearly visible from a very far distance, as well as the buildings already described previously.

4.4 Infrastructure

The area was traditionally connected by water, like the river Weser, divided into the outer Weser or the Jadebusen. In modern times the Weser, as a federal waterway, is an important channel of supply for the industry requiring the port in Nordenham.

Ferries cross the Weser. The car-ferry Nordenham–Bremerhaven runs the whole year round, the ferry Eckwarden–Wilhelmshaven is only seasonal and primarily for tourists. The tunnel underneath the Weser guarantees a constant connection with Bremen and Bremerhaven. The planned motorway A-22 will include the tunnel and runs south of Nordenham. It is thought that the motorway A-22 will bring a greater connections to Butjadingen as the traffic will cross the region in an east–west direction.

In 1893 the road system already included the most important roads in Butjadingen and Nordenham (L 858, L 860, B 212). These following the natural conditions and connect most localities. There are no direct train connection with bigger towns and cities, the ext possible transfer is in Hude (on the line between Oldenburg und Bremen). The freight traffic which comes from the industries is dependent on the harbour and the roads, as well as the train.

5. Legal and spatial planning aspects

According to the Cooperative Concept for Settlement and Free Space of the municipal working group “Wesermündung” (Bremen–Niedersachsen) 2004, expert evidence was produced with regards to the possibilities for the development of the whole region. It was the first trial to harmonize the needs of lodging, industry, tourism and free space within one concept in consideration of the tight connection to Bremerhaven. It is apparent that planning for the rural development of the city of Bremerhaven and its communities should always involve the close relation to the lower Saxonian surrounding area. Therefore the community of Butjadingen and the town Nordenham will be counted in this concept to the 2. Ring.

The community of Butjadingen and the town of Nordenham are part of the rural district of Wesermarsch. Burhave has the function of a basic centre while Nordenham is a middle-centre. In case of the regional planning Butjadingen and Nordenham are integrated in the following hierarchy: the lower Saxonian spatial planning (Landes-Raumordnung), the regional land use regulation program of the rural district “Wesermarsch”2003 (Regionalen Raumordnungsprogramm) and the land structure plans (Flächennutzungspläne) of the local communities and their possible modifications.

In addition, the Concept of Rural Development of the Lower Saxonian Costal Sea is an important factor. Specific plans about nature and the landscape are based on the landscape framework plan (Landschaftsrahmenplan) for the rural district of 1992. The superior instance is a regional authority the so called “United Landscapes” (Landschaftsverband) “Oldenburgische Landschaft”.

6. Vulnerabilities

6.1 Spatial planning

The effects of the new coastal motorway and the development of the harbour of Nordenham are, in context with the extension of the “Jade-Weser-Port” in Wilhelmshaven and the Container port in Bremerhaven, difficult to define, however they will impact on the cultural heritage of the area.

6.2 Agriculture

It is not clear whether the combination of intensive farming methods and the benefits from the compensation measures will ensure the survival of the agricultural economy. In the near future either wide areas must be laid fallow or under the control of the natural preservation order or there has to be more intensive farming production. The increase in arable production will make archaeological deposits vulnerable to ploughing. The “dieing” of farmsteads will endanger the historical building substances on the dwelling mound.

6.3 Tourism

The expansion of tourism offers can mean that the natural landscape is vulnerable. This includes the building of holiday resorts, increase in traffic and inappropriate development within the historic settlements.

6.4 Industry and energy

The extension of wind energy as a regenerating energy source has some priority in Germany. The erecting of wind energy stations can dominate the whole landscape, like for example in Krummhörn. Due to its coastal area and the huge amount of wind Butjadingen is a very attractive place for wind energy. The redevelopment of older installations will be a problem (heights now: 80 – 100 m, then: 140 m) and will cause further visual impact. In Nordenham the effect of industry and the railway has created a barrier between the town and the water losing part of the town’s historic identity. The dominant industry and its changing use have led to air pollution, which is a handicap for a status as a recreation area. This also has an impact on the historic structures and the appeal of the area.

7. Potentials

7.1 Settlement

In Butjadingen mostly the typical forms of settlements and land using, which are adopted by the life of the coastal marshes, have been preserved. Sometimes farmsteads and settlements are lying on prominent dwelling mounds. This region has a relatively high density of ancient and historic monuments. This preserved landscape and long settlement history is ideal for promoting the cultural heritage of the area both to the local people as well as the tourist industry.

7.2 Agriculture

The exploitation of the historic agricultural production methods and landscape can be used to promote tourism into the region. The changes to the agricultural economy may be seen as a potential if carefully managed. The creation of large areas of land under the Nature Preservation Order could provide the potential to manage and protect the cultural heritage. This will require an integrated approach to the natural environment and cultural heritage.

7.3 Tourism

A main source for the promotion of the history of Butjadingen is the many museums, where the material culture of the region is displayed. All together Butjadingen offers many different sources for the understanding and promotion of the historical development of the marsh. An important supposition for the preservation of these structures is its use by private persons,

farmers or tourists. It will be one of the biggest challenges to integrate these different interests and administrative memberships as well as the participation of the local population into this forming process. Butjadingen is in the position of a good working association system. Currently as well as in the past there have been some initiatives and some cooperation initiated by business, promotion and tourism:

- Interreg IIC-Project: A String of Pearls along the North Sea
More than 300 smaller and middle sized businesses of the tourist industry or private individuals have been active in this project. Single “pearls” = local cooperations between participants, who developed their own plans and their own images, produced own advertising material. Information was exchanged on mutual international visits and seminars, new contacts and cooperation were found (project ended 2001).
- LEADER +: The multifarious characteristics of the natural and cultural landscape “Wesermarsch” bears a potential of high quality for leisure and living, which is capable of development. Under the principle “Wesermarsh in motion” projects had been realized engaging regional participants, politics and administration with the financial help of the European promoting program LEADER + (2002 – 2006), developing the “Wesermarsch” in between the North Sea and the Weser enduring into an attractive region for recreation and for living.
- Regional products: Because of the wide areas of grassland, the region “Wesermarsch” is a high valued environment for some rare birds. The consideration to promote agricultural products of this region together, ended up in a cooperation between farming, butchery and gastronomy. In November 2003 the association “proRegion Wesermarsch/Oldenburg e. V.” was founded.

Further tourism potential can be seen in:

- Bed and Box Offers
- North Sea Cycle Tour
- Weser Cycle Tour
- German Sluice Tour
- Multifarious horse riding and cycle paths

On the part of the districts the tight unity of tourism and landscape will be stressed in many ways. This creates a great potential for the preservation of this unique cultural landscape.

7.4 Nature conservation

There is potential for the cultural heritage to be incorporated within management plans in those areas either protected as nature reserves or proposed to become nature reserves.

8. Sources

Author: Jürgen Knies

Literatur

Behre, K. E.: Die Veränderungen der niedersächsischen Küstenlinien in den letzten 3000 Jahren und ihre Ursachen. Probleme der Küstenforschung im südlichen Nordseegebiet 26, 1999, 9-33.

Behre, K. E.: Eine neue Meeresspiegelkurve für die südliche Nordsee Transgressionen und Regressionen in den letzten 10.000 Jahren. Probleme der Küstenforschung im südlichen Nordseegebiet 28, 2003, 9-63.

Ey, J.: Die Jedutenhügel bei Volkers, Grebswarden und Schmalenfleth. In: F. Both (Red.), Archäologische Denkmäler zwischen Weser und Ems. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 34. Oldenburg 2000, 450-452.

Ey, J.: Ergebnisse siedlungsarchäologischer Grabungen in der nördlichen Wesermarsch. In Bodenfunde aus der Wesermarsch. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 5. Oldenburg 1991, 79-86.

Först, E. (1991): Zur Besiedlungsgeschichte der Flussmarsch im Kreis Wesermarsch. Veröffentlichungen der urgeschichtlichen Sammlungen des Landesmuseums zu Hannover 37. Hildesheim 1991.

Gemeinde Butjadingen, www.butjadingen.de, Stand 08.11.2006

Kooperatives Freiraum- und Siedlungskonzept für das Gebiet der Kommunalen Arbeitsgemeinschaft Wesermündung, 11/2004, gefördert durch die Regionale Arbeitsgemeinschaft Bremen – Niedersachsen

Krämer, R.: Die Bedeutung der archäologischen Denkmalpflege für die Kulturlandschaftsentwicklung der Wesermarsch. In Bodenfunde aus der Wesermarsch. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 5. Oldenburg 1991, 9–32.

Niedersächsisches Landesamt für Statistik: Auszüge aus der Agrarstrukturerhebung für Niedersachsen und der Katasterfläche in Niedersachsen, www.nls.de, Stand: 08.11.2006

Regionales Raumordnungsprogramm des Landkreises Wesermarsch, 2003

Schmid, P.: Butjadingen. In: F. Both (Red.), Archäologische Denkmäler zwischen Weser und Ems. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 34. Oldenburg 2000, 442–449.

Stadt Nordenham, www.nordenham.de, Stand 08.11.2006

Strahl, E. (2002): Erste Bauern in der deutschen Marsch – Die jungbronzezeitliche Siedlung Rodenkirchen-Hahnenknooper Mühle, Ldkr. Wesermarsch. Berichte zur Denkmalpflege in Niedersachsen 22, 79-82.

Strahl, E. (2004): Erste Bauern in der deutschen Marsch. Die jungbronzezeitliche Siedlung Rodenkirchen-Hahnenknooper Mühle, Ldk. Wesermarsch. In: M. Fansa, F. Both u. H. Haßmann (Hrsg.), Archäologie|Land|Niedersachsen. 25 Jahre Denkmalschutzgesetz – 400 000 Jahre Geschichte, 516-519. Stuttgart (Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 42).

Stedingen, LS

1. Overview

Name:	Stedingen
Delimitation:	River Weser, Geest border, neighbouring entities Land Stadland, Friesland, Oldenburg, Delmenhorst
Size:	Approx. 580 km ²
Location:	Tidal river marsh of Lower Saxony, Germany
Origin of the name:	May derive from the word "Gestade", a reference to the inhabitants of the coastal strip west of the Weser.
Relationship/similarities with other cultural entities:	River marshes of Osterstade, Stadland, Land Würden, peatland areas, mainly pasture economy, harbour economy, shipping
Characteristic elements and ensembles:	Farm houses, linear settlements, river marsh, peatlands, pasture, trading

2. Geology and geography

2.1 General

Stedingen or the Stedingerland lies in the southern part of today's district of Wesermarsch between Brake in the north and Schönemoor in the south; the Weser forms the eastern boundary and the Geest of Oldenburg the western. The region is divided by the Hunte into the northern Niederstedingen and the southern Oberstedingen. The territory of the historic landscape of Stedingen used to be bigger than today and comprised areas east of the Weser (Osterstade).

The natural spatial arrangement of the landscape is characterised by very fertile river marshes, especially of the Weser and Hunte, as well as by the mostly cultivated fens and raised bogs towards the Geest border. One of the most widespread fens of Stedingen is the Moorriem which reaches a thickness of several metres. The higher reaches of the Stedingerlands lie roughly at sea level. Only near Pfahlhausen in the south does the Geest rises above the Weser marsh. It is typical of landscapes which originated during the post-glacial period, in that it has a structure of raised river banks and lower Sietland, the names of Leuchterseite and Brokseite are also used for this area.

The origin of the name Stedingen is unclear, it possibly derives from the word "Gestade" and thus refers to the inhabitants of the coastal strip west of the Weser.

2.2 Present landscape

The present Stedingerland lies between the Ochtum, Weser and Hunte, several small rivers like the Berne, Hörspe and Ollen run through it and on two sides it is enclosed by the Geest. It comprises the present communities of Berne and Lemwerder. Since the historic landscape of Stedingen used to be bigger, the communities of Brake (Unterweser), Elsfleth and Ovelgönne also have to be taken into account.

Along the dyked river Weser small and medium-sized settlements have developed. Lemwerder and Elsfleth on the Hunte mouth and Brake possess port facilities which influence the life, culture and economy of the region. Brake as a Middle Order Centre, with more than 16000 inhabitants is the county town of the district of Wesermarsch, and the seat of many government agencies. Communities like Berne or Ovelgönne have a much lower population density. The communities' territories, which consist mostly of marsh land, are used mainly as pasture. The community of Ovelgönne in the north of Stedingen has managed to preserve its historic character and is almost completely free of industry. Typical

of its landscape are the pastures crossed by drainage ditches, these are a characteristic feature of the Wesermarsch as well as cultivated fen areas. Remnant peatlands, like that in Rüdershausen, have been preserved in parts. The land is characterised by long narrow field strips and linear settlements.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The large-scale investigation of the North Sea tidal flats is well advanced, thanks to the efforts made by the Institute for Historic Coastal Research and by communal, district and county archaeologists. As a comparatively young geological landscape the Elbe-Weser and Weser-Ems regions are characterised by quaternary deposits.

There is only indirect archaeological evidence for the introduction of cultivation methodologies to the Stedingen. However, considering the wider archaeological context, it can be assumed that Stedingen was part of more widespread prehistoric and early historic developments. At the beginning of the post glacial period today's North Sea coast was still dry land and the coast itself lay near the present Dogger Bank, it can be surmised that the river marshes were frequented by Mesolithic hunters and gatherers.

The oldest archaeological finds to date were dredged out of the Weser. They largely consist of animal bones but antler picks which date to the Middle Stone Age (Mesolithic) are also represented.

Two stone tools, which were also dredged from the Weser between Elsfleth and Brake, date to the earliest Late Stone Age (Neolithic). They are associated with the so-called Linear Band Culture and indicate cultural contacts to this early foreign farming culture.

Various artefacts from later periods have been found along the western bank of the Weser or in the Weser itself. They include flint and other stone axes from the earliest farming culture of North Germany, the Funnel Beaker Culture, and a flint dagger from the late Neolithic. Important finds in this context are the objects from the Funnel Beaker Culture from the shores of the Hunte at the Gellener dyke near Moorriem in the parish of Elsfleth. Here pottery and flint tools have been found during earthworks with an excavator at a depth of 0.5 m below sea level on a sandy hill below the clay. They are interpreted as settlement remains. Unfortunately this site was completely destroyed. However, there might be further sites from this period along the Hunte, which could be revealed during construction works. In that case modern excavation techniques might provide important information about the early settlement in the river marsh areas.

From the Bronze Age there is a sword found in the Blömer, a side branch of the Weser near Elsfleth. Near Lemwerder a bronze chisel and dagger were retrieved from the Weser. A burial site at Berne dates back to the Middle Bronze Age. Pottery, a bronze kettle and a needle were found deep below clay deposits. The first intensive colonisation of the river marsh can only be proven for the late Bronze Age. Urn finds from the urban area of Braker, as well as pottery sherds from Huntebrück-Wührden and below the Aegidius church in Berne suggest this. The ground-level settlement Huntebrück-Wührden, community of Elsfleth, apparently continued to exist until the centuries immediately after Christ. Even though the Weser marsh can be seen as an area unfavourable to settlement with its wide bogs which separate the river marsh from the Geest areas of the Ammerland or Oldenburg, there is, apart from the rivers, other evidence for inter-communication across this space. A boardwalk, dated to the 8th century BC by dendrochronology, lead from Eckfleth, town of Elsfleth, over the bog of Ipwege towards the west. From the south two other boardwalks, dating from the third to second centuries BC, lead over the Wittemoor to Holler moor in a northerly direction. As in all the North German marsh areas, intensive cultivation of the river marsh took place around the time of the birth of Christ, this appears to have ceased in the 5th century AD. Many settlements remained ground-level settlements, with only a few reconstructed as

dwelling mounds. One such exception is the settlement which has been found beneath the church of Berne. It was raised into a dwelling mound around the birth of Christ. Another example is that of the dwelling mound of Hogenkamp south of Elsfleth. Since 1874 finds have been made and small excavations carried out on this site. The dwelling mound so far dates to the 4th/5th century AD. Some finds of national importance date to the post-Christian centuries of the Roman Iron Age. In a peat-bog near Strückhausen, south-west of the town of Brake, 28 silver-beaded bronze brooches were found during peat cutting, together with the remains of fabric and leather. They date into the second half of the third century BC and are interpreted as a trader's or craftsman's deposit. Along the Weser some Roman artefacts have been found, usually coins or pottery from between the 2nd and the 5th centuries AD. In this context some bones with rune cuttings should be mentioned, these were discovered in 1928 during the Weser excavation near Brake. Around 400 AD a very detailed Roman ship was engraved by a Teuton into one of these bones. During the 4th/5th century settlement decline began. There is only a little archaeological evidence from the now Saxon population, e.g. pottery and the unique find of a lid with a handle in the shape of a pig from a site near Altenesch.

It was not until the High Middle Ages that large-scale cultivation of the Stedinger Land take place. A few years ago a sounding on a farm dwelling mound in Bardewisch, community of Lemwerder, was undertaken. The core dwelling mound had been erected during High Middle Ages and can be seen as an example for the land-taking process of that period. When Stedingen fell to Bishop Adalbert of Bremen in 1063, because of his guardianship of Heinrich IV, he started to systematically colonise the land with farmers from the neighbouring Geest as well as with Dutch Frisians who were to turn the so far rather poor soils into fertile farmland. During this time the systematic cultivation of the peatbogs began, a process which is historically well documented. The cultivation process was based on drainage and the building of dams and dykes. The settlers built their farms in rows with the fields reaching into the bog in long thin stripes. Settlements sited along the peatbog border are characteristic of this phases of cultivation, e.g. like those at Moorriem. Here one of these linear settlements has preserved over a length of over 15 km. Further settlements of this kind can be found at Neuenhutorf, Oldenbrok-Mittelort, Harrierworp and Sandfeld. They are typified by raised settlement platforms where the peat base rises from the surrounding lowered ground level. The investigation of these places by settlement archaeology is still in its infancy.

The cultivation of the wetland towards the Weser was undertaken in the mid-12th century by dyking and drainage programs. As in other regions of North Germany, the landscape is crossed by a dense right-angled network of drainage ditches.

The medieval history of Stedingen during the 12th and 13th century is characterised by conflicts between the people of Stedingen and the authorities, they were even accused of heresy. Therefore the Bishop declared the resulting wars to be crusades. During the second "crusade" the people of Stedingen suffered complete defeat in 1234 at Altenesch. The victors split up the land. The largest parts fell to the Archbishop of Bremen and the Counts of Oldenburg. But they usually left the land to farmed by the defeated or new colonists on terms of free tenancy (Meierrecht). At the site of the battle a monument was erected in 1834 (Stedingsehre).

One of the most notable buildings of Stedingen is the St. Ägidius church in Berne, which is also called "Stedinger Dom". It was built towards the end of the 12th century on an already existing dwelling mound. The first building was erected of imported Porta sandstone from the Weser mountain range. The rather plain church building was re-built into a three-aisled church of Westphalian style after the Stedinger wars. After the conquest of the Stedingerland the Counts of Oldenburg built a burgh, or a "Motte", next to the church, which was under the authority of the Archbishop of Bremen. It is first mentioned in a document from 1242. Other early church buildings are those of Bardewisch with its late-gothic frescoes, Altenesch, Warfleth, Neuenhutorf, Elsfleth, Bardenfleth or Strückhausen.

3.2 Early Modern Times

The late Middle Ages and early Modern Times were the time of Oldenburg sovereignty of the area. After the death of Graf Anton Günther in 1667 the King of Denmark was the owner of the County of Oldenburg-Delmenhorst till 1773 and therefore of Stedingen as well. His reign was marked by the financial exploitation of the region, which caused the dykes to fall into neglect. The Christmas flood of 1717 was disastrous for the whole Wesermarsch. In Stedingen, however, the flood damages were remedied within one year. In the 19th century the Grand Duchy of Oldenburg initialised an administrative reorganisation and the establishment of new administrative bodies. Consequently, the Wesermarsch experienced an economic upturn. The harbour of Brake flourished prior to the foundation of Bremerhaven and it developed so well that Brake received its own town charter in 1879. Elsfleth with its port and dockyards was of even greater importance. Berne and Ovelgönne preserved their rural structures. New administrative structures in 1879, 1933 and 1948 caused repeated changes until in the 1970s the present community structure was introduced.

3.3 Modern Times

The medieval historic landscape of Stedingen today comprises the communities of Lemwerder, Berne, Elsfleth, Brake and Ovelgönne. From an economic and historic point of view certain principles in the settlement processes can be seen. First there is the marked difference between the more densely settled area along the Weser banks and the sparsely populated Siet and peat lands. The development of towns and villages along the Weser led to a concentration of the population in these areas.

The dykes, both old and modern, are important as a location for settlement, along their courses linear settlements developed. Then there are the fen settlements which follow the original course of the fen borders and fen roads. The communities of Lemwerder and Berne serve as examples for this type of settlement. The Ochtum-Weser dyke stretches all the way to the Hunte mouth and has an almost unbroken line of settlements with sporadic conglomerations along it. Near Altenesch the Ollen branches off, accompanied by an ancient dike line, along which settlements concentrate. To the south-west of Berne a road with an irregular course runs along the edge of the fen with only sporadic settlements of small dwelling places. There are no settlement alignments on either side of the Hunte dykes since the Hunte never played any significant role in encouraging settlement.

Between those lines of settlements there are wide empty grassland plains. Only in the centres of the fens are there scattered villages with single farmsteads and Kötereien (cottages). In the fieldscape a difference can be seen between the irregular block-shaped fields on the shore banks and the long narrow field strips characteristic of the fens.

In the community of Berne the marsh soils predominate: towards the south they change into peat marsh and peat. Accordingly pasture is the main form of land use, just as in Lemwerder. Nevertheless, the agricultural structures are disintegrating. The industry in Lemwerder with its dockyards and aircraft maintenance plant is also regressive and a change is already noticeable. The community of Ovelgönne consists of peat marsh with a high proportion of grassland. Here dairy farming is still the most important economic factor. The town of Elsfleth on the Hunte mouth with the former community of Morriem is also characterised by a prevailing pasture economy. The agricultural economy of Morriem comprises 84% dairy farming and only 3% tillage. The economic situation of the town of Brake has been largely dominated by its location by the Weser and its harbour.

4. Modern development and planning

The economy of the Stedingerland is traditionally based on animal husbandry. Only in the Weser ports of Brake and Elsfleth have dockyards and harbour industry developed; in the region of Lemwerder an aerospace industry has established. The Federal Office for Civil Engineering and Regional Planning in its regional planning report of 2005 classes the district Wesermarsch, and thus Stedingen, amongst the areas in which the population and

employment development is characterised by stagnation or a slight decline. The demand for building land and the traffic increase are rated as being rather low. To push the economic development all communities have provided building sites for small and medium-sized businesses. There are also areas which have been defined as building land for private residential buildings.

The population density differs between the rural areas of the Hinterland and the congested areas along the Weser. The community of Ovelgönne has 46.6 inhabitants per km², Berne has 83.6 and Elsfleth reaches a number of 81.1; unlike Lemwerder with 197.9. With 423.8 inhabitants per km² the district town of Brake (Unterweser) shows a very different pattern.

4.1 Land use

The region of Stedingen consists of river marshes, slightly raised river banks and the Sietland. The most prominent kind of landscape therefore is the marsh, which is protected from floods by dykes along the Weser banks. The river Hunte runs right through Stedingen and joins the Weser near Elsfleth. At the junction the Hunteperrwerk (Hunte barrage) is sited as a protection against high tides. In the west of Stedingen the Geest begins. At the road B 211 in Loyermoor there is the so called "Geest-Abbruch" (Geest drop), with a height difference of 30 meters.

The land use in the communities of Berne, Lemwerder and Ovelgönne is characterised by a high proportion of grassland. Therefore agriculture, mainly pasture, and the associated industries represent the principal economic emphasis of the area. In the community of Elsfleth the fertile sandy clayey soils of the marsh are also used mainly as grassland. The river marsh area and the former peatbogs are only sparsely wooded. With only 0.7 % of woodland the district of Wesermarsch, is almost completely free of woods. The peat marshes and former peatbog areas of the hinterland show a grassland use of 84 %, tillage on the other hand is, at 3 %, almost non-existent. There are about 130 farms with sizes of 30- 50 ha. in the community. Considering the intensive agricultural use of the land it can be assumed that the process of increasing farm sizes is going to continue. Currently the percentage of people employed in agriculture lies below 8 %, dropping to 2 % in the community of Lemwerder, and could decline even further. This development has to be seen in the context of the agricultural intensification which is responding to international pressures. The old landscape and settlement structures on the Stedinger Marsch might still be visible but radical changes are looming.

Tourism is an economic factor for the communities of Stedingen which should be encouraged in the future. For this reason historic agricultural structures and farm buildings as well as technological structures such as drainage ditches or typical views of places should be preserved.

4.2 Settlement development

The dramatic drop in employment in the dockyards and in aircraft construction, e.g. in Elsfleth, is causing gradual changes. From being an industrial community, Elsfleth is becoming a residential area within the commuter belt of the High Order Centre of Bremen.

The commuting structures of the communities of Stedingen are quite versatile, depending on the location of the respective business sites. While Lemwerder is well balanced the communities of Berne and Elsfleth have almost double as many commuters going out than coming in. Ovelgönne even reaches a ratio of three times as many commuters going out. Only Brake has more commuters coming in for work. The commuting indicates the bad employment situation which can be attributed to the regressive economy of the dockyards and aircraft industry. In the long run the southern parts of the district are in danger of turning into mere residential and dormitory areas. This might cause a loss of identity, based on the loss of economic traditions, and an uncontrolled settlement of the landscape.

There is no national museum in Stedingen. Brake has the Shipping Museum of the Weser Ports of Oldenburg, which lies by the water, it was opened in 1960. The extensive collection relates to the local shipping history of the region. In Ovelgönne the North German Crafts Museum opened in 1981. It gives an insight into the trade and crafts of the Wesermarsch in

the 19th century by reconstructing old workshops. A small regional museum in Berne presents the history of the region. Special places of interest in the community of Lemwerder include churches like those in Bardewisch or in Altenesch with its Münstermann pulpit. The monument "Stedingsehre", which was erected in 1834 by the Ochtum dyke, is a reminder of the battle of 1234. An important church building is the St.-Aegidius church in Berne, with its three-aisled gothic hall church, and the altar and the pulpit from the workshops of Ludwig Münstermann.

Recurring large-scale events of great tourist interest are the horse fair in Ovelgönner and the Kajenfest (quay festival) in Brake.

Stedingen is part of the cycle path "Deutsche Sielroute" in the district of Wesermarsch which comprises more than 200 km of cycle paths. A special feature is the Juliusplate on the Weser shore near Berne.

The tourist trade could be improved by using the beauty of the scenery, the historic settlement structure and the high recreational value of communities of Stedingen as a impetus. In addition to bicycle tourism, camper-van tourism is being encouraged. In Lemwerder a camper-van park was built and further sites were established at the Weser and the Ochtum. Elsfleth also has to offer a pleasure-craft port and landing sites. It remains to be seen in what way the plans of the community of Ovelgönne (town rehabilitation plans, planning of business parks and building land allocation, the planned expansion of Oldenbrok-Mittelort as residential area and the creation of a real village centre in the typical linear settlement) will affect the overall picture of the landscape.

4.3 Industry and energy

The district town of Brake with its 16.000 inhabitants is one of the industrial and administrative centres of the district of Wesermarsch. The industry is dominated by the port of Brake which is the second largest port of Lower Saxony. More than 12% of the people working in Brake work at the harbour industries. Besides the harbour services businesses some other large companies profit by the proximity of the Weser. A fat refinery, the North German Natural Gas Processing Association and companies like Siemens and Rehau run plants in Brake. The port serves as reloading point for the traditional bulk goods like grain, fodder, sulphur and for bulk cargo like paper and steel. The container harbour is also of great importance. The industry of Elsfleth is linked to the fluctuating significance of the harbour. The Elsflether Werft AG once used to be the largest dockyard around Oldenburg. Today there is a single shipbuilding company, one brandy distillery, one packaging industrial plant, one signboard factory and a few shipping companies which, apart from a number of smaller trade businesses and manufacturers, dominate the economy of the region. In Lemwerder there is a maintenance centre for large aircrafts as well as an airfield runway. There are also two shipyards for the construction of special ships. The subsidiary company of one of the shipyards specialises in the construction of rotor blades for wind turbines. In the community of Berne there is no industry worth mentioning. Dairy production is the main economic feature of Ovelgönne. The main employer is the company Nordmilch, formerly Botterbloom Milch e.g. in Strückhausen, community of Ovelgönne, with c. 500 employees.

Numerous wind turbines, single plants as well as wind parks, characterise the landscape of the southern district of Wesermarsch. The community of Ovelgönne is particularly affected by this with four wind parks near Ovelgönne and five more in the Oldenbroker field. They certainly don't contribute to the beauty of the landscape of the community.

4.4 Infrastructure

In the east Stehdingen is linked to the motorway network with the A 26 Oldenburg-Delmenhorst and in the west with the A 29, towards Wilhelmshaven. Near Kleinensiel, in the community of Stadland, the Weser tunnel leads to the right side of the Weser and to the junction of the A 27 Cuxhaven-Bremen. The main traffic way in the Stedingerland is the federal road 212 which runs from north to south: it starts off at Nordenham and leads to the community border of Lemwerder in the south. The federal road 211 from Brake leads to the

High Order Centre of Oldenburg. In Berne the federal road 74, comes from the area east of the Weser, meets the 212. Other than that, the country roads provide a network between the settlements of Stedingen. Only Brake can claim quite a good infrastructure, due to the location right in the middle between the towns of Bremen, Bremerhaven, Oldenburg and Wilhelmshaven. The construction of the Weser tunnel improved the connection to the motorway 27 on the other side of the Weser. At present there is the construction of a new federal road 211 planned which would improve the connection of the community of Ovelgönne with the harbour of Brake.

The railroad traffic through Stedingen, and the district of Wesermarsch, has to be called meagre, especially after the shutting down of many lines during the last decades. The only railroad line in public transport still serviced on a regular basis is that of Hude – Berne – Elsfleth – Brake – Nordenham.

The location of Stedingen by the navigable Weser, which is deep enough for ocean-going vessels, provides the region with a favourable infrastructure. In Brake, Elsfleth and Lemwerder there are harbours which are connected with the railroad network. Elsfleth, e.g., is linked by the waterways of the Hunte and the coastal channel respectively the Weser and the Mittellandkanal with the agglomeration areas of Nordrhein-Westfalen. Apart from the Weser tunnel there are also ferries: from Lemwerder to Bremen-Vegesack, from Motzen to Bremen-Blumenthal and from Berne to Bremen-Farge. The ferry from Brake to Harriersand only transports pedestrians and bicycles.

5. Legal and spatial planning aspects

From a geological-geographic point of view the Stedinger Land can be divided into two parts: First, the strip along the Weser with the main settlements and industrial sites of Lemwerder, Elsfleth, Brake and Berne. In the regional planning program of 1969 the area is addressed as being the main focus area. Secondly, the regions to the west and south with Ovelgönne and the areas of peat soils which border the interior Geest. They are seen as especially poorly structured areas.

In respect to spatial planning the Stedinger communities are subject to the regional planning program, issued by the federal state of Lower Saxony, respectively to the landscape framework plans and land use plans of the communities. Then there is also the regional development concept of Bremen in cross-county cooperation. The plans of the community should help preserve the historically grown structure of the Stedinger Land and stem the excesses in settlement and agriculture.

For the period of 2000 to 2006 the district of Wesermarsch belonged to the aim-2-area of Lower Saxony of the EU structural politics. Currently suggestions for the promotion of rural areas for the period between 2007 and 2013 are under discussion. According to this next to agriculture, other sources of income like tourism, crafts and trade should become further supporting elements of the economy of the rural area. The district Wesermarsch has already presented its own concept for the development and preservation of its cultural landscape in 2001. It suggested the promotion and realisation of smaller projects in the fields of tourism, regional products, nature and culture. Since 2004 the Wesermarsch is one of the partners in the trans-national project of "Monitoring of the Structural Changes in the Rural Areas of the North Sea Coast". It deals with questions like traffic and transport, ecological development and social aspects.

The landscape of Oldenburg is responsible for the advancement of cultural and historic interests in Stedingen.

6. Vulnerabilities

6.1 Spatial planning

The possible large-scale establishment of industrial and business parks to enhance the economic situation could have serious effects on the traditionally grown structures. The planned housing estate extension of villages or new routings with bypasses, as planned for Oldenbrok-Mittelort, with the federal road 211, will damage the typical impression of the linear villages.

6.2 Agriculture

The international competition and the pressure on agriculture caused by globalisation might result in an adjustment of the agricultural methods of production to inherent economic necessities. An enlargement of the farm areas and a simultaneous decrease in the number of farmsteads – the so-called farm dying – is the necessary consequence as can already be seen in some communities.

6.3 Tourism

The pressure of modern mass tourism could lead to the redundancy of authentic historic structures although the promotion of tourism is becoming a necessity.

6.4 Industry and energy

The many wind parks which have been constructed impact heavily on the visual cultural heritage of the landscape. The reduction in local employment and increase in commuting may cause a loss of identity, based on the loss of economic traditions, an uncontrolled settlement of the landscape and a loss of traditional structures.

7. Potentials

7.1 Settlement

Despite of modern influence the cultural landscape of Stedingen has so far managed to preserve its unique character. Dominating features are the wide marsh and former moor areas in which the settlements stand out clearly and thus, together with the dykes and dwelling mounds, give a distinctive face to the landscape. Linear settlements developed along roads and dykes while long-narrow field strips are characteristic features of the Hinterland. The marine towns and villages, which are dominated by the shipping industry, are distinguishing features of the landscape and settlement structures along the Weser. The preservation of this settlement and landscape has great potential both for retaining the regions culture and for the promotion of tourism.

7.2 Agriculture

The exploitation of the historic agricultural production methods and landscape can be used to promote tourism into the region. As has been suggested the promotion and realisation of smaller projects in the fields of tourism, regional products, nature and culture will improve the image and economy of the area.

7.3 Tourism

The tourist trade could be improved by using the beauty of the scenery, the historic settlement structure and the high recreational value of communities of Stedingen as an impetus. In addition to bicycle tourism, camper-van tourism is being encouraged.

8. Sources

Author: Frank Both

Först, E. (1991): Zur Besiedlungsgeschichte der Flussmarsch im Kreis Wesermarsch. Veröffentlichungen der urgeschichtlichen Sammlungen des Landesmuseums zu Hannover, Bd. 37. Hildesheim 1991.

Hannemann, M. (1954): Der Landkreis Wesermarsch. Die Landkreise in Niedersachsen Reihe D, Bd. 10. Bremen-Horn 1954.

Krämer, R., Fansa, M. (1991): Bodenfunde aus der Wesermarsch. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 5. Oldenburg 1991.

KomSIS: Kommunales Standort Informationssystem Niedersachsen. www.komsis.de

Meiners, G. (1987): „Stedingen und die Stedinger“. Bremen 1987.

Pätzold, J. (1955): Eine Siedlung der Großsteingrableute unter Normalnull bei Oldenburg (Oldb.). Oldenburger Jahrbuch 55, Teil II, 1955, 83-97.

Pieper, P. (1989): Die Weserrunenknöcher. Neue Untersuchungen zur Problematik: Original oder Fälschung. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 2. Oldenburg 1989.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Runge, W. (1983): Kirchen im Oldenburger Land, Bd. I. Oldenburg 1983.

Schneider, J. (2001): Mittelalterliche Siedler auf dem Rand des Hochmoores. Archäologie in Niedersachsen 4, 2001, 97-99.

Seedorf, H.H., Meyer, H.H. (1992): Landeskunde Niedersachsen, Bd. I, Historische Grundlagen und naturräumliche Ausstattung. Neumünster 1992.

Seedorf, H.H., Meyer, H.H. (1996): Landeskunde Niedersachsen, Bd. II, Niedersachsen als Wirtschafts- und Kulturräum. Neumünster 1996.

Steinmetz, W.-D. (1989): Archäologische Untersuchungen zur Siedlungsgeschichte der Oldenburgischen Moorrandreihensiedlungen. Probleme der Küstenforschung im südlichen Nordseegebiet 17, 1989, 125-165.

Wobcken, C. (1933): Die Schlacht bei Altenesch am 27. Mai 1234 und ihre Vorgeschichte. Oldenburger Jahrbuch 37, 1933, 5-35.

Stadland, LS

1. Overview

Name:	Stadland
Delimitation:	River Weser, Jade Bay, neighbouring entities Land Butjadingen, Stedingen
Size:	approx. 113,38 km ²
Origin of name:	The origin of the name Stadland is not quite clear, it may derives from "Gestade" and describe the coastal strip to the west of the Weser.
Location:	River marsh of Lower Saxony, Germany
Relationship/similarities with other cultural entities:	River marshes of Osterstade, Stedingen, Land Würden, agriculture, mainly grazing land, rural house forms, linear settlements
Characteristic elements and ensembles:	River marshes, agriculture, grazing land, rural house forms, linear settlements

2. Geology and geography

2.1 General

The Stadland is a community in the administrative district of Wesermarsch and consists of the places of Rodenkirchen, Schwei, Seedfeld and Kleinensiel. Today's form originated in the course of the administrative and area reform of 1974. In the east it is delimited by the Weser and in the west by Jade Bay. The main centre of population is Rodenkirchen which is also the principal town and seat of the local government. The historical landscape of the Stadland borders in the north roughly with Eckwarderhörne-Nordenham on the Butjadingen, and in the south north of Brake with Stedingen. Whilst the eastern Stadland is marked by a brackish marsh with a slightly raised embankment on the Weser shore, a lake marsh had formed on the side of Jade Bay. Southeast and south of Jade Bay as well as on the geest edge there are marshes, low moors and high-level moors.

The Stadland is a river marsh area originating in the postglacial age, with a typical division of landscape into an embankment up to a kilometre wide along the river and the Sietland lying behind it. The embankment originated as a deposit of mineral material from storm floods and high water. In the low lying pastures there is a lack of sediments. The combination of the low ground level and water logging led to the formation of the peat-bogs.

The origin of the name Stadland is not quite clear, possibly it derives from "Gestade" and describes the coastal strip to the west of the Weser. In the Middle Ages the Stadland was a part of the Frisian region of Rüstringen which lost its territorial unity in disastrous storm floods. In 1367 the communities of Rodenkirchen and Golzwarden were mentioned in a document as "terra Stedingorum in Rustringia".

2.2 Present landscape

The Stadland is a flat countryside with hardly any relief. The river marsh with an embankment along the western shore of the Weser, lined by dykes, is cut through by sluices and drainage channels. Big floodgates provide both irrigation and drainage. The only Weser island and landscape protection area is the Strohaus Bank. The branch of the Schweiburg separates it from the community of Stadland.

The Strohaus Bank possibly originated in the 16th/17th century, with the combination of several sand banks and increased with the deposition of sand during the course of the

Weser correction in the 19th century. Most of the island is used agriculturally. Two farms, that still exist nowadays, continue to practice extensive grassland agriculture.

Inland, in the western Stadland close to Schwei, there are extensive, high moor areas cultivated today. The Schwei Moor, as the Sehestedt Moor, originally extended into Jade Bay. However, it was eroded by the sea and reduced to its present size. Here the Sehestedt moor, outside the dyke, can be seen as a geological natural monument. The high moor is located in front of the dyke on the eastern edge of Jade Bay. The peat bog floats on the water, the formation of the "Klappklei" linked with it can be observed from the dyke. During storm floods, with heights of up to 1.70m above Mean High Tide, the moor opens up horizontally and clay is deposited in the resulting cracks which develop in the body of the moor.

About 90% of the community surface is used agriculturally, mainly as grazing land. The individual farms are usually dispersed outside built-up areas.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The investigation of the river marsh has been considerably advanced by the work of the Institute of Historical Coastal Research in Wilhelmshaven. As a geologically relatively recent landscape, the Weser Ems area is marked by quaternary deposits.

The exact date of settlement in the Stadland cannot be determined archaeologically. However, considering the situation in the surrounding area, it is probable that the Stadland did not remain unaffected by the prehistoric developments in the region. At the beginning of the post-glacial age today's southern North Sea coast was dry land and the coast at that time lay in the area of the Doggerbank in the North Sea. The river marsh of the Stadland was presumably frequented by Mesolithic hunters. Traces of a Neolithic population are absent in the Stadland; they are, however, proven in the neighbouring administrative districts. It is possible that there are sites beneath the river marsh with its subsequent millennia of sediment. It is possible that work along the rivers, particularly the widening of shipping channels, may expose cultural strata/layers which will then erode unnoticed.

The first archaeologically proven settlement took place, according to present knowledge, in about 900 to 300 BC. Only the embankment of the Weser was originally settled. From the late Bronze Age single finds have been made, which prove a human presence in the Sietland as well, e.g., an axe type "nackengebogene Axt" from the moor near Schwei.

In 1971 the oldest settlement discovered up to now in a German marsh was found to the west of Rodenkirchen, close to the mill of Hahnenknoop, some 2m below today's ground level and 1m below sea-level. Three houses of a lowland settlement were revealed during excavations for the Strohaus sluice channel. These were sited on the western embankment of the Weser on a slope facing away from the river. Further excavations (1996-2001) of a house sited to the north of the first discovery, by the Lower Saxon Institute of Historical Coastal Research in Wilhelmshaven and who in collaboration with geologists, archaeobotanists and archaeozoologists, have created a lively picture of how the people around 900 BC used this landscape. People lived in tri-sectional houses with byres, i.e. people and cattle lived under one roof. Cattle provided the economic basis. Apart from that grain was cultivated in the summer as well as nuts and berries being collected. The remains of casting crucibles and moulds are significant as they prove that the colonisers of the marsh could supply themselves with metal and also knew how to process it. When settlement ended on the marsh is still unclear, it might have been between 400 and 150 BC. The Weser river marsh became waterlogged, because of inroads made by the North Sea and was therefore unusable as a farming area.

New settlement on the embankment occurred only in the first century AD. Originally the settlements were built at ground level, the rising storm-flood levels in the 1st century AD required the dwelling areas to be raised on artificial mounds created by the piling up of clay

and dung. It is still unclear when the building of terpen on the embankments of the Stadland exactly began. Roman finds have been found at three sites. To the south of Rodenkirchen is Rodenkirchen-Wurth with farm-mounds and a medieval so-called "Jedutenhügel", a mound, whose interpretation is still disputed. Ceramic finds prove the existence of a lowland settlement, possibly dating to the first centuries AD, beneath all three places. The finds made at Knappenburg are from the time around Christ's birth, however the context of the finds is unknown. In Rodenkirchen excavations in the interior of the church of Saint Matthew proved that the church-mound is sited on top of the older village-terp, which is dated to around Christ's birth or a little earlier.

In contrast to the neighbouring regions, the settlement history of the Stadland in the early Middle Ages has not been archaeologically proven, however it was probably similar to the developments in the neighbouring Weser regions. During the migration period, in the 5th/6th century AD, the settlement activity decreased strongly, although the latest investigations reveal a fall of the sea level during this period.

Large-scale settlement activity can only be proven again from the 7th/8th century. Once again the settlements are built at ground level, and later with rising sea-levels they were again being built on mounds.

The first dykes, the ring dykes, were probably built in the 11th century. They were to protect the settlements, as well as the economic areas immediately surrounding them. Only in the 12th/13th century were continuous dyke lines built.

In the 11th century the areas of settlement were extended. They were triggered by the inhabitants of the mounds, thus about 400m south-west of the village-mound of Havendorf is the farm-mound of Havendorferberg. Excavation has shown that the oldest settlement level is about 1.40m above sea level and is a foundation dating back to the 11th century.

The oldest church foundation of Stadland is thought to be Saint Matthew on the church-mound of Rodenkirchen. It is one of many churches along the Weser, which were built from the sandstone of the Weser hills. Apart from a possible timber-frame construction, the first to be made of stone dates from the second half of 12th century.

Disastrous storm floods led to regional changes in the late Middle Ages. Jade Bay was flooded in 1219 and 1287. The "Grosse Mantränke" (The Marcellus Flood) of 1362 extended Jade Bay considerably and with the creation of the Lock Channel a connection with the Weser emerged. The maximum expansion of Jade Bay was in 1511 with the Antoni flood. The previous moor areas decreased to the size of today's Sehestedt Moor outside the dyke.

After the chieftains rule in Frisia, and their expulsion in the spring of 1414, the Stadland became the property of the town of Bremen, thus ending its autonomy. In 1514 Stadland with its five parishes fell to the Count of Oldenburg. Since that time the history of the area is closely connected to the house of the counts of Oldenburg.

3.2 Early Modern Times

In the 16th century the reclamation of land began in the area of Jade Bay. In 1591 and 1643 the Lockfleth was finally closed. The "Seefeld" was reclaimed and made available for settlement. The church of Seefeld was consecrated in 1676. The new villages were mainly linear settlements in the immediate vicinity of the dykes. Roughly 200 years ago the peatland colonisation began with the settlement on the bog with the "Heuerlingsstellen" called workers lodges. It was only between 1721 and 1725 that a dyke was built over the Sehestedt Moor. By the end of the early modern times the development of the marsh areas had progressed significantly, so that in many areas the settlements and open fields had a similar character as today although the social structure has changed. The development of big farms has affected the appearance of the mound-villages.

3.3 Modern Times

The marsh has always been used for agriculture. In the “young marsh” meadowland with pastures dominate. What once created wealth, is an agricultural problem zone today. As a consequence tourism plays an increasingly important economic role.

The settlement landscape has only changed slightly. There are isolated centres of administration, which remain relatively small. The majority of the settlements consist of long linear developments which are on the old and new dykes as well as along the edges of the peatland. In addition there are several dispersed single farms. Some places like Schwei or Rodenkirchen have taken on the appearance of scattered villages. The meadow-fields of the Stadland show a difference between the older and the younger fields. The former comprise irregular block-meadows in the old colonised embankments, these are also present in the area of the more recent Seefeld, which is demesne land. The younger meadows are more regular in plan. This can be seen in the strip-shaped fields in the newer marsh and the peatland areas. The community of Stadland in its present form was formed in 1974 from the formerly independent communities of Rodenkirchen, Schwei and Seefeld as well as the farming community Kleinsiel. Rodenkirchen is the principal settlement and the seat of local government. Nowadays there are roughly 8.000 people living in the community. Of these approximately 4.000 people live in Rodenkirchen, which is also the school and sports centre. Seefeld only originated in 1643 when dykes were built and land reclaimed. The area is predominantly agricultural with a cultural centre at Seefeld Mill. Schwei has approximately 1.500 inhabitants. The smallest place with approximately 800 inhabitants is Kleinsiel, famous for the neighbouring nuclear power-plant of Unterweser.

4. Modern development and planning

In its regional planning report of 2005 the Federal Office for Building and Regional Planning classified Stadland amongst other areas in which the development of the population and their employment is marked by stagnation or a slow growth.

The designation of specific building areas with favourable property prices has led to the construction of detached family houses and thus to a slight increase in the number of inhabitants in the villages. With its population density of less than 50 to 100 inhabitants per km², the Stadland is a thinly populated area. Only on the Weser the density with more than 100 is a little higher. The increased use of land for building and traffic is described as being average, the development of traffic as being slight.

4.1 Land use

The Stadland is a classic river marsh area with embankments and low lying pastures. On the embankments there is arable soil with a high yield. With sufficient flood control the land is suitable for intensive agriculture. However, the greater the distance from the shore, the worse the quality of the land and the conditions for its use become. The soil gets heavier, continual deposition of sediments leads to compression levels, which make the grounds impervious and create waterlogging. Additional drainage and fertilisation does however raise the yields. The Sietland with its marsh and peaty soils is exclusively used as meadowland, because the ground-water level is too close to the surface to permit arable use. Locally, in the area of Jade Bay, the turf was covered with clay and then worked. The prevailing farm economy is cattle pasturage with the keeping of dairy cattle- and fat stock as well as cattle and some horse breeding, made possible by extensive meadowland with a long vegetation period.

The river marsh area is practically without trees. The embankments have been cleared since the beginning of settlement in the area and the peatland areas have no trees. Thus the administrative district Wesermarsch with a forestation-quota of only 0.7% can be described as being nearly empty of woodland.

The main economic focus lies, except for agriculture, increasingly on tourism. The number of the farms is decreasing steadily, as for example in Schwei or Seefeld. Many farms have been converted, into holiday homes. Nowadays, the proportion of people employed in

agriculture is less than 14% and it will fall with increased intensification and farm sizes, as well as the adaptation of the area used to operational constraints.

In spite of the changes the original rural and craft culture has still been preserved: Big old farms, green meadows with milk cows and roads with avenues of trees bent by the wind make up the landscape.

4.2 Settlement development

Business commuter traffic is particularly vital for the marsh areas with a little industry traffic to and from trade locations in the immediate coastal regions such as Wilhelmshaven, Bremerhaven, but also with Bremen or Oldenburg and to the neighbouring lower Weser harbours of Elsfleth, Brake and Nordenham. The commuter-balance of 2004 is up to just below 25%. There is little industry, apart from the nuclear power plant in Unterweser. The characteristics of Stadland are low intensity as far as the establishment of companies and weak development of opportunities for employment are concerned.

Stadland does not have a state or regional museum or even local museums. The church of Rodenkirchen is a local attraction. In 1629 Ludwig Münstermann created the altar, in 1631 the pulpit and in 1637 the grave inscriptions. The church of Saint Secundus forms the focal point of Schwei. Here too L. Münstermann created the altar, the pulpit and the cover of the baptismal font.

In Seefeld the Seefeld mill has been restored and turned into a cultural and event centre, which is organised by a cultural society. In the immediate vicinity the floating bog of Sehestedt, a natural monument, can be admired.

The communication centre of the nuclear power plant at Unterweser has meanwhile developed into a culture centre which regularly organises exhibitions of paintings.

The "Bronze Age House Hahnenknoop" reconstructed the excavated house and opened it to the public in 2005. The house is sited in a field behind the mill of Hahnenknoop, south of the original settlement-area. In that way a tourist attraction was created in a community short of museums. The "Roonkarter Mart" which takes place every autumn in Rhodenkirchen, attracts many visitors.

A sign-posted cycle track-network, 220 kilometres in length, which is connected to the Weser-cycling route, offers tourist opportunities. In addition the cycle path "German Floodgate-Route" with a length more than 200 kilometres in length, runs through the administrative districts of Wesermarsch and Stadland.

Along the Weser, close to Kleinsiel, there is an approximately one kilometre long natural beach, which is going to be turned into a recreation area. A camping- and caravanning site is being planned to upgrade the tourist facilities.

4.3 Industry and energy

Despite improvements in traffic links there is a lack of industry coming into the area, This is reflected in a relatively high rate of unemployment. The nuclear power plant at Unterweser of Preussen Elektra is an industrial centre, which is due to close in 2013 due to the agreed phasing-out of nuclear power. Otherwise there are only isolated small and medium-sized companies in the construction area, metal construction as well as trouser manufacturing.

Close to Seefeld there is a large wind energy park. In the meantime numerous wind turbines in the community have changed the appearance of the landscape somewhat.

4.4 Infrastructure

The motorway-connections A 27 and A 29 can be reached on average in 10 or 25 kilometres from the historic unit of Stadland. The regional main traffic is carried by the federal roads B 212 and B 437, as well as via the Weser tunnel opened in January 2004 which should interconnect the economic areas of the lower Weser better. The ferryboat-connection, which had existed since 1644 from Kleinensiel to Dedesdorf on the other side of the Weser, was stopped in 2004 due the construction of the Weser tunnel. Country and high roads are the other possible connections within the community.

The rail traffic between Bremen and Nordenham runs via Stadland with possibilities of stopping at the railway stations in Rodenkirchen and Kleinsiel.

5. Legal and spatial planning aspects

For geological / geographic reasons Stadland can be divided into three segments: 1. the strip along the Weser with the main villages Rodenkirchen and Kleinsiel which is mentioned in the land planning programme of 1969 as a focal area, 2. western Stadland with Schwei and seven other farming communities which are characterised by marshy soil, and finally 3. the region of Seefeld which was reclaimed by erecting dykes. Both these regions are classified as specially weakly structured areas.

As far as regional planning is concerned, the Stadland community is subject to Lower Saxony's land planning programme or the regional landscape- or land use planning programme put forward by the communities. In addition, in terms of planning Bremen's regional development concept of inner-state co-operation is relevant.

For the period 2000 to 2006 the administrative district of Wesermarsch belongs to Lower Saxony's Aim 2-area of the EU's – structural policy. At the moment suggestions are being discussed for the support of rural areas for the period 2007-2013. In accordance with these suggestions, sources such as agriculture, tourism, crafts and businesses should become mainstays for the rural economic areas. Already in 2001 the administrative district Wesermarsch had presented its own concept for the development and preservation of the historic area. On this occasion, small projects from the areas of tourism, regional products, nature and culture should be promoted and implemented. In addition, since 2004 the Wesermarsch is a project partner in a trans-national project for the "Guidance of the Structural Change in the Rural Regions of the North Sea Coasts Area ". Here questions such as traffic and transport, economic development and social matters are at the core.

Culturally Stadland belongs to the area of the old dukedom of Oldenburg and is part of the historical area of Oldenburg.

6. Vulnerabilities

6.1 Spatial planning

The establishment up of intensive industrial zones and commercial areas to improve the economic situation necessarily leads to disturbances of traditional structures. However, up to now Stadland has been untouched by such developments, apart from the industrial area "Hiddingen-Weserquerung" and there should be the opportunity to integrate cultural heritage into any strategic planning for the area. .

6.2 Settlement

Linear settlements along the roads and dykes as well as long slim pastures mark the hinterland. The changes brought about by the building of industrial zones, expansion of settlements and the attempt to strengthen tourism makes the original settlement structure vulnerable to change.

6.3 Agriculture

The biggest problem for the preservation of the cultural landscape of Stadland is the emerging change in the use of space. Above all this concerns agricultural production and the search for new structures of employment, which have already begun with tourism and which will intensify even more. International pressure and the pressure of use resulting from international competition will probably drag an adoption of the agricultural means of production to economic practical constraints along. The reduction in the number of farms – the so-called "dying of farms" – is the inevitable consequence and can be seen already in some inland communities.

6.4 Tourism

Modern mass-tourism can lead to the loss of authentic structures. In addition, necessary commuter movements could provide the loss of local reference.

6.5 Industry and energy

The creation of wind farms has a direct impact on the visual cultural heritage of the area.

6.6 Infrastructure

It is possible that work along the rivers, particularly the widening of shipping channels, may expose prehistoric and medieval cultural strata/layers which will then erode unnoticed.

7. Potentials

7.1 Settlement

Despite modern influences the cultural landscape of Stadland has been able to retain its special character. Wide marshes prevail, in which the single yards and villages stand out clearly on the dwelling mounds and even today in combination with the dykes give it its distinct appearance. Linear settlements along the roads and dykes as well as long slim pastures mark the hinterland. Despite the changes brought about by the building of industrial zones and the attempt to strengthen tourism, it is sensible to maintain these structures. Careful integration of the cultural heritage into new development proposals provide the potential to both protect and promote the cultural heritage of the area.

7.2 Tourism

The increasing tourism in Stadland provides the opportunity to promote the cultural heritage of the area. Careful conversion of redundant farms provides the opportunity to retain the buildings. The cycle network can also provide the opportunity for cultural trails through the area.

8. Sources

Author: Frank Both

Behre, K.-E., Kučan, D. (1999): Neue Untersuchungen am Außendeichsmoor bei Sehestedt am Jadebusen. Probleme der Küstenforschung im südlichen Nordseegebiet 26, 1999, 35-64.

Bundesamt für Bauwesen und Raumordnung (BBR) (2005): Raumordnungsbericht 2005. Berichte 21, Bonn

Ey, J. (1991): Hochmittelalterlicher und frühneuzeitlicher Landesausbau zwischen Jadebusen und Weser. Probleme der Küstenforschung im südlichen Nordseegebiet 23, 1991, 265-315.

Ey, J. (2000): Die Jedutenhügel bei Volkers, Grebswarden und Schmalenfleth. In: F. Both (Red.), Archäologische Denkmäler zwischen Weser und Ems. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 34. Oldenburg 2000, 450-452.

Först, E. (1991): Zur Besiedlungsgeschichte der Flussmarsch im Kreis Wesermarsch. Veröffentlichungen der urgeschichtlichen Sammlungen des Landesmuseums zu Hannover, Bd. 37. Hildesheim 1991.

Graf Finckenstein, A. (1975): Die Geschichte Butjadingens und des Stadlandes bis 1514. Oldenburger Studien Bd. 13. Oldenburg 1975.

Haiduck, H. (1999): Die mittelalterliche Baugeschichte der Kirche von Rodenkirchen nach archäologischen und kunstgeschichtlichen Befunden. Archäologische Mitteilungen aus Nordwestdeutschland 22, 1999, 99-121.

Hannemann, M. (1954): Der Landkreis Wesermarsch. Die Landkreise in Niedersachsen Reihe D, Bd. 10. Bremen-Horn 1954.

Krämer, R., Fansa, M. (1991): Bodenfunde aus der Wesermarsch. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 5. Oldenburg 1991.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Seedorf, H.H., Meyer, H.H. (1992): Landeskunde Niedersachsen, Bd. I, Historische Grundlagen und naturräumliche Ausstattung. Neumünster 1992.

Seedorf, H.H., Meyer, H.H. (1996): Landeskunde Niedersachsen, Bd. II, Niedersachsen als Wirtschafts- und Kulturräum. Neumünster 1996.

Schütte, R. (2000): Die Strohauser Plate. Entwicklung, Verwaltung und Nutzung der Weserinsel bis zum Ende des 2. Weltkrieges. Oldenburger Jahrbuch 100, 2000, 27-48.

Strahl, E. (2004): Erste Bauern in der deutschen Marsch. Die jungbronzezeitliche Siedlung Rodenkirchen-Hahnenknooper Mühle. In: ArchäologieLandNiedersachsen. 25 Jahre Denkmalschutzgesetz – 400 000 Jahre Geschichte. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 42. Stuttgart 2004, 516-519.

Friesische Wehde, LS

1. Overview

Name:	Friesische Wehde
Delimitation:	Jadebusen, the river Jade, the river Wapel in the east and continental raised bog in the west, neighbouring entity Land Ostfriesland, the north of the Friesische Wehde borders on the river Bitze, and in the south on the neighbouring entity Land Ammerland and its continental raised bog.
Size:	ca. 271,78 km ²
Location:	A rural district in the south of Friesland, Nordsee, Jadebusen Lower Saxony, river Jade, river Bitze, Wilhelmshaven, Germany
Origin of name:	'Wehde' derives from the Frisian word for forest and indicates a formerly wooded area.
Relationship/similarities with other cultural entities:	Villages on dwelling mounds, Frisian farmhouses called Gulphaus, Geest ridge of Oldenburg and East Frisia, slightly wavy Geest, marsh, scattered settlements (Köttersiedlung), loosely grouped settlements near Büppel southeast of Varel, brick works in Bockhorn
Characteristic elements and ensembles:	Villages on dwelling mounds, Frisian farmhouses (Gulphaus), geest, marsh, scattered settlements (Köttersiedlung), loosely grouped settlements, brick works straight roads and paths, often running parallel to the dyke lines. Single farmsteads and settlements are aligned along these roads and paths. Neuenburger Urwald forest. Bronze Age boardwalk across the moor between Büppel and Jethausen is of particular note

2. Geology and geography

2.1 General

The Friesische Wehde consists of a 20-25 km long Geest and marsh strip and one part of the Geest ridge of Oldenburg and East Frisia (Oldenburgisch- Ostfriesische peninsula). The Friesische Wehde belongs to the administration of the district of Frisia. Zetel, Bockhorn, Neuenburg and formerly Varel belong respectively to the former communities of that name.

Contrary to the rest of the district, which lies mostly in the marsh, the Friesische Wehde lies on a Geest ridge which only borders the coast in a few places and therefore offers a coast safe from flooding (e.g. at Dangast). Because of its location between the rich Frisian marsh and the Geest of Oldenburg, as well as the harbour of Varel, the Friesische Wehde always used to be a centre for trade. Neuenburg, for example, was built as a border stronghold and possibly as a customs office between East Frisia and Oldenburg.

The geomorphology of the region is dominated by two elements: the ground moraine of the Geest of East Frisia and Oldenburg and the raised bogs in the district of Frisia. An important feature in East Frisia and Frisia are the Fehn channels, built for the transport of peat and the drainage of the raised bogs. Ditches constructed chiefly for drainage in advance of peat cutting are mainly found in the bordering moor regions.

The small towns of Horsten, Zetel, Bockhorn and Varel are concentrated on the rim of a c. 15m high Geest ridge. Typical of the Friesische Wehnde are the straight roads and paths, often running parallel to the dyke lines. Single farmsteads and settlements are aligned along these roads and paths.

2.2 Present landscape

The Friesische Wehnde lies between the raised bog complex of East Frisia and the rivers Jade and Wapel. In the east of the region, the raised bogs of Spolzener Moor and Basenmeersmoor are located, in the south west is the Lengener Moor near Westerstede and in the south there are raised bogs on the border with the Ammerland. The Friesische Wehnde is characterised by the contrast between the Geest and the marsh. Based on this, a landscape developed which differs notably from the other Geest and marsh areas of Lower Saxony.

The Geest landscape of Friesische Wehnde occupies the southern third of the district. The relief is slightly undulating and in the north east there is a range of low hills which are dissected by streams and valleys. The Geest ridges reach heights of 16.5m above sea level, the lowest valleys lie only 1.3m above sea level. In the valleys and in the transition zones close to the marsh there are also fens and humid sandy valleys which are partly interspersed with bands of marsh soils (e.g. in the region of the Zeteler Tief).

The feature which makes the Geest of East Frisia and Oldenburg so unique is the almost flat surface which ranges between 5 and 10 m above sea level and shows a stronger relief in the area of the dune landscapes. Numerous small rivers dissect the moraine plateau and characterise the landscape with its alternating moor areas and the sandy, drift-covered, moraine ridges.

The name Wehnde derives from the Frisian word for forest and indicates a formerly wooded area. Today the letter "l", derived from the noun "loh" (forest/ woodland), at the end of place names still indicates a formerly wooded area. Examples of such place names are Varel, Driefel or Ruttel. One of the greatest natural monuments of the Friesische Wehnde is the Neuenburger Urwald (virgin forest of Neuenburg). It is all that remains of the formerly great medieval Hudewald (or Hutewald).

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

After the last Ice Age storm tides changed the North Sea coast at the present Jadebusen. To the north of today's Jadebusen there used to be a several kilometre-wide coastal marsh strip, which had been created by the sea tides.

The most important morphologic process in all areas of the Geest was the extensive surface erosion, this may have amounted to as much as 25 metres in some areas. The post-glacial temperature rise and the melting of the inland ice caused a rise of the sea level. But this was neither a steady nor a constant development. Core samples from under the North Sea show that transgression was not only interrupted, but sometimes was even regressive.

The exact date of prehistoric settlement of the Friesischen Wehnde is based only on indirect archaeological evidence. However, considering the wider archaeological context, it can be assumed that the Friesische Wehnde was also part of local prehistoric and early historic developments. It can therefore be concluded that by the beginning of the post-glacial period, today's southern North Sea coast was dry land and the areas of the river marshes and Geest ridge were frequented by Mesolithic hunters-gatherers and their predecessors.

Since about 4000 BC the region was settled by groups of farmers. This process is evidenced by many prehistoric sites, e.g. at Neuenburg, Driefel and Ruttel. The Neolithic marks the change from a natural landscape influenced by a hunter-gatherer economy towards a cultural landscape characterised by agriculture. The landscape development of the Geest was largely influenced by this prehistoric land-use, with its extensive forest clearance and

the use of the resulting heathland. Important monuments dating to this period include the cairn to the east of Bockhorn with its large capstone and the barrows near Birkenfeld which are enclosed by stone circles.

The succeeding Bronze and Iron Ages (about 1000 to 600 B.C.) are also well represented by numerous sites like burial mounds and urn graves. The excavation of the Bronze Age boardwalk (1356 B.C.) across the moor between Büppel and Jethausen is of particular note, this seems to have provided a connection between the Geest and a harbour place on the Jade.

The first farming settlements of Germanic tribes arrived around 250 A.D. in the coastal area between the Ems and Elbe. Roman authors call these tribes the Chaukes. Although it is known that these tribes in the Weser-Ems region settled on dwelling mounds (Wurten), erected for protection against storm tides, there are hardly any dwelling mounds documented for the area of the Friesische Wehde.

There seem to have been dykes in the Friesische Wehde as early as the end of the 11th century. Commentaries on the Deichfrieden (dyke peace) in the "siebzehn Küren" (seventeen elections), a manuscript of the Rüstinger laws which dates back to the time of the Frisian freedom (12th to 14th century), refer to them. Despite this early construction of dykes, the settled marsh areas had to be abandoned due to rising levels of the storm tides (as with the parish of Dangast flooded by the Marcellus tide of 1362). The flooded areas and swamps became uninhabitable and the local population withdrew to the Geest and the Geest edge. Resettlement of the parts of the lost marsh areas only took place after dyke-construction in the years 1576 and 1578.

On the Geest edge are the small towns of Bockhorn, Zetel und Varrel, of which Bockhorn and Zetel are mentioned in documents of 1220-1423 A.D. The oldest buildings of these towns are the St. Martin Church in Bockhorn (1249 AD) and the St. Cosmas/Damian Church in Zetel which, in its present state, dates back to 1344 AD. These typical Frisian churches are built of erratic blocks of stone located on artificially built dwelling mounds.

Near Varrel-Jeringhave the earthwork of the Jedutenhügel survives (probably from a time between 512 – 1066 AD), its exact age and function are still unclear, it might have been a land mark or the site of a court.

In the vicinity of today's Geest settlements, medieval Eschböden survive, these were created by the laying down of grass or heath sods that had been previously laid down in the stables, in order to fertilise the depleted sandy soils. The sod cutting led to an increase in the amount of heath in the Geest. The heaths and raised bogs which developed were used as extensive pasture. Since medieval times these areas were colonised by Kötters, they usually lived in scattered or loosely-knit settlements. Examples of these Kötter settlements, which were built in loose rows, include the village of Büppel (founded about 1570 A.D.) south-east of Varrel and the nearby villages of Neuenwege and Rosenberge.

Because of timber-logging in the extensive deciduous woodlands, the Friesische Wehde had already gained economic importance by the second half of the 14th century. For this reason the Counts of Oldenburg tried to regain their old sovereign rights, which they had lost during conflicts with the Frisian chieftains in the area of the Friesische Wehde. A particular cultural monument from this time is the Neuenberger castle which was built in 1462 by the Count Gerd zu Oldenburg as a stronghold against the East Frisians. When the Friesische Wehde became part of the Oldenburg is not recorded, but it can be assumed that it happened by 1480. However, the territorial administration for parts of the Friesische Wehde is only officially documented since the time of the Peace of Zetel in 1517. These documents clearly state that Count Johann was granted the villages of Zetel and Driefel with their associated territories.

3.2 Early Modern Times

During the Thirty Years' War the Count of Oldenburg, Anton Günther, enlisted Danish auxiliary troops. The country was mostly spared pillage but the overall situation of the region only improved after the peace treaty in 1648. With the death of Count Anton Günther in 1667 the counties, including the Friesische Wehde, fell to the King of Denmark and the Duke of Holstein-Gottrop until 1773. After changing regencies, Oldenburg, which (under Count Peter Friedrich Ludwig of Oldenburg) had advanced to be a Grand Duchy, regained the sovereign rights.

The economy of the Friesische Wehde in those times was characterised by agriculture, with the addition of timber-logging, peat-cutting and clay-works. A striking feature is the small forest stand of the Oldenburgische Vogtei (1790-1799). The forest had been severely decimated because of extensive and lasting de-forestation for the building of dykes and strongholds as well as due to agricultural over-exploitation of the mixed forest economy (grazing, cutting foliage to use as litter and sod cutting).

Towards the end of the 18th century several settlements developed along Tiefs (drainage channels) and sluices. These included numerous businesses, trading houses, brick works and home weaving. This development became possible not only because of the population increase but also because of the profits made in agriculture which were available for investment.

The regional development of the Friesische Wehde also benefited from rich clay deposits of an unusually high quality. These clay deposits consist of a kind of yellow-banded clay which is mined in a depth of one to two metres (Bockhorner Klinker) and the Lauenburger clay which is mined down to a depth of 100 metres (red bricks). At the end of the 18th century the first commercial brickworks developed on these clay deposits. This industry was aided by the construction of brick roads in the early 19th century in the course of the development of the local public infrastructure. The production of the last hand-made bricks only ended in 1914, whilst the industrial brick production still forms an important economic feature of the Friesische Wehde.

A good example for this is the business association Vereinigte Oldenburgische Klinkerwerke GmbH which was founded in 1908 and is still sited in Bockhorn. The demand for bricks continually increased over the years and the name of Bockhorn became known all over Europe.

3.3 Modern Times

During the time of the French administration (1807 till 1814) the population as well as the trade in the Friesische Wehde suffered under the reformations and restrictions. Under the influence of the French-dominated Kingdom of Westphalia, the feudal system was abolished in 1808 and a communal constitution, as well as a new legal system, was introduced. During this time the Friesische Wehde consisted of the Canton Varel with the Mairien (parishes) of Bockhorn, Neuenburg, Varel and Zetel. After 1814 these reformations were revoked and the Grand Duchy of Oldenburg introduced new administrative rules and created new community structures and offices. This led to the foundation of numerous new settlements and was accompanied by a systematic drainage which allowed an intensive cultivation of the moor areas.

Since the 18th century home-weaving developed mainly in Zetel (Zeteler Leinen) but also in Bockhorn and Varel. The necessary flax was cultivated in the Friesische Wehde but also in the fertile marshes. During the 19th century an impressive upturn of the industry took place in the Friesische Wehde. Since the 1920s the cloth-weavers came under pressure because of the cheap cotton products from England.

Clothing factories developed alongside the weaving mills at the end of the 19th and the beginning of the 20th century. Following the 1950s the cotton and cloth weaving mills declined and had nearly vanished by the end of the century. The brick works on the other hand are booming. The demand for bricks increased with every year and the brick industry made the name of Bockhorn known all over Europe.

4. Modern development and planning

4.1 Land use

Unlike northern Frisia, the Friesische Wehde consists of a densely wooded region which is also characterised by Geest and moor areas which are used for agriculture and as pasture. Agriculture still plays an important role in the economic output of the region but has lost ground to the service sector. The share of manufacturing industries has declined by 18%, whilst the share of the private and public services sector has increased significantly. This progress is demonstrated by the influence of the structural change on the industrial concentration which has declined by 50%. However, the region has coped well with structural change as can be seen in the continual population increase during the last 15 years. But even though the indebtedness of region of the Friesische Wehde (especially Zetel) it lies below the national average, the unemployment rate is above the national average.

Forestry has ceased to be an important employer in the Friesische Wehde, partly because the forests have almost vanished due to intensive usage and partly because the remaining forest areas (e.g. the Neuenburger virgin forest) are placed under protection.

Today this area is used by tourism. The district administration is banking on a further development of tourism in the natural and cultural landscapes of the Friesische Wehde, e.g. in the moors and marshes or Geest landscapes. To encourage and feed the tourist interest in the unique culture of this region it is necessary to preserve the historic agricultural and technological structures (field structures, drainage ditches) and buildings, as well as historic settlements and their special characteristics.

A widespread system of hedges on banks of great cultural historic importance provide additional structural variety and fulfil important roles in the landscape. The lower parts of the Friesische Wehde are characterised by grassland and notable waterways. There are also some beech groves which form valuable small habitats. The areas of the Geest borders are also characterised by grassland but mostly used on a more intensive scale.

4.2 Settlement development

With a size of 608 km² the district of Frisia, to which belongs the Friesische Wehde, is the smallest of the districts in the Oldenburger Land. On the other hand it has the highest population density with 162 people per square kilometre.

The main settlement emphasis in the Friesische Wehde lies in the small towns of Varel, Zetel, Bockhorn and Neuenburg in the south. As a consequence most of the infrastructural facilities are concentrated in these areas. The diversity of the district of Frisia is shown not only in its landscape, but also in its cultural life. To preserve this diversity the Wadden Sea National Park was founded, this protects the salt marshes and tidal flats but is still open to tourism as a recreational area. Together with agriculture, trade and industry, tourism has developed significantly over the last few years. The tourist bureau of the district of Frisia counted 3.44 million booked overnight stays during the year of 2004. The officially recognised climatic spa of Neuenburg registers many thousands of overnight stays per year and lives mainly on tourism. The visitors of the Friesische Wehde are attracted not only to the close proximity of the North Sea but also to the wide marsh and moor landscapes (e.g. Bockhorner Moor) and the natural monument of the Neuenburger virgin forest.

The community of Zetel on the other hand does not depend as much on tourism as many other holiday resorts but nevertheless it also contains some sights like the church of Zetel and the North-West German School Museum. In the community of Varel there is the regional museum and the palace chapel of Varel which is one of the oldest buildings of the town. The first historic mentioning of the building of this church dates back to 1144; the richly furnished inside of the church is especially worth seeing.

4.3 Industry and energy

The Friesische Wehde is an economically rather poorly-developed region, but it is characterised by a large number of small and medium-sized businesses and sited close to several big industrial sites. Numerous industrial enterprises are based in the neighbouring towns of Wilhelmshaven, Rastede and Oldenburg. Then there is the brickworks of the Röben-Gruppe in Schweinebrück, one of the most important employers of the Friesische Wehde. Other important employers are the forwarding companies in Zetel, Schweinebrück and Collstede. During the last ten years vigorous efforts were made to create new jobs in the area of the Friesische Wehde. To this effect two medium-sized industrial parks were created in Driefel and Collstede.

The Bundesstatistikamt (Federal Office for Statistics) and the Institute for Economic Research of Lower Saxony prognosticate a population and employment increase for the region due to the planned schemes. These schemes relate to the expansion of the harbour of Wilhelmshaven, the extension of the wind farm in Varel as well as an expansion of the aircraft construction sites of Varel and Nordenham and the planned extension of the Hinterland connections.

4.4 Infrastructure

The Autobahn A 29 leads in the east of the area of the Friesische Wehde from north to south from Wilhelmshaven via Oldenburg to the Autobahn junction Ahlhorner Heide where it meets the A 1. This connection links the area to the national network of trunk roads. There is also the B 437 which runs through Bockhorn and Neuenburg from Friedeburg over Varel to the newly-built Weser-tunnel. On working days there are busses commuting almost every hour from Zetel to Varel, Wilhelmshaven and Westerstede. The railroad traffic in the Friesische Wehde can be called meagre at best. Public railroad transport only services the line Wilhelmshaven-Sande-Varel-Oldenburg-Osnabrück on a regular basis.

An important step towards improvement in the local traffic network would be the construction of the planned coastal motorway A22 which is going to lead from the Elbe crossing at Stade through the new Weser-tunnel near Rodenkirchen to the A 28 at Westerstede. It is going to pass the small towns of Varrel, Bockhornerfeld and Altjürden and meet the Autobahn A 29 at junction 10.

5. Legal and spatial planning aspects

The district of Frisia, and therefore the Friesische Wehde, lies east of the historic landscape of East Frisia. The differentiation of the names Frisia and East Frisia can be explained by the fact that this area belonged historically to the old Frisia but never was part of the county of East Frisia but of Oldenburg.

The Friesische Wehde consisted of the communities of Bockhorn and Zetel until in 1867 the community of Neuenburg was founded. In 1933 Bockhorn, Neuenburg and Zetel were combined and became the large community Friesische Wehde with its seat in Bockhorn. Together with the Council of Varel it became the newly-created district of Frisia but in 1948 the three old parishes were re-established.

In the course of the new regional and administration reformation (1972) in Lower Saxony the communities of Varel and Neuenburg lost their status as independent communities and were integrated into the large community Friesischen Wehde. The Friesische Wehde in turn was integrated in the district of Ammerland when the district of Frisia was disintegrated. This process was again revoked in 1979.

With regard to land use planning the communities of the Friesische Wehde are subject to the regional planning program of Lower Saxony respectively to the landscape framework plans and land use plans of the communities. Furthermore the regional development concept for Wilhelmshaven and the regional planning concept for the coastal sea of Lower Saxony have to be taken into account. The communities of the Friesische Wehde of Lower Saxony belong to the regional authority of Frisia.

6. Vulnerabilities

6.1 Settlement

The changing land use could endanger the unique cultural and natural landscape of the Friesische Wehde with its moors, hedges on banks, woodland biotopes as well as the Geest and the historic cultivated village structures and buildings. The expansion of tourism will put pressure on historic villages to expand.

6.2 Agriculture

For agriculture to adjust in its production quantities to the pressure of increasing competition of cheap foreign imports an extension of the productive areas is going to be necessary. This could result in a landscape characterised by mono-cultures which would remodel the typical landscape structures. In the future a changing land use planning affected by economic development impulses could have a negative influence on the historical landscape Friesische Wehde.

6.3 Tourism

There is increasing pressure across the area for a further development and enlargement of the tourist industry.

6.4 Industry and energy

The planned construction of a container deep water harbour in Wilhelmshaven (Jade-Weser-Port) will have an impact on its regional surroundings, including the Friesische Wehde.

6.5 Infrastructure

In regard to the increasing globalisation and the deep water harbour an industrial park (Jade Weser Park) is planned which will lead to the need to expand the infrastructure of the area. The increasing flow of goods is mirrored by a demand for efficient reloading points which in turn could cause a development of land and the establishment of businesses and employers. In this context some aspects have to be seen in a negative light: new settlements which are not integrated into the landscapes, larger industrial plants and commercial areas ruining the landscape as well as the additional strain caused by the expansion of the road networks, e.g. of the A 29 or the coastal motorway A 22. The improved accessibility of the Hinterland could cause a loss of Identity in the traditional means of living and local culture due to increasing commuting, new settlers with foreign background (regional as well as cultural) and mass tourism.

7. Potentials

7.1 Spatial planning

It is essential for the preservation of the historic cultural landscape of the Friesische Wehde that the major development such as at Jade-Weser Port and its associated infrastructure include the cultural heritage as an integrated part of the planning process. There is the potential to both protect and promote the cultural heritage within the spatial planning of the region if it can be integrated at an early stage.

A development concept has been issued by the Niedersächsischen Institut für Wirtschaftsforschung (NIW) (Institute for Economic Research of Lower Saxony) with special regard to the expected regional economic effects of the Jade-Weser Port on the town of Wilhelmshaven and its associated region. This concept is of great economic importance for the region of Wilhelmshaven. It encompasses not only the actual harbour extension but also the expansion of the infrastructure and the Hinterland connections as well as the development of a business park (Jade Weser Park). The area Friesische Wehde shows great potential especially in the field of maritime economy and also the fields of air and space industry seem promising, as can be seen in the Airbus plants in Varel and Nordenham.

Therefore the quality of the infrastructure between the different sites is gaining importance for the regional economic development. In this context a coastal motorway like the planned A 22 would be advantageous. It would provide a more speedy connection of the coastal sites, better integration of the industrial plants into the Hinterland and increase the number of short break tourists and commuters. This concept provides great potential if the cultural heritage can be clearly integrated with the proposals.

7.2 Settlement

In many places, e.g. in the small town of Büpel near Varel, in Neuenwege and Rosenberge, the old settlement patterns and structures (Köttersiedlung) are still visible and provide the potential to promote the cultural history of the area. Careful integration of the cultural heritage into planning proposals is essential to retain the layout and ambience of the settlements. There are also many cultural and landscape monuments like the Neuenburger Schloss, the churches of Zetel and Bockhorn, the Jeduten hill, and the Frisian castle hills.

7.3 Agriculture

The Friesische Wehde has preserved its charm of a cultural historic, agriculturally used landscape. Characteristic for the cultivation process of the Geest sites are the Eschböden which were created by a sod-cutting economy. This agricultural practice only ceased with the introduction of mineral fertiliser. Much of the historic field pattern survives with many hedges and trees on banks which is rare and provides the potential to preserve and promote the historic farming method.

7.4 Tourism

The importance of the region for tourism should be seen as a catalyst for the enhancement for other sectors of the comparatively economically underdeveloped region. Various cultural programs can be promoted, including events and exhibitions about the cultural monuments of the Jade-Weser region. Institutions dealing with the subject of (cultural) landscape are: The Coastal Museum in Wilhelmshaven, the regional museums in Varel and Friedeburg, the castle Neuenburg, the State Museum for Art and Cultural History of Oldenburg, the city museums of Oldenburg, the State Museum for Nature and Man of Oldenburg and the windmill in Varel. These institutions promote the cultural identity of the region and also present the results of the latest research in their exhibitions. There is the potential to promote cultural tourist routes either via car, bicycle or walking via these centres.

7.5 Natural environment

The Friesische Wehde shows a high structural diversity. Especially worth mentioning in this context are the protected Neuenburger virgin forest with its up to 800-year-old oaks, the Geest and moor areas which are used as fields and pasture as well as the marsh areas in the north and the salt marshes in the proximity of the North Sea coast (Jadebusen).

8. Sources

Author: Nils Schilke

Brune, Werner (Hrsg.): Wilhelmshavener Heimatlexikon in 3 Bänden 1986-1987

Bundesamt für Bauwesen und Raumordnungen (BBR) (Hrsg.) : Raumordnungsbericht 2005.
Bonn

Jung, Hans-Ulrich, Pohl, Martha & Weber, Kai (Hrsg.): Wirtschaftliche Entwicklungsperspektiven des Jade-Weser-Raums unter besonderer Berücksichtigung des geplanten Jade-Weser-Port/ Regionalwirtschaftliche Auswirkungen u. Handlungsnotwendigkeiten f. d. Stadt Wilhelmshaven u. d. Landkreise Friesland, Wesermarsch. Hannover, 2001. Bremen

Meyer, Georg (Hrsg.): Die Geschichte der Friesischen Wehde in 2 Bänden 1910, Reprint der Original-Ausgabe 1995

Niedersachsen / Landesamt für Bodenforschung (hrsg.): Geologische Karte von Niedersachsen : Bundesrepublik Deutschland, 1958. Hannover

Niedersachsen / Landesverwaltungsamt; Institut für Denkmalpflege(Hrsg): Archäologische Denkmale und Fundstellen in Niedersachsen, Aufsatzsammlung: Archäologische Denkmale im Landkreis Friesland / [Text: F. W. Wulf] , Niedersächs. Landesverwaltungsamt1986. Hannover

Schäfer, Rolf (Hrsg): Oldenburgische Kirchengeschichte erw. Aufl. 2005. Oldenburg Isensee

Schmidt, Heinrich (Hrsg.): Mittelalterliche Kirchengeschichte / Heinrich Schmidt. – 2005. Oldenburg.

Schmidt, Heinrich (Hrsg): Ostfriesische Landschaft; Ostfriesland und Friesland / Geschichte / Aufsatzsammlung; Lengen, Hajo van, Ostfriesland / Aufsatzsammlung, Ostfriesische Landschaftliche Verl.- und Vertriebsges., 2005. Aurich

Wulf, F.- W.: Übersichtskarte der geschützten Landschaftsteile sowie der urfrühgeschichtlichen Funde / F.-W. Wulf . - 1994.Hannover

Wangerland/Jeverland, LS

1. Overview

Name:	Wangerland/Jeverland
Delimitation:	North Sea, in the west the Harlebucht (Harlingerland) and further on the border to the district of Wittmund, in the east the Außenjade respectively the town of Wilhelmshaven, the southern boundary is rather uncertain and lies somewhere in the northern part of the Maadebucht
Size:	~ 285 km ²
Locations:	Marsh landscape in the northern part of the district of Friesland with the communities Wangerland, Jever, Schortens as well as in the eastern part of the community Sande, Lower Saxony, Germany
Origin of name:	From 'wanga', meaning grassland or plain
Relationship/similarities with other cultural entities:	Comparable both for its cultural and heritage landscape to Harlingerland and Auricherland and other cultural entities around the Jade and Weser. Shares the East Frisian "Gulf House" style.
Characteristic elements and ensembles:	East-Frisian "Gulf-house", dwelling mounds landscape, church and village dwelling mounds, settlements following the course of dykes, sluice harbours, irregular blocks of land of the Altmarsch (old marsh) region, organised strip fields of the Grodenmarsch region

2. Geology and geography

2.1 General

The cultural entity of Wangerland/Jeverland is in the northern part of the present district of Friesland. Wangerland forms the northern part of the Jeverland and is a historical name which dates back to the Frisian area wanga, meaning grassland or plain. The islands along the coast, the dune island of Wangerooge, as well as the unsettled flat sand plates of Minsener Oog and Oldeoog, are also part of the district area.

The Jeverland dates back to the historic territory of Jever which developed in the 14th century and combined the Wangerland, great parts of Östringen, as well as the Banter Viertel in the north-western part of Rüstringen. A precise definition of the boundaries of the Jeverland is rather difficult, due to changing political power structures and border conflicts as well as natural disasters which caused various territorial changes. Examples for these processes include the development of the small-scale immediate lordships of Inhausen and Kniphausen in the present area of the town of Wilhelmshaven towards the end of the 15th century, and the sea incursions in the medieval period of the Harlebucht and the Jadebusen.

To the north the Wangerland and Jeverland are bordered by the sea while the Außenjade and the Jadebusen form the eastern border. The southernmost districts reach almost to Sande. The western border originates in the 15th century separation of Ostfriesland and Jeverland (Oldenburg). This border remains such a strong institution in the minds of the people, that in 1977 the merging of the districts Wittmund and Friesland had to be reversed.

The Wangerland and Jeverland largely comprises a completely flat marsh landscape. Only in the south-western part of the Jeverland does part of the East Frisian-Oldenburger Geest, together with its towns of Jever and Schortens, reach far into the marshes. Along the Geest ridge there are many border fens, known as the Sietland. The marsh landscape can be divided into an old and a young marsh which differ clearly in their genesis and formation. The old marsh came into existence during the post-glacial sea-level changes in prehistoric times and has been settled since then. The young marshes on the other hand are the results of land reclamation schemes following medieval land loss to rising sea-levels. The younger marshes are mainly in the Crildumer Bucht area, west of the Jadebusen and in the Maadebucht. Most of today's coast line was in place by the end of the 19th century. The composition of the marshland soils echoes their origins. The old marshes comprise densely bedded, waterlogged, clay soils which support 'classic' grassland habitats, whilst the younger and sandier sea marshes make quite good arable land. The coast comprises tidal flats, dune islands and sand flats, these form part of the national park of Niedersächsisches Wattenmeer.

2.2 Present landscape

There is a stark contrast between the Jever Geest with its fens, birch trees, bank hedges and tree-lined roads and the wide-open sparsely-wooded marsh landscape. The old marsh strip in the north-east of the cultural entity covers an area up to 10 km wide and c. 15 km long. The shape and outline of this region can still be clearly distinguished in today's landscape at the Jadebusen, even after the re-dyking of the Harlebucht and the Crildumer Bucht. A very distinctive feature is the course of the road along the well preserved and slightly raised 14th century dike line which encloses the old marsh region. Its origin is well documented by place names such as Tettenser, Medenser, Wiarder or Wüppelser Altendeich (old dyke).

The contrasting history of the marsh areas is also reflected in the different land use and settlement structures which characterise the landscapes of the Jeverland. In the old marshes the fieldscape comprises small-scale irregular plots, in contrast to the regular large-scale blocks of land of the Grodenmarsch regions at the Jadebusen and in the Maadebucht. The old marsh is also characterised by dwelling-mounds (warf or terpen) with their buildings and trees. The Grodenmarsch regions are characterised by settlements aligned along the dyke lines. The buildings in both areas are characterised by impressive farm houses of the 'Gulf'-house type.

3. Landscape and settlement history

The Wangerland/Jeverland has a complex settlement history, and the marsh landscape in particular reflects man's continual struggle to reclaim and retain land from the sea, as evidenced by the characteristic dykes and dwelling mounds.

3.1 Prehistoric and Medieval Times

Large scale study of the North German mud flats and the adjacent Geest have successfully progressed, due to the efforts of the Institute of Historical Coastal Research and municipal, regional and local archaeologists. As a geologically recent area the Weser-Ems area is marked by quarternary deposits. The tidal river marshes of the Jeverland/Wangerland have developed since the end of the last Ice Age.

The exact date of the first settlement in the Jeverland/Wangerland is based on comparison with neighbouring areas. At the beginning of the post-Ice Age, today's southern North Sea coast was dry land and the North Sea coast was located in the area of the Dogger Bank. It is presumed that the Jeverland/Wangerland's tidal river-marshes were frequented during the Palaeolithic and Mesolithic period by hunter-gatherers. It is also possible that sites relating to this period of occupation are located beneath the marsh-soils and their millennia of sedimentary deposits.

The Geest has probably been permanently settled since the Neolithic, c. 4.000 BC, by farmers. However, the exact extent of this settlement is still unknown. The oldest surviving archaeological monuments are sited near Schortens: cemeteries consisting of burial mound cemeteries which have been in use since c. 2000 BC.

The standard of knowledge about the early settlement of the marsh is also fragmentary. There are sporadic settlement sites from the time around the birth of Christ. In the beginning the marsh settlements were built on flat ground. With the subsequent rise in sea level during the first century BC, the building of dwelling mounds began. These were formed by the heaping up of dung and clay to raise the settlement site above the surrounding marsh. There were several hundred dwelling mounds with villages, churches and single farmsteads scattered across the Jeverland, mainly erected during medieval and early modern times.

The increasing threat of continually rising storm tides forced the marsh population to build their villages on large joint dwelling mounds. The location of these settlements can still be seen in the rows of dwelling mounds in the old marsh. Like beads on a string, the mounds are aligned along the oldest areas of firm marsh land in the Wangerland and thus mark the fringes of the oldest settlement areas in this region. The village dwelling mound Ziallerns in the district of Tettens is unique. It probably is the best preserved and most self-contained unit of its kind in the Jeverland. Ziallerns lies in the old marsh on a system of priels (drainage channels) which probably once linked the Harlebucht and the Jadebusen. Boreholes have shown that the dwelling mound was erected over a ground-level settlement dating to the Roman Iron Age. The nearly circular construction, with a radial inner structure, is 200 m wide and almost 5 m high, and rising clear above the surrounding land. The mound is enclosed by a circular path from which other agricultural roads radiate like a spider's web into the landscape. Other impressive examples of villages on dwelling mounds are the Langwurten (long dwelling mounds) of Neuwarfen and Wüppels.

After the Conversion of the Frisians to Christianity in the 10th century, people began to build more and more churches. Since the mid 12th century wooden churches were replaced by massive granite stone churches. Churches were either built on separate mounds erected near the village dwelling mound, or in the centre of existing high village dwelling mounds. Many churches in the Geest, like that in Jever, are also sited on artificial earth mounds to make them more prominent in the landscape. In the Wangerland and Jeverland there is a unique concentration of Romanesque granite block churches, forming a very characteristic features of the landscape. The reasons for the building of such an unusual number of impressive churches in an agricultural setting within a short period of time during the 13th century are still largely unknown.

The construction of dykes began in the 11th century. The first ones were circular dykes which protected the fields and meadows of a village rather than the settlement itself. Later these systems were gradually extended, until they linked up to form the so-called Altdeich (old dyke) which enclosed the whole Wangerland. The old dwelling mounds were not however abandoned. Even though they were not strictly necessary anymore because of the safety provided by the dykes, they still protected the settlements from the soddenness of the ground during the winter months. Gradually the dwelling mounds merged to form villages, and the medieval settlement of the newly gained agricultural areas proceeded. Unlike the other marsh regions of the North Sea coast, the dwelling mound landscape of the old marsh of the Jeverland largely comprises widely scattered settlements. In the new marsh Deichreihensiedlungen (linear settlements along dykes) developed, as demonstrated to the north of the Maadebucht and south of Wilhelmshaven.

3.2 Early Modern Times

The settlement of the new marsh in the Crildumer Bucht began in medieval and early modern times. The principal settlement of the Wangerland since the medieval period was Hohenkirchen. The history of the region is however very complex. Originally the East Frisian

peninsula was divided into two counties, however this developed into an almost complete independence of the Frisian countries ("Friesische Freiheit") in the 12th century. The Frisian country communities were subject to a cooperative self-administration.

After the mid 14th century some members of the farmers' upper class developed as local potentates, known as chieftains. As a consequence, the 14th and 15th centuries were marked by power-struggles, with single chiefs trying to extend their spheres of influence. Competition between the chiefs included improving the appearance of their dwellings and surroundings and the construction of castles in the form of tower-like stone houses which were fortified by banks and ditches. None of these castles have been preserved in their original layout.

Whilst several small castles from the Renaissance (e.g. Rickelhausen near Westrum or Canarienhäuser near Waddewarden) have completely vanished, there are some good examples of this type of building, e.g. Groß Scheep near Wiefels and the particularly impressive Schloss Fischhausen near Wüppels, the latter underwent modification in 1578. The Sibetsburg used to be one of the most powerful castles of its time. Here the Rüstringer chiefs ruled until their downfall in 1433, this led to the rise of the dominion of Jever. Even though the castle was demolished in 1435 the castle hill as well as the bailey and the extensive system of banks and ditches can still clearly be seen in the townscape of Wilhelmshaven. The castle in Jever with its characteristic onion spire dates back to a defensive work of the 14th century, whilst today's representative four-winged structure was built in the 16th century. In Gödens and Kniphausen, the chiefs' residences of the 14th century have also been preserved, although they have undergone widespread modifications, as at the castle of Jever.

3.3 Modern Times

Agriculture is the traditional economy of the Jeverland. It has characterised and transformed the landscape, particularly in the last century. Several periods can be clearly distinguished which have led to distinctive changes in the land use, or in its intensity, in turn causing changes to the appearance of the cultural landscape. After the medieval settlement phases and the land reclamation around 1500 there was an increase in the agricultural productivity of the Jeverland.

The agricultural economy, which had been largely animal based changed to tillage after 1650 due to the influence of wider global economics. Strong population growth and a rising demand for food promoted the trade in grain as well as meat and dairy products. This led to a temporary domination of the cultivation of grain in the 18th and 19th centuries which was followed by a stronger emphasis on dairy production in the old marsh by 1900. A further change was caused by the beginning of the industrialisation of agriculture after 1950.

All these phases had different impacts on the cultural landscape of the Wanger- and Jeverland which still can be seen in today's landscape. One of the most characteristic features of this period is the "Gulf"-house. These impressive dwelling and farm buildings reflect the high productivity of the agriculture of this time. The acquisition of agricultural land and the enlargement of the farms resulted in the consolidation of agricultural enterprises and a lack of reallocation of land (Flurbereinigung) in the Jeverland. This had a positive effect on the preservation of traditional field systems. Relicts of a temporary boom of grain production, which should be definitely preserved within the modern landscape, are the ridge and furrow-systems (Wölbäcker), now largely relict in meadows.

4. Modern development and planning

Many characteristic features of the cultural landscape of Wangerland and Jeverland have been preserved until today: including the distinct landscape of dwelling mounds with its villages and big farmsteads. There have however also been changes to the landscape since the second half of the 20th century, which continue until today. The alterations result mainly from the agri-industrial structural change in agriculture. This has led to an emphasis on

agricultural techniques, ignorance of the natural environment, and the loss of employment in agriculture. In addition there are new claims on the land, like tourism which is pushing into the hinterland of the coasts and wind-power. One of the biggest infra-structure projects of Lower Saxony is planned in the neighbouring Wilhelmshaven, the Jade-Weser-Port.

4.1 Land use

Wangerland and Jeverland are dominated by an agricultural economy, and agriculture is the principal land use in this region and cause of the cultural landscape. Because of the different soil conditions the agricultural use varies according to area: the older parts of the marsh, with their heavy, wet soils, are mainly used as pasture, whilst the younger parts of the marsh along the coastline and beside the Außenjade are used for corn growing. There is no increase in the growing of renewable resources even though there is a new law (Erneuerbare-Energien-Gesetz [EEG]) to promote the cultivation of those plants. Corn-growing is still economically productive.

The abolition of the milk quota will pose a problem for the economy of the older marshes with its high percentage of grassland. There are only very few possibilities for these farmsteads for independent conditioning. In addition the payments for not using the meadows as pasturage are not sufficient to ensure a farmers income. Therefore, a program especially for cattle farmers of disadvantaged areas is needed. There are for example of the Lower Saxonian "Agri-Environmental-Program" of the Ministry of Agriculture promoting pasturage. A complete change to the historic agricultural use of this area would have devastating consequences for the preservation of the historical cultural landscape.

The change in agricultural practices, which lead to bigger cattle herds and a movement to new, larger farmsteads on the outskirts of the villages, have also affected the characteristic settlement structures. These new farmsteads with modern stables or chicken-mast-houses dominate the landscape.

Many of the cultural monuments, which were originally used for agriculture, have lost their function because of this change, and their upkeep is neglected. Only 30 to 70% of the older farm-buildings are still in use today. In addition the modernising of the rural infrastructure can cause damage to single monuments or parts of ensembles. Thus the facades of historical buildings will be changed by introduction of insulation and the old surfaces of streets be altered by the addition of tarmac or concrete (this latter change is particularly pertinent to the important cobble-stone pavements [Klinkerstraßen] in the Wangerland). The introduction of an energy-pass by the energy-saving decree (Energiesparverordnung [EnEV]) will have a particular impact, as houses which do not meet the standards of the decree will suffer from depreciation and the modernisation of building for the sake of saving energy will be encouraged.

4.2 Settlement development

There is an increasing need for land for housing, especially around the main towns of the region like Jever, Schortens, Sande, Hohenkirchen, near the sluices at the Jadebusen, and particularly around Wilhelmshaven. Prior to this, some districts of the city of Wilhelmshaven became somewhat abandoned. This tendency of consumption of land on the Geest, and even more obviously in the Marshes, leads to a loss of traditional settlement structures and the region's unique landscape. Urban development and administrative urban planning are absolute necessary to control the development, e.g. with concepts for an increasing inner-urban concentration. These problems will become even more pressing when it comes to the building of the Jade-Weser-Port. During the time of construction, between 2007 and 2010, a large quota of employees will be needed, and who will require housing. It is possible that there will be other more wide-reaching effects of the construction of this deep water harbour on the Jeverland, dependent on the establishment of local logistic services besides the freight trade.

Since the middle of the 1950's the coastal region has developed as an important recreational area. With 2 million overnight stays per year, tourism has become one of the most important sources of income in Wangerland, including the isle of Wangerooge. While the tourist opportunities in the marsh regions are mostly limited to "Holiday on a Farm", there are intensive recreation facilities concentrating around the sluices along the coast, which occupy large areas of land, e.g. campsites, resorts etc. There is also a growing tendency to establish these kinds of structures in the hinterland. A good example is the location in the neighbourhood of Hohenkirchen, where it is planned to install a new kind of recreation area with an artificial pond for swimming and a hotel on a former pit where sand has been removed.

The museum of the castle in Jever and the Institute of Historical Coastal Research (Institut für Historische Küstenerforschung) in Wilhelmshaven are two of the most important institutions for research and education. Their work is focused on the development of the cultural landscape of the Wangerland and Jeverland. A small regional museum (Heimatstube) on Ziallerns demonstrates the development of the dwelling mounds of the Jeverland.

4.3 Industry and energy

Whilst there are only a few industries in Wangerland and Jeverland, the Groden (what are these ?) are the most important locations for industry in the region. They were built one by one at the Jadebusen in Wilhelmshaven (Voslapper Groden, Rüstersieler Groden and Heppenser Groden). These highly visible industrial structures are now having an effect on the scenery of the Wangerland.

Wilhelmshaven, with its Oil-Harbour, the tanker discharge bridge and the NOW-Pipeline, has gained national significance as Germany's biggest harbour for crude oil. The NOW-Pipeline runs to the Rhein-Ruhr region and crosses the south-eastern part of Jeverland.

Wind energy plants have also had a lasting effect on the historical landscape of Wangerland and Jeverland in recent times. Since 1989 81 single wind turbines have been erected. The highest increase came from the "Bürger Windpark" near Bassens. Since the community of Wangerland was designated as a specific area for the purpose of gaining power by wind energy in its land utilisation plan (Flächennutzungsplan), the uncontrolled erection of wind energy plants had been stopped. Now no wind energy plant can be erected outside these specific areas anymore. In the future "Repowering" will encourage a reduction in the numbers of single installations and encourage their concentration on wind farms. Amongst other sites, it is hoped to remove single worn-out installations on the Hohenstiefersiel for the sake of the scenery.

4.4 Infrastructure

The problematic layout of the road network in the Wangerland and Jeverland, the water ways were used for traffic in to recent times. Trading goods were exported and imported over the sea. Even in the inland areas, the natural water ways, like the Tettenser Tief or the Hooksielier Tief, were used. During the most part of the year the clay roads were impassable and goods could not be transported. In the middle of the 19th century a path, called the "Wangerweg" which led from Jever to Hohenkirchen, was an important traffic route. This as an extension of the Frisian Hostway (Friesische Heerstraße) from Oldenburg to Jever. In Wangerland it belonged to a road network with its side paths linking up the parishes of the 16th century.

The historical road network has not changed until modern times in the Wangerland. The waterways are not important anymore but the main streets and roads follow the original road network which developed during the settlement of the land during the past centuries and follows the historical dykes.

Nowadays traffic from the south comes in over the A-29. Further on, the north-west and south-east connection are the main roads 210 towards Wittmund and B 436 towards Friedeburg as a by-pass. Some years ago the B 210 had been extended in the region around Jever. It now is a "Krafftahrtstraße" (clear way) of a "2 to 1"-system without any crossings. The same is planned for the area around Schortens. From there on the motorway will have

four lanes and lead to the harbour of Wilhelmshaven. The coastal motorway A-22, which is in planning, will bring a direct connection to the regions east of the Jadebusen and Hamburg.

The formerly well developed railway system in Wangerland and Jeverland was reduced since the second half of the 20th century. There is no direct connection to the coastal regions by train anymore. Since 2000 a private railroad company (Nord-West-Bahn GmbH) runs the lines in the area of Oldenburg-Wilhelmshaven-Jever-Wittmund. This has grown to be an attractive transport system for the region. During the construction of the Jade-Weser-Port it will be necessary to think carefully about a by-pass of Sande.

5. Legal and spatial planning aspects

The Wangerland and Jeverland belong to the rural district of Friesland. The northern part has the communities of Wangerland and Schortens, the western part the community Sande and the city of Jever. The north-western part of the county borough of Wilhelmshaven, which is its eastern neighbour, belongs to the Jeverland.

The regional program for spatial planning (Regionaler Raumordnungsplan [RROP]) from the 10th of September 2004 for the rural district Friesland, strengthens the more general aims of the Lower Saxonian state office spatial planning of the Wangerland and Jeverland and fixes the regional aims for its development. An individual contribution from the Office for Natural Protection is the landscape framework plan (Landschaftsrahmenplan) of the rural district of Friesland. It is the basis for the protection of historical cultural landscapes or parts of historical cultural landscapes of specific characteristics as well as special important historical elements of cultural landscapes like cultural, building or ancient monuments. The advice of the land utilisation plan of the communities will also have to be taken into account.

Another important basis for enduring and sustainable spatial planning in Jeverland is the innovative ideas of the inter-municipal co-operation of the districts of Friesland, Wittmund and the city of Wilhelmshaven. They took part at the program "Modellvorhaben der Raumordnung (MORO)" (pattern of tasks of spatial planning) of the Federal Office of Traffic, Building and Urban Development (BMVBS) as well as the "Flächenagentur Region – Friesland – Wittmund – Wilhelmshaven" (Agency for space of the region Friesland – Wittmund – Wilhelmshaven) which was founded in 2003.

Because of its historic origins in the district of Oldenburg, the rural district of Friesland, including the Jeverland, belongs to the "Oldenburgische Landschaft", whose duty it is to take care of the historical and cultural interests.

6. Vulnerabilities

6.1 Spatial planning

Strategic planning for large scale developments especially within Jeverland needs to consider the existing cultural heritage both in the form of surviving landscape as well as the buried archaeological deposits.

6.2 Settlement

The historic settlement pattern is important within this area and is vulnerable to the threat from development within the core and expansion around the perimeter. The historic farmsteads are also vulnerable to change of use away from traditional agricultural production.

6.3 Agriculture

Globalisation and competition with wealthy regions within Germany has led to more intensive agricultural production and an enlargement of farmsteads. Wide areas of the Jeverland, especially the older Mashas, are limited by its natural conditions and it is very difficult to intensify agricultural production. There is the possibility that the area could lose its economic attraction for agriculture, and there is the potential that farming will be abandoned on a large scale. Both these scenarios would result in the cultural landscape of the Jeverland being vulnerable to change.

6.4 Tourism

Tourism in the Wangerland depends at least in some parts more or less directly on reconcilable agriculture. If the agricultural basis is abandoned the landscape and structures within it will decline. On the other hand tourist use should not lead to the installation of large scale infrastructure without any reference to the natural and historic cultural landscape.

6.5 Industry and energy

Wind turbines and wind farms can have an adverse effect on both the visual historic landscape as well as the buried cultural heritage. The qualities of parts of this landscape are its openness and its quietness and these are at threat from continuing expansion of wind energy. The construction of more concentrated wind farms needs to consider both the visual landscape and the potential buried archaeological deposits.

7. Potentials

7.1 Spatial planning

It is essential for the preservation of the historical cultural landscape of the Jeverland that projects of communal co-operation in spatial planning include the cultural heritage as an integrated element. For the preservation of the cultural landscape a consistent and interdisciplinary co-operation between the Office for Natural Preservation and the Bureau for Conservation of Historic Monuments will have many positive effects.

7.2 Settlement

The historic settlement pattern is important within this area and has potential for being a resource to encourage tourism. Careful integration of the cultural heritage into planning proposals provides the potential both for the preservation and management of the historic settlements. The historic farmsteads have the potential to promote local agricultural production as well as to be carefully used as tourist accommodation.

7.3 Agriculture

Agriculture has been the main historic economy for this area and remains so. The area has not suffered as badly as other areas through intensification and many of the historic monuments associated with agriculture survive within the landscape. These have great potential to be promoted, protected and managed via tourism and protection via agricultural schemes. These features tell an important story for the development of this area and their value should be identified both to the local population and the incoming tourists.

7.4 Tourism

The high density of historic monuments and the good quality of the surviving historic landscape means that this area has a high potential for increasing its tourist value. The museum Jever and the Institute of Historical Coastal Research in Wilhelmshaven have the potential to be the focal points for the development of cultural tourism in the area.

8. Sources

Author: Ortrun Schwarzer

- Blischke, H. (1997): Die Marsch des südwestlichen Jadegebietes. – Geschichte – Gegenwart – Zu-kunft -. Unveröffentl. Projektarbeit am Inst. f. Landschaftspflege und Naturschutz der Universität Hannover. Hannover.
- Coldewey, H., Murken, T., Reinhardt, W. & Schrade, W. (1986): Wilhelmshavener Heimatlexikon 1. Wilhelmshaven.
- Coldewey, H., Murken, T., Reinhardt, W. & Schrade, W. (1987a): Wilhelmshavener Heimatlexikon 2. Wilhelmshaven.
- Coldewey, H., Murken, T., Reinhardt, W. & Schrade, W. (1987b): Wilhelmshavener Heimatlexikon 3. Wilhelmshaven.
- Ellenberg, H. (1990): Bauernhaus und Landschaft in ökologischer und historischer Sicht. Stuttgart.
- Entera (2006): Umweltbericht der Strategischen Umweltprüfung zum Niedersächsischen und Bremischen Programm für die Förderung der Entwicklung des ländlichen Raumes 2007-2013. Gutachten im Auftrag des Niedersächsischen Ministeriums f. d. ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz. Hannover.
- Ey, J. (2000): Der frühe Deich- und Sielbau. Archäologische Denkmäler zwischen Weser und Ems. Oldenburger Forschungen N. F. 13, 171–181.
- Haiduck, H. (1997): Mittelalterlicher Kirchenbau in Friesland. In: A. Sander-Berke (Hrsg.), Fromme Friesen. Mittelalterliche Kirchengeschichte Frieslands. Oldenburg, 51–80.
- Jürgens, A. (1982): Hohenkirchen ein Marschendorf im Wandel der Zeit. Jever.
- LANCEWAD (2001): Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. In: Common Wadden Sea Secretariat (Hrsg.), Wadden Sea Ecosystem. Wilhelmshaven.
- LRP LK FRI – LANDKREIS FRIESLAND (1996): Landschaftsrahmenplan Landkreis Friesland. Planungsgruppe Grün. Bremen, Jever.
- Luft, H. (1998): Fremdenverkehr im Wangerland. Fremdenverkehrsstruktur und –entwicklung der Gemeinde Wangerland. Wilhelmshavener Schriftenreihe Tourismuswirtschaft 4. Limburgerhof.
- Neidhardt, H. (1980): Baudenkmäler im Oldenburger Land. In: Oldenburgische Landschaft (Hrsg.), Führer zu Boden-, Bau- und Siedlungsdenkmälern. Oldenburg.
- Nitz, H.-J. & Jachens, U. 1993: Historische Geographie des mittelalterlichen Deichbaus. Abschlussbericht des Forschungsprojekts. Unveröffentl. Manuskript. 83 S., Geograph. Inst. d. Univ. Göttingen.
- Niedersächsisches Institut für Wirtschaftsforschung (NIW; 2005): Regionalbericht Norddeutschland 2005. Hannover.
- Reinhardt, W. (1969): Die Orts- und Flurformen Ostfrieslands in ihrer siedlungsgeschichtlichen Ent-wicklung. – In: J. Ohling (Hrsg.), Ostfriesland im Schutze des Deiches 1. Pewsum, 201–375.
- Rüther, W. (2000): Gulfhäuser-Verzeichnis. In: Ostfriesische Landschaft & Niedersächsisches Landesamt für Denkmalpflege (Hrsg.), Gulfhäuser in Ostfriesland. Kartgraph. Darstellung. Norden.
- Salomon, A. (1986): Historisch-Landeskundliche Exkursionskarte von Niedersachsen, Teil 10. Blatt Wangerland, Hooksiel-West. 1:50 000. Erläuterungsheft. Veröffentlichung des Instituts für Historische Landesforschung der Universität Göttingen. Hildesheim.
- Schenk, W. (1963): Die Verkehrswege im Landkreis. In: Landkreis Friesland (Hrsg.): Der Landkreis Friesland. Geschichte, Kultur, Landschaft, Wirtschaft. Oldenburg, 19–22.
- Schwahn, C. (1997): Kriterienbildung einer ästhetischen Bewertung von Marschenlandschaften. In: L. Fischer (Hrsg.), Kulturlandschaft Nordseemarschen. Hever, 189–200.
- Schwarzer, O. (2002): Landschaftliche Eigenart im Wangerland/Friesland – Grundlagenermittlung für die Landschaftsrahmenplanung. Unveröffentl. Diplomarbeit am Inst. f. Landschaftspflege und Naturschutz der Universität Hannover. Hannover.

Seedorf, H. & Meyer, H.-H. (1996): Landeskunde Niedersachsen 2. Natur- und Kulturgeschichte eines Landes. Niedersachsen als Wirtschafts- und Kulturraum. Neumünster.

Siemens, M. (1989): Getreidebau im Jeverland. Historische Grundlagen und technologische Entwicklung. In: U. Meiners (Hrsg.), Museums-Materialien des Schlossmuseums Jever 2. Jever.

Strahl, E. (2000): Ländliches Siedlungswesen im frühen und hohen Mittelalter (ca. 600 – 1200). In: Archäologische Denkmäler zwischen Weser und Ems. Oldenburger Forschungen N. F. 13, 108–121.

Streif, H. (1990): Das ostfriesische Küstengebiet. Nordsee, Inseln, Watten und Marschen. Sammlung Geologischer Führer 57. Berlin.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler (Hrsg.), Archäologie der ältesten Kultur in Deutschland. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Wulf, F.-W. (1986): Zur Inventarisierung archäologischer Baudenkmale im Landkreis Friesland. Oldenburger Jahrbuch 86, 267–289.

Wangerooge, LS

1. Overview

Name:	Wangerooge
Delimitation:	The island of Wangerooge is situated in the Wadden Sea of Lower Saxony. The administrative border lies at the line of the average high tide (MThw).
Size:	Approx. 4.97 km ² (administrative district of Friesland)
Location – map:	The most easterly of the seven islands in the Wadden Sea area of Lower Saxony. Its nearest neighbour is Spiekeroog.
Origin of name:	The syllable „Oog“ can be translated as island.
Relationship/similarities:	Frisian Islands, Islands of Lower Saxony, dune landscape, maritime landscapes and settlements.
Characteristic elements:	Barrier island, dune landscape, tree groves, Friesian building-types (Suderloog)

2. Geology and geography

2.1 General

Wangerooge is one of seven East Frisian Islands off the coast of Lower Saxony and is sited in the c. 2780 km² large national park Niedersächsisches Wattenmeer.

The island has a length of 8 km from west to east and a maximum width of about 1.4km.

Wangerooge is one of the barrier islands and has developed in the course of the interaction of wave energy and tidal range. Barrier islands originate from periodically flooded sand plates and develop first into flood-free beach banks and then into dune-covered islands. An important part of this process is the blowing of sand from the wet beach which initiates dune formation. The natural tendency is for the island to move in an easterly direction, with the loss of land at the western end and the deposition of sand at the eastern end. Thus much, and maybe all, of the earliest settlement has been lost.

2.2 Present landscape

At present, Wangerooge, is a dune-covered island affected by the steady interaction of low and high tide. To the south of the island are the mudflats of Lower Saxony. The islands are separated by deep tidal inlets, known as the Seegats.

The continuing destruction of the western part of the island shows that Wangerooge is still subject to constant change. The reason for this is the west-east sand drift which is induced by the interaction of the tidal currents on the one hand and the prevailing westerly winds on the other hand. The currents cause sand erosion in the west and sedimentary deposition to the east. In addition the sand reefs on the eastern Tipp of Spiekeroog break loose, and then move in an arc (Riffbogen) to the neighbouring island of Wangerooge to the east and deposit their sands in the middle or the east of that island. Efforts are being made on Spiekeroog to slow down this morphological process.

There are some trees on the island, chiefly within the settlement areas. Dunes, dune valleys and salt meadows are characteristic natural landscape elements of every East Frisian North

Sea Island. The western and eastern ends of Wangerooge is covered by dune complexes and salt meadows, and the vast beach on the eastern end of the island; the settlement is located in the area between them the settlement is located.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

In the course of the post-glacial period and the melting of the ice sheet, the North Sea reached the present-day coastal line by c. 5500 B.C. The transgressive North Sea, under the influence of waves and tides pushed a seam of sand in front of it, which progressively increased in size. This barrier zone of sand supplied the material for the sand plates which largely evolved in the slipstream of Geest cores and later developed into true barrier islands, the predecessors of today's dune islands. On the former beach bank systems and higher sand plates Wangerooge developed, as one of the barrier islands which align like a string of pearls from the west to the east. This process is still active today and induces a high natural dynamic to the natural space of the mudflats.

As a consequence of the geological development of Wangerooge, all remains of Palaeolithic and Mesolithic human activity, like settlement remains, burials etc., are covered by younger sediments and surface finds are not to be expected. But it can be assumed that the area now occupied by the island of Wangerooge was also inhabited in prehistoric times. Archaeological finds, however, would be buried deep beneath the sediments which would make it almost impossible to discover and retrieve them today.

Wangerooge is recorded first in medieval times, and it is thought that it was settled, in common with its neighbours, in the 13th or 14th centuries. In medieval East Frisia the influence of the Old Saxon language extended to the Geest ridge while in the marshes and on the islands the Frisian dialect prevailed. However these earliest settlements would have been very vulnerable to both the natural movement of the island eastwards and the occasional storm-floods; the Grote Mandrake Flood of 1362 was particularly devastating in this part of the coast.

3.2 Early Modern Times

To the first settlers of medieval and early modern times the island must have presented itself as a barren dune landscape with only sparse vegetation. They were caught in an incessant fight against a hostile environment. On the one hand there was nature with its storm floods and sand storms and on the other hand they had to defend themselves against attacks and pillaging which continued until the 16th century.

Next to fishing and some sheep farming, salvaging flotsam and jetsam was a further important source of income. The Western Tower was originally built on the eastern end of the island in 1597 as a navigational aid.

3.3 Modern Times

Napoleon's Continental System of 1806, which was supposed to prevent trade between the continent and the British Isles, also disrupted the seafaring activities of the people of Wangerooge. Thus the main source of income of the island dwellers ran dry and the population quickly sank into poverty, leading to emigration.

A lighthouse station was established in 1830, the Old Lighthouse was constructed in 1856 as a 39m high round stone tower clad in metal plates. It was closed in 1969 and now houses the Local museum. The New Lighthouse has taken over its original function.

Little is known about the origins of Wangeroog's development into a seaside resort, although it probably developed in response to the decline in the fishing industry and in emulation of the other spa-resorts on the neighbouring islands.

Wangerooge formed part of the Atlantic Wall defence system of the Second World War. It was extensively bombed in 1945. It is famous for the bizarre crash of two B-17 bombers in 1944, where the ball turrets of each plane impaled the chassis of the others. Most of the crew baled out leaving the pilots to successfully crash land the entangled planes.

4. Modern development and planning

The island of Wangeroog belongs to the district of Friesland and is therefore subject to the regional planning of the federal state of Lower Saxony. The basis for this is the Law for Regional Planning and Land Use Regulation (NROG) and its Supplemental Administrative Regulations (VV-NROG) of Lower Saxony. The aims and principles of the land use planning are defined in the Regional Planning Program of the Federal State of Lower Saxony (LROP). The LROP forms the basis of the Regional Planning Program of the Administrative Districts (RROP).

According to the regional planning report of 2005 of the federal office of building and regional planning Spiekeroog lies in a region in which the development of the population and employment is characterised by a significant growth. Since the middle of the 19th century this growth bases economically on the expansion of the tourism.

4.1 Land use

There is no intensive agricultural usage on Wangerooge. Neither does fishing play any longer any significant role for the island dwellers, having ended as a significant economic factor in 1900.

Since 1986 the island has been part of the national park Niedersächsisches Wattenmeer and divided into three different protective zones of varying intensity: Protective zone I (= quiet zone) has the strictest usage regulations. Here the protection of animals and plants takes priority. It may not be accessed „cross-country“ but only by hiking-, riding- and cycling paths which give visitors the chance to explore and enjoy nature without disturbing it. Protective zone II acts as buffer zone (= intermediate zone) enclosing the more strictly protected area. In the intermediate zone the main goal is to preserve the impression of the typical landscape. It may be accessed freely but like in the quiet zone it is prohibited to pick plants or take away any thing which is part of the natural environment. In the salt meadows of the intermediate zone protected bird species breed from the beginning of April till the end of July. These areas are specially marked. During the breeding season they may only be accessed by the paths. Protective zone III comprises the remaining parts of the national park with only slight regulations (= recreational zone). This quiet area acts as recreational area for human beings; e.g. no motor powered appliances are allowed here. Within the landscape the borders of the national park and the different protective zones are marked by blue signs with white writing.

In contrast to this is the role of tourism on the Wangerooge landscape. The main focus of tourism on the island is for recreation in close communion with nature. The village of Wangerooge has clinker-paved streets and red, usually low Frisian Houses, giving the impression of a self-contained island world which has managed to preserve its character. Cars are prohibited on the island.

4.2 Settlement development

There are c. 1,055 inhabitants, supplemented by a further 7,000 visitors on a dialy basis. Tourism is overwhelmingly the principal source of income and the architecture and activities are largely geared towards that. There is no State- or supra-regional museum, however the island museum in the Old Lighthouse presents the history of Wangeroog and its surroundings.

4.3 Industry and energy

At present there are no industrial or wind energy plants on Wangerooge.

4.4 Infrastructure

There are no cars (apart from emergency vehicles) on the island and transport is by foot, bicycle or a small train. Currently Wangerooge can be reached from Harlesiel by ferry, depending on the tides. There is also a small air-strip, with flights to Harlesiel, Bremen and Hamburg.

5. Legal and spatial planning aspects

The community of Wangerooge is sited in the administrative district of Friesland and belongs to Lower Saxony. With regard to land use planning, the community is subject to the regional planning of the federal state of Lower Saxony respectively of the landscape framework plan and the land use utilisation plan of the community. In addition there is the regional planning concept for the coastal sea of Lower Saxony. It is part of the Regional Structure Conference of East Frisia.

The territory of the community ends at the MThw line (line of the Average High Tide). The coastal sea below the MThw line is a „community-free area“. Accordingly, the regional and building plan only applies to the land but not to the marine area.

The presently valid regional planning of the federal state of Lower Saxony (LROP) contains only a few regional planning goals for the marine area. The area of the national park is registered at the EU for the Fauna Flora Habitat guideline (FFH) and therefore belongs to the biotope network system Natura 2000. The main part of the park lies within the territory of the EU water withdrawal guideline. In 1996 the Wadden Sea area within the borders of the national park was recognised by the UNESCO as biosphere reservation in the context of the program „Man and Biosphere“.

6. Vulnerabilities

6.1 Tourism

The promotion of nature-oriented ecotourism may create a situation which will alter the natural state of the island into an artificial-looking structure.

6.2 Natural erosion

The continuing erosion of parts of the island will result in areas of surviving cultural heritage monuments or buried archaeological deposits being lost to natural processes.

7. Potentials

7.1 Settlement

The historic settlement on Wangerooge still contains several of its historic buildings and provides the potential both for protection of the historic buildings and settlement layout and there promotion via the tourist industry.

7.2 Tourism

Tourism should be orientated in the direction of nature-related tourism, however, there is the opportunity to include the cultural heritage within this and develop further tourism via the cultural heritage assets. Since Wangerooge is part of the national park special emphasis is placed on the protection and preservation of these unique habitats and there is potential for this to be expanded to protect and promote the cultural heritage of the island.

7.3 Nature conservation

There is potential for the cultural heritage to be incorporated within management plans for the nature conservation on the island. By creating integrated management plans for both the natural and cultural environment the islands potential for carefully managed tourism can increase.

8. Sources

Author: Franziska Grieb

Gemeinsames Wattenmeer Sekretariat (Hrsg.; 2005): Das Wattenmeer. Kulturlandschaft vor und hinter den Deichen. Stuttgart.

Gutmann, H. (1990): Deutsche Nordsee-Inseln. In: HB-Bildatlas. Sonderausgabe 5. Hamburg.

Meyer-Deepen, H. und Meijering, M. P. D. (1970): Spiekeroog. Spiekeroog.

Maier, R. (1974): Ur- und frühgeschichtliche Denkmäler und Funde aus Ostfriesland. In: Wegweiser zur Vor- und Frühgeschichte Niedersachsens 8. Hildesheim..

Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft, und Verbraucherschutz – Regierungsvertretung Oldenburg – Landesentwicklung, Raumordnung (Hrsg.; 2005): Raumordnungskonzept für das niedersächsische Küstenmeer. Stand 2005. Oldenburg.

Petersen, J. und Pott, R. (2005): Ostfriesische Inseln. Landschaft und Vegetation im Wandel. Hannover.

Roterberg, P. (1983): Die Nordseeinsel Spiekeroog. Vom Fischerdorf zum Nordseeheilbad. Hamburg.

Spiekeroog, LS

1. Overview

Name:	Spiekeroog
Delimitation:	The island of Spiekeroog is situated in the Wadden Sea of Lower Saxony. The administrative border lies at the line of the average high tide (MThw).
Size:	Approx. 18,3 km ² (administrative district of Wittmund)
Location – map:	One of the seven islands in the Wadden Sea of Lower Saxony Spiekeroog lies between the islands of Langeoog and Wangeroode. The island community Spiekeroog is one of six communities in the district of Wittmund, federal state of Lower Saxony.
Origin of name:	The origin of the name Spiekeroog has been disputed and there have been many attempts for interpretation. Today it is assumed that the syllable „Oog“ can be translated as island. The word “Spieker” probably derives from the old-saxon word “Spick” which means storage. According to tradition Spiekeroog was used by the mainland dwellers as a “storage island”.
Relationship/similarities:	Frisian Islands, Islands of Lower Saxony, dune landscape, maritime landscapes and settlements.
Characteristic elements:	Barrier island, dune landscape, tree groves, Friesian building-types (Suderloog)

2. Geology and geography

2.1 General

Spiekeroog is one of seven East Frisian Islands off the coast of Lower Saxony and is sited in the c. 2780 km² large national park Niedersächsisches Wattenmeer.

The island has a length of 9.5 km from west to east and a north-eastern width of almost 2 km. It lies 5.7 km off the mainland.

Spiekeroog is one of the barrier islands and has developed in the course of the interaction of wave energy and tidal range. Barrier islands originate from periodically flooded sand plates and develop first into flood-free beach banks and then into dune-covered islands. An important part of this process is the blowing of sand from the wet beach which initiates dune formation.

2.2 Present landscape

At present, Spiekeroog, is a dune-covered island affected by the steady interaction of low and high tide. To the south of the island are the mudflats of Lower Saxony. The islands are separated by deep tidal inlets, known as the Seegats.

The continuing destruction of the western part of the island shows that Spiekeroog is still subject to constant change. The reason for this is the west-east sand drift which is induced by the interaction of the tidal currents on the one hand and the prevailing westerly winds on the other hand. The currents cause sand erosion in the west and sedimentary deposition to

the east, e.g. on the eastern Tipp of Spiekeroog reefs break loose which then move in an arc (Riffbogen) to the neighbouring island of Wangerooge to the east and deposit their sands in the middle or the east of that island. Efforts are being made to slow down this morphological process (morphogenesis) and to secure the western head of Spiekeroog by constructing large-scale protective measures.

Spiekeroog is known as a green island with many groves of trees, including a large number of trees within the settlement areas. Dunes, dune valleys and salt meadows are characteristic natural landscape elements of every East Frisian North Sea Island. The main western part of Spiekeroogs (some 4.5km long) is covered by dune complexes and salt meadows; in the transition areas between them the settlement is located. The remaining 5 km are taken up by the large sand plate with wide dune areas and salt meadows.

The village of Spiekeroog lies on the southern side of the island which faces the mainland. Clinker streets and low red Frisian houses dominate the face of the village.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

In the course of the post-glacial period and the melting of the ice sheet, the North Sea reached the present-day coastal line by c. 5500 B.C. The transgressive North Sea, under the influence of waves and tides pushed a seam of sand in front of it, which progressively increased in size. This barrier zone of sand supplied the material for the sand plates which largely evolved in the slipstream of Geest cores and later developed into true barrier islands, the predecessors of today's dune islands. On the former beach bank systems and higher sand plates Spiekeroog developed, as one of the barrier islands which align like a string of pearls from the west to the east. This process is still active today and induces a high natural dynamic to the natural space of the mudflats.

As a consequence of the geological development of Spiekeroog, all remains of Palaeolithic and Mesolithic human activity, like settlement remains, burials etc., are covered by younger sediments and surface finds are not to be expected. But it can be assumed that the area now occupied by the island of Spiekeroog was also inhabited in prehistoric times. Archaeological finds, however, would be buried deep beneath the sediments which would make it almost impossible to discover and retrieve them today.

According to the chronicles Spiekeroog was only settled in medieval times, it was first mentioned as „Eyland Spickeroch“ in a document of 1398. In medieval East Frisia the influence of the Old Saxon language extended to the Geest ridge while in the marshes and on the islands the Frisian dialect prevailed. This makes it quite likely that the Anglo-Saxon name Spick was transferred to the island without consideration of its true meaning. Spieker-oog therefore would mean Island of Spick in which Spick would mean store, albeit one which was not situated on the main land. The assumption of the existence of such a place called Spick near the present island of Spiekeroog is not improbable. During the course of the collapse of the Harlebucht in early medieval times the mainland in front of Spiekeroog up to the Geest ridge was largely destroyed, including probably the original island of Spick.

3.2 Early Modern Times

To the first settlers of medieval and early modern times the island must have presented itself as a barren dune landscape with only sparse vegetation. They were caught in an incessant fight against a hostile environment. On the one hand there was nature with its storm floods and sand storms and on the other hand they had to defend themselves against attacks and pillaging which continued until the 16th century.

Next to fishing and sheep farming, salvaging flotsam and jetsam was a further important source of income. Based on old settlement traces, discovered in 1832, it is assumed that in

the time before the 17th century an older village existed in the west of the island. However, nothing is known about the circumstances of its foundation or abandonment.

The oldest restored East Frisian Island church, which is found on Spiekeroog, dates back to 1696. At this time the island was 5.2 km long and 1.6 km wide. Besides the main island, there existed two smaller islands: „Lütjeoog“ (today's Lütjeoog-Dünen in the Westergroen) was sited south of the main island while „Oldeoog“ lay in the east on a plate between the tidal inlets „Alte Harle“ and „Harle“.

Until the construction of the stabilised banks on Spiekeroog the western coast of the island drifted annually ca. 3.5 m eastwards; between 1650 and 1850 it travelled a total of c. 900 m.

3.3 Modern Times

Napoleon's Continental System of 1806, which was supposed to prevent trade between the continent and the British Isles, also disrupted the seafaring activities of the people of Spiekeroog. Thus the main source of income of the island dwellers ran dry and the population quickly sank into poverty. Since the number of inhabitants then declined it is assumed that many inhabitants left the island during those years. From 1850 on the number of inhabitants of Spiekeroog has again steadily increased.

Little is known about the origins of Spiekeroog's development into a seaside resort. Towards the end of the 19th century, when the fishermen of Spiekeroog began to feel the impact of the competition from deep-sea fishing, new sources of income had to be considered and people began to let rooms to visitors. In the first years of the 19th century spa visitors began to frequent Spiekeroog and in 1846 the island was first mentioned as a seaside resort. In 1849 there were already c. 80 beds for guests available but they were still considered to be more of a sideline.

Until about 1880 seafaring was the main source of income for the island dwellers and the development of tourism only commenced slowly. But towards the end of the 19th century the number of spa visitors began to rise continuously. However, the simple task of reaching Spiekeroog proved difficult. It took two days just to get from Emden to Spiekeroog. In 1891 the first landing stage was built so that guests didn't have to any longer directly climb from the ferry into a horse carriage.

Today Spiekeroog is called "The Green Island", due to its many groves of trees. But until the middle of the 19th century the dune areas of Spiekeroog were still covered with white sand drifts, the vegetation canopy was not closed yet and there were no trees. Only a change in the living conditions led to a greening of the island. After the planting of beach grass, the banning of grazing domestic animals in the dunes, a ban on the cutting of beach grass as fodder or bedding, and the extermination of rabbits (hares were released instead), the paving of paths and the planting of trees did it finally became possible on Spiekeroog for a relatively undisturbed island vegetation to develop.

4. Modern development and planning

The island of Spiekeroog belongs to the district of Wittmund and is therefore subject to the regional planning of the federal state of Lower Saxony. The basis for this is the Law for Regional Planning and Land Use Regulation (NROG) and its Supplemental Administrative Regulations (VV-NROG) of Lower Saxony. The aims and principles of the land use planning are defined in the Regional Planning Program of the Federal State of Lower Saxony (LROP). The LROP forms the basis of the Regional Planning Program of the Administrative Districts (RROP).

According to the regional planning report of 2005 of the federal office of building and regional planning Spiekeroog lies in a region in which the development of the population and employment is characterised by a significant growth. Since the middle of the 19th century this growth bases economically on the expansion of the tourism.

4.1 Land use

There is no intensive agricultural usage on Spiekeroog. Neither does fishing play any longer any significant role for the island dwellers, having ended as a significant economic factor in 1900.

Since 1986 the island has been part of the national park Niedersächsisches Wattenmeer and divided into three different protective zones of varying intensity: Protective zone I (= quiet zone) has the strictest usage regulations. Here the protection of animals and plants takes priority. It may not be accessed „cross-country“ but only by hiking-, riding- and cycling paths which give visitors the chance to explore and enjoy nature without disturbing it. Protective zone II acts as buffer zone (= intermediate zone) and, like a coat, encloses the more strictly protected area. In the intermediate zone the main goal is to preserve the impression of the typical landscape. It may be accessed freely but like in the quiet zone it is prohibited to pick plants or take away any thing which is part of the natural environment. In the salt meadows of the intermediate zone protected bird species breed from the beginning of April till the end of July. These areas are specially marked. During the breeding season they may only be accessed by the paths. Protective zone III comprises the remaining parts of the national park with only slight regulations (= recreational zone). This quiet area acts as recreational area for human beings; e.g. no motor powered appliances are allowed here. Within the landscape the borders of the national park and the different protective zones are marked by blue signs with white writing.

In contrast to this is the role of tourism on the Spiekeroog landscape. The main focus of tourism on the island is for recreation in close communion with nature. Besides the natural and near-natural, island areas with their typical relief and corresponding characteristic vegetation the village of Spiekeroog has to be mentioned as well. The clinker-paved streets and the red, low Frisian Houses gives the impression of a self-contained island world which has managed to preserve its character.

There is a continual work on coastal protection for the island. The western end of Spiekeroog is secured by a protected area of an overall length of 1.6 km with 13 groins, 1.500 m of bank stabilisation, a ca. 800m-long sheet pile wall and a substantial tetrapode embankment.

4.2 Settlement development

The population figures of Spiekeroog have not changed significantly during the last 15 years. There are c. 825 people living on the island today.

The most important source of income in the region is tourism. During the last two decades the number of long-term visitors almost tripled from a 20.000 to nearly 60.000. Hotels, holiday flats and a camping site are available on the island. For example there is the marketing company „Die Nordsee – Sieben Inseln eine Küste“ which organises recreational as well as active holidays on the East Frisian Islands and on the North Sea coast. In addition thereof the „Ostfriesland-Tourismus-GmbH“ (OTG) was founded by the end of October in 2004 which in turn was inspired by the “Touristisches Leitbild und Entwicklungskonzept für den Raum Ostfriesland“ (touristic model and development concept for the region of East Frisia).

On Spiekeroog there is no State- or supra-regional museum. The island museum presents the history of Spiekeroog and its surroundings. In addition there is the historic horse tramway which is the only surviving horse tramway in Germany. A private shell museum and the island church also welcome visitors. The church from 1696 is the oldest East Frisian Island church. In it there is a Renaissance pulpit, a pietà and apostle pictures which probably were rescued from a ship of the Spanish Armada which stranded off Spiekeroog in 1588. The old island house from 1705 is also worth seeing since it presents the building style of the 18th century in an almost unaltered way. The most remarkable feature of the house is its roof construction. During storms or floods the inhabitants fled to the roof which could be easily detached from the house and, in the case of a complete flooding, could drift to the mainland like a ship. Chronicles tell about cases where island dwellers with their roofs safely “anchored” well behind the dyke lines of the mainland.

4.3 Industry and energy

At present there are no industrial or wind energy plants on Spiekeroog.

But there are a modern sewage plant and a thermal power station as well as waterworks. The waterworks tap into the underground freshwater lens for high quality drinking water. The lens feeds on rainwater which collects underneath the dunes in a freshwater reservoir. This process is essential for the island and only makes it inhabitable in the first place.

4.4 Infrastructure

The horse tram, which was founded in 1896, was the last one in Germany to go out of service in 1949 and was replaced by an island train with a diesel locomotive which ran along a wider track. But the construction of a harbour near the village rendered the service of the train, which was operated from 1949 to 1981, unnecessary. The old horse tram, however, still runs as a museum train line across the island.

Currently Spiekeroog can be reached from Neuharlingersiel by ferry one to three times a day, depending on the tides. The village of Spiekeroog comprises about 350 houses and 27 streets. Cars are not allowed on the island and bicycling is also almost completely prohibited. Electric cars are used to transport heavy goods. But you can also rent or bring along a handcart.

There are several public facilities in the village of Spiekeroog: including three churches, two schools, one post office, several cafés and restaurants etc.

5. Legal and spatial planning aspects

The community of Spiekeroog is sited in the administrative district of Wittmund and belongs to Lower Saxony. With regard to land use planning, the community is subject to the regional planning of the federal state of Lower Saxony respectively of the landscape framework plan and the land use utilisation plan of the community. In addition there is the regional planning concept for the coastal sea of Lower Saxony.

The community of Spiekeroog, together with other communities in the district of Wittmund, is part of the Regional Structure Conference of East Frisia.

The territory of the community ends at the MThw line (line of the Average High Tide). The coastal sea below the MThw line is a „community-free area“. Accordingly, the regional and building plan only applies to the land but not to the marine area.

The presently valid regional planning of the federal state of Lower Saxony (LROP) contains only a few regional planning goals for the marine area. The area of the national park is registered at the EU for the Fauna Flora Habitat guideline (FFH) and therefore belongs to the biotope network system Natura 2000. The main part of the park lies within the territory of the EU water withdrawal guideline. In 1996 the Wadden Sea area within the borders of the national park was recognised by the UNESCO as biosphere reservation in the context of the program „Man and Biosphere“.

6. Vulnerabilities

6.1 Tourism

The promotion of nature-oriented ecotourism may create a situation which will alter the natural state of the island into an artificial-looking structure.

6.2 Natural erosion

The continuing erosion of parts of the island will result in areas of surviving cultural heritage monuments or buried archaeological deposits being lost to natural processes.

7. Potentials

7.1 Settlement

The historic settlement on Spiekeroog still contains several of its historic buildings set within a luxuriant stand of trees provides the potential both for protection of the historic buildings and settlement layout and there promotion via the tourist industry.

7.2 Tourism

Tourism should be orientated in the direction of nature-related tourism, however, there is the opportunity to include the cultural heritage within this and develop further tourism via the cultural heritage assets. Since Spiekeroog is part of the national park special emphasis is placed on the protection and preservation of these unique habitats and there is potential for this to be expanded to protect and promote the cultural heritage of the island.

7.3 Nature conservation

There is potential for the cultural heritage to be incorporated within management plans for the nature conservation on the island. By creating integrated management plans for both the natural and cultural environment the islands potential for carefully managed tourism can increase.

8. Sources

Author: Franziska Grieb

Gemeinsames Wattenmeer Sekretariat (Hrsg.; 2005): Das Wattenmeer. Kulturlandschaft vor und hinter den Deichen. Stuttgart.

Gutmann, H. (1990): Deutsche Nordsee-Inseln. In: HB-Bildatlas. Sonderausgabe 5. Hamburg.

Meyer-Deepen, H. und Meijering, M. P. D. (1970): Spiekeroog. Spiekeroog.

Maier, R. (1974): Ur- und frühgeschichtliche Denkmäler und Funde aus Ostfriesland. In: Wegweiser zur Vor- und Frühgeschichte Niedersachsens 8. Hildesheim..

Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft, und Verbraucherschutz – Regierungsvertretung Oldenburg – Landesentwicklung, Raumordnung (Hrsg.; 2005): Raumordnungskonzept für das niedersächsische Küstenmeer. Stand 2005. Oldenburg.

Petersen, J. und Pott, R. (2005): Ostfriesische Inseln. Landschaft und Vegetation im Wandel. Hannover.

Roterberg, P. (1983): Die Nordseeinsel Spiekeroog. Vom Fischerdorf zum Nordseeheilbad. Hamburg.

Langeoog, LS

1. Overview

Name:	Langeoog
Delimitation:	The two great inlets "Accumer Ee" and „Otzumer Ee“ separate Langeoog from its neighbouring islands; Baltrum to the west and Spiekeroog to the east. Neighbouring entity: Harlingerland, the surrounding mudflats belong to the national park Hamburgerisches Wattenmeer.
Size:	The island is 10.9 km long, and varies in width from 1.9km to 1.3km. The overall area of the island is c. 19.6 km ² .
Location-map:	Langeoog is a sandy island offshore of the mudflat coast of Lower Saxony and belongs to the district of Wittmund, federal state of Lower Saxony, Germany.
Origin of name:	The name Langeoog consists of the Frisian words "lange" (for long) and "oog" (for island) and therefore means "long island". It is first mentioned in a document of 1398 as „Langeooch“.
Relationship/similarities with other cultural entities:	Frisian Islands, islands of Lower Saxony, of the Netherlands, dune landscapes, mudflat, national park of Lower Saxony, maritime landscapes and settlements.
Characteristic elements and ensembles:	On Langeoog roughly six different landscape types can be defined: the dune regions with their dune valleys, a small grove, the flood-free beach, the Heller (salt meadows) covered with grass and herbs, protective constructions like dykes, dams, or the harbour and the island settlement, railway.

2. Geology and geography

2.1. General

The process by which the islands came into existence began about 10,000 years ago. Unlike the North Frisian Islands on the coast of Schleswig Holstein and Denmark the East Frisian Islands are not remains of former mainland. Instead they were created by sedimentation caused by the tide and floods. They keep the water in constant movement and the direction of the current changes with the tides. These bodies of water are carrying a significant amount of sand. In shallow water, when the carrying capacity of the current is not sufficient anymore, the sand is deposited and the waves shape it into barrier beaches and Platen (sandbanks) which are reinforced by plant growth. Langeoog has proved to have the most stable location of the East Frisian Islands. The west end has hardly shifted in its position during the centuries and the eastern end has only gained slightly in length.

2.2 Present landscape

About 870 of the overall 2000 hectares of the island consist of dunes. 500 hectares are covered by salt meadows and another area of the same size features dry sandy beaches.

In the western part of Langeoog, protected by dunes, lie the settlement and the airport. The shape of the western end of Langeoog is a special case amongst the East Frisian Islands as it has not been subject to significant ground loss; instead there have even been some

accumulation of land. The situation of the currents is so favourable that protective measures so far have not been necessary. Repeated artificial application of sand has been sufficient for the protection of the island. These become necessary when there is not enough natural wash-up of accumulated material in order to prevent the break-up of the great dunes. There are some monuments which characterise the present look of the island: that is the flood-safe dyking of the grassland to the south and east of the village (1932/33) and the summer dyke to the south (1934/35).

The Melkhörndüne to the east of the settlement is the highest overall point in the East Frisian Islands. It reaches a height of up to 23 meters. In the southwest of the island the area „Flugfeld“ ought to be mentioned. This is a former military airfield from the time of the Second World War. Today its broad concrete runways encircle a reservation which is the home of many rare plants. Further characteristic features of the island are the dune valleys with their typical vegetation and the salt meadows. They form the largest part of the island.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Geologically speaking, the island is quite young. Even though there are some prehistoric finds from the region of East Frisia there are no traces of prehistoric activity on the present island. However, since the island has repeatedly changed its shape and location over time any archaeological finds would be buried beneath meters of sediment. At the drop-off on the northwest beach of the island, old alluvial Darg (a special kind of peat consisting of reed and silt layers) derived from marsh soils sometimes surfaces which could contain archaeological remains.

Langeoog's harbour „Ackumhe“ is first mentioned in a document in 1289 and the island itself in 1398, under the name of „Langeoock“. These references show that the island was already inhabited by that date. The settlement remains on the beach of Langeoog provide tangible evidence for this. After the break-up of the dunes on the beach, a Darg deposit surfaced in which traces of buildings and banks, together with pottery other finds were discovered. They indicate the existence of a settlement founded in the 13th or 15th century.

The island soils and climate are not suitable for intensive agriculture, and there is no documentary evidence for intensive agriculture taking place.

3.2 Early Modern Times

During the 17th century and at the beginning of the 18th century the villages of the island had to be frequently relocated. This became necessary because of heavy sand drifts which buried houses, farmland and the Heller. During this time houses had to be moved approximately every 30 years because of the „Jagsand“.

For the year of 1627 there is evidence for a reeve and seven households. In 1660 there were already 16 houses on Langeoog and 62 people were living there. A good secure harbour in the western end is also mentioned. In 1666 a church and a parsonage were newly built, but there is no precise location given for these new buildings. From 1702 to 1706 a church and a settlement were built near the Melkhörn Dune.

The Christmas flood of 1717 submerged the sandy plane between the western and eastern dune complex and threatened to split the island. Just four years later another storm tide devastated the island so severely that the inhabitants were forced to leave and move to the mainland. In 1723 occupants of Helgoland and the neighbouring islands were making a new attempt at resettling Langeoog. In 1732 however, there were only three East Frisian families left on the island. 1741 the reeve Taaken built himself a home at the eastern end of the island, today's Meierei (dairy farm). Since 1744 the tending of the dunes, by erecting sand-trapping fences and planting beach grass, has been promoted and the Prussian government granted aid for shipping and shell fishing in order to produce lime. In 1749 four huts were erected for lease in the west of the island and in the east a single settler was living. There were only 16 inhabitants during this time.

In 1796 it is reported that the dwellers of Langeoog were still exempt from taxation. The constitutional status of the island dwellers was determined until the 18th century by the fact that the island has been the possession of the gentry and the inhabitants never owed the land they lived on but always had been leaseholders. Therefore they lacked political rights.

3.3 Modern Times

The economy improved from the middle of the 18th century, due to the systematic tending of the dunes and protective measures. After new set-backs because of the storm tide of 1825, a long period of positive land formation followed which continued until 1900, especially influencing the eastern end. Between 1825 and 1841 the „Flinthörndünen“ developed, in parts this comprises quite young dunes.

Since 1829 a pasture regulation has been introduced on the island, and in 1848 a ban on hunting waterfowl followed. The foundation of a beach resort in 1830 did not raise much interest amongst the local population, but it marked the beginning of the island's tourist economy. In the late 19th century the role of traditional shipping as a source of income declined in the face of the competition from steamboats. However, parallel to this decline fishing rose in importance.

In 1867 the regular weekly link between Langeoog and the mainland began. By the end of the 19th century the 20 meter-high „Melkhorndünen“ and the eastern end of Langeoog were joined when the „Kleine Sloop“ that used to separate them, closed in the course of natural dune formation. This process was encouraged, however, by erecting sand trapping fences and planting beach grass. Until 1906 the Grosse Sloop used to separate the core dunes of the western head from the rest of the island. The gap was then closed by a dyke.

The turn of the century saw a massive extension of the settlement, of the spa and of the harbour which was enlarged by a military harbour.

Before the Second World War the parish was planning a cemetery and the washing up of 12 bodies on the shore in 1940 meant that it was put into provisional operation even before it was completed. After the war and with the consent of the British military government the dune cemetery was extended. 450 Russian prisoners of war were sent in 1941 to Langeoog on fatigue duty, between 1941 and 1942 more than one hundred of them died of spotted fever. Since the number of deaths exceeded the capacity of the new cemetery a new burial place was created northwest of the parish. In 1953 the Volksbund Deutsche Kriegsgräberfürsorge set up three commemorative plaques on the Russian Cemetery. A second memorial is dedicated to the German-Balts who died as war refugees on Langeoog. All in all there are 326 people buried there.

With the extension of the Flinthörndeiches in the west of the island and of the eastern dyke in the period between 1937-44 Langeoog received a flood-safe dyke enclosure facing the mudflat. The dykes have been adapted to the present requirements by extensions and enforcements between 1971 and 1975. The settlements all lie in the dune areas near the western and northern end of the island.

4. Modern development and planning

Langeoog is part of the national park „Niedersächsisches Wattenmeer“ and is located within the quiet zone (Zone 1), the core area of the nature protection area. Wide parts of the island itself are protected as well. Therefore the marginal dunes may not be accessed at all and the mudflat can only be accessed in the company of professional guides. Settlements, harbours and other infrastructure features on the island, however, are not part of the protected area.

The national park is trying to preserve and protect the special character of the nature and landscape of the mudflat region, including the typical appearance of the landscape. The course of natural processes is supposed to be ensured and the biological diversity is to be preserved.

4.1 Land use

The economy of the island is traditionally orientated towards the sea: fishing, production of shell lime and, at times, shipping. Additionally there was some animal husbandry and a little gardening and tillage. Horses, on the other hand, are kept only for the sake of the tourists. Today the economic structures of the island are dominated by tourism.

4.2 Settlement development

The settlement on the island has largely preserved its village character. There are no really large building structures. The majority of the buildings are residential houses which date back to the last century. The impression of the village is quite modern. The typical houses on the island are built of red bricks with white grout and have red roofs, white gables with wooden gable facings. Other typical features are the wooden Victorian patios, especially with the older houses. A traditional decorative roof element is the Malljan, a vertical pole or board on the gable, this is not specific to Langeoog but is an East Frisian peculiarity.

Of the old preserved buildings the Meierei from 1741 should be mentioned as the oldest building of the island. The hospice was built as a guest house of the monastery of Loccum in 1884/85 and is used today by the protestant church as a family holiday resort. The central buildings of the island are almost all concentrated at or around the village.

Today Langeoog has two churches. The protestant one was built in 1891 by the monastery of Loccum, the catholic church of St. Nikolaus is from 1961-63. Documents mention older churches but due to the frequent relocations of the village their remains are not found within the present settlement area. From the 19th century a „Seemannshus“ from 1844 has been preserved which is presently used as local museum and guest house. The Inselbahn (train of the island), which still serves as an important means of transportation from the harbour to the village, in 1937 replaced the horse tram which was built in 1902.

Today's harbour was built in 1937-41. In 1951 the eastern pier in the tidal-independent basin was replaced by a new pier in the western part which was rebuilt over time to suit the changing traffic situation.

After the Second World War the tourism and recreation areas have been extended. Important buildings include the spa centre of 1971 as well as the recreational and adventure salt water pool from 1967-69 which has been changed and renovated several times since then. The landmark of Langeoog, the water tower, dates back to 1908/1909 and is located in the south of the settlement.

4.3 Infrastructure

Traditionally the transport connection to Langeoog is by water. The island can be reached by ferry leaving from Benseniel. Since 1976 this connection has been independent of the tides. The island itself is free of cars but has a good network of footpaths and cycle paths. A main road is leading from the village to the eastern end of the island. In 1973 an airport was built which is still in use today.

In 1909 the water supply system and the canalisation were set up. Groundwater from a freshwater lens which is situated beneath the island is available as drinking water. Since 1923 electricity for the island is provided from the mainland.

5. Legal and spatial planning aspects

The parish of Langeoog belongs to the district of Wittmund in the federal state of Lower Saxony. In terms of land use planning the community of Langeoog is subject to the regional planning of the federal state of Lower Saxony respectively of the landscape framework plan and the land utilisation plan of the community. Additionally, there is the regional planning concept for the coastal sea of Lower Saxony. The territory of the community ends at the MThw line (line of the Average High Tide). The coastal sea below the MThw line is „community-free area“. Accordingly, the regional and building plan only applies to the land but not to the sea area.

The present regional plans for the federal state of Lower Saxony (LROP) contain only a few regional planning goals for the sea area. The area of the national park is registered at the EU for the Fauna Flora Habitat guideline (FFH) and therefore belongs to the biotope network system Natura 2000. The main part of the park lies within the territory of the EU water withdrawal guideline. In 1996 the Wadden Sea area within the borders of the national park was recognised by the UNESCO as biosphere reservation in the context of the program „Man and Biosphere“.

With regard to building regulations there are the Niedersächsische Bauordnung (NbauO; Lower Saxon Code on Construction) and the Baugesetzbuch (the German Statutory Code on Construction and Building), also a Gestaltungssatzung (design statute) with its Gestaltungsfibel (design primer) of 1995; a preservation statute; tourism statute; a statute for the permission to subdivide land; various complementary statutes to ca. 15 land-use plans (inner, middle and outer area). In the course of the village reformation these regulations are just being reviewed.

6. Vulnerabilities

6.1 Spatial planning

The protected area of the National Park does not extend to settlements, harbours and other infrastructure features on the island which is likely to leave them more vulnerable to change.

6.2 Settlement

Settlement development could have a negative effect on the characteristic landscape of the island, on the protection of the cultural heritage and historic landscape features and therefore on cultural tourism. For this reason it is in the public interest to keep the landscape as free of buildings as possible to allow an unimpeded view across the landscape to the sea.

6.3 Management of the cultural heritage

The need to protect the cultural heritage and wider cultural landscapes can impede other land uses or projects or even make them completely impossible leading to possibly detrimental effects on the islands development and economy.

6.4 Nature conservation

The high nationally as well as internationally recognised ecological value of the Wadden Sea and its economic value to the inhabitants of the island, demands a solution which will meet the requirements of both sides.

6.5 Tourism

A significant problem for the cultural heritage and wider landscape of the island is the stresses caused by tourism. There is an increasing tendency for signs of stress, due especially to dense and maladjusted building activity and to a high concentration of recreational facilities. There is also a conflict between the recreational value and short-term use by daytime visitors since Langeoog has a tidal-independent link to the mainland and there is no “tourist-free” period. Tourist pressure on the dunes could lead to erosion of archaeological remains from earlier periods of settlement on the island.

6.6 Industry and energy

The planned installation and use of wind energy turbines (off shore wind farms) could have a negative visual impact on the open landscape of the island.

6.7 Natural processes

Because of its exposed maritime location and the characteristics of a sandy island Langeoog is threatened by natural forces. The sands in front of the islands and at the beach are continuously moved eastwards by the surf which rolls in mainly from the north-east. This

dynamic island process is affecting the landscape and, in the long run, will affect the historic settlement structure. The geomorphological problems are largely caused by nature-geography, but human influence also has to be taken into account. In view of future sea level rise due to climatic changes, current and future development schemes will have to consider necessary adaptation strategies. The natural environment of the island can also be problematic for building renovations or construction of new buildings which attempt to follow historic building styles or use historic materials, since the salty air is highly aggressive and therefore (badly cared for) wood is not a durable building material. Natural erosion could also affect the archaeological remains that have surfaced on the beach at Langeoog and which provide evidence of the medieval settlement of the island.

6.8 Coastal protection

Beach recharge could lead to damage to the marine cultural heritage.

7. Potentials

7.1 Settlement

During building projects there is an attempt to observe a style that is typical or characteristic of the island, which has largely retained its village character. An effort is made to get away from the functional chic of the 60ies and 70ies. Instead historic building styles and materials are used for renovations or in the construction of new buildings, although this is dependent on the financial position of the owners. To date it has been possible to control building development so as to maintain the unimpeded views across the islands landscape to the sea.

7.2 Nature conservation

The former WWII military airfield which is the home of many rare plants, offers a good example of the links between the cultural and the natural environments and the importance of managing both in an integrated way. Despite all the restrictions it brings, the national park also offers a potential for a specific regional development. While in the past the restrictions imposed by the national park have been the subject of public discussion, now more attention is paid to the chances offered by the natural landscape of the Wadden Sea. These chances do not only relate to tourism but also the fishing industry which has a causal interest in the preservation of a sound ecological system of the Wadden Sea: only a long-term fishing potential can secure a lasting economic survival and the continuation of traditional structures. Langeoog is integrated into the scientific network of the region and thus has great scientific and research potential. Apart from universities of applied sciences there are also research institutes in the region like the Terramare, the Institute for Chemistry and Biology of the Sea (ICBM) and the German Centre for Marine Biodiversity Research (DZMB). The scientific marine research has a long tradition in the region.

7.3 Tourism

Langeoog has preserved its traditional landscape because it has been spared most of the influences of modern development. There are no large buildings, built over areas or hotel complexes. The dune valleys and Heller (salt meadows) have staid mostly free of buildings. This situation and the more or less unspoilt nature of the national park of Lower Saxony are of great importance to the tourist concept of the island. Thanks to Langeoog's maritime location there are no extreme temperatures. The aspects of a mild climate, fresh air and a lot of sunshine have always been used on the island to market its spa and bathing therapies. An enhancement and expansion of tourism requires a close cooperation of official and private parties. A good example is the marketing company „Die Nordsee – Sieben Inseln eine Küste“ (The North Sea – Seven Islands And One Coast) which was founded in 2004. In this way the existing range of potentials and synergies between the East Frisian Islands can be made better use of.

7.4 Natural processes

The exposure of archaeological remains from the medieval period on the beach at Langeoog, provide opportunities for the recording, understanding and possibly promotion of the island's cultural heritage for visitors and residents alike.

8. Sources

- Backhaus, H. (1943): Die ostfriesischen Inseln und ihre Entwicklung: ein Beitrag zu den Problemen der Küstenbildung im südlichen Nordseegebiet. Oldenburg
- Buchwald, K., Rincke, G., Rudolph, K-U. (1985): Gutachtliche Stellungnahme zu den Umweltproblemen der Ostfriesischen Inseln: Schlussbericht. Hannover
- Niemeier, G. (1972): Ostfriesische Inseln. Berlin
- Petersen, J., Pott, R. (2005): Nordfriesische Inseln: Landschaft und Vegetation im Wandel. Hannover
- Pflüger, B. (1997): Gletscher- und Inlandeis in Polargebieten. Universität Hamburg
- Pott, R. (1995): Farbatlas Nordseeküste und Nordseeinsel: ausgewählte Beispiele aus der südlichen Nordsee in geobotanischer Sicht. Stuttgart
- Sindowski, K-H. (1973): Das ostfriesische Küstengebiet: Inseln, Watten und Marschen. Berlin
- Streif, H. (1990): Das ostfriesische Küstengebiet: Nordsee, Inseln, Watten und Marschen. Berlin

Reports:

- Horb, F. Gemeindecarchivar Langeoog (1992): Der Dünenfriedhof, der Russenfriedhof, Baltengedenkstätte, Langeoog
- Kurverwaltung Langeoog: Gäste-Informationen (Eine Information der Abteilung Marketing). Stand : Januar 2007
- Merian (Heft 3/XXV), Ostfriesland und seine Inseln, Hoffmann und Campe Verlag, Hamburg
- Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz (2006): Landes-Raumordungsprogramm Niedersachsen, Ergänzung 2006, Hannover
- Niedersächsisches Ministerium für Wirtschaft, Arbeit und Verkehr (2005): Bericht der Landesregierung: Entwicklungen an der niedersächsischen Küste, Hannover

Baltrum, LS

1. Overview

Name:	Baltrum
Delimitation:	Baltrum is one of the seven East Frisian islands. It is separated from Nordeney to the west by the Wichter Ee channel and from Langeoog to the east by the Accumer Ee, the southern side is bordered by the Steinplate mud-flats which belong to the National Park of Hamburgerisches Wattenmeer.
Size:	The island is 5km long, and 1.5 km wide. The overall area of the island is c. 6.5 km ² .
Location-map:	Baltrum is a sandy island offshore of the mudflat coast of Lower Saxony and belongs to the district of Aurich, federal state of Lower Saxony, Germany.
Origin of name:	Baltrum is first referred to as 'Balteringe' in 1398, a name deriving from the Old Frisian for 'grassland', alternatively it refers to the 'Settlement of Balter or Baldur'.
Relationship/similarities with other cultural entities:	Frisian Islands, islands of Lower Saxony, of the Netherlands, dune landscapes, mudflats, national park of Lower Saxony, maritime landscapes and settlements.
Characteristic elements and ensembles:	19 th century houses associated with the fishing industries

2. Geology and geography

2.1. General

The process which brought the islands into existence began about 10.000 years ago. Unlike the North Frisian Islands on the coast of Schleswig-Holstein and Denmark, the East Frisian Islands are not remnants of former mainland. Instead they were created by deposition of sediments by the tide and currents. These keep the water in constant movement, with the direction of the current changes with the tides. These bodies of water carry significant amounts of sand. In shallow water, when the carrying capacity of the current lessens, the sand is deposited and the waves shape it into barrier beaches and Platen (sandbanks) which are subsequently reinforced by plant growth. The result is a sandy barrier island which, if unprotected, gradually shifts position over the millennia, losing material on the seaward side and depositing it on the leeward side. The eastern end of Baltrum was approximately 4.5km to the west some 400 years ago (roughly located where the eastern end of the island of Nordeney is now sited).

2.2 Present landscape

The settlement is concentrated in the western half of the island, and comprises the villages of Westdorf and Ostdorf, which have practically merged. The eastern half of the island is entirely natural, with sand dunes, salt-marshes and tidal mud. The northern, North Sea face of the island comprises a large beach, which widens to the east and is stabilised by lengthy groynes to the west. The island elevation is 5m above sea-level.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Geologically speaking, the island is quite young. Even though there are some prehistoric finds from the region of East Frisia there are no traces of prehistoric activity on the present island. However, since the island has repeatedly changed its shape and location over time any archaeological finds would be buried beneath meters of sediment or in the sea.

The island is referred to in the chronicle which describes the effects of the disastrous storm flood of 1362 (the Grote Mandrenke or Marcellus flood), “and Baltrum a spade of sand, slipped out of a Giant’s hand, swept by wind and waves”. Although there are no written sources for the earlier medieval period in Baltrum, it is believed that the first permanent settlements on the island were established during the 13th and 14th centuries. There is a documentary reference to Baltrum as ‘Balteringe’ in 1398. It is known that in the 1600s the western end of the was approximately 4.5km to the west, roughly where the eastern end of Nordeney now stands. Nordeney was some 5.7km shorter than its present length in 1650. Any settlement on Baltrum would have been very vulnerable to flooding events and would have severely damaged, if not lost altogether, during the 1362 flood. As the island shifted eastwards any settlement would also have had to move in that direction.

3.2 Early Modern Times

Around 1700 there were some 1400 inhabitants on the island. However, because of the storm floods in the 18th century, in particular the Christmas Flood of 1717, the islanders were forced to move their townships and churches further and further eastwards. In the 17th and early 18th century fishing remained the primary economy of Baltrum. However, by the second half of the 18th century the marine trade industry had grown in importance. This had become increasingly profitable by the mid-19th century, a fact that is reflected in the surviving houses from that period with their souvenirs from foreign lands, Delft tiles and ‘Buddelein’ (wall cabinets).

Baltrum was part of Prussia from 1744 to 1806. Following Napoleon’s defeat of Prussia in 1806 Baltrum, together with the rest of East Frisia, became part of the Kingdom of Holland. In 1866 Prussia annexed the Kingdom of Hanover and the island again became Prussian.

In 1876 Baltrum became a sea side resort, although initially visitor numbers were very low due to difficulties in accessing the island. In 1891 the Baltrum town council ruled that all sea-bathing was only permitted with the aid of a mobile beach cabin.

3.3 Modern Times

In 1925 Baltrum received an electricity supply and in 1935 water supply. The number of visitors increased greatly after the Second World War. To-day the island has a permanent population of 600 and a visitor population of 3,500 in the summer months.

Developments catering for the visitor included a sea-water indoor swimming pool and a miniature golf course as well as the ferry terminal.

4. Modern development and planning

The eastern half of Baltrum is part of the national park “Niedersächsisches Wattenmeer”. This enables protection of the dunes, the saltmarsh, the beach and the tidal flats. The national park is intended to preserve and protect the special character of the nature and landscape of the dune and saltmarsh region, including the typical appearance of the landscape. By this means the course of the natural processes is supposed to be ensured and the biological diversity is to be preserved.

4.1 Land use

The economy of the island was traditionally orientated towards the sea: fishing and maritime trade. However, the economic structures of the island are now dominated by tourism.

4.2 Settlement development

The settlement on the island is architecturally a resort settlement, comprising a mixture of older resort buildings and more modern structures. Red-brick and red tiled roves predominate. The tallest buildings are 4-storey. The settlement is concentrated in the western half of the island in the villages of Westdorf and Ostdorf. There is very little in the way of buildings on the remainder of the island.

4.3 Infrastructure

Traditionally the transport connection to Baltrum is by ferry from Norddeich-Mole, near the German city of Norden. The status of the island as part of the National park has affected all kinds of traffic on the island, and vehicular traffic is subject to strict regulations.

Water and electricity supplies were introduced to the island in the first half of the 20th century

5. Legal and spatial planning aspects

Baltrum belongs to the district of Aurich in the federal state of Lower Saxony. In terms of land use planning the community of Baltrum is subject to the regional planning of the federal state of Lower Saxony respectively of the landscape framework plan and the land utilisation plan of the community. Additionally, there is the regional planning concept for the coastal sea of Lower Saxony. The territory of the community ends at the MThw line (line of the Average High Tide). The coastal sea below the MThw line is „community-free area“. Accordingly, the regional and building plan only applies to the land but not to the sea area.

The present regional plans for the federal state of Lower Saxony (LROP) contain only a few regional planning goals for the sea area. The area of the national park is registered at the EU for the Fauna Flora Habitat guideline (FFH) and therefore belongs to the biotope network system Natura 2000. The main part of the park lies within the territory of the EU water withdrawal guideline. In 1996 the Wadden Sea area within the borders of the national park was recognised by the UNESCO as biosphere reservation in the context of the program „Man and Biosphere“.

With regard to building regulations there are the Niedersächsische Bauordnung (NbauO; Lower Saxon Code on Construction) and the Baugesetzbuch (the German Statutory Code on Construction and Building), also a Gestaltungssatzung (design statute) with its Gestaltungsfibel (design primer) of 1995; a preservation statute; tourism statute; a statute for the permission to subdivide land; various complementary statutes to ca. 15 land-use plans (inner, middle and outer area). In the course of the village reformation these regulations are just being reviewed.

6. Vulnerabilities

6.1 Settlement

The historic settlement pattern on Baltrum comprises the villages of Westdorf and Ostdorf both of which are largely designed for the tourist industry. The settlements are vulnerable to expansion and conversion within the settlements.

6.2 Tourism

Tourism is the major economic factor on Baltrum and in itself provides both potentials and threats to the Island. The expansion of Baltrum clearly is a threat to any surviving archaeological deposits or surviving cultural heritage features.

6.3 Industry and energy

The major reliance on tourism for the economy of the island could result in the cultural heritage not being given appropriate protection in competition with the development of the islands tourist infrastructure.

6.4 Natural processes

Because of its exposed maritime location and the characteristics of a sandy island Baltrum is also threatened by natural forces. The sands in front of the islands and at the beach are continuously moved eastwards by the surf which rolls in mainly from the north-east. This dynamic island process is affecting the landscape and, in the long run, the settlement structure.

7. Potentials

7.1 Tourism

Baltrum already has a thriving tourism industry and there is potential to further promote the Cultural Heritage through the existing network of cycle routes, walking routes etc.

7.2 Nature conservation:

There is potential for the cultural heritage to be incorporated within management plans for the nature conservation on the island. By creating integrated management plans for both the natural and cultural environment both elements can benefit.

8. Sources

- Backhaus, H. (1943): Die ostfriesischen Inseln und ihre Entwicklung: ein Beitrag zu den Problemen der Küstenbildung im südlichen Nordseegebiet. Oldenburg
- Buchwald, K., Rincke, G., Rudolph, K-U. (1985): Gutachtliche Stellungnahme zu den Umweltproblemen der Ostfriesischen Inseln: Schlussbericht. Hannover
- Niemeier, G. (1972): Ostfriesische Inseln. Berlin
- Petersen, J., Pott, R. (2005): Nordfriesische Inseln: Landschaft und Vegetation im Wandel. Hannover
- Pflüger, B. (1997): Gletscher- und Inlandeis in Polargebieten. Universität Hamburg
- Pott, R. (1995): Farbatlas Nordseeküste und Nordseeinsel: ausgewählte Beispiele aus der südlichen Nordsee in geobotanischer Sicht. Stuttgart
- Sindowski, K-H. (1973): Das ostfriesische Küstengebiet: Inseln, Watten und Marschen. Berlin
- Streif, H. (1990): Das ostfriesische Küstengebiet: Nordsee, Inseln, Watten und Marschen. Berlin

Reports:

Merian (Heft 3/XXV), Ostfriesland und seine Inseln, Hoffmann und Campe Verlag, Hamburg

Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz (2006) : Landes-Raumordungsprogramm Niedersachsen, Ergänzung 2006, Hannover

Niedersächsisches Ministerium für Wirtschaft, Arbeit und Verkehr (2005): Bericht der Landesregierung: Entwicklungen an der niedersächsischen Küste, Hannover

Nordeney, LS

1. Overview

Name:	Nordeney
Delimitation:	The island is separated from Juist to the west by the Busentief inlet and from Baltrum to the east by the Wichter Ee, the southern shore is delimited by the Rifgat inlet. Neighbouring entities are the islands of Juist and Baltrum, and the Norderland on the mainland, the surrounding mudflats belong to the National Park "Niedersächsisches Wattenmeer".
Size:	The island is 14 km long, and about 2.5km wide. The overall area of the island is c. 26.3 km ² .
Location-map:	Nordeney is a sandy island offshore of the mudflat coast of Lower Saxony and belongs to the district of Aurich, federal state of Lower Saxony, Germany.
Origin of name:	The name Nordeney derives from 'Norder neys Oog' meaning Northern New Island
Relationship/similarities with other cultural entities:	Frisian Islands, islands of Lower Saxony, of the Netherlands, dune landscapes, mudflats, national park of Lower Saxony, maritime landscapes and settlements.
Characteristic elements and ensembles:	Wattenmeer National Park, Nordeney 'Kap' or cape building

2. Geology and geography

2.1 General

The process by which the islands came into existence began about 10.000 years ago. Unlike the North Frisian Islands on the coast of Schleswig Holstein and Denmark, the East Frisian Islands are not remnants of former mainland. Instead they were created by deposition of sediments by the tide and currents. These keep the water in constant movement, with the direction of the current changes with the tides. These bodies of water carry significant amounts of sand. In shallow water, when the carrying capacity of the current lessens, the sand is deposited and the waves shape it into barrier beaches and Platen (sandbanks) which are subsequently reinforced by plant growth. The result is a sandy barrier island which, if unprotected, gradually shifts position over the millennia, losing material on the seaward side and depositing it on the leeward side. The island, in its present form, has only existed since the middle of the 16th century, making it the youngest of the seven East Frisian Islands.

2.2 Present landscape

The western end of the island comprises the town of Nordeney, to the east of this is a band of dunes and the only surviving areas of agricultural land. The entire eastern half of the island belongs to the National Park Niedersächsisches Wattenmeer and comprises dunes and saltmarsh. The northern, seaward, side of the island consists of a single large, dry sandy beach, which widens towards the east. The island elevation is 5m above sea-level.

3. Landscape and settlement history

The large scale investigation of the North German mud flats by the Archaeological Service of the East-Frisian Association (Ostfriesische Landschaft) and the Institute for Historic Coastal Research among others, has added considerably to our understanding of this area.

3.1 Prehistoric and Medieval Times

Geologically speaking, the island is quite young. Even though there are some prehistoric finds from the region of East Frisia there are no traces of prehistoric activity on the present island. However, since the island has repeatedly changed its shape and location over time any archaeological finds would be buried beneath metres of sediment or in the sea.

The island had its origins in the larger island of Buise, this was split in half by the "Grote Mandrenke" flood of 1362. The surviving eastern portion of the island was renamed Osterende. What was left of Buise shrunk in size over the years, finally disappearing into the sea during the Petri flood of 1651. In contrast, Osterende grew in size. A 1550 census refers to it as 'Norder neys Oog' (Northern New Island), and notes that it had a church and 18 houses. The inhabitants at this time worked principally as fishermen, the island's climate and soils are not suitable for intensive agriculture.

Although there are no written sources for the earlier medieval period in Nordeney, it is believed that the first permanent settlements on the island were established during the 13th and 14th centuries, the first documented record is for 1398. A town may have developed on the western part, protected by the surrounding high dunes. These would have been very vulnerable to flooding events and would have severely damaged, if not lost altogether, during the 1362 flood.

3.2 Early Modern Times

In 1650 the island was about 8.3km long (approx. 5.7km shorter than its present length), with a village of 18 houses, a church and about 101 inhabitants. The island suffered considerably in the Christmas Flood of 1717. In the 17th and early 18th century fishing remained the primary economy of Nordeney. By the second half of the 18th century the marine trade industry had grown in importance.

In 1797 Nordeney became the first German resort in the North Sea. The resort featured meeting houses and bath houses, as well as bathing machines. Initially the guests were boarded by the islanders, however in 1797 the first of a series of wooden and thatched resort houses was built.

The Nordeney 'Kap' or cape building was first constructed in wood in 1848; the present stone structure was erected in 1870. At night a fire was lit on the top of the structure, a role that has been replaced by lighthouse. The windmill dates to 1862.

Nordeney was part of Prussia from 1744 to 1806. Following Napoleon's defeat of Prussia in 1806 Nordeney, together with the rest of East Frisia, became part of the Kingdom of Holland. The resort operations came to a standstill during this period and were not reopened until 1811. Tourism played an important role in the islands economy, combined with shellfish harvesting, fishing and marine trade. In 1836 the Crown prince George of Hanover, Duke of Cumberland, visited Nordeney for the first time, and from 1851 he held court each summer on the island. With his patronage the island became a resort of the rich and famous. In 1858 a 950m long deck with promenade was built along the north-western tip of the island. In 1866 Prussia annexed the Kingdom of Hanover and the island became again a Royal Prussian sea-bathing establishment.

3.3 Modern Times

By 1899 the island had 4,018 inhabitants and 26,000 resort guests. Developments of that date, catering for the local population and the guests, included a hospital, a school, water system, electricity for the promenade, stables, gas works, and a pier. The resort ceased to operate during World War I, but had fully recovered by 1925, when regular flights to the island by Lufthansa commenced.

The present resort comprises most of the western end of the island. Architecturally it is a mix of turn of the century 'resort architecture', including hotels, the promenade and the Marienhöhe, and modern resort buildings, some of which are over 7 storeys high. The brick-built lighthouse in the centre of the island is the most prominent feature and a local land and seamount.

Within the English-speaking world Nordeney achieved fame as the setting for the climax of the spy-novel *The Riddle of the Sands* by Erskine Childers.

4. Modern development and planning

The eastern half of Nordeney is part of the national park "Niedersächsisches Wattenmeer" and is located within the quiet zone (Zone 1), the core area of the nature protection area. Therefore the marginal dunes may not be accessed at all and the saltmarsh can only be accessed in the company of professional guides. Settlements, harbours and other infrastructure features on the island, however, are not part of the protected area. The national park is intended to preserve and protect the special character of the nature and landscape of the dune and saltmarsh region, including the typical appearance of the landscape. By this means the course of the natural processes is supposed to be ensured and the biological diversity is to be preserved.

In its regional planning report of 2005, the Federal Office for Building and Regional Planning includes the administrative district of Aurich amongst those regions which show a small increase in population, and where employment is decreasing. Actually, the development of Nordeney is affected by economic growth based on the tourist sector.

4.1 Land use

The economy of the island was traditionally orientated towards the sea: fishing, production of shell lime and, at times, shipping. However, the economic structures of the island have been largely dominated by tourism. Since the early 19th century and to-day it is exclusively a tourist economy.

4.2 Settlement development

The settlement on the island is architecturally a resort settlement, comprising a mixture of older resort buildings and more modern structures. Unusually for the East Frisian islands it has a number of large, multi-storey buildings (some in excess of 7 storeys), and the impression is that of intensively-settled urban space. There is very little in the way of buildings on the remainder of the island.

4.3 Infrastructure

Traditionally the transport connection to Nordeney is by ferry from Norddeich pier, near the German city of Norden. The island has also been accessed by air since 1925. The status of the island as part of the National park has affected all kinds of traffic on the island, and car traffic is subject to strict regulations.

Water and electricity supplies were introduced to the island at the turn of the 20th century.

5. Legal and spatial planning aspects

The Nordeney belongs to the district of Aurich in the federal state of Lower Saxony. In terms of land use planning the community of Nordeney is subject to the regional planning of the federal state of Lower Saxony respectively of the landscape framework plan and the land utilisation plan of the community. Additionally, there is the regional planning concept for the coastal sea of Lower Saxony. The territory of the community ends at the MTHW line (line of the Average High Tide). The coastal sea below the MTHW line is „community-free area“. Accordingly, the regional and building plan only applies to the land but not to the sea area.

The present regional plans for the federal state of Lower Saxony (LROP) contain only a few regional planning goals for the sea area. The area of the national park is registered at the EU for the Fauna Flora Habitat guideline (FFH) and therefore belongs to the biotope network system Natura 2000. The main part of the park lies within the territory of the EU water withdrawal guideline. In 1996 the Wadden Sea area within the borders of the national park was recognised by the UNESCO as biosphere reservation in the context of the program „Man and Biosphere“.

With regard to building regulations there are the Niedersächsische Bauordnung (NbauO) and the Baugesetzbuch (BauGB; the German Statutory Code on Construction and Building), also a Gestaltungssatzung (design statute) with its Gestaltungsfibel (design primer) of 1995; a preservation statute; tourism statute; a statute for the permission to subdivide land; various complementary statutes to ca. 15 land-use plans (inner, middle and outer area). In the course of the village reformation these regulations are just being reviewed.

6. Vulnerabilities

6.1 Settlement

The early historic settlement pattern on Norderney has largely been destroyed by the initial development of the island as a Hanoverian royal baths, which itself has then suffered at the hands of later settlement expansion. Building activity in the later 20th century has significantly altered and destroyed the uniformly consistent picture of the resorts 19th century architecture.

6.2 Tourism

Tourism is the major economic factor on Norderney and in itself provides both potentials and threats to the Island. The visible expansion of the Norderney settlement clearly is a threat to any surviving archaeological deposits or surviving cultural heritage features.

6.3 Industry and energy

The major reliance on tourism for the economy of the island could result in the cultural heritage not being given appropriate protection in competition with the development of the islands tourist infrastructure. The extension of the 65km-long power cable channel leading over Norderney to the mainland is going to cause massive interference into the submarine cultural landscape of the North Sea.

6.4 Natural processes

Because of its exposed maritime location and the characteristics of a sandy island Norderney is also threatened by natural forces. The sands in front of the islands and at the beach are continuously moved eastwards by the surf which rolls in mainly from the north-east. This dynamic island process is affecting the landscape and, in the long run, the settlement structure. The geomorphological problems are not only caused by nature-geography but human influence has also to be taken into account.

7. Potentials

7.1 Settlement

Only in the last two decades have efforts been made to protect the built heritage of Norderney with over 100 now protected. These buildings provide the opportunity to promote the seaside and spa architecture of the settlement to its many visitors.

7.2 Tourism

Norderney already has a thriving tourism industry and there is potential to further promote the Cultural Heritage through the existing network of cycle routes, walking routes etc.

7.3 Nature conservation

There is potential for the cultural heritage to be incorporated within management plans for the nature conservation on the island. By creating integrated management plans for both the natural and cultural environment both elements can benefit.

8. Sources

Backhaus, H. (1943): Die ostfriesischen Inseln und ihre Entwicklung: ein Beitrag zu den Problemen der Küstenbildung im südlichen Nordseegebiet. Oldenburg

Buchwald, K., Rincke, G., Rudolph, K-U. (1985): Gutachtliche Stellungnahme zu den Umweltproblemen der Ostfriesischen Inseln: Schlussbericht. Hannover

Bundesamt für Bauwesen und Raumordnung (BBR; 2005): Raumordnungsbericht 2005. Berichte 21, Bonn.

Merian (Heft 3/XXV), Ostfriesland und seine Inseln, Hoffmann und Campe Verlag, Hamburg

Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz (2006) : Landes-Raumordnungsprogramm Niedersachsen, Ergänzung 2006, Hannover

Niedersächsisches Ministerium für Wirtschaft, Arbeit und Verkehr (2005): Bericht der Landesregierung: Entwicklungen an der niedersächsischen Küste, Hannover

Niemeier, G. (1972): Ostfriesische Inseln. Berlin

Petersen, J., Pott, R. (2005): Nordfriesische Inseln: Landschaft und Vegetation im Wandel. Hannover

Pflüger, B. (1997): Gletscher- und Inlandeis in Polargebieten. Universität Hamburg

Pott, R. (1995): Farbatlas Nordseeküste und Nordseeinsel: ausgewählte Beispiele aus der südlichen Nordsee in geobotanischer Sicht. Stuttgart

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Sindowski, K-H. (1973): Das ostfriesische Küstengebiet: Inseln, Watten und Marschen. Berlin

Streif, H. (1990): Das ostfriesische Küstengebiet – Nordsee, Inseln, Watten und Marschen. Sammlung Geologischer Führer 57. Berlin und Stuttgart.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler [Hrsg.], Archäologie der ältesten Kultur in Deutschland. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Juist, LS

1. Overview

Name:	Juist or Töwerland (Frisian for “Magic Land“), Aurich district, federal state of Niedersachsen
Delimitation:	The island of Juist is bordered by the Haaksgat, a side branch of the Osterems, in the west and the Kalfamergat in the east.
Size:	Approx. 16.43 km ²
Location – map:	Juist is sited in the national park of Wattenmeer, off the German coast of Lower Saxony. The geographic position of the island lies at: 53° 39´ and 53° 41´ northern latitude/ 6° 51´ and 7° 06´ eastern longitude.
Origin of name:	The name Juist is first mentioned in an official document in 1398 and probably derives from the word güst meaning barren.
Relationship/similarities with other cultural entities:	There are cultural historic links with the islands of the Netherlands to the west, which share similar living conditions and traditions, e.g. traditional costumes, language or building styles.
Characteristic elements and ensembles:	The characteristic features of the landscape of Juist are still preserved today. It is a typically maritime landscape with its dikes. Lighthouse, harbour, former railway.

2. Geology and geography

2.1 General

The North Sea Island of Juist is one of seven inhabited East Frisian Islands; it lies between the islands of Norderney (to the east) and Borkum (to the west). The geological structure of the island consists of a Geest core on which sand drifts have agglomerated assisted by tides in the course of the rise of the sea level during the Holocene.

Today the island stretches over a length of 17km from west to east and is sited c. eight km offshore. In the middle, where the Juist or alternatively called the “village” lies, between the mudflat and the beach the island has a width of only 500m. In the west, at the Domäne Bill, at its widest part it spans hardly more than 800m. With this shape and an overall size of c. 16.43 km² Juist is the longest and at the same time the narrowest East Frisian Island.

The main settlement activity focuses, protected by a line of dunes, on the centre of the island. The western settlement part Loog which lies 1.5km further west now belongs to the actual village.

2.2 Present landscape

The island of Juist is a holiday island in the national park Wattenmeer. During the main season the picture of the landscape is strongly influenced by the presence of the tourists. The landscape is characterised by a long sandy beach, wide green spaces, the chain of dunes in the north of the island and the small island of Memmert in the south which lies between Juist and the mainland.

Because of the tidal range, the areas towards the mainland which are protected by the island are frequently exposed, thus creating the mudflats. In the process the island of Juist, just like its neighbouring islands to the east and west, acts as a barrier island in front of the mainland coast.

3. Landscape and settlement history

The work of the district archaeologists and geologists on the island of Juist, as well as the entire Wadden Sea, has helped illuminate the origin and settlement history of the island. Their work is restricted only by the North Sea which, due to its sometimes unpredictable currents, can make the search for historic information difficult or even impossible.

3.1 Prehistoric and Medieval Times

10,000 years ago, roughly at the end of the last ice age, large areas of the present North Sea between Great Britain and the European mainland were still dry land, because of the amount of water locked up in the glaciers. The coastal line ran c. 300km to the north along the rim of the Dogger- and Jütlandbank. It can therefore be assumed that Palaeolithic and Mesolithic foragers frequented the area between the Doggerbank to the north and the present North Sea coast. It can be anticipated that maintenance works on the sea lanes for the shipping as well as excavations, especially between Juist and the coastal landscape of Lower Saxony, will come upon cultural layers of those ages.

With the end of the last ice age and the melting of the glaciers the region between the British Isles and the European mainland was flooded, until c. 5.500 B.C. the present coastal line was reached. The rising water, combined with storm-tides, deposited sand on the higher Geest ridges. Over time these sand banks grew into large areas, the so-called Platen, which were not endangered even by high tides. Sea couch grass was one of the first pioneer plants on Juist, reinforcing the ground with its roots.

With the development of Juist, all possible former settlement areas, as well as all traces of prehistoric activity on the island were buried beneath the island in the mudflat. Thus there is little evidence of human settlement for the millennia before the medieval period, although historic sources do mention an island which was located at the area of present-day Juist.

The first written evidence for the existence of the island of Juist is found in a document from 1398 A.D. The first church of the island, however, was only built in 1464. It was situated c. 300-400 m north of the Hammerdeich, in a place which today is part of the mudflat. By this time, at the end of the 15th century, Juist had an entirely different shape. The island was then only half as long but twice as wide. This phenomenon of the continuing westward shifting of the island is explained by the east-western current of the English Channel. This current has a major impact on the shape of the island, especially in the form of strong water movements during the autumn storms.

During medieval times the people on Juist lived on fishing and subsistence agriculture.

3.2 Early Modern Times

From 1526 A.D. a busy sea trade relating to Juist is documented. With fishing, agriculture and the exposed situation for merchant shipping, the course was set for future prosperity. This meant the end of the natural isolation of the island of Juist. With the emerging trade and the resulting contacts with other merchants the island dwellers began to take part in the social life of the mainland. Nevertheless life on the North Sea Island remained hard because Juist, like all other East Frisian Islands, was constantly threatened by heavy storm tides.

Due to such natural disasters the village had to be repeatedly shifted to the east. In 1651 a storm tore the island in two, and only 277 years later at the beginning of the 20th century were these two parts re-linked by large-scale dune constructions with bush fences and sand deposits.

The people, however, had not only to fight against nature: during the Napoleonic Wars there were plenty of political problems to cope with as well. The peace treaty of Tilsit forced Prussia to cede all areas west of the Elbe to France. From this time on Juist, like all other neighbouring islands, belonged to the "Department Oostvriesland" of the Netherlands which in turn was ruled by France. The new political situations called for new sources of income. So when in 1806 the Continental System disrupted the sea trade the people of Juist became smugglers.

3.3 Modern Times

In the years between 1928 and 1932 an effort was made to re-link the two parts of the island which had been torn apart by a heavy storm in 1651. When, in the course of the repairs, another storm flood took place, the 30ha Hammersee emerged at the place where the dune construction had already commenced. Today the lake is fed by the freshwater lens under the island of Juist. In response to the repeated storms and storm tides another dyke was built in 1885 to protect the village.

An economic problem of this time was the decline in agriculture which, next to fishing, had been a safe means of income for the island dwellers. When merchant shipping declined in the 19th century as well, the economic existence of the inhabitants of the island was under serious threat. This situation only changed with the opening of the seaside resort in 1840 when tourism became the dominant economic factor on Juist.

The most important requirements for the change from a predominately agricultural island towards a recreational centre were the setting up of a permanent ferry connection to Emden, as well as supplying electricity for the island from the mainland. In the cold winter of 1917 the airship "Zeppelin 16" was employed to secure the connection with the island. The landing place was sited near the Kalfamer at the eastern end of the island.

Following this the island dwellers began to open up the island to tourism. The road network was extended as well as the number of overnight accommodation in hotels and guesthouses. Nevertheless, due to the shortness of the season, a maximum of 14 weeks of the year, the economic existence of the people of Juist remained uncertain. As a consequence seafaring remained an important economic factor on the island until the middle of the 20th century, even as the number of tourists kept rising.

In 1986 the national park regulation became effective which turned large parts of Juist into a reserve area. From this moment on the people of Juist lived mainly on tourism.

4. Modern development and planning

The island of Juist in the East Frisian Wadden Sea is a landscape which in its development is largely dominated by tourism and in the future is likely to be even further influenced by human interference. If this trend is not regulated in some way then it is going to have a negative impact on the fragile ecosystem of the island.

4.1 Land use

The East Frisian Island of Juist is a dune landscape with a percentage of 90-95% grassland which in parts is used by various types of birds as a retreat. Too much tourism would lead to an increase in landscape problems since the destruction of the grass landscape, caused by construction works and environmental pollution, might effect the preservation of the dunes. These changes to the island landscape are certainly going to pose a danger for the inhabitants and tourists which will be reflected in the rising costs for protective measures.

Therefore the intensification of the tourism is closely monitored and regulated by the national park administration. An effort is made to consolidate the tourist usage of the island with the preservation and expansion of the nature reserve and coastal protection measures. This way the possibility of a further usage of the eco-system of the mudflats and therefore of the island of Juist is guaranteed for the following generations.

4.2 Settlement development

Today Juist has c. 1.500 inhabitants who depend on the c. 90.000-100.000 guests, who come either as daytime visitors or spend their holidays on the island. Despite the high number of visitors, the island has remained car-free. The only means of transportation for guests, luggage and goods are horse carriages and bicycles, this helps to protect the fragile eco-system of the island of Juist. Presently there is not a pressing danger from the impact on the natural environment by tourism. Nature- and landscape preservation laws limit an expansion of the settled areas which amount to ca. 7% and thus regulate the further settlement development and tourism. This way it was, and will be, possible to consider the

competing claims for land both by tourism and the inhabitants of Juist and to preserve a fair balance.

The island of Juist, like her sisters in the Wadden Sea, offers many possibilities for recreation. On the many artificial paths through the dune landscape the visitor can explore the island; guided tours are also offered to those who are interested in getting to know the nature and the fragile eco-system. The protected areas of the national park are divided into three zones: I. The quiet zone, the zone under the strictest protection where the most valuable animal and plant species are found; II. The intermediate zone which shows the character of the Wadden Sea with the mudflats off the beaches, the beach segments east and west of the bathing beach and the region of the dyke foreshore which may only be accessed outside of the brooding season; III. The recreational zone with the bathing beaches. When the weather does not suit the outdoor activities then the guests can visit the salt water adventure pool with its many activity areas. This way the visitors can find recreation and rest which make for a well-balanced vacation.

One way to explore the history of the island, especially during bad weather, is visiting the coastal museum of Juist. Here the history and problems of the seafaring, ecology and the overall coastal area of East Frisia are illustrated. Special exhibitions about maritime art which also deals with the North Sea complete the picture.

4.3 Industry and energy

On the island of Juist there are no wind farms or other energy-producing facilities since the households are provided with electricity by a sea cable from the coast of Lower Saxony. This way no high structures affect the appearance of the landscape of the island.

An annual volume of c. 300.000 m³ water, which is mainly needed for tourism, is provided by 25 wells which tap the freshwater lens beneath the island. This freshwater reservoir is fed only by the annual rainfall which amounts to 675 to 700 mm per square metre and thus is ca. 100 mm above national average.

The only large facility is that of the fully biological wastewater treatment plant in the west of the island. Two pump stations in Loog and Dorf take care of the disposal of the waste-water.

4.4 Infrastructure

The island is linked to the mainland by water and air. Access by water has been used since the first settlement of the island and therefore presents the first and oldest way to reach the island. Since the 19th century ferries have commuted to Juist from the coast of Lower Saxony, first from Emden and today from Norddeich. The ferries are not only a means of transportation for tourists and locals but also secure the transport of essential goods. The departures are subject to the table of the tides of the Wadden Sea.

The other way to reach the island of Juist is to use a plane. There are year round flights of visitors and their luggage from Hamburg, Emden and Norddeich by three airlines. The air service is also used for sightseeing flights over the island and the mudflats. The transport from the airport in the east of the island to the accommodation is provided by horse-drawn carriages.

5. Legal and spatial planning aspects

The community of Juist belongs to the administrative district of Aurich in the federal state of Lower Saxony. With regard to land use planning the community is subject to the regional planning of the federal state of Lower Saxony, that is the landscape framework plan and the land use utilisation plan of the community. In addition, there is the regional planning concept for the coastal sea of Lower Saxony (ROKK). The territory of the community ends at the MTHW line (line of the Average High Tide). The coastal sea below the MTHW line is a community-free area. Accordingly, the regional and building plan only applies to the land but not to the marine area.

In the Wadden Sea regions of Germany, the Netherlands and Denmark wind energy farms are not permitted. The area of the national park is registered at the EU for the Fauna Flora Habitat directive (FFH) and almost the entire Wadden Sea area is a bird sanctuary. It

belongs to the biotope network system Natura 2000. In 1996 the Wadden Sea area within the borders of the national park was recognised by the UNESCO as biosphere reservation in the context of the program "Man and Biosphere".

6. Vulnerabilities

6.1 Settlement

Larger building projects could disrupt the islands ecological structures and would impact negatively on the landscape and potentially damage the below and above ground cultural heritage. One focal point has to be the economic pollution by man who, despite all efforts to maintain the ecologic system of the national park, can easily upset the ecological balance simply with the production of waste water. This aspect will inevitably lead to higher costs for the disposal of waste which in turn will put increased financial strain on community funds.

6.2 Nature conservation

The islands designation as part of the Wattenmeer National Park and the emphasis on management of the natural environment could lead to conflicts with the management of the cultural heritage.

6.3 Tourism

In the future the biggest problem for the island of Juist is going to be an increase in the number of tourists and the facilities required by them. Unlimited access to the ecologically fragile areas of the dune landscape might also interfere with the natural environment and cultural landscape. It is therefore necessary to maintain the balance between the tourist use of the island and the ecological equilibrium. Problems resulting from increased tourism could also affect the historical structures of the island and its inhabitants. Century-old living habits would inevitably be changed by too great an infiltration of tourists and changes that would result. Historic monuments, below or above ground, could be destroyed by construction works. All this would cause significant and irreversible changes in the visual appearance of the island as well as of the typical regional culture. However, since Juist's economy is based mainly on tourism its competitive position with its neighbours also has to be taken into consideration. The desired prosperity would also be accompanied by rising demands on space which has to be reconciled with the regulations of the national park Wattenmeer. To find the balance between economic growth and nature preservation will be the challenge of the future for this island.

6.4 Infrastructure

With 40,000 arrivals and departures the island airport is, next to the airport of Hanover-Langenhagen, one of the most frequented airports of Lower Saxony. Besides the exhaust gas pollution there is also the noise pollution which poses a big problem to the animal life, to tourists and to visually to the wider landscape. It can be anticipated that maintenance and dredging works on the sea lanes for shipping, especially between Juist and the coastal landscape of Lower Saxony, will disturb prehistoric cultural layers.

6.5 Natural processes

The island is exposed to continuing processes of coastal erosion which could lead to the loss of elements of the cultural heritage located in the adjacent mud flats.

6.6 Coastal protection

The coastal protection of Juist is going to involve increasing financial cost due to present and future climate changes. Heavy storm tides flooding the island with salt water could render the freshwater lens beneath the island useless. This would endanger the independent water supply of the island and necessitate an expensive construction of a freshwater supply line from the mainland. This illustrates how fragile the ecological structures of the island of Juist are. Coastal protection measures could also cause significant damage to the cultural heritage and have a negative impact on the wider landscape.

7. Potentials

6.1 Settlement

Restrictions placed on the development of the island because of the natural environment, should serve to limit the impact of new buildings and associated works on the cultural heritage.

6.2 Management of the cultural heritage

From time to time evidence of the cultural heritage is going to surface in the mudflats or on the island itself. The new insights gained from the archaeological finds will complete the knowledge of the former living conditions of the island dwellers and will be presented to visitors to the island in the coastal museum.

6.3 Nature conservation

There is the opportunity to integrate nature conservation management with the cultural heritage in order to derive enhancement and positive management of both.

6.4 Tourism

Life on the island of Juist is dominated strongly by the weather situation of the North Sea, just as it has been for centuries. On the one hand this asks for a high level of flexibility on the side of the island dwellers, on the other hand the climatic situation of the island opens a chance for the future. The mild annual average temperature and the long late summers make the island of Juist, with its dust- and germfree air, an especially attractive destination for tourists from urban centres. The most influencing factor on the life of the inhabitants of Juist are the visitors which at the same time present the economic potential of the island. The island's cultural heritage has the potential to be further promoted for the purposes of tourism to benefit the economic situation of the island. In turn, an element of the wealth generated could be used towards the benign management of the cultural heritage and the increased economic importance attached to it could lead to a better appreciation of its importance.

8. Sources

Author: Thomas Wignanek

Bärenfänger, R. (Bearb. u. Red.; 1999): Ostfriesland. Führer zu archäologischen Denkmälern in Deutschland 35. Stuttgart.

Bundesamt für Bauwesen und Raumordnung (BBR; 2005): Raumordnungsbericht 2005. Berichte 21, Bonn.

Feldmann, R. W. (1991): Grüße aus Juist. Borkum.

Loock-Braun, M. (2002): Unterwegs auf Juist. Naturkundlicher und kulturhistorischer Inselspaziergang. Husum.

Lozán, J. L., Rachor, E., Reise, K., Weternhagen, H. von und Lenz, W. (Hrsg.; 1994): Warnsignale aus dem Wattenmeer. Berlin.

Raumordnungskonzept für das niedersächsische Küstenmeer (ROKK). Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Streif, H. (1990): Das ostfriesische Küstengebiet – Nordsee, Inseln, Watten und Marschen. Sammlung Geologischer Führer 57. Berlin und Stuttgart.

Streif, H. (2002) Nordsee und Küstenlandschaft – Beispiel einer dynamischen Landschaftsentwicklung. Hannover, 134–149.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler [Hrsg.], Archäologie der ältesten Kultur in Deutschland. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Borkum, LS

1. Overview

Name:	Borkum
Delimitation:	North Sea, neighbouring cultural landscape entities are the Krummhörn (D) and Fivelingo (NL)
Size:	Approx. 36 km ² (administrative district Leer)
Location – map:	In the Ems estuary between the branches of the Westerems and the Osterems, Germany
Origin of name:	The first documentary record Borkum dates to 1227 where it is called “Borkna”. Subsequently other variations are used (1379 “Borkinna”, 1398 “Borkyn”, 1440 “Borchum Ooge”, 1462 “Borkom”, 1559 “Borchum”).
Relationship/similarities:	Frisian Islands, Dutch Islands, dune landscapes, mudflat, national park of Lower Saxony, landscapes and settlements of maritime character. Similar whaling tradition and tourist economy to other islands.
Characteristic elements and ensembles:	Military fortifications (Napoleonic, Kaiserzeit), coastal protection, 5 lighthouses, lightship, radio history (first official radio service), early history of space flight (first rocket launches by Wernher von Braun in 1934), tourism, whaling tradition (Netherlands, Amsterdam, Emden, Hamburg), pirates (with connections with the Netherlands [Les Gueux] and the Baltic Sea [Vitailleurs])

2. Geology and geography

2.1 General

Borkum is the most westerly and the largest of the East Frisian Islands. Like Juist, Norderney, Baltrum, Langeoog, Spiekeroog and Wangerooge it belongs to the group of barrier islands whose origin and development are influenced by the waves and the tide. In order to prevent the islands from shifting eastwards, their western ends are stabilised by groins and bank stabilisations/beach walls. Unlike the other East Frisian Islands which have the protective mudflats to their rear, Borkum is sited in the mouth of the river Ems, north of the Netherlands coast and Lower Saxony, between the West Frisian Island of Rottumeroog (Netherlands) and the East Frisian Islands of Juist, Memmert with Kachelot-Plate and Lüttje Hörn (Lower Saxony). The island and the bordering mudflat belong to the national park Niedersächsisches Wattenmeer.

It is assumed that Borkum and the other East Frisian Islands developed from a Geest core which rose above the mudflats and promoted the agglomeration of sediments. The Geest core in the North Frisian Islands, which also developed during the ice ages, is still preserved. Another influencing factor in the development of the East Frisian Islands is the Average High Tide (2.4 m) which is typical for the region and also promoted the agglomeration of the sediments and the development of the dune island. Once the island had risen above the high tide level the development of sand drifts and colonisation by plants became possible.

2.2 Present landscape

The island of Borkum, with its sandy beaches in front of the dunes on the seaward side and the Randzel Mudflat to the mainland, rises to an average height of 6m over sea level. Like all the East Frisian Islands Borkum is located over a freshwater lens which is fed by rain water. There is also a freshwater lake which was created in the course of the construction of the sea dyke.

The Binnengroden (island marshes) in particular have an important role for agriculture on the island. Unlike all the other East Frisian Islands, only Borkum had sufficient farm land for its needs, today however this is only used as a sideline for the local market. The current economic basis is tourism and during high seasons Borkum can even assume an almost "town-like" character.

Until 1863 Borkum consisted of two islands, the Westland and the Eastland, which were separated by a tidal creek. The Tüskendör ("In between") still indicates this old division. In the west of the island there is the Greune Stee ("green spot"). This is a large birch and alder tree grove traversed by dunes which was planted at the beginning of the 20th century on the initiative of the head of the Heimatverein (Society for the Conservation of Local Traditions).

The language of the island dwellers is almost identical to that of the Groningerplatt which is spoken on the Dutch side of the Ems estuary.

3. Landscape and settlement history

The Institute for Historic Coastal Research and the Archaeological Service of the East Frisian Landscape have undertaken large scale investigation of the North Sea mudflats.

3.1 Prehistoric and Medieval Times

As a geologically recent landscape, the barrier islands of the Wadden Sea of Lower Saxony are characterised by quaternary deposits. Until the present the island of Borkum is subject to a continual process of expansion and reduction. However, the village of Borkum in particular shows evidence of great spatial continuity.

There is little archaeological evidence for the exact date for settlement on the island of Borkum, but it can be deduced from the wider context of the pre- and early historic development. At the beginning of the Holocene the area of the present North Sea was dry land and the North Sea then lay at the area of today's Dogger Bank. It can be assumed that the former river marshes of the Ems were accessible to Mesolithic foragers. In the course of the post-glacial temperature rise, the rising waters of the North Sea reached today's coastal lines around 5.000 B.C. and the barrier islands developed. It is possible therefore that the earliest archaeological sites are buried beneath metres of sediments.

The Neolithic colonisation of the 4th millennium can be deduced from the hinterland. The Funnel Beaker culture (TBK) is represented by a number of sites within the coastal area of Lower Saxony. Again it is possible that there are archaeological sites buried beneath the deposited marsh soils or sands which agglomerated over the millennia.

The Bronze Age is represented by several sites in the Weser-Ems region, including burial mounds and urn cemeteries. The same applies to the Roman Iron Age and the following Dark Ages.

In the 13th century Borkum is first mentioned in a written document in the context of a crusaders' fleet anchoring off the island. In the 14th century, during the time of the Hanseatic League, because of its highly favourable strategic location, Borkum provided a refuge for pirates (Vitailleurs and later Liekedeler). Between 1400 and 1401 the Hanseatic League got rid of the pirate problem. During this time, about towards the end of the 14th century, Borkum was ruled by East Frisian chieftains until in 1464 the regency passed to the Counts of East Frisia.

3.2 Early Modern Times

The infrastructure of Borkum developed from the 16th century, with the erection of several large buildings, the raising and rebuilding of the church tower as a navigation mark (1576) and the completion of the Old Dyke (1620).

During this time of religious conflict, Borkum was politically dominated by the war between the Netherlands and Spain. In 1569 the Geux de Mer ("water beggars"), like the Vitailleurs before them, chose Borkum because of its good strategic position as their base for their fight against King Philip II of Spain.

At the beginning of the 17th century the second so-called Upholmdeich (1620) was built. At this date a strong resurgence took place in seafaring after the disruption caused by privateering during the War of Spanish Succession (1701-13). In this period flotsam and jetsam was a welcome source of income. An intensified maritime trade and arctic whaling became important parts of the Borkum economy. Whaling Commanders from Borkum played a very active part in whaling until it declined at the end of the 18th century. One reason for this was the war between the Netherlands and England in which Borkum sided with the Netherlands. Another reason was the dramatic decline of the whale population. The few preserved whalers' graves on the cemetery by the old lighthouse with their scull-decorated tombstones as well as the fences made of whale jaws, like that at the reformed parsonage (Wilhelm-Bakker-Straße) and at the local museum, provide tangible evidence of this period.

After the death of Prince Carl Edzard in 1744, the last male descendant of the house of Cirksena, Borkum passed to Prussia. From 1780 onwards, following a period of wealth, a recession developed due to the decline in whaling and sea trade.

3.3 Modern Times

At the beginning of the 19th century this economic decline picked up speed. Influencing factors included the French occupation from 1810 to 1813, combined with heavy storm floods and severe sand drifts. The population was reduced by half, dwelling houses were deserted and migration to the mainland set in. The Franzosenschanze as a part of the Napoleon's continental system from 1809 is a reminder of this period.

During the Peace of Tilsit (1807 to 1810), Borkum first passed to the Dutch Kingdom and then to France. After the defeat of France, Borkum returned to Prussia and at the Congress of Vienna in 1815 it was allocated to the Kingdom of Hannover.

A few years later the Land Hanover rebuilt the church tower (old lighthouse) of Borkum as the first lighthouse (1817). In 1828 the German language replaced Dutch as the official language. During this period the island dwellers again sank into poverty. An economic improvement began after 1830 when more and more merchant families from Emden began to spend their holidays on Borkum. As early as 1844 an association acting as an agent for accommodation was founded and in 1860 there were already c. 500 people who spent their annual holidays on Borkum. Tourism grew to be a new economic factor and led to further extensions to the island infrastructure. In 1879 the Great Lighthouse was constructed, in 1888 the first pier was built, in 1891 canals were constructed and in 1891 the water tower was built.

At this date the Peace of Prague led to the annexation of the Kingdom of Hanover, and Borkum again became Prussian. In 1902 Emperor William II decided to turn Borkum into a sea fortress. The strategically important island was equipped with batteries and bunkers and was dominated for the following 100 years by the military. Since the Second World War an extension of the spa took place.

4. Modern development and planning

From an administrative point of view Borkum, which today belongs to the administrative district Leer, became part of the federal state of Lower Saxony only in 1946 and received its town charter in 1950. The town of Borkum comprises the settlement Borkum in the west of the island as well as the smaller communities of Ostland and Reede (in the south-east by the harbour).

Borkum therefore is subject to the urban and regional land-use planning of Lower Saxony. The basis for this is the Law for Regional Planning and Land Use Regulation (NROG) and its Supplemental Administrative Regulations (VV-NROG) of Lower Saxony. The aims and principles of the land use planning are defined in the Regional Planning Program of the Federal State of Lower Saxony (LROP). The LROP forms the basis of the Regional Planning Program of the Administrative Districts (RROP).

According to the regional planning report of 2005 of the federal office of building and regional planning, Borkum lies in a region in which the development of the population and employment is characterised by a significant growth. Since the middle of the 19th century this growth is based on the expansion of tourism.

4.1 Land use

For a long time the land use on Borkum was dominated by seafaring (trade, whaling, fishing) and agriculture. Another important source of income was the collecting of flotsam and jetsam. In this context it has to be taken into account that next to the periods of economic crisis there were also always periods of prosperity.

Nevertheless the decline of whaling, the changes within sea trade and the decline of the fishing resources because of overfishing led to a massive orientation towards tourism which, since the 1950s, has been the most regionally influential factor. As early as 1850 Borkum had the status of a seaside resort and, compared to the other seaside resorts, it was initially considered to be rather cheap and casual.

After the Second World War Borkum grew to be a centre of tourism which has over 150.000 visitors per season and about 2.2 million overnight stays today. Directly or indirectly, tourism provides almost 80% of the jobs on the island. The percentage of industry in contrast lies at 8.2%. Therefore almost every inhabitant of Borkum is directly or indirectly dependent upon tourism.

Although Borkum, in contrast to the East Frisian Islands, has sufficient farmland at its disposal, agriculture is declining slowly, largely because tourism is an easier source of income. Another problem is the European agricultural policy which is aiming at an optimisation, intensification and rationalisation.

4.2 Settlement development

Settlement development is historically dominated by economic criteria. Since the middle of the 19th century tourism has been the primary factor. In contrast to the other East Frisian Islands, Borkum, especially during the summer, gives the impression of a mainland city with large building complexes. As a licensed North Sea spa the island has numerous recreational and tourist facilities which dominate the appearance of the town (including one of the largest youth hostels in Europe, swimming pool "Gezeitenland", boardwalk, a light railway, a museum of local history, lighthouses, etc.).

4.3 Industry and energy

Considering the lack of alternatives, it is probable that tourism is going to be the future base for the economy and development of the island. The isolated location of Borkum makes the siting of industrial plants unprofitable in comparison to mainland locations. Additionally, such industrial settlements with their accompanying environmental stress could hardly be coordinated with the tourist interests of the island.

The connection of Borkum with the German, respectively European, power and gas supply system is achieved via three 20kV sea cables and two natural gas pipelines. There are also several telecommunication cables linking the island with the mainland, including the first sea cables to England, and later the complete German overseas telegraph network, which have crossed the island since 1856. In 1900 the Reichs-Post und Telegraphenverwaltung (postal and telegraph administration of the empire) set up the first official worldwide radio service on Borkum.

A pilot project for renewable energy on the island, the foundation "Borkum West" (a wind farm 45km north of Borkum with 12 wind energy plants) has been authorised and the start of construction is scheduled for 2008. The extension of the 65km-long power cable channel

leading over Norderney to the mainland is going to cause massive interference into the submarine cultural landscape of the North Sea. In the German Exclusive Economic Zone of the North Sea 968 wind-energy plants have been authorised and for the extension phase 12.410 wind-energy plants are planned. If these plans were realised then the island dwellers are worried about the safety of the ships because instead of the present soft groundings on the sand and mud there will be the danger of hard groundings on the anchorages of these plants. The anchorages act like artificial reefs and are planned in the direct proximity of the main shipping lanes. If the wind farm "Riffgat", which is planned only 13.5 km from Borkum with 44 180m-high turbines, is constructed then it is going to severely impede the cultural landscape.

4.4 Infrastructure

Traditionally Borkum was accessed by water. Prior to 1850 the ferry only called at Borkum every fortnight. With the growth in tourism a weekly service was set up which alternately called at Greetsiel and Emden. In 1883 a jetty was constructed as part of the extension of the island train, which was completed in 1888.

Today there is a tidal-independent connection between Borkum and Emden and Eemshaven. The traffic to the mainland of Lower Saxony to Emden Außenhaven (outer harbour) which is linked to the European railway network and to the harbour of Eemshaven of Lower Saxony is serviced by car ferries and passenger express ferries. From Borkum you can also reach the neighbouring islands.

With the completion of the railway line Emden-Meppen in 1856 Borkum was integrated into the German railway network. This had an imminent effect on the growth of tourism.

By the end of the 19th century the extension of the island railway line and the harbour terminal began. The impulse for this was a threatening competitive disadvantage in view of the extension of the traffic infrastructure on Norderney. A horse tram was built in 1879 which was first used for the transport of building material for the new lighthouse and was rebuilt as the island railway line. When Borkum became a sea fortress the narrow gauge railway was extended from a length of 8km to over 40km, in parts comprising two lines. During the Second World War, next to the "main line" the military constructed several light railway lines which linked the main settlement to the different parts of the fortress.

In the 1970s the importance of the island railway line grew in response to the growth in tourism, and in 1990 it became necessary to add new rolling stock. There is also an hourly bus service from the harbour which almost follows the route of the train. The bus service also links the eastern part of Ostland, which is not serviced by the railway line. Car traffic is restricted on the island.

East of the town of Borkum there is a commercial airport for recreation flights and for smaller passenger aircraft which is regularly serviced from Emden. The flight time of the line Emden-Borkum is about 15 minutes. The airport is also used by private aircraft.

5. Legal and spatial planning aspects

The community of Borkum belongs to the administrative district of Leer in the federal state of Lower Saxony. With regard to land use planning the community is subject to the regional planning of the federal state of Lower Saxony, that is the landscape framework plan and the land use utilisation plan of the community. In addition there is the regional planning concept for the coastal sea of Lower Saxony. The territory of the community ends at the MTHW line (line of the Average High Tide). The coastal sea below the MTHW line is a community-free area. Accordingly, the regional and building plan only applies to the land but not to the marine area.

The current regional plan for the federal state of Lower Saxony (LROP) contains only a few regional planning goals for the marine area. To define suitable areas for wind energy utilisation at sea even within the 12-seamile zone (Riffgat and Nordergründe) an alternation of the regional planning concept of the federal state of Lower Saxony – part II was published.

In the Wadden Sea regions of Germany, the Netherlands and Denmark wind energy farms are not permitted. The area of the national park is registered at the EU for the Fauna Flora Habitat guideline (FFH) and for the most part is a bird sanctuary. It belongs to the biotope network system Natura 2000. The main part of the park lies within the territory of the EU water withdrawal guideline. In 1996 the Wadden Sea area within the borders of the national park was recognised by the UNESCO as biosphere reservation in the context of the program "Man and Biosphere".

The sea lane Ems at the south-western shore of the island is joint German-Dutch contract-territory. Borkum belongs to the area of the Trilateral Wadden Sea Plan (D, NL, DAN).

6. Vulnerabilities

6.1 Agriculture

Globalisation has led to more intensive agricultural production and an enlargement of farmsteads. The structural change in agriculture is leading to a loss of historic and cultural landscape features as well as change of use of redundant farm buildings. There is a lack of young people in farming on the island resulting in gradual decline.

6.2 Tourism

Since the 1950's tourism has become the most influential factor on the island. The numerous recreation facilities need to be maintained, renewed and expanded which can create vulnerable situations for the cultural heritage.

6.3 Industry and energy

The construction of the power cable in the Wadden Sea will cause significant disturbance to the sub water landscape of the North Sea. The construction of extensive windfarms in the North Sea will impact severely on the visual outlook of Borkum.

6.4 Natural resources

The fresh water reserves beneath the island has a diameter of up to 40 metres and is presently protected by the dykes and protective dunes. The drinking water comes from shallow and deep wells which are situated on the Ostland of the island and which tap the freshwater lens which is fed by rain water. Another source of water is the „Waterdelle“. The continuous withdrawal of water, however have caused the upper part to fall dry and this problem is likely to continue.

7. Potentials

7.1 Agriculture

The promotion of cultural landscape management by agriculture production moving towards more high quality products for the local tourist market provides the potential for protection of the historic landscape. Products could be developed which are based on local tradition and at the same time meet ecological and landscape preservation requirements.

7.2 Tourism

For tourism to be successful in a sustainable way a close local, regional and supra-regional cooperation of the official and private parties is required. Good examples are collective marketing companies like „Die Nordsee – Sieben Inseln eine Küste“ (The North Sea – Seven Islands And One Coast) which was founded in 2004. Their aim is to make better use of the existing range of potentials and synergies between the East Frisian Islands and of the region of the North European Wadden Sea. Areas such as the seafaring and agriculture history of the island as well as the history of the tourist industry can be promoted.

8. Sources

Author: Ulf Ickerodt

Borkum 2000 Jahre, 7 v. Chr. -1993 (1993) Hrsg. von der Kurverwaltung Nordseebad Borkum GmbH. Borkum.

125 Jahre Nordseeheilbad Borkum (1975): Hrsg. von der Kurverwaltung Nordseebad Borkum GmbH. Borkum.

Bundesamt für Bauwesen und Raumordnung (BBR; 2005): Raumordnungsbericht 2005. Berichte 21, Bonn.

Beeneken, W. (1987): Rund um den Alten Leuchtturm. Hrsg. vom Heimatverein Borkum e.V. Borkum.

INSEL-WERBUNG (Hrsg.; 2001), „Ditjes un' Datjes“. Kleine Borkumer Geschichten zum Zeitvertreib. Borkum.

Kappelhoff, B. (1989): Die Fähre zum Festland. Eine kulturhistorische Betrachtung des Borkumverkehrs aus Anlass des 100jährigen Jubiläums der Borkumer Kleinbahn 1988 und der Reederei Aktien-Gesellschaft „Ems“ 1989. Emden.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Schweers, H. (1976): Der Borkumer Dünenexpress. Die Geschichte der Borkumer Kleinbahn und der Nordseebäderdienstes Emden-Borkum. Hrsg. vom Arbeitskreis für Kleinbahngeschichte. Aachen.

Streif, H. (1990): Das ostfriesische Küstengebiet – Nordsee, Inseln, Watten und Marschen. Sammlung Geologischer Führer 57. Berlin und Stuttgart.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler [Hrsg.], Archäologie der ältesten Kultur in Deutschland. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Harlinger Land, LS

1. Overview

Name:	Harlinger Land
Delimitation:	North Sea with the islands Langeoog and Spiekeroog, Geest border, neighbouring entities Norderland, Auricher Land, Wangerland
Size:	Approx. 657 km ² (administrative district Wittmund)
Location:	Sea marsh in the western part of Lower Saxony, Germany
Origin of name:	Wangerland is a historical name which can be traced back about 1200 years to the Friesian Gau Wanga. The name Wangerland is derived from the Friesian Wanga, a pasture or plain. The earliest mention of the name (in two different sources) was in 787 AD. The Wanga is mentioned in the chronicles of Moissac Abbey in southern France, and also in the Vita of Saint Willehad.
Relationship/similarities with other cultural entities:	Similar Heritage and cultural landscape to Norderland and parts of Wangerland/Jeverland. Shares tourist activities with both the mainland and island coastal resorts. Used similar sod techniques on the Geest similarly to other Geest areas such as Auricherland.
Characteristic elements and ensembles:	Dwelling mound landscape with its large village mounds and massive farmhouses. The maritime heritage significant of coastal regions is reflected by dykes and floodgates as well as by sluice harbours. Lake marsh, Geest, peatland areas, tourism, agriculture rural house forms with Frisian gulf-houses, loose scattered villages, sluices, linear settlements and settlements on dykes

2. Geology and geography

2.1 General

The cultural entity of Harlinger Land stretches across the whole northern part of the East Frisian administrative district of Wittmund as well as across both the islands of Spiekeroog and Langeoog. Nowadays the area is known as the administrative district of Wittmund Harlinger Land.

In the north it reaches the coast, whose offshore mud flats belong to the Wadden Sea National Park of Lower Saxony. The origin of the East Frisian Islands goes back to sand banks, uncovered at high tide, which formed around the time of Christ's Birth, on which sand dunes developed. The islands are mobile and have changed their position and size numerous times over the centuries. They would still do this today if the sea defences were removed.

The edge of the marsh consists of deposits from two former bays: to the west the bay of Durnumersiel and to the east the Harlebucht (Harle Bay). In the south the Harlingerland covers the northernmost outcrop of the East Frisian-Oldenburg Geest. Off this was the large Geest-island of Esens with a marsh fringe to the north, in which there are a number of smaller Geest-islands.

The bay of Donumersiel was created by the flooding of an Ice Age meltwater valley. Around 5000 BC, the sea reached the present coast of East Frisia and flooded the valley of Dornumersiel. In the high Middle Ages storm floods broke into the area of Dornum-Westeraccum and to the south of it. Between Bengersiel and Neuharlingersiel an approximately two kilometre broad piece of the coast has disappeared since medieval times. The village of Otzum was left outside the dykes in 1420; its remains – especially those of the church – can still be seen in the mud flats. In 1570 the dykes around the villages of Westbense and Ostbense were completely destroyed. Harlebucht (Harle Bay) forms the eastern part of the Harlinger Land. It originated in big land losses due to storm floods in the high Middle Ages and reached from Neuharlingersiel in the west to Friederikensiel in the east, with its four side bays of Esens, Burhaffe, Wittmund and Sandel. From about 1400 dykes were built in the bay and land reclamation began.

2.2 Present landscape

Most of the landscape is characterised by the sea marshes of Dornumer Bucht (Dornum Bay) and Harlebucht (Harle Bay). The East Frisian Islands are marked by their dune-landscapes and tourist facilities. The healthy sea climate with its clear, salty air, moderate changes in temperature and long durations of sunshine have made them an important area for leisure activities. Modern spas and seaside resorts have developed out of fishing villages on the coast.

On the Geest, as well as on its northerly boundary, there are extensive raised bogs. Here the peatlands of Meerhusener Moor and Tannenhausener Moor as well as the nature reserve area Ewiges Meer form important landscape components.

Within the Geest-area varied groupings of arable- and meadowland, trees and embankment hedges, secluded farmyards and villages are evident today. Villages and farmyard groupings on large mounds (settlement mounds) as well as small, flat dwelling mounds with farms contribute to the unmistakable character of the landscape. With its great variety in natural areas the Harlinger Land represents every type of landscape present in the Lower Saxony's coastal-region.

3. Landscape and settlement history

The Harlingerland has a complex and fluid settlement history. In the marsh in particular, man's continual struggle to gain and preserve land can still be observed well in the characteristic dykes and dwelling mounds.

3.1 Prehistoric and Medieval Times

Large-scale investigation of the North German mud flats and on the adjacent Geest has progressed considerably, due to the efforts of the Institute of Historical Coastal Research and of municipal, regional and local archaeologists. As a relatively recent geological area, the Weser-Ems area is marked by quaternary deposits. The tidal river marshes of the Harlingerland have been formed since the end of the last Ice Age.

The exact date when the Harlingerland was settled can only be determined by comparison with neighbouring areas, and by assuming that the same trends and developments occurred in the Harlingerland. At the beginning of the post-Ice Age period, today's southern North Sea coast was dry land and the North Sea coast itself was located in the area of the Dogger Bank. It can be presumed that Harlingerland was frequented up to the Mesolithic by foragers. It is entirely possible that sites belonging to these or later phases are located beneath the marsh and its layer of sediment deposits.

The Geest was settled by farmers in the Neolithic Age, c. 4000 BC. Monumental evidence for this period included the megalithic grave sited on a Geest-ridge near Uтары, unfortunately the above ground remains of this have been utterly destroyed. Numerous finds attest to peoples inclusion of the peatlands of the region within their land use. For the Middle and Late Bronze Age, roughly between 1500 and 1000 BC, there was a phase of sea-withdrawal. A

few archaeological finds show that those people living on the coast reacted to the changing ecological conditions and settled in the marshy regions. The Geest was relatively densely settled during the Bronze Age, as the number of graves dating to that period demonstrate. A fine example is the "Radbodsberg" near Dunum, where the Frisian king Radbod is supposed to have been buried. Before excavation the mound still had a diameter of 25 to 30 metres and was regarded as the biggest tumulus in East Frisia. The primary burial dated to the late Neolithic period. In the Early Iron Age it was used for further burials. Remains of Late Bronze Age settlements were discovered when the topsoil was removed prior to development in Brill and Westerholt.

This settlement period of prehistory ended around 300 BC, when the sea once again advanced. Archaeological finds in the mud flats off Ostbense and the dating by dendrochronology to 210 BC of wood from a number of excavated houses from that site, has raised the issue as to whether there was really a complete abandonment of the sea marshes at that time. Between 150 and 50 BC another withdrawal of the sea led to a new settling-period, which did not end this time when the sea penetrated yet again in the 1st century AD. Instead the people living on the coast started building dwelling mounds (settlement mounds), that is symmetrical mounds consisting of dung and clay on which the dwelling place was sited. Archaeological finds from today's mud flats off Ostbense give proof of the changed coast line. Remains of such a settlement mound, dating to the 1st to the 4/5th centuries AD was documented here. In addition burials of the 5th century provide evidence for the existence of former settlement areas, which probably sank in the early Middle Ages. Excavations of a settlement in Westerholt, in the immediate vicinity of the marsh, provide insights into the life and the activities of the 4/5th century on the northerly Geest border. Here farmhouses, outhouses and leftovers from iron-processing were discovered.

In the 5th century a thinning of population started in the north of Germany. According to new research, a withdrawal of the North Sea did not take place between 350 and 700 AD, so ecological reasons cannot have been the reason for this population reduction. A few ceramic finds, for example from Ostochtersum, demonstrate that there was not a complete lack of settlement. Stronger settlement activity began in the 7th century AD.

The next settlement of the marsh is ascribed to the Frisians, who expanded from their tribal-area in the Netherlands. In comparison to the situation on the coast, the high Geest was probably only thinly settled. This situation changed in the 6/7th century AD due to a long-term extension of land (not clear what is meant here). The oldest remains found to date on a Geest settlement, have been excavated close to Esens. Six houses with byres, which existed one after the other, have been recorded. The settlement began in the 6th century. The large burial ground of Dunum gives an even better idea of the situation. Here 778 burials from the late 7th to the 10th century were uncovered. The inventory of the Frisian burial ground provides information about the local- and long-distance trading which was across the North Sea to England and across the Balti to Scandinavia.

About 300 mounds (settlement mounds) are known on the North Sea coast, of which roughly 220 are farmyard-mounds, 33 village-mounds and 18 church-mounds. These were subsequently surrounded by dykes. In western Harlingerland there are a number of village-mounds, and in the marshland close to the coast reaching as far as Ostbense there are a number of small mounds. Whilst the village- and church-mounds lie close to the Geest, the majority of the farm-mounds are sited in the outlying marsh, mainly in the Harle Bay. On the western shore there are such mounds as: Gross Holum, Werdum with the smaller secondary mound of Berdum, Eggelingen, Toquard and the village-mound of Funnix. On the Geest-islands further dwelling mounds exist. With the aid of place name-research it can be inferred that they were expansion-villages of the late Middle Ages. A number of farmyard-mounds along the older secondary-dykes makes up small settlements. However without appropriate investigations the precise dating of these settlements is often virtually impossible.

In the 11th century the mounds of Funnix, Werdum and Eggingen were protected by ring-dykes for the first time, which were primarily to protect the settlements and the working areas in the vicinity from high tides. In the high and late Middle Ages the first closed dyke-lines following sea-side embankments were constructed, as at the Funnixer Altdeich or Berdumer Altdeich (Old Dyke). The marsh was drained both by natural and artificial (Harle) watercourses, which still run through the countryside. Sluices in the outer-dykes, the so-called floodgates, have regulated the flow of water since the 15th century. In the Seriem mud flats a floodgate was partially uncovered, which was dated post-1464 by means of dendrochronology. It presumably belongs to the western end of Harlebucht (Harle Bay) or to or a withdrawal dyke which was set up after the village of Otzum was excluded from the protection of the dyke in 1420.

In the high and late Middle Ages a number of castles and fortified mansions were built, which still exist in Berdum, Butforde, Esens, Funnix, Seriem, Uтары, Werdum and Wittmund.

Since the high Middle Ages the living conditions on the Geest had stabilised due to new agricultural techniques. The use of the sod-technique of fertilising in combination with the cultivation of winter rye provided increased returns and incidentally the burying of archaeological evidence. The monasteries of Marienkamp and Schoo, founded in the late Middle Ages, have left no significant traces. Today an artificial fish-pond is the only remnant of the monastery of Schoo (today Domäne Schoo nearby Esens).

3.2 Early Modern Times

In the 15th century the setting up of dykes began around Harlebucht (Harle Bay), which had been breached by storm floods in the early Middle Ages. The building of dykes began on the western edge. Between 1500 and 1550 a dyke which began in Altfunnixsiel, ran past the site of the future Altharlingersiel and reached the coast at Neuharlingersiel, founded in 1693. The Berdumer Altdeich (Old Dyke) was built in the centre in 1570 and the old middle dyke of Berdum, which had been built in 1598, moved. In 1617 dykes were built on the Werdumer Altengroden. In combination with the foundation of Neufunnixsiel in 1658, the new middle-dyke of Berdum was built. In the 17th century further dykes were built. In 1729 the harbour of Carolinensiel was founded. In 1765 the Friedrichsschleuse was developed in front of Friedrichsgroden. Up to 1895 the places Schwerins-, Neu-Augusten- and the Elisabethgroden were added. With the foundation of the sluice-harbour of Harlesiel in 1956 the building of dykes around Harlebucht (Harle Bay) ended.

Political rule by chieftains in East Frisia developed in this period. After the chieftain Sibet Attena had united Esens, Wittmund and Stedesdorf in 1454/55, the united Harlingerland kept its independence for a while. Battles with the Cirksena, the lords of East Frisia, took place. From 1600, after much back and forth, Harlingerland belonged to East Frisia. In 1744 all the Cirksena possessions, including the Harlingerland, were taken over by the Prussian kingdom.

The Harlingerland did not have any characteristic sea-trading places rooted in the Middle Ages, such as Emden. Only two trading places with a typical structure developed, at Esens and Wittmund. Here the centre is built around a church mound, with a square serving as a market in front of it and a long street with urban houses. Esens received town-rights around 1500 and in the late Middle Ages was the capital of Harlingerland. In 1744 the Prussians transferred the essential functions such as the mint to Aurich and Esens degenerated into a provincial town. Finally in 1806 the Prussians designated Wittmund as the district city of the Harlingerland enlarged by the district of Friedeburg.

At the watergates the small harbour-settlements typical of the Harlingerland developed, as at Carolinensiel, whose heyday was in the mid 18th century. With the appearance of steamboats at the beginning of the 20th century, however, its era came to an end.

3.3 Modern Times

The administrative district of Wittmund emerged from the districts of Wittmund and Esens as well as the town of Esens. Within the scope of district reform of 1977 in Lower Saxony, the administrative district of Wittmund was dissolved and fused with the communities of Jever Sande, Schortens, Wangerland, Wangerooge into a new administrative district of Friesland. After a complaint about infringement of the constitution at the constitutional court of Lower Saxony in Bückeburg, the administrative reform was changed once more and the administrative district of Wittmund was restored to its present form.

The economy of the Harlingerland is traditionally characterised by agriculture, and today by tourism. Seen from an industrial and trade point-of-view there are a number of medium-sized companies and family run businesses.

Wittmund consists of unified communities such as Langeoog, Spiekeroog, Friedeburg and the town of Wittmund as well as the administrative units of Esens and Holtriem. Wittmund as district town and the seat of administration is the largest town with more than 21.000 inhabitants, followed by Esens with roughly 7.000 inhabitants. Esens is a small town with a distinct tourist infrastructure which, however, has also got extensive industrial estates and a newly built suburbs encircling the entire town. With a long-term project for town redevelopment the attempt is being made to adjust to the requirements of a tourism centre.

The coastal area with its islands belongs to Wadden Sea National Park of Lower Saxony and, according to the National Park-Law of 2001, most of it belongs to the zones 1/ Restricted zone and 2/ Intermediate zone. In the restricted zone, as the most sensitive area, the strictest protection-regulations are in force. The designated areas may be entered only on marked paths.

4. Modern development and planning

Traditionally the economy of the Harlingerland consists of livestock breeding and farming. In the coastal sluice harbours shipping and fishing used to play a big role, but tourism now predominates. In its regional planning report of 2005, the Federal Office for Building and Regional Planning includes the administrative district of Wittmund amongst those regions which show a small increase in population, and where employment is decreasing. The use of land for settlements and the increase in traffic are classified as slight. To encourage economic development, industrial estates for small- and medium-sized companies have been provided in all community-areas. In addition there are designated building-areas for the erection of single-family homes.

The Harlingerland with its 88,3 inhabitants per square kilometre is classified as a thinly populated area.

4.1 Land use

The Harlingerland is a complex natural space. The land to the north of Wittmund up to the coastal region with the former Harlebucht (Harle Bay) is meadowland and arable marsh: a very fertile area, which despite its small surface-size produces good average grain yields. On the other hand the Geest banks to the west and south of Wittmund are designated as farmland with at present unfavourable production conditions as far as natural environment and business management are concerned. Only 9% of the employees work in agriculture and the percentage is declining, although the areas of agricultural use in the communities with 51.000 hectares represent the largest surface use. The number of the farms continues to decline from year to year.

In contrast, tourism is increasing, not only in the coastal bathing resorts and islands, which with their nature and landscape protection areas and the mud flats off the coast give the area its particular charm, but also in the hinterland, with its traditional field structures, the nature reserve "Ewiges Meer" and a relatively high proportion of woodland by coastal standards of 3.580 hectares.

4.2 Settlement development

The general lack of industry and the major urban centres leads to commuting. The communities of Friedeberg and Holtriem lead with the total number of 1.000 to 1.500 commuters leaving. Wittmund and Esens have got at least 300 to 600 more commuters leaving than those coming. The greater number of incomers, on the islands Langeoog and Spiekeroog, are tourists.

Tourism is thus one of the most important economic branches of the administrative district. Over recent decades the two North Sea islands have accommodated a large numbers of guests during the summer months. In addition the coastal settlements of Harlesiel, Esens-Bensersiel and Neuharlingersiel have been turned into tourist resorts in recent years. Even areas further away from the coast, such as Friedeburg and Holtriem, can claim rising guest-figures from year to year. More than five million over-night stays in the administrative area are recorded every year. The proportion of people employed in trade and tourism is 30%, outstripping the productive businesses and agriculture.

There is no Landesmuseum In the Harlingerland, but there are numerous regional- and local history museums, which deal with the usual features of the region. On the island of Langeoog the shipping-museum with the North Sea- Aquarium is sited in the spa-centre supported by the spa-administration. Here numerous items, which are connected with shipping and coastal-shipping, are exhibited. Furthermore there is the "Seemannshus", a museum dealing with local history including a historic wedding-room and the water tower, which is the landmark of Langeoog. Apart from its island-museum, Spiekeroog has got a curious shell-museum and a school-museum to offer. The coastal resorts have similar features. Neuharlingersiel, for instance, has a ship-in-a-bottle museum and a sea reserve museum. In Altfunnixsiel there is the leisure park "Lütge Land". The park should probably be seen as a leisure facility in connection with the seaside resort tourism. The German Museum of Tidal Harbours in Carolinensiel around the old harbour is somewhat larger. Besides the museum harbour with its floating "veteran ships", historic buildings such as a granary from 1840, and a signposted trail belong to the ensemble. The museum has got numerous collections dealing with the building of dykes and sluices, shipping, fishery and trading. In Carolinensiel there is also a national park house.

Museums dealing with local history can be visited in Wittmund and Friedeberg. The museum of local history, Peldermühle, in Wittmund displays items on town history as well as on the culture and history of the Harlingerland. The town of Esens has even developed into "stronghold of museums". The exhibition "Leben am Meer" ("Life by the Sea") is located in a mill, with many archaeological objects, which have emerged from today's mud flats. Besides this there is the Amber House, a precious stones and jewel museum, and a museum of holography amongst others.

4.3 Industry and energy

There are no important industrial sites in the Harlingerland. About 550 small trade businesses have settled here. There are roughly 15 industrial sites with around 20 employees. All in all around 1.000 people work in this field.

In the meantime a number of wind turbines have made their mark on the landscape, especially in the urban areas of Wittmund and Bassens.

4.4 Infrastructure

Points of access to the motorway are relatively far away in the Harlingerland, as the nearest motorway is the A 29 from Oldenburg to Wilhelmshaven. Here, close to Schortens, the Federal road B 210 crosses, which links Jever, Wittmund and Aurich. Well developed roads run from north to south from Friedeberg to Wittmund and from here as the B 461 to Harlesiel on the coast as well as from the B 210 near Middels via Esens to Bensersiel. From here and from Neuharlingersiel there are ferry-connections to the islands. Otherwise the places in the administrative district are well connected to each other.

There is little railway-traffic in the Harlingerland or rather in the administrative district Wittmund, especially since the closure of the lines during the last decades. Thus of the former 51 km of rail network 33 km have been closed. The remaining line with the stations Wittmund, Esens and Burhufe is now operated by NordWestBahn instead of the Deutsche Bahn AG.

5. Legal and spatial planning aspects

As far as its natural spaces are concerned, the Harlingerland can be divided into various zones; 1. The mud flats which belongs to the Wadden Sea National Park of Lower Saxony and the islands. 2. The North Sea coast with its sea marshes and the marshes of the former Harlebucht (Harle Bay) surrounded by dykes. 3. The county inland with the Geest and the peatlands.

In matters of regional planning the communities are subject to the regional planning program of Lower Saxony or the regional landscape or land use planning program set up by the communities. As far as planning is concerned there are regional development concepts for East Frisia and the concept of regional planning for the coastal area of Lower Saxony. The "Regional Structure Conference of East Frisia" has planned to strengthen the economic structures. In addition an Ems-axis project is to be funded. The potentials are to be arranged according to the fortes of each administrative district. The administrative district of Wittmund has taken over the overall responsibility for the area of tourism. For the period 2000 to 2006 the administrative district of Wittmund is part of the Lower Saxon Aim-area 2 of EC-structural policy. There are currently proposals for the support of rural areas for the period 2007-2013. Sources such as agriculture, tourism, crafts and businesses should become main stays for the rural economic areas.

The communities of the Harlingerland in Lower Saxony are a part of the Ostfriesische Landschaft (East Frisian landscape). As an institution it is responsible essentially for tasks such as the areas of culture, science, preservation of historical monuments and education.

6. Vulnerabilities

6.1 Settlement

The historic settlement pattern is important within this area and is vulnerable to the threat from development within the core and expansion around the perimeter. The historic farmsteads are also vulnerable to change of use away from traditional agricultural production.

6.2 Agriculture

The structural change in agriculture and the dependence of the future direction taken by this branch of industry on the agrarian policy of the EU, will continue to accelerate the trend towards intensification of the production in the Harlingerland. Declining numbers of employed people in agriculture has led to an increase in commuters, as the job market in the rural regions cannot retain the work force. The change in the nature of the economy also threatens traditional agricultural production.

6.3 Tourism

The cultural landscape is part of the identity of the area and from the view point of tourism is a basic and indispensable factor in the economy, particularly in a region in which tourism accounts for so much employment. Modern mass-tourism can lead to the loss of authentic structures. Constant adaptation of the available tourist infrastructure facilities to the generally increased demands for quality and the changed expectations of specific target groups is unavoidable. Measures which would extend the tourist season by the creation of additional facilities or areas of interest are important. However, the aim must be expansion which is environmentally and culturally sustainable and which is, e.g., in accordance with the national park idea.

6.4 Nature conservation

There is the possibility that surviving cultural historic assets will not be taken into consideration when conservation programmes are being planned for the nature protection and woodland areas.

6.5 Industry and energy

Due to the different use to which the sea is put fishing as a traditional economic system in the mud flats has become problematic. The historic industry is in decline and an alternative use of the fishing boats is required. Development of wind farms needs to take into consideration the cultural heritage and the visual landscape when new sites are being identified.

7. Potentials

7.1 Settlement

Large villages-mounds, middle-sized mounds with groups of farms and small, flat farm-mounds as well the dykes and floodgates of the coastal region contribute to the unmistakable landscape and provide significant potential for the promotion of the cultural landscape of the area. The fishing villages of the coast with their marine character have turned into modern spa- and bathing resorts, however there is the potential for identifying the historic development of the villages and their earlier industry.

7.2 Agriculture

The cultural landscape of the Harlingerland has maintained its special character in spite of modern influences although many farms are being abandoned. With the increase in tourism it is important to find appropriate new functions for these farm complexes which protect their historic character.

7.3 Tourism

Part of the area is characterised by the sea marshes of the Dornumer Bucht (Dornum Bay) and Harlebucht (Harle Bay). The East Frisian Islands distinguish themselves by their dune scenery and tourism facilities. The healthy sea-climate with pure, salty air, small temperature variations and long hours of sunshine has made them into an important recreation-area. On today's Geest colourful variety of arable land and pasturage, groups of trees and embankment hedges, single farms and villages can be seen.

7.4 Nature conservation

The nature- and landscape protection areas and the mud flats off the coast, as well as the hinterland, with the historic field structures and the nature reserve "Ewiges Meer", offer a uniquely varied landscape. Both promotion and protection of the cultural heritage of the area can be achieved by including the cultural heritage within the development and management plans for these areas.

7.5 Industry and energy

Due to the different use to which the sea is put fishing as a traditional economic system in the mud flats has declined. Tourism can and should develop synergy-effects with for example, fishing boat-trips or the promotion of historical fishing techniques. In this way the cultural heritage of the area can be partially preserved.

8. Sources

Author: Frank Both (Übers. Mai-Catherine Botheroyd)

Bärenfänger, R. (Bearb. u. Red.; 1999): Ostfriesland. Führer zu archäologischen Denkmälern in Deutschland 35. Stuttgart.

Bärenfänger, R. (2004): Organische Funde aus der spätkaiserzeitlichen Siedlung bei Westerholt, Ldkr. Wittmund. In: ArchäologieLandNiedersachsen. 25 Jahre Denkmalschutzgesetz – 400 000 Jahre Geschichte. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 42. Stuttgart, 423–424.

Bärenfänger, R. (2004): Mittelalterliche Geestsiedlungen in Ostfriesland. In: ArchäologieLandNiedersachsen. 25 Jahre Denkmalschutzgesetz – 400 000 Jahre Geschichte. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 42. Stuttgart, 460–464.

Behre, K.-E. (2003): Eine neue Meeresspiegelkurve für die südliche Nordsee. Transgressionen und Regressionen in den letzten 10000 Jahren. Probleme der Küstenforschung im südlichen Nordseegebiet 28, 9–63.

Behre, K.-E., van Lengen, H. (Hrsg.; 1998): Ostfriesland. Geschichte und Gestalt einer Kulturlandschaft. Aurich ³1998.

Bundesamt für Bauwesen und Raumordnung (BBR; 2005): Raumordnungsbericht 2005. Berichte 21, Bonn.

Ey, J. (2000): Der frühe Deich- und Sielbau. Archäologische Denkmäler zwischen Weser und Ems. Oldenburger Forschungen N. F. 13, 171–181.

Fansa, M. (Hrsg.; 2006): Mensch und Meer, Küste und Marsch – Eine ewige Liebesgeschichte. Schriftenreihe des Landesmuseums für Natur und Mensch Oldenburg, Heft 44. Oldenburg.

LANCEWAD (2001): Landscape and Cultural Heritage in the Wadden Sea Region – Project Report. In: Common Wadden Sea Secretariat (Hrsg.), Wadden Sea Ecosystem. Wilhelmshaven.

Niederhöfer, K. (2004): Archäologie im Wattenmeer. In: ArchäologieLandNiedersachsen. 25 Jahre Denkmalschutzgesetz – 400 000 Jahre Geschichte. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 42. Stuttgart, 511–513.

Niedersächsisches Institut für Wirtschaftsforschung (NIW; 2005): Regionalbericht Norddeutschland 2005. Hannover.

Ohling, J. (Hrsg.) (1969): Ostfriesland im Schutze des Deiches. Beiträge zur Kultur- und Wirtschaftsgeschichte des Ostfriesischen Küstenlandes I. Leer.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Reinhardt, W. (2000): Das Harlingerland. In: F. Both (Bearb. u. Red.), Archäologische Denkmäler zwischen Weser und Ems. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 34; Oldenburger Forschungen, N.F. 13. Oldenburg, 480–483.

Rüther, W. (2000): Gulfhäuser-Verzeichnis. In: Ostfriesische Landschaft & Niedersächsisches Landesamt für Denkmalpflege (Hrsg.), Gulfhäuser in Ostfriesland. Kartgraph. Darstellung. Norden.

Schmidt, H. (1975): Politische Geschichte Ostfrieslands. J. Ohling (Hrsg.), Ostfriesland im Schutze des Deiches V. Leer.

Schultze, A. (1962): Sielhafenorte und das Problem des regionalen Typus im Bauplan der Kulturlandschaft. In: H. Mortensen, W. Czajka, Göttinger Geographische Abhandlungen 27, Göttingen.

Schwarz, W. (1999): Archäologische Fundstellen zwischen Nesse, Ldkr. Aurich, und Esens, Ldkr.

Wittmund. Ein Beitrag zur archäologischen Landesaufnahme in Ostfriesland. Archäologische Mitteilungen aus Nordwestdeutschland 22, 5–32.

Seedorf, H. & Meyer, H.-H. (1996): Landeskunde Niedersachsen 2. Natur- und Kulturgeschichte eines Landes. Niedersachsen als Wirtschafts- und Kulturraum. Neumünster.

Strahl, E. (2004): Archäologie der Küste: Marsch, Watt, Ostfriesische Inseln. In: ArchäologieLandNiedersachsen. 25 Jahre Denkmalschutzgesetz – 400 000 Jahre Geschichte. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 42. Stuttgart, 495–510.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler (Hrsg.), Archäologie der ältesten Kultur in Deutschland. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Auricher Land, LS

1. Overview

Name:	Auricherland
Delimitation:	Geest, peatland, neighbouring entities Harlingerland, Moormerland, Brookmerland
Size:	~506 km ²
Location:	Part of East Frisian-Oldenburg Geest-ridge and surrounded by former raised bogs, Lower Saxony, Germany
Origin of name:	Not known
Relationship/similarities with other cultural entities:	Similar Heritage and cultural landscape to Brookmerland and parts of Wangerland /Jeverland. Used similar sod techniques on the Geest similarly to other Geest areas such as Harlingerland. Fen settlements are based on the Dutch models.
Characteristic elements and ensembles:	Scattered villages, embankment hedges, sod-technique farming, fen settlements, fenland canals, fenland fields, horticulture

2. Geology and geography

2.1 General

The historic cultural landscape of the Auricherland is part of today's district of Aurich. Located in the middle of East Frisia, it is delimited by the Harlingerland to the north and today's district of Wittmund. The Moormerland borders it to the south of Bagband and the Lengenerland to the southeast.

Aurich is on the flat East Frisian-Oldenburg Geest-ridge, which extends as far as Oldenburg and is rarely higher than 10 m above sea-level. Broad Ice Age valleys formed around the East Frisian Geest-ridge, in which developed peatlands under the influence of the increasing sea-levels and the Atlantic climate, dividing the Geest into small sections. The extensive raised bogs, today largely stripped of their peat, have levelled out the earlier differences in the terrain, so that the land now gives the impression of being wide and level.

2.2 Present Landscape

Today's Auricherland is marked by constant variety in the use of the land, including arable land, pasturage, wooded areas and wasteland, linear and single settlements. The fact that arable land is mostly higher than the one time common land is due to use of sods. The sod method of improving fertility involved the cutting of sods of grass and heather on the common land. These were taken to the byre, and then taken dung-saturated, into the fields. Many of the embankment-hedges, typical of the region, which came into being as land divisions on the Geest following the splitting up of common land, have been destroyed by land re-organisation. However, there are surviving examples around Bagband. Drainage ditches fulfill the function of boundaries in the peat-bog/marshland areas. The landscape of the former highlands comprises a mix of arable and pastoral agriculture.

The forms of settlement on the Geest are simple farms, hamlets, villages which developed from individual farms and have grown into scattered villages. The old castle town and residency of Aurich is the administrative and educational centre for the region. Aurich is

connected by the Ems-Jade Canal to the towns of Emden and Wilhelmshafen. The town was enlarged in the community reform of 1917 by the addition of 20 neighbouring communities and has 40.000 inhabitants.

The raised bogs systematically opened up and settled since the 17th century are marked by linear settlements along the marsh channels. In the Auricherland fen settlements set up according to Dutch models are typical. They are all near watercourses which were used for transporting peat, and the settler's houses were close to these. The community of Grossefehn, has this settlement pattern, with Ost-, Mitte- and Westgrossefehn as its centre. Some fenland settlements originate on the basis of the peat-burning culture. Wiesmoor, which only came into being at the beginning of the 20th century, is the most recently founded town, being granted a town charter in March 2006. Founded around peat-production for a power station, which closed in 1965, Wiesmoor turned into a gardening settlement with large tree nurseries and gardening centres and is recognised as a climatic health resort.

3. Landscape and settlement history

The Auricherland has a complex settlement history, and its marsh landscape reflects man's continual struggle to gain and preserve the marsh for human habitation. Characteristic monuments of the process are the dykes, fens and dwelling mounds. The large scale investigation of the North German mud flats, as well as the Auricherland marsh and Geest, has been carried out by the Archaeological Service of the East-Frisian Association (Ostfriesische Landschaft) and the Institute for Historic Coastal Research (Institut für historische Küstenforschung) among others, revealing a complex settlement history.

3.1 Prehistoric and Medieval Times

Late Palaeolithic stone artefacts demonstrate that groups of hunters frequented East Frisia. The Geest was cultivated since the Neolithic period, c. 4000 BC, by groups of farmers, belonging to the west group of the Funnel Beaker Culture. Unfortunately most of the best known monuments of this period, the megalith burial places, have been destroyed. A burial place in Tannenhausen still has three stones, one supporting and two covering stones. In addition there are burials in single graves, as an example rich in ceramics from Wiesens, demonstrates. A move to expand the useable land seems to have occurred during the single grave culture of the later Neolithic period. Finds from this period have been made in areas which have not been previously exploited, such as the edges of the marshes, river valleys and fenland. A bog track leads from Tannenhausen in the direction of the Ewiges Meer in the district of Wittmund. Numerous remains of wagons provide evidence for vehicle traffic at this time.

Single Bronze Age finds, some from the fens, have often been recovered. A bronze lance tip has been discovered in Ochtelbur during peat-digging. Prehistoric grave mounds have been preserved in the woods of Aurich. At Wiesens a grave mound has been excavated, this had four long rows of double posts which lead up to an oval row of posts. Finds from the Bronze Age have also been made in Wiesens. A number of remarkable finds have been made in the fens and peat-bogs. These include the golden disc of Moordorf, which is west of Aurich and actually belongs to the Brookmerland, interpreted as belonging to a cult-chariot comparable to the sun-chariot of Tundholm. The famous plough of Walle, found on Tannenhausen Moor during peat-digging is from the early Bronze Age. In the Bronze Age the damper locations used for settlement in the late Neolithic period seem to have been avoided. In the later Bronze Age and the pre-Roman Iron Age, cremation became the usual burial practice. The most frequent finds of this age are grave urns. A bronze knife, richly decorated with stylised ships and waves, is a rare find from a grave mound near Aurich. In the middle of the pre-Roman Iron Age settlement seems to increase.

Towards the end of the pre-Roman Iron Age new settlement of the coastal areas began. This seems to have been concentrated on the marsh regions and the areas on the edge of the Geest. The higher Geest seems to have been settled only in pockets. The thinly populated high Geest lost even more of its inhabitants in the course of the 4th century AD with the sweeping changes of the period caused by the migration of peoples. However, the evidence of plant pollen showing settlement from the Upstalsboom demonstrates that was not complete depopulation.

The finds from the early Middle Ages show that the Geest, was once again settled by the mid 8th century. About 1000 AD new agricultural techniques were introduced including the sod technique of fertilising the land and the growing of winter rye. These meant that arable land did not have to be constantly transferred to new unused land. The Upstalsboom near Rahe, west of Aurich, between the Brookmerland and the Auricherland is important in cultural history. Finds from here indicate a grave mound of around 800. According to historical sources there was an assembly place for the Frisians on top of it in the High Middle Ages. In 1833 a four-sided pyramid made up of erratic boulders was built to recall the historic assembly place of the free Frisians in the Middle Ages.

Aurich probably existed as a settlement in the Middle Ages. It developed with the building of a castle and a large church, which were the basis for territorial development. Various chieftains' families followed one another in Aurich. In the 13th century the construction of the Cistercian monastery in Ihlow began. It played an important role in the economic and political life of East Frisia. In 1529 it felt victim to the chaos of the reformation. Today walls, ditches and ponds form the scant remains of a onetime flourishing and imposing monastery, which has recently been excavated. None of the 28 medieval monasteries which once existed in East Frisia have survived.

3.2 Early Modern Times

After East Frisia was ravaged by war, the counts and dukes of East Frisia, the Cirksenas, began to rebuild Aurich in 1513. The outline of this re-foundation still determines the shape of the town centre. In 1539 the administration of all the areas around was concentrated in Aurich. When the Cirksenas were expelled from Emden they made Aurich their seat. The Cirksenas were responsible for the reorganisation of the town and its growth. In 1744 Aurich fell to Prussia and remained the Land's administrative centre. As a fortress, garrison and administrative town, Aurich gained importance trans-regionally. The regents added to the cultural landscape with parks and woods. However economically Aurich could never compete with the seaport of Emden, because of its inland location. Even the Ems-Jade Canal, built 1882 and 1887, stimulated the town's economy only briefly.

The opening up and settlement of the fenland areas began in the 17th century. Fen settlements were set up according to Dutch models. They supplied the areas, which had little by way of fuel, with peat. As this was initially a lucrative business, fen companies and further fen colonies were founded. The first is Grossefehn in East Frisia; many more colonies were founded prior to 1879. Soon peat canals were cut across the countryside. As well as peat-digging the fenland was cultivated. Farmers settled, and stripped the fenland, living partly from peat-digging and partly from agriculture. The black peat was excavated and the overlying white (mineral-rich) peat back-filled into the cut-away areas, the ground was then used for agriculture. In order to survive, the farmers also used un-stripped land to grow buckwheat. The decline of the peat industry, due to competition from coal and oil, led to a change in the economy. The fen dwellers turned to shipping and boat building, but this line of business in turn declined. The canals gradually lost their function as working waterways and serve only as drainage channels; in some fens they are being filled in at the moment. Today traffic mainly runs on roads which run along both sides of the canals.

3.3 Modern Times

The modern district of Aurich came into being in 1977 as the result of community reforms in Lower Saxony, and was made up of the onetime district of Aurich and Norden. In spite of this people still speak occasionally in terms of the old districts. Aurich is the district town and entitled since 2004 to put up place name signs in High and Low German. The area reform of 1971 added 20 neighbouring communities to the town; it now has a population of over 40.000.

Over time a change in the population has taken place. Nowadays the fenland settlements are regarded as decidedly weak in their structures. Business commuters travel to distant cities and regions. Wiesmoor with its population of 13.000 celebrated the first hundred years of its existence in 2006. It has developed into a town with tree nurseries and gardening centres as well as being a climatic health resort. The community of Grossefehn with its population of 13.000 is composed of 14 places, four of them fen settlements and so-called Geest villages. The community of Ihlow has a population of almost 13.000. Tourism forms the primary role of the local economy.

The traffic linkage of the Auricherland and of Aurich in particular can be described as "traditionally bad". In 1883 the Prussian State Railway extended the railway line from Leer via Emden to Aurich.

4. Modern development and planning

The Auricherland is regarded as a particularly weakly structured area with high unemployment. Unsatisfactory traffic linkage, particularly of the town of Aurich, is identified as the main cause. The Federal Office of Building and Regional Planning in its regional planning report for 2005 classified the Auricherland amongst areas showing a slight rise in population. The population density in the rural areas of Ihlow and Grossefehn is approximately 100 people per km²; Wiesmoor has approximately 160 per km² and the centre of Aurich has over 200 per km². The use of land for settlement and the growth of traffic are classified as very slight. In all of the communities land is made available for industrial and commercial purposes.

4.1 Land use

Today's Auricherland is characterised by constant variety in the landscape, including arable land, pasturage, woodland and wasteland, linear and single settlements in the form of closed scattered villages. The typical embankment hedges, which arose after the common land was split up as divisions on the Geest, have disappeared due to the re-parcelling of land. Arable land and pasturage are characteristic of the former fenlands, as well as of the fen settlements and the fen/marsh canals. By East Frisian standards the Auricherland has a relatively high proportion of meadowland, 2,8%. It is regarded as an agricultural area with nature and business production conditions which are at present rather unfavourable. The intensification of agriculture, in view of international competition, will result in the increase of farm sizes and the adaptation of the areas used to economic constraints. Preserving historic culture landscapes, with a view to tourism might well be problematical.

The proportion of people employed in agriculture is very small indeed: 4% in Ihlow, 2% in Grossefehn and hardly anyone in Aurich. Wiesmoor is completely atypical with its 15% of the population working in agriculture and forestry. However, this is not surprising considering the community's speciality in horticulture.

Tourism plays an important role in the Auricherland and particularly areas of Aurich. The main emphasis is on boat tourism along the Ems-Jade Canal, which runs straight through the town. Tourism has developed into an important element in the place's economy. Despite its situation inland, Aurich can register a large number of overnight stays each year. The other communities, particularly Wiesmoor, now live mainly off their tourist facilities. Nature

reserves with recreation possibilities, also leisure parks and such like dominate the landscape.

4.2 Settlement development

East Frisia is one of the structurally weak regions with a high unemployment rate and a strong tendency for well trained, qualified people to leave the area. This leads to an increase in the proportion of old people. However, as the region has quite a high birth-rate and there is a movement of population into the area, a slight increase in population can be registered.

The regions of the Auricherland which are weakest structured have far more commuters leaving than them coming into them. In the community of Ihlow the inward flow is 800, the outward one is 3000. Grossefehn has a difference of 858. Only in the case of Wiesmoor are the two flows approximately balanced. Aurich is the exception. As the local industrial centre and seat of the district's administration, its incoming flow exceeds its outgoing one by almost 3500.

The Auricherland has no Land or trans-regional museum. Since 1985 Aurich has had the Historical Museum in the "Old Chancellery"; built around 1530. The history of East Frisia's rulers, with emphasis on Aurich as a residency, is presented here. In addition the town has a specialised mill museum: a five-storey "Stiftsmühle" of 1858. It is East Frisia's second highest gallery windmill still fully functioning. The museum is maintained by the Heimatverein Aurich e.V. (Aurich's local history association). Some historic buildings and sights have become tourist attractions. The Knodtsche Haus in Aurich's marketplace, built about 1735, is a town house in the Dutch late Baroque style. The Aurich Mausoleum is a neo-Romanesque vaulted building of 1875. In it are the tombs of the Cirkesana family, counts and dukes of East Frisia. A classical building at the Am Ellernfeld, the Art Pavilion, is used nowadays for exhibitions. Since 1990 the Sous-Tower in Aurich's market place, a 25 metre high sculpture, is an additional tourist attraction in Aurich.

The other museums are concerned with area or local history. In 1991 a museum of this type was opened by the community in Westgrossefehn – the Fehnmuseum Eiland. The exhibition is concerned with settlement, canal and sluice building, turf-digging, ship building, change in employment amongst many other things. In addition there are five restored gallery windmills in the community of Grossefehn.

In Wiesmoor a museum is concerned with regional history: the Moorkolonistenhaus/ the Moor Colonists' House. The so-called Torf- und Siedlungsmuseum/ the Turf and Settlement Museum provides information on the hard life of the fenland colonists of the late 19th century. It consists of several reconstructed buildings, including a historic village school, a smithy and a colonist's house. Peat-digging machines of various sizes can be viewed in the grounds. Wiesmoor's later commercial speciality offers its own sights. Wiesmoor's emblem is the "Blumenhalle" (The Flower Hall). In which more than 10.000 flowers are shown, and East Frisia's only water organ. A fenland railway connects the Flower Hall with the fen colonist's house and runs through the park. An artificial fenland lake – the Ottermeer – offers various leisure facilities and a camping and bungalow park. An annual event, which attracts many tourists, is the festival of blossoms with a big flower parade.

Although the community of Ihlow has no museums, it does have the Ihlow forest, 350 ha in size, and the small lake, Sandwater, which is designated as a nature reserve. They offer recreational possibilities, as does the leisure complex Ihler Meer.

4.3 Industry and energy

East Frisia has developed into the bastion of wind energy use in Germany. Due to the low population density and the powerful coastal winds many wind farms have come into being in the region.

Electrical and mechanical engineering are the mainstays of Aurich's economy. The firm Enercon, the biggest German manufacturer of wind energy installations, has its headquarters and factory in Aurich. The firm WIMA is a world leader in the field of foil capacitors, and a

rarity in the sector of electronic components. Further firms are involved in steel and metal processing.

Communities such as Ihlow or Grossefehn have no businesses worth mentioning. There are small commercial areas, including one on the motorway interchange Riepe. Wiesmoor has concentrated its business activities on large tree nurseries and garden centers and, as a state organized climatic health resort, on holiday-makers since its peat burning power station was closed in 1966 and power production was ended in 1995 with the demolition of its gas turbine power station.

4.4 Infrastructure

The Auricherland's traffic linkage is via two motorway stretches. The A28, an east-west connection between Leer and Oldenburg, runs about 10 km away from the southern boundary of the area. The A31 connects Emden with the Ruhr area and is also called the East Frisian Spit or the Emsland Motorway. Those in favour of extending the road system have been demanding a connecting motorway stretch in the direction of Aurich. Connections are better via the federal roads. The B72 runs in a north-south direction via Aurich to Norden. The B210 crosses East Frisia in an east-west direction and connects Wilhelmshaven via Wittmund and Aurich with Emden. The B436 connects Bagband with Sande.

The town of Aurich is not connected at the moment to the railway network. Although there are plans to re-activate the line from Aurich to Abelitz, closed in 1996, it will be used for goods traffic at first.

Aurich, which does not have port facilities, is connected by the Ems-Jade Canal to the network of waterways. At present the canal is important only for sports boats and is used only occasionally for goods transport from the port of Emden to Aurich.

5. Legal and spatial planning aspects

The Auricherland can be divided into two areas: firstly the Geest-ridge with the intermediate centre of Aurich and secondly the one-time peatland area around the Geest, with the communities Wiesmoor, Grossefehn and Ihlow.

As far as regional planning is concerned the communities are subject to Lower Saxony's Land Regional Planning Programme and (L-ROP) the overall plans of the communities for the area and the use of land. In addition the regional development concept East Frisia and the regional planning concept for the sea off Lower Saxony's coast are relevant for planning. The "Regional Structure Conference East Frisia" has the strengthening of economic structures as its aim. Ems-Axis cooperation is, too, to be encouraged. The potentials are to be arranged according to the fortes of each district involved. The district of Aurich is to be responsible for the area of energy. According to the coastal report of 2005 a connection of the intermediate centre of Aurich to the A31 and the improvement east-west traffic route B 210 is an urgent necessity. A bypass is also being planned.

For the period 2000-2006 the district of Aurich belongs in part to Aim-2 areas of Lower Saxony profiting from the EU structural policy. In accordance with these plans not only agriculture but employment possibilities such as tourism, crafts and trade are to become mainstays of this rural economic area.

The communities of the Auricherland are part of the East-Frisian Association (Ostfriesische Landschaft). It is mainly responsible for tasks in the area of culture, science, preservation of historic objects and education.

6. Vulnerabilities

6.1 Settlement

The historic settlement pattern is important within this area and is vulnerable to the threat from development which alters their original layout. The historic farmsteads are already vulnerable to change of use away from traditional agricultural production.

6.2 Agriculture

Agriculture must continue to enjoy a high priority. At the moment the family farm prevails. The change in agriculture will, however, continue with the number of farms decreasing and the number of people employed falling. The consequences will be a change in the traditional landscape which cannot be reversed, although extensive damage has already been caused to elements of the landscape. The ecological value of the region is equally important for nature protection and tourism. Horticulture is an important element of agricultural production for the Auricherland. This needs considerable land as well as energy to be profitable and the cultural heritage can be threatened by its expansion.

6.3 Tourism

Tourism has become the most important source of income on the one-time peatland regions and of Aurich's Geest. The unique natural and cultural variety of the place and the landscape with lakes, preserved peatland areas, fen canals and embankment hedge landscapes offer a rich potential, linked with cultural sights, sports, recreation and health facilities. Thus the aim has to be expansion which is ecologically, socially and culturally acceptable. What natural space offers must remain individual, and not be adapted to the needs of modern mass-tourism.

6.4 Industry and energy

As an "energy region", the region has a special significance in the use and further development of wind energy. The further increase of wind farms will only increase the visual impact on the historic landscape.

6.5 Infrastructure

Traffic infrastructure is a big problem for the Auricherland. To improve inter-regional traffic linkage the centre of Aurich needs to be connected to the motorway A31 as well as improvement to the east-west traffic-axis, the B210 and a bypass are urgently needed. The area also needs a railway connection. Re-activating the railway line to Aurich would encourage industrial developments. The expansion of the traffic linkage will lead to an even greater number of commuters, which can mean a loss of local identity. The biggest German builder of wind energy installations, Enercon, is located in Aurich. For this reason it would certainly be sensible to expand the traffic infrastructure. However, it has to be remembered that establishing industrial and commercial areas taking up a great amount of land could destroy cultural heritage assets as well as the surviving historic landscape.

7. Potentials

7.1 Settlement

The Auricherland has retained its settlement pattern, attuned to life in the area of the one-time peatland and the Geest. Fen canals and linear settlements of the early modern times in the one-time peatland regions provide a charming, peaceful and tranquil picture, just as do pasturage, arable land, woodland, individually preserved embankment hedge landscapes and Geest settlements. With the elements of landscape and its health resorts such as Timmel, Westgrossfehn and Wiesmoor, within the Auricherland there is potential for expansion of tourism as well as the protection of the cultural heritage. Development within settlements and dispersed farms needs to consider the cultural heritage as there is potential

for the preservation of existing structures despite changes in their use, and careful planning can protect the cultural heritage of settlements where expansion is required.

7.2 Agriculture

An important pre-condition for maintaining the traditional structure of the landscape and the buildings within it is the use of the land by private individuals, tourism and agriculture. A chance of linking the two economic branches, tourism and agriculture, could be the expansion of ecological agriculture, as well as the inclusion and encouragement of farmers in processes aimed at preserving the countryside.

7.3 Tourism

The town of Aurich has adequate historical assets necessary for tourism. Single historic buildings, church buildings, and small museums in which the settlement, development and use as well as the material culture of the area are presented enable the cultural history of the area to be presented and promoted to both the local population and tourists. Tourism is orientated towards the natural and cultural landscape, peatland canals, the Ems-Jade Canal and some lakes which offer water activities of all kinds. Small woodland areas such as the Meerhusen Wood or the Ihlow Forest serve walkers. Cyclists can explore the landscape on well signposted bicycle tours. Thus the region has sufficient potential to harmonise tourism and the historic cultural landscape and the potential to increase the promotion and management of the cultural heritage.

7.4 Nature conservation

Some nature protection areas provide us with an image of what the one-time landscape looked like. It is important that the management plans for the nature protection areas have integrated cultural heritage policies and programmes for cultural heritage protection and promotion.

8. Sources

Author: Frank Both

Bärenfänger, R. (Bearb. u. Red.) (1999): Ostfriesland. Führer zu archäologischen Denkmälern in Deutschland 35. Stuttgart 1999.

Behre, K.-E., van Lengen, H. (Hrsg.) (1998): Ostfriesland. Geschichte und Gestalt einer Kulturlandschaft. Aurich ³1998.

Berg, E. (2004): Die Kultivierung der nordwestdeutschen Hochmoore. Oldenburger Forschungen Neue Folge Bd. 20. Oldenburg 2004.

Both, F. (Bearb. u. Red.) (2000): Archäologische Denkmäler zwischen Weser und Ems. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 34. Oldenburg 2000.

Both, F. (2004): In der Jungsteinzeit Ostfrieslands mit dem Wagen über das Moor. In: Archäologie in Niedersachsen. 25 Jahre Denkmalschutzgesetz – 400 000 Jahre Geschichte. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 42. Stuttgart 2004, 482-484.

Bundesamt für Bauwesen und Raumordnung (BBR) (2005): Raumordnungsbericht 2005. Berichte 21, Bonn

KomSIS: Kommunales Standort Informationssystem Niedersachsen. www.komsis.de

Ohling, J. (Hrsg.) (1969): Ostfriesland im Schutze des Deiches. Beiträge zur Kultur- und Wirtschaftsgeschichte des Ostfriesischen Küstenlandes, Bd. I. Leer 1969.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Schmidt, H. (1975): Politische Geschichte Ostfrieslands. J. Ohling (Hrsg.), Ostfriesland im Schutze des Deiches, Bd. V. Leer 1975.

- Schwarz, W. (1999): Archäologische Fundstellen zwischen Nesse, Ldkr. Aurich, und Esens, Ldkr. Wittmund. Ein Beitrag zur archäologischen Landesaufnahme in Ostfriesland. Archäologische Mitteilungen aus Nordwestdeutschland 22, 1999, 5-32.
- Schwarz, W. (2002): Siedlung, Grab und Heiligtum von Wiesens, Stadt Aurich. Ein prähistorischer Lebensraum vom mittleren Neolithikum bis zum Ende der frühen Eisenzeit. Materialhefte zur Ur- und Frühgeschichte Niedersachsens Bd 29. Rahden/Westf. 2002.
- Seedorf, H.H. (1977): Topographischer Atlas Niedersachsen und Bremen. Neumünster 1977.
- Seedorf, H.H., Meyer, H.H. (1992): Landeskunde Niedersachsen, Bd. I, Historische Grundlagen und naturräumliche Ausstattung. Neumünster 1992.
- Seedorf, H.H., Meyer, H.H. (1996): Landeskunde Niedersachsen, Bd. II, Niedersachsen als Wirtschafts- und Kulturräum. Neumünster 1996.

Norderland, LS

1. Overview

Name:	Norderland
Delimitation:	North Sea mud flats, Ley Bay, Dornumersiel, Berumerfehn Canal, Nenndorf Moor and Lake "Ewiges Meer", neighbouring entities Harlingerland and Brookmerland
Size:	Approx. 174 km ²
Origin of name:	Not known
Location:	East North Sea marsh and geest borders, administrative district Aurich, Lower Saxony, Germany
Relationship/similarities with other cultural entities:	Landscape and cultural similarities to Harlingerland and Krummhorn. Shares a similar political history in the Middle Ages under Chieftain rule with other Lower Saxony and East Frisian areas.
Characteristic elements and ensembles:	Rural house-forms, linear villages, artificial mounds, Geest, agricultural use, drainage channels, fishing industry, coastal protection

2. Geology and geography

2.1 General

The Norderland, together with the city of Norden, is sited in the extreme north-west of the East Frisian peninsula at the end of the Oldenburg and East Frisian Geest ridge. The Norderland borders on the Harlingerland in the east and the Brookmerland in the south. Its present dimensions correspond to the old administrative district of the Norderland, roughly enclosing the area of Norden and the local government area Hage. Whist the city of Norden is located on a Geest-island, the rest of the Norderland is characterised by the marsh-landscapes of the Westermarsch, Ostermarsch and Hage Marsh. These are primarily made up of recent sea-sediments (sand, silt and clay), while the old marsh (at Hooker and Wischer) to the south lies in front of the Geest ridge. In the more recent marsh area especially, variations in sea level led to temporary re-salinification and areas being turned into fenland. Thus the profile of the marsh consists of alternating layers of mineral matter and peat layers. Natural drainage of the land occurs via the Norder Tief area into the Ley Bay, as well as via the water courses directed to the north-east. Off the coast there is the Watt, the mud flats, a part of the Wadden Sea National Park of Lower Saxony.

2.2 Present landscape

Today the Norderland, due to the fertility of its alluvial marshy soils, is characterised by intensive agricultural usage. The traditional settlement forms and the numerous drainage channels characterise the marsh landscape. The Norder Tief as well as Lay Bay serves as main drainage channels which flow into the Marschtief and Dornumersiel Tief. The settlement of the marshland mainly consists of scattered farmsteads and marshland settlements on dwelling mounds, as for example at Westerloog and Osterloog in the Lintel Moor. The biggest settlement is the town of Norden (approx. 25.000 inhabitants) with its harbour of Norddeich.

Geomorphologically the alluvial marshy land is delimited to the south-west and the south by the Geest and the Nenndorf Moor (peatland).

3. Landscape and settlement history

The Norderland has a complex settlement history, and its marsh landscape reflects man's continual struggle to gain and preserve the marsh for human habitation. Characteristic monuments of the process are the dykes, fens and dwelling mounds. The large scale investigation of the North German mud flats, as well as to a smaller degree the Brookmerland marsh, has been carried out by the Archaeological Service of the East-Frisian Association (Ostfriesische Landschaft) and the Institute for Historic Coastal Research (Institut für historische Küstenforschung) among others.

3.1 Prehistoric and Medieval Times

Archaeologically, the exact date when the Norderland was settled can only be determined indirectly. On the basis of comparison with surrounding areas, it can be assumed that Norderland was affected by wider prehistoric developments. At the beginning of the post-Ice Age, today's southern North Sea coast was dry land and the North Sea coast was in the area of the Dogger Bank, and it can be presumed that Norderland's tidal river-marshes were frequented in the late Palaeolithic and the Mesolithic by hunter-gatherer groups. It is possible that evidence for this and later phases are located below the river marsh with its millennia of sediment deposits. Subsequently the Geest has been settled by farmers since the Neolithic Age, from about 4.000 BC, the marsh colonisation in the sea marshes began in the early 1st century AD.

As a result of sea level variations, the low lying coastal fringe turned into land, thus enabling the settlement of the marsh. The areas sited further to the west of the north-west German coastal region seem to have been settled earlier than the marshes on the other side of the Weser and the Elbe. Based on archaeological research in Süderhaus and Westdorf we have evidence of settlements around the 1st century AD which required artificial elevation of the settlements, with the creation of low mounds of clay and dung. In the 5/6th century AD the settlement activity in the area appears to have decreased. However, in the 7/8th century AD increased settlement is discernible. At the beginning the outer marshes, elevated a little by mud, were settled with villages and farms on dwelling mounds, because these, in contrast to the lower areas of Hooker and Wischer, kept naturally drier. In the inner, lower marsh, the Sietland, only a few single farmyards were built, otherwise it mainly functioned as pastureland. The individual small farms on dwelling mounds in the marshes without dykes were surrounded by irregular block-meadows. There is proof of settlement in these farms as early as the early Middle Ages in the form of earthen-ware containing limestone grit from individual dwelling-mounds in the Wischer and on the edge of the Hilgenried Bay in the Hage Marsh. In addition there is evidence for an early medieval graveyard on the north side of the dwelling-mound of "Süderhaus". From the late Middle Ages the marsh was surrounded by dykes and was protected permanently against high tides. At the same time the natural drainage system was completely changed by partially diverting watercourses to floodgates (as at Sietlog and Marsch-Tief). Archaeological evidence has demonstrated that a continuous coastal dyke has existed since the late Middle Ages, possibly along today's road close to the coast from Osterloog via Honnewarf and Wilhelmsfeld to Seelust and Theener. Even older dykes probably existed in the Hage Marsh, for the damming of the former Hilgenried Bay and for the protection of smaller settlement areas. The drainage of the areas inside the dyke improved their agricultural potential which made inland colonisation possible; this took place after the 13th century.

A number of settlements were established on the higher Geest-ridges during the Middle Ages, which still shape settlement-centres today. As their names demonstrate, Lintel, Ekel and also Norden belong to the early medieval settlement foundations. Norden, originally a village on a long dwelling-mound, which received town rights in 1255, was at the end of two long-distance trade routes (Emsweg to Münster, Küstenweg to Bremen) and gained trans-regional significance as a trading place. Livestock, Muschelkalk and salt were exported from there. The Benedictine monastery Marienthal was founded in the 11th century and in 1264

the Dominicans settled at the Fräuleinshof. In 1285 a castle was built at Norden. The former economic importance of the city is still reflected in a number of buildings, including the Ludgeri Church dating from the 13th century which has the second largest preserved Arp Schnitger organ (1693), as well as the Castle Lütetsburg. In addition the large marketplace, probably built in the first half of the 13th century, reflects the economic significance of Norden. Nesse is another early medieval village, with narrow streets built alongside a road on a long artificial mound. Built on a former sea dyke as a settlement alongside a road, the small town of Hage is only mentioned after 1400.

As in the rest of East Frisia, the previous co-operative territorial form of community was also replaced in the Norderland by hierarchical forms: chieftains ended the existence of autonomous land communities. In the 15th century this system of local- and regional noblemen developed via provincial nobles into the region to the imperial count in East Frisia.

3.2 Early Modern Times

Numerous severe storm-floods between 1150 and 1600, which swamped the existing dykes, led to considerable variations in the coastline in the Norderland. In the course of the storm floods Ley Bay developed as (?) a visible result of the forces of nature. Dyke construction measures continued due to climatic changes, including the "Little Ice Age" between 1300 and 1850, which was marked by an increase in strong storm-floods. Thus the Christmas storm-flood of 1717 led to a complete flooding of the Norderland, and during the February flood of 1825 the coastal dykes of the Norderland broke in numerous places. In addition the climate of this period had a negative effect on the agricultural yield. However, growing experience in dyke-construction and the support of the nobility led to a constant improvement in coastal protection-measures. From about 1500 a change occurred, with the balance turning from loss to gain with the setting up of dykes around bays and along the coastal lines of the North Sea. In the Norderland, Harling Bay and Ley Bay are relevant in this respect. When Ley Bay was at its widest at the end of the 15th century, it reached as far as the city of Norden and provided direct access to the sea. The resulting harbour, which survived far into the 19th century, allowed Norden to flourish economically over a long period. The ships from Norden sailed the waters of the North Sea and Baltic under their own merchant flag. However, the erection of dykes in 1498 created the first polders in Ley Bay and the reclamation of land began. Up to the end of the 16th century the five polders in Ley Bay were surrounded by dykes.

In 1531 the army of the nobleman Balthasar von Esens invaded the unfortified town of Norden, and in the process destroyed a number of monasteries and St. Andrew's Church. From an economic point of view the Norderland was strongly orientated towards agriculture, however fishing and overseas trade also played an important role. Due to the dykes the agricultural and settlement areas were constantly expanding.

East Frisia was elevated to an imperial county in 1464 and had extended to its present area by 1600. In 1744 East Frisia, and thus also the Norderland, were incorporated into the kingdom of Prussia. After the period of Napoleonic occupation from 1806 to 1813 it fell to the kingdom of Hanover. With the end of the Hanoverian kingdom Norderland returned to Prussia.

3.3 Modern Times

In the 19th century marsh-settlements prevailed in the marsh region of the Norderland, directly behind the main line of dykes, whilst the region east of Norden continued to be marked by settlements on dwelling mounds. Because of the influx of refugees after World War Two the population in the Norderland increased considerably, the new town of Norden-Neustadt was built at this time. The renovation of the historic part of the town, which was carried out in the 1960s and 1970s, led to a big loss of the historical fabric in Norden and to the disruption of the townscape because of the building of multi-apartment houses and three multi-storey blocks of flats.

Since 1950 a new rise in storm-flood activity has been registered again and the tide-heights of 1962, 1976 and 1994 are amongst the highest water levels ever measured on the coast of Lower Saxony. The storm floods of 1953 and 1962, in particular led to considerable expansion and the strengthening of coastal protection-measures. The first plan to build dykes around the entire Ley Bay were not carried out in the 1980s, due to changed social attitudes towards coastal protection. However, a few years ago, the last big dyke in Lower Saxony was built in Ley Bay. Here the newly reclaimed areas were designed as areas for nature conservation and water. 65 hectares were dredged, up to two metres deep, within the dyke to extract clay. This area and a further 15 ha of low lying land was then flooded and turned into a nature reserve.

The Norderland was opened up to railway traffic by the connection of Norden in 1883 to the railway, which had opened in the same year between Emden and Aurich. Also in 1883 this line was extended via Hage and Dornum to Esens. In 1892 the construction of the railway-line from Norden to Norddeich followed. At the beginning of the 19th century numerous unsurfaced roads, which connected the single settlements and scattered farmsteads with each other, led through the Norderland. In the second half the 19th century a north-south connection linked Norden to the road between Emden and Aurich, which had already existed around 1863 and which the B72 still follows today. A further connection to the south was a regional road between Aurich and Dornum. From west to east a regional-road ran between Norden and Dornum, as well as a further one branching off linking the villages directly behind the dyke.

4. Modern development and planning

In its regional planning report for 2005 the Federal Office for Building and Regional Planning lists the Norderland as a region which is marked by strong economic growth worthwhile this development may not lead to an increased use of space for settlements.

4.1 Land use

The marshy areas are still used traditionally for agriculture, with the marshes directly behind the dykes being reserved for arable farming. In the areas further inland, on Ostermarsch and Hage Marsh, meadows characterise the landscape. Beside the areas, primarily used for agriculture, small woodlands exist close to Hage and Lütetsburg. The structural change in agriculture is evident, too, in the Norderland there is an increase in the number of abandoned farms as well as an increase in the size of the remaining farms. Since the end of the 1960s this has led to a decrease in arable farming in the marsh area, whilst the proportion of permanent meadow land has also decreased. Despite the large-scale agricultural use of the region, only a small percentage of less than 30 % of employed people work in agriculture, and this is declining.

The economic importance of fishing is slight. However it belongs to the image of a coastal society and its way of life and is very important for tourism.

The mud flats of the North Sea are characterised by their high biological productivity for instance as a spawning ground for many types of fish. Off the coast of the Norderland there are vital breeding and resting areas for many kinds of birds. The Itzendorf Bank, north-west of Norddeich is used at low tide as a resting place by seals and birds. The salt meadows, mud flat-areas and banks are a part of the Wadden Sea National Park of Lower Saxony under special protection since 1986. Outside the dykes of the Norderland, parts of the Norden mud flats, the Ostmarsch mud flats, Westernnessmerheller, Osternessmerheller and Ley Bay belong to the protective zone I, which as a resting area may be entered only on the marked paths. The region of the Norden mud flats off Norddeich, the Ostermarsch mud flats with the High Reef, as well as Hilgenried mud flats, Nessmer mud flats and Dornum mud flats belong to Protective Zone II, which may be entered. The salt meadows, however, may only be entered on the marked paths during hatching- and rearing time of birds between 1st of April and 31st of July.

4.2 Settlement development

The Norderland belongs to the catchment area of the town of Emden, which is the principal destination for business commuters in this region. Tourism is an important component in the economy of the Norderland and is characterised by an increasing number of overnight stays. The number of visitors depends greatly on the season, as mainly comprises summer-tourism and day-visitors. In addition a great number of employed people partially live off tourism, with small businesses playing an important role in overnight tourism in the Norderland. Supplementary income, as well as part-time employment and seasonal employment play an important role. In the regional planning programme of the administrative district of Aurich of 1992 the places Dornumersiel, Nessmersiel and Norddeich are named as places dedicated to the functions of relaxation and tourism. At the same time these are the locations for harbours (general harbours and sports boat harbours) and the communities have been allocated the special development task of "relaxation"/ "leisure time activities".

Apart from the tea-museum, Norden has a museum of local history in the old town hall. Places of interest, apart from the large marketplace, are the Ludgeri Church as well as the Frisia-Mill. Norddeich, apart from a beach, offers numerous tourist attractions, such as indoor swimming- and wave pool and the national park-centre with the seal rearing station.

Attractions in the region of the local administrative area Hage, include the St. Ansgari Church in Hage with its crooked tower, the Hage Mill from 1597 (being the highest mill in East Friesland), the castle grounds of Lütetsburg and the Magda-Heyken-House with a local history collection can be named. The Motodrom in Halbmond, a speedway-arena, functions as a further tourist attraction. In Hilgenriedersiel, a part of Hage Marsh, a number of natural bathing places on the East Frisian North Sea coast exist. Hage is also a health resort.

Further attractions in the Norderland are the moated castle of Berum, the church in Arle from the 12th century, the castle surrounded by water of Norderburg in Dornum and St. Bartholomew's Church from the 12th century in Dornum. Apart from the bathing-areas close to Nessmersiel and Dornumersiel there is a national park-house with information on the Wadden Sea National Park of Lower Saxony

4.3 Industry and energy

Tourism is the main economic focal point for the city of Norden (North Sea bathing-resort Norden-Norderdeich), in addition to the service trade, mechanical engineering, metal processing and printing technology. In addition, tea-processing companies are settled in the town (tea-town Norden). In the remaining area of the Norderland the first wind turbines have been installed.

4.4 Infrastructure

The Norderland was opened up to traffic via the North Sea, as well as via the country roads and up to this day the peripheral location of the Norderland is apparent. The nearest motorway connection to the A31 is only as far as Emden. From the mid 19th century the road-connection leading to Norden was extended from the connecting stretch Emden – Aurich (today's B210 and B72). The present B72, which leads up to Norddeich, follows the old road. At the moment the federal road still runs through the city of Norden, however a by-pass around the east of the city is being built. The other north-south and east-west connections are only completed by district roads. In order to link the rural settlements and single farms a strongly branched traffic-network is necessary.

The railway-connection to Norden, Norddeich and Norddeich-Mole is maintained today by the network of the Deutsche Bahn AG, while since its closure in 1983 (passenger traffic) and 1989 (freight traffic), the stretch between Norden and Dornum is only used by the museum-train Küstenbahn Ostfriesland. The remainder of the Norderland can be reached by means of public transport buses.

There are ferry-connections to the East Frisian islands from Norddeich to Norderney and Juist and from Westerdeich to Baltrum. A further traffic-link to the islands is via the airport close to Norddeich.

5. Legal and spatial planning aspects

As far as regional planning is concerned the Norderland communities are subject to the Regional Planning Programme of 1992 of the administrative district of Aurich, as well as the regional planning programme set up by Lower Saxony. In its regional planning programme of 1994 with its supplements of 1998 and 2002 the town of Norden is designated as the region's centre. The communities of The Norderland belong to the East Frisian area. This is the only superior municipal association in Lower Saxony.

6. Vulnerabilities

6.1 Settlement

The historic settlement pattern has survived in the marsh-areas to a large extent with only limited expansion. The increased immigration to the rural areas creates a growing and changed demand on land use, which could become a problem in the Norderland. Up to now only in urban Norden have extensive areas been designated as building land. However, the marsh region could also be affected if the demand increases. The settlement pattern on the coast has been significantly changed with the development of holiday homes in non-local styles.

6.2 Agriculture

The structural change in agriculture and the dependence of the future direction taken by this branch of industry on the agrarian policy of the EU, will continue to accelerate the trend towards intensification of production in the Norderland. At the same time the proportion of agricultural land put under protection or with restrictions on use is increasing. This has resulted in land being abandoned due to the low profit margins. Declining numbers of employed people in agriculture has led to an increase in commuters, as the job market in the rural regions cannot retain the work force.

6.3 Industry and energy

The building of wind farms may lead to changes in landscape perception and thus in the image of the historically evolved landscape. It is important to integrate cultural heritage within the development plans put forward for the renewable energy plants.

6.4 Natural processes

A main problem of the future, which is difficult to predict, is climate change which is progressing faster than expected. Already since 1950 increasing storm flood activity has been observed. Reinforced coastal protection-measures with dyke heightening and dyke widening will be necessary, requiring the quarrying of clay and sand needed for it. Any plans to protect the area will need to have the cultural heritage interests as an integrated part of the proposals. Nature conservation interests oppose the dyke extensions outwards, while the moving of dykes inwards meets with opposition from within the local population. This situation in densely built-up town areas and tourism sites, as for example in Norderdeich is especially problematic. The scenarios of the change in climate forecast up to now will affect all sectors of the Norderland: cultivation and settlement, agriculture, tourism, shipping, port business, fishing, water distribution and coastal ecosystems.

7. Potentials

7.1 Settlement

In the Norderland most forms of settlement and use of the land, adjusted to the lives of the people in the marshes of the North Sea coast, are preserved to a considerable degree. The constant interaction with the special conditions of this area of settlement can be seen as the cultural and historic heritage in the landscape: farm-dwelling mounds, village-dwelling

mounds, old and new dyke-lines (e.g. in the former Ley Bay), areas of brackish water, colcs, clay pits, and drainage ditches reflect the interactions in the past and the present with the sea.

7.2 Agriculture

An important precondition for maintaining the traditional structure of the landscape and the buildings within it is the use of the land by private individuals, tourism and agriculture. A chance of linking the two economic branches, tourism and agriculture, could be the expansion of ecological agriculture, as well as the inclusion and encouragement of farmers in processes aimed at preserving the countryside.

7.3 Tourism

In view of the peripheral location of The Norderland on the mainland the possibilities of intensifying co-operation in tourism with the offshore islands should be considered. The cultural heritage of the area can be used to encourage and promote tourism in the Norderland. At the same time care has to be taken that the original character of the cultural landscape is not lost, but is integrated into the development of the Norderland for the purposes of future requirements.

7.4 Nature conservation

The aims of nature conservation and coastal protection can be perfectly well integrated, as the pilot project of Deichacht Norden in 2003 showed. As both parties would like to achieve the preservation of a stable dyke foreshore and land outside the dykes need not necessarily be used for agricultural production, the farmers in Norden appear to have taken on the role of guardians of the countryside. A coastal area several kilometres wide along the coastline of The Norderland should be considered as an area reserved for leisure activities. It is essential that any development or management plans for these areas integrate the cultural heritage. This then provides the potential to both promote and manage the cultural heritage of the area.

8. Sources

Author: Wolfgang Scherf

Behre, K.-E. 1999: Die Veränderungen der niedersächsischen Küstenlinien in den letzten 3000 Jahren und ihre Ursachen. Probleme der Küstenforschung 26, 1999, 9-33.

Behre, K.E. 1999: Naturraum und Kulturlandschaftsentwicklung Ostfrieslands. Führer zu archäologischen Denkmälern in Deutschland 35. Ostfriesland. Stuttgart 1999, 10-27.

Behre, K.-E., Haarnagel, W. 1984: Veränderungen des Küstenverlaufs. Ursachen und Auswirkungen, III Niedersachsen. In: G. Kossack, K.-E. Behre und P. Schmid (Hrsg.), Archäologische und naturwissenschaftliche Untersuchungen an Siedlungen im deutschen Küstengebiet 1, Ländliche Siedlungen, Weinheim 1984, 68-82.

Brandt, K.1992: Besiedlungsgeschichte der Nord- und Ostseeküste bis zum Beginn des Deichbaus. In: KRAMER, J. und ROHDE, H., Historischer Küstenschutz, Deichbau, Inselschutz und Binnenentwässerung an Nord- und Ostsee, Stuttgart 1992, 207-240.

Canzler, G. 1994: Norden. Museen im Alten Rathaus. 75 Jahre Heimatverein Norderland. Norden 1994.

Heun, S. 1995: Archäologische Untersuchungen auf dem Hüttenplatz in Lütetsburg, Ldkr. Aurich. Archäologische Mitteilungen aus Nordwestdeutschland 18, 1995, 85-110.

Jeschke, A. 2004: Raumplanung als vorsorgendes Instrument im Küstenmanagement. Oldenburg 2004.

Kramer, J. 1992: Küstenschutz und Binnenentwässerung zwischen Ems und Weser. In: Kramer, J. und Rohde, H., Historischer Küstenschutz, Deichbau, Inselschutz und Binnenentwässerung an Nord- und Ostsee, Stuttgart 1992, 207-240.

Landkreis Aurich 1992: Regionales Raumordnungsprogramm des Landkreises Aurich. Aurich 1992.

van Lengen, H. 1999: Burgenbau und Stadtentwicklung. Führer zu archäologischen Denkmälern in Deutschland 35. Ostfriesland. Stuttgart 1999, 128-140.

Reinhardt, W. 1965: Wurtengrabungen in Ostfriesland, Fundchronik Land Niedersachsen und Land Bremen. Germania 43, 1965, 410-413.

Reinhardt, W. 1969: Die Orts- und Flurnamen Ostfrieslands in ihrer siedlungsgeschichtlichen Entwicklung. In: J. Ohling (Hrsg.), Ostfriesland im Schutze des Deiches 1. Pewsum 1969, 201-375.

Schwarz, W. 2000: Die Wurtenslandschaft im Norderland. Archäologische Denkmäler zwischen Weser und Ems. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 34, Oldenburg 2000, 215-218.

Wassermann, E. 1985: Aufstrecksiedlungen in Ostfriesland. Abhandlungen und Vorträge zur Geschichte Ostfrieslands 61. Aurich 1985.

Brookmerland, LS

1. Overview

- Name: Brookmerland
- Delimitation: Berumerfehn-Canal, Berumfehn Moor, town-boundary Aurich, Ems-Jade-Canal, city-boundary Emden, connection to Emden – Ley Bay, neighbouring cultural landscapes: Krummhörn, Norderland and Harlingerland
- Size: Roughly. 174 km²
- Location: East Frisian Geest-ridge and peatland marsh, administrative district Aurich, Lower Saxony, Germany
- Origin of name: “fallow land” (?)
- Relationship/similarities with other cultural landscape entities:
Comparable to Auricherland and parts of Wangerland/Jeverland. Shares a similar political history in the Middle Ages under Chieftain rule with other Lower Saxony areas.
- Characteristic elements and ensembles:
Agricultural use, “Aufstreck-settlements” (linear street village), peatland colonisation, Geest landscape, fehnland, peat-cutting, dikes, dwelling mound-villages, brick churches, pirates based in Marienhaf

2. Geology and geography

2.1 General

Brookmerland is located in the western part of East Frisia, within the administrative district of Aurich. It occupies the Geest-ridge from Osteel in the north, to Forlitz-Blaukirchen in the south. Whether the so-called Suderland, with the villages of Simonswolde, Riepe, Ochtelbur and Bangstede belongs to it, is not completely certain. Apart from Marienhaf, Aurich is mentioned in the Brookmer Letter from the 13th century as the market-town of a district. Thus the Zuder- and the Aurich Land must have been split off as separate units at a later date. In the Middle Ages the central peat-zone of the East Frisian Geest-ridge dominated the east of the Brookmerland, whilst the peat-marsh extended to the west of the Geest-ridge. This originated from the post-glacial increase in sea level which caused the Geest-ridge peatland to be covered with clay and water sediments. Due to the rise in the sea level the drainage of water from the Geest was hindered and thus the growth of peat developed. Only the rise in the sea-level in the 1st century BC stopped the growth of the peat. In this period a small bay developed, into which the river Lay flowed.

The character of today's area is the result of the medieval building of dykes. The Abelitz, which rises close to Marienhaf, drained the Brookmerland. The depression and the Wolden area to the south, squeezed in between the high marsh of the Krummhörn and the Geest-ridge of today's “Grosses Meer”, drains the area into the Bay of Sielmönken. In the end the building of dykes in the 12th/13th century made a diversion into Lay Bay necessary. This increased flow of water into the bay triggered the expansion of the Lay Bay and the catastrophic loss of land in the 14th century.

The name of the cultural landscape “Brookmerland”, formerly Brokmerland still refers in the present day to the original composition of the land as “fallow land”.

2.2 Present landscape

The present Brookmerland consists of the administrative district of Brookmerland and the community of Südbrookmerland. The area is dominated by intensive agricultural use and the settlement structure of the so-called "Aufstreck-settlements" as well as by the drainage-ditches. The Old and the New Greetsiel sluice channels to the west, as well as the Knockster Tief to the south drain the area. Geomorphologically Brookmerland is subdivided into the Geest, with the peatbog areas and the peat-marsh areas off the Geest, as well as into the marsh-areas in the former Ley Bay.

The Brookmerland is divided into almost equal parts from the north to the south, as well as from west to east by today's federal roads, B72 and B210.

3. Landscape and settlement history

The Brookmerland has a complex settlement history, and its marsh landscape reflects man's continual struggle to gain and preserve the marsh for human habitation. Characteristic monuments of the process are the dykes, fehns and dwelling mounds. The large scale investigation of the North German mud flats, as well as to a smaller degree the Brookmerland marsh, has been carried out by the Archaeological Service of the East-Frisian Association (Ostfriesische Landschaft) and the Institut für historische Küstenforschung (Institute for Historic Coastal Research) among others.

3.1 Prehistoric and Medieval Times

At what time the Brookmerland was settled, and the form of that settlement has not yet been identified. However, the climatic conditions were favourable for the colonisation of the low land around 1000 AD. The archaeological finds and geographical investigations into settlement indicate that as early as the early Middle Ages, i.e. in the 9th/10th centuries, the colonisation of the marsh began; it was extended in the 9th and 11th centuries to the peat-bogs. The Geest border of the Brookmerland offered the initial settlement a starting point for the Aufstreck-fields (ridge-and-furrow field system). Here the settlers were provided with strips of land of an exact width. The starting point for settlements of the Aufstreck-type (linear street village) was the border between different types of soil; the worked strips of land could thus be extended into the adjacent peatland. This planned settlement reached its climax in the 12th/13th centuries, especially as the Julian flood of 1164 forced many people to move inland from the coast. Castles and stone houses were built only at the end of this series of settlement movement. Whereas the peat-marsh and the hinterland with its carr/ fen wood (Bruchwald / Wolden) and the highland peats were not settled at first, there were settlements on the coast in the early Middle Ages. As finds of ceramics with shell grit show, individual farm-dwelling mounds were built in the peat-marsh west and north of the Grosses Meer (Woldmer Meer). These individual farm-dwelling mounds survived until the late Middle Ages. Presumably the point of departure for the settlement of the silt-covered peat was in the marsh. Finds of ceramic fragments with shell-grit in the peat and carr (Wolden) area of the Geest show that attempts to colonise the bog involved the construction of mounds. Three of four sites with ceramics of the 10th century also produced ceramics of the more recent medieval periods. In the late Middle Ages the inhabitants of the Aufstreck-settlements (linear street village) on the moor had to leave their land because the water could not be drained off. The settlements of Burhufe and Südwolde were abandoned, too. The Grosses Meer came into being because of the drainage which followed and the stripping of peat from the bog. The old tracks connecting the Brookmerland with the Emsigerland could be used only occasionally; in some cases they could not be used at all.

The Brokmer are mentioned for the first time in the Östring (Rasteder) Chronicle of 1148; from 1251 the Brokmen appear as a separate community, the Brokmerland. The region was divided into three districts with two main churches each: Marienhof and Engerhufe, Wiegboldsbur and Burhufe (nowadays individual farms in the Victorbur Marsh), as well as Bedekaspel and Südwolde (Blaukirchen). The parishes belonged to the diocese of Münster.

The bishop of Münster, who separated the Brookmerland from the deaneries of Uttum and Hinte and made it in its own parish, finally erected a castle in Fehnhusen in the parish of Engerhufe (the so-called Oldeborg), which formed the core of the present place. The rest of the colonised area with the places Bastede, Bangstede, Ochtelbur, Riepe, Simonswolde and the Cistercian monastery of Ihlow stayed with the Aurichland.

The Brookmerland had its own system of justice and with the Brookmer Letter its own constitution, too. In all of this the political leadership and the system of justice were, with the people living there, in the hands of the farmers appointed as officials for a year, the so-called Red-jeven. In the second half of the 14th century the powerful family, the Kenisnas, took over the title of chieftain and hence power in the same area. The family, who later adopted the name tom Brock, erected castles in Brooke and Aurich. Towards the end of the 13th century the Aurichland joined the Brookmerland and formed the fourth district of the Land community. The rule of the tom Brock family was ended by the struggle for supremacy over the Frieslands on both sides of the Ems, in which their chieftain Ocko II was defeated. The rule of the victor, Focko Ukena, over the Brookmerland ended around 1430 in a popular rising which developed into East Frisian uprising. On 14th December 1430 the East Frisian National Associations (Landesverbände) and the minor chieftains concluded the bond of liberty of the seven Frieslands under the leadership of the Cirksena family. Around 1440 the Cirksenas had progressed from being judges and guardians into the chieftains of the Brookmerland and the Aurichland. In 1464 they succeeded in having the emperor elevate their East Frisian territory to an imperial county. The areas ruled by their castles became regional authorities. Now the Brookmerland belonged to the district of Aurich and was made up of the North Brookmer Protectorate (Osteel, Marienhufe, Siegelsum) and the South Brookmer Protectorate (Engerhufe, Victorbur, Wiegboldsbur, Bedekaspel, Forlitz-Blaukirchen).

The principal settlement, Marienhufe, became a harbour for a time after the severe storm floods of 1374 and 1377, so that goods could be transported direct by water to the Münsterland. At the end of the 14th century pirates around Klaus Stötebeker based themselves in Marienhufe, as the harbour had been opened for the "victuallers". The transshipment of the stolen goods was only stopped by the punitive expeditions of the Hanseatic City of Hamburg. However, by contrast to other East Frisian settlements Marienhufe was not destroyed in the process.

The inhabitants of the Brookmerland attained considerable wealth with farming, cattle breeding and trade. This was expressed particularly in the building of brick churches in the region, every village competing in the size and magnificence of their church. The churches of Marienhufe, Osteel, Engerhufe and Victorbur were built in the middle of the 13th century. Their construction is a milestone in the history of Frisian church building. The church in Marienhufe, Brookmerland's market centre even vied with the Osnabrück Cathedral and was the largest church in north-western Germany. The lavish ruler's box in its tower expressed the way in which the Brookmer population regarded itself. Their wealthy upper class felt themselves to be equal to the nobility. The present condition of the churches in Osteel, Marienhufe and Engerhufe do not reflect their original size, as these churches, which were gigantic in proportion to the size of the population, were reduced in area even from the Middle Ages.

3.2 Early Modern Times

In 1744 the Brookmerland, together with the whole of East Frisia, felt to Prussia. The division into the North and the South Brookmer Protectorates was kept. A legal basis for the settlement of wasteland was created by the Friedrich the Great's edict of 22nd July 1765 to cultivate the land, which led many landless inhabitants of the Brookmerland to hope that they could support themselves by cultivating a piece of fenland. As early as 1765 the first colonists settled in Leezedorf, where in the course of the years a scattered settlement came into being. In 1767 the settlement of Moordorf began with the opening of a new area for settlement, the fehn colonies and in 1770 of Moorhausen and Münkeboe in the South Brookmer Protectorate. These first colonies finally formed a number of communities of a new type. On the other hand the areas of Norden and Greetsiel profited from the dyke building of

Ley Bay; Brookmerland's profit was slight. During the Napoleonic occupation (1806 – 1813) Brookmerland belonged to the arrondissement of Aurich, first in the Dutch, then French departement of Ostem. The northern part of the Brookmerland, as the mairie of Marienhafé with Marienhafé, Upgant, Schott, Leezdorf and Tjüche, belonged to the canton of Norden. The southern part of the Brookmerland was divided into the mairie of Victorbur ((Victorbur, Uthwerdum, Marsch, Theene, Neu-Ekels und Moordorf), Wiegboldsbur (Wiegboldsbur, Bedekaspel, Forlitz, Blaukirchen and Moorhusen together with Westerende and Fahne) and Engerhafé (Engerhafé, Marsch, Fehnhusen, Oldeborg, Upende) and belonged to the canton of Aurich.

After the wars of liberation the Brookmerland became part of East Frisia in the kingdom of Hanover (1815 – 1866) and was divided according to Hanoverian principles. Southern Brookmerland from Wiegboldsbur to Moorhusen together with Bangstede, Westerende, Barstede, Ochtelbur and Riepe the Sub-Protectorate Riepe of the Protectorate of Aurich. The parish of Osteel of the former North Brookmer Protectorate of Norden. The middle of the Brookmerland formed the Protectorate of Victorbur, which consisted of the Sub-Protectorate of Victorbur (parishes of Victorbur and Engerhafé) and the Sub-Protectorate of Marienhafé (parishes of Marienhafé and Siegelsum). On the 1st of January 1828 the Sub-Protectorate of Marienhafé was added to Norden. The boundary, which so arose between Aurich and Norden formed the boundary of the district of Aurich until 31st July 1977.

Agriculture continued to play a decisive role. However, the yields in the fenland colonies were at first slight because of massive problems with the cultivation of the land. For a long time the digging of peat and its sale provided people in these areas with a living. The economic situation in the fen colonies improved in the 19th century due to improvements being made in agricultural methods. Examples of constructions preserved from this period are the mill built in Leezdorf in 1896/1897 and the twin-cylinder water pump mill in Wirdum of 1872.

3.3 Modern Times

In 1938 there was community reform in South Brookmerland, in which the earlier communities Engerhafé, Fehnhusen, Oldeborg and Uende made up the larger community of Oldeborg. On the 1st August 1969 the local government area of Brookmerland was founded, which consists of the communities of Leezdorf, Marienhafé, Osteel, Rechtsupweg, Upgant-Schott and Wirdum. The dwelling mound -village of Wirdum originally belonged to Greetsiel, later to the former district of Emden and from 1932-1972 to the district of Norden, but then decided to join the Brookmerland. The administrative centre of the local government area with approximately 13.000 inhabitants is in Marienhafé. The community of South Brookmerland was established on 1st July 1972: it consisted of the communities of: Bedekaspel, Forlitz-Blaukirchen, Moordorf, Moorhusen, Münkeboe, Oldeborg, Theene, Uthwerdum, Victorbur and Wiegboldsbur. The community of South Brookmerland has a population of approximately 19.000.

Economically, tourism is a priority alongside agriculture and small commercial enterprises. The regional development of the Brookmerland, particularly its southern part, is, however, influenced by the proximity of the cities of Emden and Aurich. These two centres attract the majority of commuters from the Brookmerland.

The Brookmerland was opened up for traffic as early as 1863 by the road connection between Emden and Aurich as well as by the road branching from this one, which connects with Norden. The federal roads B 72 and B 210 still follow this route today. Around 1893 several country roads opened up further areas of the Brookmerland. Brookmerland was connected to the railway network in 1883 by the opening of lines between Emden and Aurich with its branch line to Norden. The railway lines run directly parallel to the roads.

4. Modern development and planning

In its regional planning report for 2005 the Federal Office for Building and Regional Planning lists the Brookmerland as a region which is marked by strong economic growth worthwhile this development may not lead to an increased use of space for settlements, which is accompanied by traffic growth.

4.1 Land use

The structure of linear street villages is still well preserved. These are farms, strung together, one after the other, on the flat embankments used for settlement, which were intended to secure the edge of the peatland. In Leezdorf the original development of the place as a scattered village can still be recognised although a centre to the settlement with a market place has developed. However new developments have been built on the stripped peatland so changing the image of settlement which is still characterised by the kilometres of arable fields. In Marienhaf industrial and residential areas have been established which have largely obscured the main road orientated towards the marketplace. Since 1979 the amount of land used for agriculture has fallen continually. Grain is the most important crop; large areas are used for the growing of maize and rape-seed as well as for pasturage. There are a few wind farms.

The Haneburg (Hane Castle) in Upgant and Castle Upgant are isolated examples of cultural monuments which have been preserved; both of them originating from the 15th/16th century. The Upgant and the Marienhaf windmills are also significant historic buildings in the landscape.

4.2 Settlement development

The population of the Brookmerland has risen since 1970. The Brookmerland is characterised by its situation between the intermediate size centres of Norden and Aurich and the regional centres of Emden designated by the Regional Planning Programme of Lower Saxony (L-ROP). Aurich and Emden with its Volkswagen works are the main workplaces for commuters from the Brookmerland.

Tourism is an important constituent of the Brookmerland's economy and is marked by a rising number of overnight stays. The number of visitors is strongly dependant on the season, as particularly summer tourism and day-visitors make for a great many visitors. In addition many employed people live only partly off tourism and small businesses play an important role in facilitating these overnight stays.

Alongside agriculture and small industrial enterprises, tourism has developed in South Brookmerland, particularly in the areas Bedekaspel and Forlitz-Blaukirchen with the recreation areas "Grosses Meer" and "Kleines Meer", into a significant economic factor. In these two places there are approximately 600 weekend and holiday homes. In addition a yacht marina, two camp-sites and an extensive network of bicycle tracks have been set up.

St. Mary's church with its Störtebeker-tower in Marienhaf is a significant structure although only the central nave of the previous three naves of the vaulted, cruciform basilica of the 13th century have survived, as large parts of the church had to be demolished in 1822 because of dilapidation. The tower, too, which is said to have served Störtebeker as a refuge from 1396-1401, had its top two storeys removed. In the interior of the church the pulpit of 1669, and the organ built by G. von Holy from 1712 to 1715 survive, and a museum room commemorates Klaus Störtebeker. In addition there are mills in Marienhaf. The mill at the Mühlenloog, which can be visited, was built from 1770-1776 and heightened in 1821; the mill in the area Tjüche was built as a gallery windmill in 1895/96. Marienhaf has various sports facilities as an infrastructure for tourism. A permanent exhibition of the subject "Old Customs" is shown in the windmill at Leezedorf, a gallery mill. The mill in Upgant-Schott can also be viewed. The second oldest organ in East Frisia, built by Edo Evers in 1619, is in St. Warnfried's church of the community of Osteel. The church goes back to the 13th century. There is a privately owned zoo in Rechtsupweg which may be visited. In 1996, 1999, 2002 and 2005 the Störtebeker Open Air Festival took place in the Brookmerland; and there is now the so-called Störtebeker Tourist Route.

4.3 Industry and energy

The majority of industrial and commercial enterprises are small and medium-sized firms. Besides workshops these are mainly service enterprises and firms in the areas of electrical and mechanical engineering. Since 1979 the area used by commerce and industry has almost doubled in the administrative area Brookmerland, and has even more than doubled in the community South Brookmerland. The production of regenerative energy from wind power is a growing market. Up to now only a very few wind farms have been built, e.g. the wind farm of Reithamm with its 60 m high wind turbines near Osteel.

The only trans-regional structures which should be mentioned are the gas and crude oil pipelines crossing the Brookmerland.

4.4 Infrastructure

Traffic access to the Brookmerland is shaped by the connections between the regional centre of Emden and the intermediate centres of Aurich and Norden. Today's main roads, the B210 and the B72 follow the route of the old roads and go through the middle of the area of the Brookmerland north-south and west-east. Both the two main roads are used every day by between 5.000 and 10.000 cars. The road and rail junction of Georgsheil in South Brookmerland has an important function in the traffic access to the Brookmerland. The other regions are accessed by Land and district roads. The nearest motorway link is to the A31 near Emden.

Railway connections run parallel to federal roads. There is a railway station in Marienhafen, which provides connections with regional trains on the line from Emden to Norddeich-Mole, much frequented by tourists. Rail traffic on the line Abelitz to Aurich ceased on the 30th April 1996. Areas off the federal roads and thus the railway lines can only be reached by public transport via the bus routes of the integrated transport system Ems-Jade.

The Ems-Jade Canal, built between 1880 and 1888, runs through the southern edge of the Brookmerland. Having been used for some time mainly by sports boats its economic importance for goods transport has grown again in recent years.

5. Legal and spatial planning aspects

The region of the Brookmerland is subject to the Regional Planning Programme of the Land of Lower Saxony and the Regional Planning Programme set up by the district of Aurich.

The local government area of the Brookmerland and the community of South Brookmerland are part of East Frisia. This is the only community organization (Höherer Kommunalverband) in Lower Saxony.

6. Vulnerabilities

6.1 Settlement

The construction of new housing estates on the stripped fenland, adjacent to existing historic settlements, has created permanent changes in the settlement pattern. Many of the settlements are still well preserved, however the continuing pressure for development will make these vulnerable. The construction of holiday villages constitutes a serious problem as far as changes in the landscape in the Brookmerland are concerned.

6.2 Agriculture

The structural change in agriculture and the dependence of the future direction of this branch of business on the agricultural policy of the EU increases the trend towards intensification of production in the Brookmerland. At the same time the proportion of land under protection or land with restrictions on its use is leading to an increasing number of farms closing because of insufficient yields. Falling numbers of people employed in agriculture are leading to increasing commuter movement or the drift from the areas concerned, as the labour market in the rural areas cannot support the surplus work force. The nature of intensification and the

abandonment of the original function of farms results in the cultural landscape being threatened by significant change.

6.3 Industry and energy

The debate on the setting up of wind farms has been growing in intensity in the Brookmerland in recent years. The increasing pressure from the industry on the communities to allocate land in their plans for wind farms is opposed by a growing number of local initiatives. In each case applied for it is essential to consider exactly in what form historic perspectives will change and the image of the historic cultural landscape will be spoilt.

6.4 Infrastructure

The possibilities for development of the rural areas are limited by the nature of the Brookmerland's position between the centres Emden, Norden and Aurich. Yet the neighbouring town of Aurich suffers from the structural weakness of the region. According to the data contained in the regional planning report of 2005 the commuter movements in this region in the direction of Emden are increasing significantly. In this context the problem of insufficient traffic linkage, particularly in the eastern part of the South Brookmerland, is clear. In economic terms the town of Aurich is suffering due to this. The closure of the railway line from Abelitz to Aurich is having a negative effect. Although demands have been made for sometime for this connection to be reactivated and even the manufacturer of wind-energy installations has offered to take over some of the costs involved. However, this project is competing with one being discussed to create a motorway connection by extending the A31 to Aurich. This projected road would use part of the route of the disused railway. Building the motorway according to this plan would have far reaching consequences for the Brookmerland. First the Southbrookmerland would be cut through to a much greater extent than at present. Secondly the communities east of Georgsheil would have no chance of a rail connection. The problem would arise of infrastructure coming into being which would be atypical of the area in addition to the motorway route using more land than the railway, disturbing the image of the landscape and probably causing the entire region to be burdened by increasing traffic. Innovative traffic concepts are, however, urgently needed in view of the increasing movements of commuters created by the demands of industry and commerce for improved traffic linkage and of the possible increase in tourism.

7. Potentials

7.1 Spatial planning

To both protect and promote Brookmerland overall planning beyond the boundaries of the single cultural landscapes has become increasingly necessary. The crucial basis for the East Frisian area has been set up with the establishment of the Regional Structure Conference East Frisia, which amongst other things led to the founding of the Integrated Traffic System Ems-Jade (EVS), and the Regional Innovation Strategy for Tourism. The advantages of Krummhörn and its neighbouring region, can be increased and its disadvantages decreased by the interlinking of the cycle tracks and footpaths, as well as a programme range covering the single cultural landscapes.

7.2 Settlement

In the Brookmerland the forms of settlement and use of the landscape attuned to life on the moorland and its periphery are still recognisable in many aspects. The permanent interaction with the specific conditions of settlement in this area can be identified as the cultural-historic heritage in the landscape: village-dwelling mounds, linear street village-settlements with adjacent fields, windmills and drainage channels reflect the settlement history of the region.

7.3 Agriculture

An important pre-condition for maintaining the traditional structure of the landscape and the buildings within it is the use of the land by private individuals, tourism and agriculture. A

chance of linking the two economic branches, tourism and agriculture, could be the expansion of ecological agriculture, as well as the inclusion and encouragement of farmers in processes aimed at preserving the countryside. The growing of renewable raw materials would offer further possibilities for development in agriculture. Also the potential of nature protection could be an additional source of income for agriculture, e.g. in the Grosses Meer region.

7.4 Tourism

The great attractiveness of the Brookmerland for tourism is the potential for economic development. The maintenance of the attractiveness of the landscape and the improvement of the tourist infrastructure will create the potential to improve the protection and management of the cultural heritage assets and the historic landscape.

7.5 Nature conservation

There is potential for the cultural heritage to be incorporated within management plans in those areas either protected as nature reserves or proposed to become nature reserves.

8. Sources

Author: Wolfgang Scherf

Behre, K. E.: Die Veränderungen der niedersächsischen Küstenlinien in den letzten 3000 Jahren und ihre Ursachen. *Probleme der Küstenforschung* 26, 1999, 9-33.

Bundesamt für Bauwesen und Raumordnung (BBR) (2005): *Raumordnungsbericht 2005. Berichte* 21, Bonn 2005.

Heun, S.: Archäologische Untersuchungen auf dem Hüttenplatz in Lütetsburg, Ldkr. Aurich. *Archäologische Mitteilungen aus Nordwestdeutschland* 18, 1995, 85-110.

van Lengen, H.: Bauernfreiheit und Häuptlingsherrlichkeit im Mittelalter. In: K.-E. Behre u. H. van Lengen (Hrsg.), *Ostfriesland. Geschichte und Gestalt einer Kulturlandschaft*. Aurich 1995, 113-134.

van Lengen, H.: *Burgenbau und Stadtentwicklung. Führer zu archäologischen Denkmälern in Deutschland* 35. Ostfriesland. Stuttgart 1999, 128-140.

Niedersächsisches Landesamt für Statistik: NLS-Online Tabelle K 6070411, K 6070412, Z 0000001

Reinhardt, W.: Die Orts- und Flurnamen Ostfrieslands in ihrer siedlungsgeschichtlichen Entwicklung. In: J. Ohling (Hrsg.), *Ostfriesland im Schutze des Deiches* 1. Pewsum 1969, 201-375.

Rödiger, H.-B., Ramm, H. 1979: *Friesische Kirchen im Auricherland, Norderland, Brokmerland und im Krummhörn*, Jever 1979.

Schwarz, W.: Die Wurt- und Moorlandschaft am Großen Meer. *Archäologische Denkmäler zwischen Weser und Ems. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft* 34. Oldenburg 2000, 211-214.

Wassermann, E.: *Aufstreckensiedlungen in Ostfriesland. Abhandlungen und Vorträge zur Geschichte Ostfrieslands* 61. Aurich 1985.

Wirth, K.: Ein Beitrag zur mittelalterlichen und frühneuzeitlichen Besiedlung des Riepster Hammricks, Gemeinde Ihlow, Landkreis Aurich. *Offa* 56, 1999, 105-119.

Full catalogue of historic maps used, survey evidence etc.

Karte des Nordwestlichen Teils von Ostfriesland. Herausgegeben vom Generalmajor Le Coq 1805, Sect. III. Nachdruck 1984.

Glossary:

Wolden: former parishes Badekaspel, Forlitz and Blaukirchen in the low lying area of the Grosse Meer.

Aufstreck-settlements: settlements set up on the basis of the Upstreek- law/ right (?) in accordance to which the length of a strip of land of a fixed width could be extended ad libitum.

Krummhörn, LS

1. Overview

Name:	Krummhörn
Delimitation:	North Sea mud flats, Leybucht (Ley Bay), inland marsh Brookmerland, Ems and Ems estuary, neighbouring entities: Norderland and Brookmerland
Size:	Approx. 275 km ²
Location:	Marsh areas on the western edge of the East Frisian peninsula, administrative district Aurich, Lower Saxony, Germany
Origin of name:	The name Krummhörn, colloquially also called the Krummhörn, appeared in the 16 th century for the first time, after which the East Frisian peninsula had developed into an enclosed landscape and can be roughly translated as 'crooked corner'.
Relationship/similarities with other cultural entities:	Similar natural and cultural landscape to the neighbouring cultural entities around the river Ems (Rheiderland).
Characteristic elements and ensembles:	Agricultural use, fishing, coastal protection, rural house-forms, settlement mound-villages, detached farm-settlement mounds, churches, dykes and polders

2. Geology and geography

2.1 General

The wide marsh landscape of the Krummhörn is located on the western edge of the East Frisian peninsula. In the south and in the west it is bordered by the River Ems or its estuary, in the north by the Leybucht (Ley Bay) and in the east by the cultural entity of Brookmerland. Historically the whole geographical area between Greetsiel and Oldersum was called Krummhörn, comprising the present area of the boroughs of Krummhörn, Hinte, Emden and parts of Moormerland. Today the name of the former cultural entity is reduced to the area of Krummhörn borough situated in Aurich County. The area of the Krummhörn borders directly on the Wadden Sea National Park of Lower Saxony.

The Krummhörn is entirely comprised of former sea-marsh. Its present appearance is essentially the result of an increase in the sea level around 300 B.C., as a result of which the coast line shifted to the south and bays developed near Campen and Sielmönken. At the same time, mud-flat sediments were extensively deposited.

2.2 Present landscape

The present Krummhörn landscape is dominated by waterlogged lowlands, unfavourable for agriculture. These developed in areas where silt covered peatland shrank and subsided gradually under the superimposed load and/or by drainage. As a consequence today's lowland surface, such as in the Freepsumer Meer, is in part up to 2 m below sea level. The bays of Campen and Sielmönken divide the Krummhörn into older marshland and newer marshland; the latter was only reclaimed piecemeal during the Middle Ages by dykes. In contrast to the former area it has chalky and fertile soil, which still offers favourable preconditions for farming and settlement. Drained marshes surrounded by dykes require an extensive system of ditches, whilst in the lower areas of the marsh pumping stations have to be used.

3. Landscape and settlement history

The Krummhörn has a complex settlement history, and its marsh landscape reflects man's continual struggle to gain and preserve the marsh for human habitation. Characteristic monuments of the process are the dykes and settlement/ dwelling mounds. The large scale investigation of the North German mud flats, as well as to a smaller degree the Krummhörn marsh, has been carried out by the Archaeological Service of the East-Frisian Association (Ostfriesische Landschaft) and the Institut für historische Küstenforschung (Institute for Historic Coastal Research) among others.

3.1 Prehistoric and Medieval Times

The large scale investigation of the North German mud flats and the Krummhörn marsh, by the Archaeological Service of the East-Frisian Association (Ostfriesische Landschaft) and others, has added considerably to our understanding of this area. As a geologically recent area it is marked by Quaternary deposits. The tidal river marshes of the Krummhörn have developed since the end of the Ice Age until today.

The exact date when the Krummhörn was settled can only be determined indirectly, on the basis of comparison with the surrounding areas. At the beginning of the post-Ice Age, today's southern North Sea coast was firm land and the North Sea coast of that time was in the area of the Dogger Bank. It is possible that there are sites of this or later phases below the marsh and its layers of sediment deposits.

However, little is known about the beginning of settlement in the Krummhörn. From the 1st century AD and in the following centuries the presence of a number of lowland settlements has been established (e.g. near Emden-Nesserland, on the drainage-canal close to Wolthusen and on the Uttumer Escher). These settlements were apparently not significantly elevated above the marsh and were as a consequence abandoned when the sea level rose.

A large number of village- and farm-dwelling mounds dating from the Middle Ages and modern times are known. These were densely strung out along the embankments of the River Ems as well as along the former shores of the bays of Campen and Sielmönken. A dwelling mound-row stretches from Manslagt (size approx. 10 hectare), which was formerly sited offshore on a Hallig-like island near the bay's coastline, across the northern edge of the former Sielmönken Bay up to Loppersum. On the southern edge of the bay a dwelling mound-row stretches from Groothusen as far as Suurhusen. On the bay of Campen there are the settlements of Rysum, Loquard and Campen. On the northern bank of the River Ems the dwelling mound-row of Wybelsum runs upstream along the stream course via Emden and Borssum. It is possible that there are remains of earlier settlement-phases under these medieval and modern dwelling mound-settlements. The size of each dwelling mound varies considerably, ranging from a small farm-dwelling mound with only one detached farm to a large village-dwelling mound with more than a dozen farms. A classic example of a village-dwelling mound is the round village of Rysum, formerly situated on the Bay of Campen. Even in the 19th century 15 big farms were still grouped concentrically around the church in the middle of the village, as well as the smaller houses of craftsmen and workers and the site of the former castle.

Apart from the round dwelling mound with their distinct settlement pattern, there were also linear dwelling mounds in the Krummhörn, which have a completely different character. These two dwelling mounds of Groothusen and Grimersum, each about 500 m long and 200 m wide, were trading-places, whose inhabitants mainly lived of crafts and service activities. Archaeological excavations in Groothusen have revealed that it was constructed as early as the 8/9th century in this form.

A comparable long dwelling mound, running from east to west, has been excavated in the centre of Emden. Today's Emden developed very early, out of a number of closely situated settlements, as a trading-place with a grid road system. A number of finds of Rhenish imported ceramics and coins are evidence of active trading. During excavations in the

Grosse Kirche in Emden two oak-posts were uncovered and dated to 966 by means of dendronochronology. This is evidence for the oldest church in East Frisia. From the early Middle Ages new areas of the region were developed, spreading out from the village-dwelling mound. Excavations on the dwelling mound in Middelsteweher and Alt-Damhusen revealed ceramics of the 8/9th century.

In the 12/13th century the building of dykes increased in momentum. Silting up and dyke building secured the bays of Campen and Sielmönken as settlement-areas. Inland colonisation was carried out by single farms. In spite of the construction of dykes as protection against floods, these were still placed on small dwelling mounds of 1-2 m in height and 30 to 50 m in diameter. Finds from the 13th and 14th centuries have been found in these dwelling mounds, which were subsequently abandoned. The construction of dykes requires intensive draining of the land, which led to the characteristic drainage-ditches.

In the 14th century Greetsiel was founded. Here the Greetmer Sieltief drained the northern marshland. As a harbour it attained trans-regional importance and became the first residence of the East Frisian counts of the Cirksena family. Hinte and Pewsum were further economic and administrative centres. Nowadays the 15th century Manniga-Castle, which has been completely restored, still stands in Pewsum. Up to 1565 it was the seat of the chieftain's family, the Mannigas.

3.2 Early Modern Times

Towards the end of the Middle Ages settling of the Krummhörn was largely complete. However its isolated geographic position and the lack of common- or fallow land made an influx from other cultural landscapes difficult.

Before 1600 severe storm floods led to repeated changes to the coast line and made the strengthening of the dykes necessary. The Christmas flood of 1717, which inundated the whole area of the Krummhörn, cost the lives of 215 inhabitants.

East Frisia had been elevated to the rank of an imperial county in 1464 and before 1600 had expanded to cover today's region. In 1744 East Frisia, including the Krummhörn, was integrated into the Kingdom of Prussia. After the Napoleonic period of occupation from 1806 to 1813 it fell to the Kingdom of Hanover. With its end the Krummhörn was restored to Prussia.

Since the end of the Middle Ages the fertile marshy ground in the Krummhörn has formed the basis for the great wealth of the farmers. It made productive farming and dairy pasturage possible. The majority of farms in the Krummhörn were large or middle sized, so that the wealthy farmers required a great workforce.

3.3 Modern Times

The number of inhabitants in the marsh-villages remained relatively stable until the mid 19th century. The social structure of the Krummhörn was almost exclusively regulated by the size of land owned. The farmers thus were at the top of the social hierarchy, regardless of whether the land was owned or leased. Being able to vote also depended on the ownership of land, as did access to political and ecclesiastical offices. Workers and day labourers, who owned no property, were at the bottom of the social hierarchy. In many marsh villages the middle class was completely absent, being located instead in the coastal towns and in the administrative centres. It consisted mainly of business people, craftsmen and administrative officials.

Since 1950 a renewed increase of storm flood activity has been registered, thus the tide-levels of 1962, 1976 and 1994 are amongst the highest ever measured on the coast of Lower Saxony. The storm floods of 1953 and 1962 in particular led to extensive extension and reinforcement work on the coastal protection systems. The plan to build a dyke-ring around the entire Leybucht (Ley Bay) was not implemented in the 1980s on account of the changed social attitude towards coastal protection which now prioritises ecology. However the last extensive strengthening of the outer dykes occurred only a few years ago in Lower Saxony, when a dyke was built in Leybucht (Ley Bay). The severe incursions of storm floods from the North Sea up the river Ems made raising the dykes along the river essential. The severe

March storm of 1906 led to a heightening of the dykes on both sides of the Ems, built between 1906 and 1913.

Pewsum, the administrative seat of today's administrative unit of Krummhörn is about ten kilometres northwest of the municipality of Emden. The administrative unit of Krummhörn, which covers 159,2 km² of the historic cultural landscape, emerged from 19 once-independent communities in the framework of Lower Saxony's community reform in 1972. Today it has roughly 13.560 inhabitants.

The churches in the centre of round dwelling mounds, are of impressive dimensions, considering the size of their communities, and most have a higher architectural standard than for example the churches in Campen and Eilsum. The majority are originally late Romanesque or early Gothic buildings. In the church of Rysum there is the oldest playable original organ in Northern Europe of 1457.

The only two lighthouses in mainland East Frisia, are from more recent times. They were erected between 1889 and 1892 off Campen and Pilsum on the Ems-dyke.

Big farms are characteristic of the Krummhörn. Some date back to the 16th century and still play their part in shaping today's landscape. Just as typical for the image of the Krummhörn landscape is the contrast between the compact village-dwelling mounds and the open marsh-areas with a small number of single farm-dwelling mounds scattered across the countryside. This settlement-structure was established in the Middle Ages and has lasted to present times. The village cores have kept the old settlement-character too. Due to the expansion of development areas with one-family homes, especially in the vicinity of Emden, the landscape is being more and more built-up and its typical character is being threatened.

In the 1990s the Leyhörn on the southern side of Leybucht (Ley Bay) was completed. The construction stretches as a spit of land into the mud flats and includes a reservoir as well as an approach road from the lake to the Greetsiel harbour. The use of the approach road to the harbour in Greetsiel is independent of the tides thanks to the integration of a sluice in its construction.

4. Modern development and planning

4.1 Land use

The marsh areas are still used traditionally for agriculture. The historic coast line in the Leybucht (Ley Bay) area is retained in the shape of the farm land. However in the Krummhörn, the structural changes in agriculture can be also seen in the growing number of farm-closures and the increasing farm size (scale enlargement). This also leads to a decrease in arable farmland-areas in the marshes and therefore to an increase in long-term meadowland. Here regional factors play a minor role; it is the influence of EU agricultural policy, which will lead to a further intensification of production.

Economically the role played by fishing is slight (there are still 28 shrimping boats at Greetsiel) although it is part of the culture of the Krummhörn and is of importance for the people of Greetsiel and for tourism as a constituent of their traditional environment. The long-term existence of this economic sector is questionable because of the de-population of fish stocks in the North Sea.

The role of tourism in the Krummhörn is important. Its quality is based particularly on the area's historic land use structures and on its maritime characteristics. Here especially the fieldscape, the dwelling mound-villages, agricultural buildings, dykes, lighthouses and drainage-ditches should be mentioned. Every year there are about 400.000 overnight-stays and roughly 1 million day-visitors are registered, with the main emphasis on the fishing-village of Greetsiel.

A characteristic of the mud flats area of the North Sea coast is its high biological productivity, for instance as a spawning ground for many types of fish. Off the coast of the Krummhörn there are vital breeding and resting areas for many kinds of birds. Parts of the foreshore of the dykes of Krummhörn as far as the Ems-estuary are a part of Protective Zone I of the

Wadden Sea National Park of Lower Saxony, which as rest areas may only be entered on marked paths.

4.2 Settlement development

The population of the Krummhörn is increasing due to immigration, while the city of Emden registers a drastic decline. This is reflected in an increase in one-family homes being built. Housing estates are expanding into the countryside along the edges of dwelling mound-villages, altering the historic village plans. This development can be seen in Upleward, Hamswehrum, Groothusen, Visquard, Eilsum and Uttum.

The north-side of the former dwelling mound-village of Manslagt is still clearly typical of its type, as are settlement structures of the village-dwelling mound of Rysum. To this day the landscape of the Krummhörn offers many possibilities to observe the way in which the development of the countryside was organised from the dwelling mound-villages throughout time.

Tourism is an important component of the economy of the Krummhörn and is characterised by the rising number of overnight stays. The number of visitors depends strongly on the season. In addition a great number of employed people only live partially off tourism. Part-time employment and seasonal employment play a big role.

Apart from the harbour of Greetsiel, the national park house is also a tourist attraction. In the centre of Pewsum there is the Pewsum Castle museum. In addition there is a mill museum located in a three-storey gallery-windmill in Pewsum. The East Frisian Agricultural Museum is situated in Campen. The Krummhörn can offer a number of buildings worth visiting, such as the lighthouse of Pilsum (13 meters high, it is the smallest lighthouse on the German North Sea coast), the lighthouse of Campen (65 meters high – the highest lighthouse on the German North Sea coast), the Church of the Holy Cross from the 12th century in Pilsum, the church in Eilsum from the 13th century, as well as the church in Manslagt from the 14th century. The East Frisian Regional Museum is located in Emden.

4.3 Industry and energy

Industrial installations and the processing industries are mainly sited in the city of Emden with its VW-works, shipyards and seaport. There is a large trading estate in Pewsum on the L 3, which attracts consumers from the Krummhörn, Hinte and Emden. In Greetsiel a new commercial estate is being built on the L 25.

The gas and crude oil pipelines are significant trans-regional structures. In addition gas is extracted at several places in the Krummhörn. There are two natural gas wells to the west of Greetsiel and gas wells in the regions of Uplewart and Campen. Close to the settlement of Rysum another natural gas power station exists.

Wind farms have been set up extensively in the Krummhörn to the west of Pilsum south of Visquard and southwest of Manslagt, as well in the Larrelter Polder. A number of single wind turbines are scattered across the entire cultural entity.

4.4 Infrastructure

From the point-of-view of traffic the Krummhörn is marked by its distinctly peripheral position. For a long time the ring roads around the village-dwelling mounds and the smaller roads branching off them, shaped the traffic-network which served the marshy areas. By 1863 a fully-developed road connection developed between Emden, Aurich and Norden (today's B 210 and 72). Up to 1893 the Krummhörn was only linked to the trans-national road system by a number of country roads. Still today the Land roads follow the old course of these roads.

A highly branched road system is necessary to connect all the rural settlements and farms. The Krummhörn is linked via Emden by a number of Land roads (L 2, L 3, L 4, L 25, L 27) and by local roads. The nearest points of access to the motorway are near Emden, onto the A 31 (via the "Pewsum" interchange amongst others).

On the 27th July 1899 passenger- and freight transport on a narrow-gauge local railway, which was popularly called "Jan Klein", opened on the line between Emden and Pewsum. From the 27th September 1906 the extension of the line reached as far as Greetsiel. All traffic

however completely stopped on the 25th May 1963. The railway was dismantled and public transport transferred to buses. Today, the Krummhörn has no linkage to the national railway network. The nearest railway stations are in Emden and Marienhaf. Public transport is by bus.

The Krummhörn has access to shipping on the Federal waterways River Ems and the North Sea via the harbours in Emden and Greetsiel. The harbour of Greetsiel can be accessed from Emden by small boats. The Alte Greetsieler Sieltief and the Neue Greetsieler Sieltief connect the place with the East Frisian inland waterway network.

5. Legal and spatial planning aspects

In matters of regional planning the Krummhörn region is subject to the Land Planning Programme of Lower Saxony of 1994 with its supplements of 1998 and 2002, as well as Regional Planning Programme set up by the administrative district of Aurich. In the Land's regional planning programme the city of Emden is categorised as the centre for this region. Apart from the shipping waterways of the River Ems, the entire area of the coastal waters has been declared as a priority-area for nature and landscape and belongs to the Wadden Sea National Park of Lower Saxony. In the regional planning programme of the administrative district of Aurich, Greetsiel is named as a recreation/ tourist area and therefore the community was assigned the special task of developing "recreation".

The community of Krummhörn belongs to the administrative district of Aurich and thus to the Ostfriesische Landschaft (East Frisian landscape). This is the only upper communal association (Höhere Kommunalverband) in Lower Saxony. As an institution it is responsible essentially for tasks such as the areas of culture, science, preservation of historical monuments and education.

6. Vulnerabilities

6.1 Settlement

The continuously increasing population in the rural areas of the Krummhörn, as a result from the movement of people from Emden, will lead to the formation of further settlement areas, or expansion of existing settlements and thus changes in the historic settlement pattern. Careful planning will be required to protect and manage the surviving historic settlements.

6.2 Agriculture

In the Krummhörn, the structural changes in agriculture can be seen in the growing number of farm closures and the increasing farm size (scale enlargement). This leads to a decrease in farmland areas in the marshes and therefore to an increase in long-term meadowland. Here regional factors play a minor role; it is rather the influence of EU agricultural policy, which will lead to a further intensification of production. This will mean that both the present dispersed settlement pattern and the existing land use will be vulnerable to change.

6.3 Industry and energy

The building of larger wind farms with higher wind turbines lead to changes in landscape perception and thus in the character of the historically evolved landscape. Investigations will be needed into the extent natural gas extraction leads to a subsidence of the area of the Krummhörn, which is increasing the threat of inundation.

6.4 Infrastructure

The rise in population figures in the Krummhörn will lead to an increase in traffic on the Land- and Federal roads, as will the flow of commuters to Emden. Increased local public transport can only be road transport because of the lack of rail linkage in this area which will create pressure on the historic structure of the road system.

6.5 Natural processes

A main problem of the future, which is difficult to predict, is climate change which is progressing faster than expected. Since 1950 increasing storm flood activity has been observed. Reinforced coastal protection-measures with dyke heightening and dyke widening will be necessary, requiring the quarrying of clay and sand needed for construction purposes. The flooding danger is increased by the subsidence of land in the Krummhörn, possibly triggered by drilling for natural gas. The Ems-estuary is a specifically endangered area. It has become a “gateway” for storm floods due to the constant changes, straightening and deepening, as well as the building of dykes. Evidence for this is the drastically increased range of tides and the clear increase in extreme water levels. Any plans to protect the area will need to have the cultural heritage interests as an integrated part of the proposals.

7. Potentials

7.1 Spatial planning

To both protect and promote Krummhörn overall planning beyond the boundaries of the single cultural landscapes has become increasingly necessary. The crucial basis for the East Frisian area has been set up with the establishment of the Regional Structure Conference East Frisia, which amongst other things led to the founding of the Integrated Traffic System Ems-Jade (EVS), and the Regional Innovation Strategy for Tourism. The advantages of Krummhörn and its neighbouring region, can be increased and its disadvantages decreased by the interlinking of the cycle tracks and footpaths, as well as a programme range covering the single cultural landscapes.

7.2 Settlements

In Krummhörn most forms of settlement and land use, adjusted to the lives of the people in the marshes of the North Sea coast, are preserved to a large degree. The relationship of the settlements with the natural landscape can be seen as the cultural and historic heritage in the landscape: farm-dwelling mounds, village-dwelling mounds, old and new dyke-lines (e.g. in the former Leybucht/ Ley Bay), areas of brackish water, colcs, clay pits, and drainage ditches reflect the interactions in the past and the present with the sea. This pattern provides great potential for the promotion of the area both in the production of traditional produce and for the tourist industry.

7.3 Agriculture

An important pre-condition for maintaining the traditional structure of the landscape and the buildings within it is the use of the land by private individuals, tourism and agriculture. A chance of linking the two economic branches, tourism and agriculture, could be the expansion of ecological agriculture, as well as the inclusion and encouragement of farmers in processes aimed at preserving the countryside.

7.4 Tourism

The great attractions of the landscape of the Krummhörn for tourism are a potential source of economic development. The preservation of the attractiveness of the landscape and the improvement of the tourist infrastructure (hotels, restaurants, footpaths, etc.) is vital for this. In view of the peripheral location of the Krummhörn on the mainland the possibility of intensifying co-operation with neighbouring cultural landscapes should be examined. At the same time care must be taken that the original character of the cultural landscape is not completely lost but is integrated in the development of the Krummhörn in accordance with future requirements. A decision to classify the whole Dutch-German Wadden Seas area as a “Place of World Natural Heritage” could open opportunities. This would protect this region of the North Sea better – up to now it has been only classified as World Culture Heritage with emphasis on “shipwrecks” – and prevent negative developments. Encouraging and

promoting the historic settlements, landscape and museums of the area will increase the tourist industry and help in the protection and management of the cultural heritage assets.

8. Sources

Author: Wolfgang Scherf (Übers. Mai-Catherine Botheroyd)

Behre, K.-E. (1999): Die Veränderungen der niedersächsischen Küstenlinien in den letzten 3000 Jahren und ihre Ursachen. *Probleme der Küstenforschung* 26, 9–33.

Behre, K.-E. (1999): Naturraum und Kulturlandschaftsentwicklung Ostfrieslands. *Führer zu archäologischen Denkmälern in Deutschland* 35. Ostfriesland. Stuttgart, 10–27.

Beise, J. (2001): Verhaltensökologie menschlichen Abwanderungsverhaltens – am Beispiel der Krummhörn (Ostfriesland, 18. und 19. Jahrhundert). Dissertation; Gießen.

Brandt, K. (1992): Besiedlungsgeschichte der Nord- und Ostseeküste bis zum Beginn des Deichbaus. In: J. Kramer & H. Rohde, *Historischer Küstenschutz, Deichbau, Inselschutz und Binnenentwässerung an Nord- und Ostsee*. Stuttgart, 207–240.

Bundesamt für Bauwesen und Raumordnung (BBR; 2005): *Raumordnungsbericht 2005*. Berichte 21, Bonn 2005.

Jeschke, A. (2004): *Raumplanung als vorsorgendes Instrument im Küstenmanagement*. Oldenburg.

Kramer, J. (1992): Küstenschutz und Binnenentwässerung zwischen Ems und Weser. In: J. Kramer & H. Rohde, *Historischer Küstenschutz, Deichbau, Inselschutz und Binnenentwässerung an Nord- und Ostsee*. Stuttgart, 207–240.

LANCEWAD (2001): *Landscape and Cultural Heritage in the Wadden Sea Region – Project Report*. In: *Common Wadden Sea Secretariat (Hrsg.), Wadden Sea Ecosystem*. Wilhelmshaven.

Landkreis Aurich (1992): *Regionales Raumordnungsprogramm des Landkreises Aurich*. Aurich.

Lengen, H. van (1999): Burgenbau und Stadtentwicklung. *Führer zu archäologischen Denkmälern in Deutschland* 35. Ostfriesland. Stuttgart 1999, 128-140.

Niederhöfer, K. (2004): Archäologie im Wattenmeer. In: *ArchäologieLandNiedersachsen. 25 Jahre Denkmalschutzgesetz – 400 000 Jahre Geschichte*. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 42. Stuttgart, 511–513.

Niedersächsisches Institut für Wirtschaftsforschung (NIW; 2005): *Regionalbericht Norddeutschland 2005*. Hannover.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsisches Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz - Regierungsvertretung Oldenburg - Landesentwicklung, Raumordnung. Stand 2005.

Reinhardt, W. (1999): Die Wurtenlandschaft der Krummhörn. *Führer zu archäologischen Denkmälern in Deutschland* 35. Ostfriesland. Stuttgart, 245–247.

Reinhardt, W. (2000): Die Krummhörn. *Archäologische Denkmäler zwischen Weser und Ems*. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 34. Oldenburg, 206–211.

Rödiger, H.-B. & Ramm, H. (1979): *Friesische Kirchen im Auricherland, Norderland, Brokmerland und im Krummhörn*. Jever.

Seedorf, H. & Meyer, H.-H. (1996): *Landeskunde Niedersachsen 2. Natur- und Kulturgeschichte eines Landes*. Niedersachsen als Wirtschafts- und Kulturraum. Neumünster.

Strahl, E. (2004): Archäologie der Küste: Marsch, Watt, Ostfriesische Inseln. In: *ArchäologieLandNiedersachsen. 25 Jahre Denkmalschutzgesetz – 400 000 Jahre Geschichte*. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 42. Stuttgart, 495–510.

Thieme, H. (1997): Älteres Paläolithikum aus dem Gebiet zwischen Weser und Elbe. In: L. Fiedler (Hrsg.), *Archäologie der ältesten Kultur in Deutschland*. Materialien zur Vor- und Frühgeschichte von Hessen 18, 328–356.

Moormerland, LS

1. Overview

Name:	Moormerland
Delimitation:	Rivers: Jümme, Leda, Ems; City border: Leer; Fehnjter Tief; Sanwater; Bagbander Tief, community border: Hesel; neighbouring cultural landscapes: Lengerland, Overledingerland, Rheiderland
Size:	ca. 122 km ²
Location:	Emsmarsch and Geest, rural district Leer, Ostfriesland, Lower Saxony, Germany
Origin of name:	Not known
Relationship/similarities with other cultural entities:	Adjoins Rheiderland, Overledinger, Krummhöm, Brookmerland and Auricherland.
Characteristic elements and ensembles:	Dwelling mound settlements, Fehnsettlements (settlements along a canal on cultivated former moorland), rural house types, peat-cutting, dikes

2. Geology and geography

2.1 General

The region of Moormerland lies to the east of Ostfriesland and between Emden and Leer. Its current extent corresponds to the modern community of Moormerland in the county of Leer. In the past Moormerland was much larger, covering parts of the adjoining community of Hesel to the east and to the south the area down to the lowlands of the Leda and Jümme and the area of the city of Leer.

The glaciers of the Saale ice age brought the sandy soils east of the river Ems in the county Leer, overlying boulder clay. The clay is close to the surface, resulting in a permanent wetness in the overlying soils. The overlying bogs grew intensively during the Holocene. Before the land was covered with a dense flora, drifts built layers of shifting sand and dunes. The valleys of creeks and brooks were filled by fluvial sand and clay during the Holocene. Because of the rapid rise of the sea level since the end of the ice age the water formed lagoons and created the marshes of the Ems and the Leda-Jümme low land. Human settlement concentrated on the land between the creeks and rivers. The rivers drained the surface waters of these areas, eventually creating dry areas suitable for more permanent settlements.

2.2 Present landscape

The Moormerland formerly covered the great plateau of high, dry land (Geest) from Neermoor, Hesel, Holtland, Nortmoor and Leer. Today this cultural entity covers only the area of the community of Moormerland. The cultural landscape is divided into different natural areas: a small, three kilometre wide border of river marsh along the Ems, lower bogs at the edge of the Geest and the Geest which is sometimes widely covered with raised bogs. The bogs have been mostly drained and the peat cut, so they look almost like the marshes with their straight canals, the so called "Wieken". The main drainage channels of the Moormerland are the Bagbander and the Rorichumer Tief as well as the Sauteler Tief, all of which drain into the Ems.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The Geest was visited by hunter and gatherer groups c.9000 years ago in the Mesolithic. In the Neolithic period (c. 4000 BC) the first farmers settled there. The few known megalithic burials in this region (Leer, Brinkum) are now almost all destroyed. In Westerhamrich (close to Leer) some cremation burials of the Trichterbecherkultur (Funnel Beaker Culture 2900 – 2700 BC) were discovered. These graves are the oldest cremations known in north-west Germany. Settlements of the Funnel Beakers are known from Nortmoor. The distribution of finds demonstrates that there had been settlers in Moormerland and Overledingerland in this early period, even though nothing can be said about the density of the early settlements. In this period the bogs were crossed by wooden track-ways, constructed with considerable effort, and the many water ways were also used for water-borne traffic. The Funnel Beaker and the Single Burial Culture (Einzelgrabkultur) used the same tool inventory, as well as the same burial places and settlement locations, demonstrating that there was an adaptation of the local people to cultural change elsewhere. Up to now, there is no evidence for an influx of foreign settlers. The large number of finds dating to the Single Burial Culture demonstrates a high density of settlement in the area; these began with the nuclear settlements of the Funnel Beaker people.

At the end of the Neolithic period the Bell Beaker Culture immigrated from the west into Moormerland. They introduced the knowledge of manufacturing metal to the northern parts of Europe. Two Bell Beakers excavated in Logabirum could be grave goods. However the majority of the finds from the Early and Middle Bronze Age are still made of stone, with single bronze artefacts found in bogs.

In the middle of the first millennium BC it seems that the occupation came to an end on the Geest. A reason for this might have been the erosion of the soil resulting from intensive agriculture, as suggested by layers of drifting sand found in the archaeological record. The settlements moved into the marshes along the rivers like the Ems, Leda and Jümme, where the fertile sandy soils of the marshes were cultivated. Both settlements and graves have been excavated dating to the Iron Age and Roman period. A Roman graveyard, dated to the 3rd century AD, was discovered at Nortmoor during quarrying for sand.

Since the migration period (Völkerwanderungszeit/Dark Age), in the 5th century, the settlement activity in this region declined. It wasn't until the Carolingian period that occupation of the area increased again and even the Geest was settled once more. This is demonstrated by finds from Hollen, Hesel, Loga and the area of Nortmoorer Hamrich; the latter can be dated to the late 8th or the 9th century. During the 12th century the settlement was abandoned again because of the high frequency of floods. The lower Sietland was not cultivated prior to the 10th/11th century.

Around 1100 AD the building of dikes began along the coast of the North Sea and the mouths of the main rivers and streams, which was completed around 1300 AD. Since this time the natural drainage-ditches (Tiefs) have been used for drainage, protected from high tides and storm tides by sluice-gates.

Oldersum was probably founded between 700 and 800 BC in the marshes of the river Ems on a long dwelling mound. It corresponds to the classical type of a long dwelling mound, with a church at one end and a fortification at the opposite end of the mound. The location of a second, documented fortification is yet unknown. After the erection of the dikes, the lower land was occupied as well, so east of the dwelling mound a new village (Neustadt) was founded. In the 14th century Oldersum belonged to the chiefs "tom Brock" but from 1427 it belonged to the chiefs of Neermoor (Focko Ukena). Both fortifications of Oldersum were destroyed by the campaigns of Hamburg against the pirates of Ostfriesland in 1433. Only one was re-erected. In 1438 Wiard Haiken became the new chief of Oldersum, while his descendants ruled the "Herrlichkeit Oldersum" (the Grandness Oldersum) until 1631.

Around 1000 AD the dwelling mound Rorichum is mentioned in the “Güter- und Heberegister” (a register for trading goods and toll) of the cloister Werden, situated on the east side of the river Ems. The church of Rorichum, which is a rectangular church of only one room and without an apse, was build at the beginning of the 14th century.

Gandersum is mentioned around 1000AD in the “Heberegister” of the abbey of Werden. Hatshausen is documented from 1439 and is mentioned around 1500 in the register of the rectory of Münster. Hatshausen might have had only a small chapel, which was cared for by the monks of the Bockzelter cloister. Hatshausen was subsequently joined with the village of Ayenwolde, to form a single large parish. The village of Veenhusen had its origins in the 12th century, and was mentioned in 1435 in the register of the rectory of Münster.

The marshes served as the centre of trading during the medieval period, whilst the Geest was chiefly used for agriculture. With the introduction of the sod-cutting economy (Plaggenwirtschaft or “Eschwirtschaft”) in connection with the cultivation of winter rye, living conditions improved because of the possibility of manuring. Agriculture was no longer restricted to natural fertile soils and settlements could be permanently occupied. Heather turf was cut and brought into the stables where it was mixed with animal dung and later on brought up to the fields as manure.

3.2 Early Modern Times

In the 17th century a shortage of fire wood in the treeless coastal regions combined with a growing population led to new developments on the bog with the introduction of a peat-cutting industry. A new type of settlement, the Fehncolonies of the northern Netherlands, was adopted. The bogs were drained by newly built canals, which were also used for transport. From the main canal, side-canals (Wieken) were dug into the bog. Following the initial peat extraction, the area became settled by farmers who lived partly from peat extraction and partly from agriculture. Because the raised bogs were not very fertile, the farmers used mud deposits from the Ems and organic waste, delivered by the peat boats, as manure for their fields and meadows. The colonists settled at both sides of the canals. The single row settlements are still characteristic of the topography of the Fehnsettlements.

The family of Iherings is known from Ostfriesland since 1561, and were instrumental in the reclamation of new land in the coastal areas by erecting dikes around the foreland. In 1772 Iheringsfehn was mentioned for the first time. In 1726 the family of Warsing bought the manor Siewe in Rorichmoorer Meedlanden, on the edge of the raised bog. In 1736, Fehn was founded (its original name was Warsingfehn) which became a kind of a centre for the surrounding settlements.

In 1744 Ostfriesland, including Moormerland, became Prussian.

3.3 Modern Times

Closely connected with the economical use of the Geest is the “ever lasting cultivation of rye”. Since the 10th century the undemanding rye was cultivated on the poor soils of the Geest, fertilised by the addition of turf sods mixed with manure. Sod cutting meant the lasting destruction of the soils from where they were cut, followed by drifting sands. The results were the characteristic soils called “Eschaufragsböden”. This was the way agriculture was practised until the 19th century, until the importation of guano manure from South America.

Due to the threat of storm tides entering into the Ems, the dikes along the rivers had to be heightened. After the heavy storm tide in March 1906, the dikes on both sides of the Ems were raised between 1906 and 1913. Like the dikes along the coastline they were not just raised but also re-profiled to make the slope shallower. The low land in the Leda-Jümme area was often flooded by storm tides or swelling rivers through heavy rainfalls. In 1950 and 1954 a Leda barrier was erected to stop the storm tides.

Until the middle of the 20th century in Oldersum the houses and shops lay densely along Church Street, while some great farmhouses could be found along the side streets. Since the beginning of the 20th century all the settlements have increased gradually, however since the Second World War the topography of the villages was changed considerably as a result of

the immigration of refugees and expellees and the consequent expansion of the settlement. In Rorichum the brick stone church of the 14th century, with its free standing belfry, the former rectory and the former school house are a valuable group on the highest top of the dwelling mound. Even after the structural changes following the Second World War, the typical rural character of Rorichum was still preserved.

After the reform from the 1st of January 1973 the former independent communities of Boekzetelerfehn, Gandersum, Hatshausen, Iheringsfehn, Neermoor, Oldersum, Rorichum, Terborg, Tergast, Veenhusen and Warsingsfehn were added to the community of Moormerland. Today approximately 23.000 inhabitants live in Moormerland. The landscape is dominated by the drainage and cutting of the bogs. Because of the spreading of trade and industry and therefore the expansion in settlement, Moormerland has lost its characteristic topography in many places. However, the preserved hedgebank-landscape (Wallheckenlandschaft) in the south gives an impression of the former historical landscape.

4. Modern development and planning

4.1 Land use

In the past decades there had been a great change in the structure of the community of Moormerland, which is mostly dominated by agriculture. With the disbandment of smaller farms and growth of new commuter settlements, particular in Neermoor, Veenhusen and Warsingsfehn, there had been a change in use of the cultural landscape. More environmentally friendly methods of agriculture are not yet very important in Moormerland, but there is potential for development in this sector.

In the area of Veenhusen there is currently a proposal for the extraction of quartz sand on a huge scale. High quality quartz sand is used in the production of silicon, the main element in the production of photovoltaic plants. This application will particularly affect the industrial area of Neermoor (north of the L 2 and west of the railroad tracks), an area at Neermoor/Veenhusen (east of the railroad tracks between the Suteler canal and the K 8), as well as an area at Veenhusen/Altschwoog (east of the B 75 and between the K 8 and the A 31). It will make Moormerland the principal source of supply of quartz sand within the region of Ostfriesland, including the neighbouring counties like Friesland, Ammerland, Cloppenburg, Emsland as well as the eastern part of the province Groningen in the Netherlands.

Quartz sand has been and is extracted within Moormerland in a variety of locations. In the area of Neermoor/Veenhusen, to the south of the Sauteler canal the former deposits of quartz sand are already completely exhausted. The cuts and pits will be refilled with mud deposits from the maintenance of the Ems. Digging for quartz sand north of the Sauteler canal has been abandoned due to deterioration in its quality. One pit is now re-used as an artificial pool for swimming while another is already refilled with mud deposits from the Ems. In the area of Veenhusen, east of the B 70 and south of the K 8, the quartz sand deposit is finished and the pit refilled. The southern part is an area with a high priority for digging quartz sand within the Regional Program for Spatial Planning (Regionales Raumordnungsprogramm) and which will be extracted in the coming years.

Beside the river dikes along the rivers (Ems, Leda Jümme), there is the Ems-Flood-Barrage at the lower Ems near Gandersum, which is meant to protect the water system of the Ems from storm tides. It is also needed to retain water in the Ems for accomodating ships with a deep draught. Discussions about a possible offence of the European bird protection directive following construction of the Ems- Flood-Barrage have now ended with an agreement between the Federal State of Lower Saxony and the environmental associations.

The low lands, for example the Leda-Jümme low land, will be registered in the Regional Program for Spatial Planning of the county Leer, as a huge area for pasturage and its

protection and development. Most of the waters of Moormerland are artificial or at least very much changed. Only the Bagbänder Tief fulfils the characteristics of “natural water” in the meaning of the European Water Framework Directive (WFD).

4.2 Settlement development

There has been considerable settlement expansion in the form of commuter suburbs, in particular single-family houses, which has led to changes in the historic topography of the villages. The majority of commuting is to the city of Leer, the second biggest city for shipping companies in Germany and home to many trading companies and industrial enterprises.

4.3 Industry and energy

Approximately 400 companies are settled in Moormerland. The enterprises are mostly located within two different areas – one in Neermoor and the other in Oldersum. The business areas Neermoor I and II are close to the exit of the motorway A 31. The area in Oldersum lies directly by the L 1.

Because of the strength of the wind, parts of the Moormerland are economically attractive for gaining wind energy. Many companies are profiting from an extension of wind energy plants as well as from the production of the company ENERCON, which is a world wide leading producer of wind energy plants. In this region some wind energy plants had been erected, too, like in Neermoor-Memgaste. To date there is no wind energy plant which is higher than 100 m.

4.4 Infrastructure

In the past, the water ways were used for transportation in Moormerland because the road network was in a bad condition.

Around 1863 the city Leer, and therefore Moormerland as well, was connected by a road from Aurich to Oldenburg. In 1890 the road between Leer and Terborg was built. Since 1893 a few roads were built crossing Moormerland, including a road running directly to Emden. Since 1975 the motorways A 28 and A 31 were built which meant a national connection. In 1856 the city Leer, and thus Moormerland, was connected to the German railway system.

The region of Moormerland offers all kind of shopping facilities and community services. Because of the proximity of the city of Leer, Moormerland is well-connected in terms of routes. Some improvements are needed in terms of the railway connections, but a basic service exists. A concrete improvement would be the re-activating of the railway station in Neermoor. At present, public transport mainly comprises buses.

In Leer the harbour gives access to the federal water ways of the Ems and North Sea. The harbour in Oldersum is mainly used for trading goods and it is one of 4 places in the county of Leer for the transshipment of goods from trucks to ships and reverse. The many water ways are also important for water sports, particularly for sailing. There are three marinas in this region. Since 1998 Gandersum became famous for the erection of the Ems-Flood Barrage, intended to retain water for accommodating ships with a deep draught and to save the Ems from storm tides, but which was controversial with regard to the natural environment.

5. Legal and spatial planning aspects

All villages of Moormerland fall within the Regional Program for Spatial Planning (Regionales Raumordnungsprogramm) of Leer county (2005) and into the Lower Saxonian Program for Spatial Planning. This has resulted in some differences in approach to spatial planning for the region of Moormerland. Moormerland belongs to the East-Frisian Association (Ostfriesische Landschaft) which is one of the higher municipal associations in Lower Saxony.

6. Vulnerabilities

6.1 Settlement

Residential areas in Moormerland continue to expand, in part due to settlement associated with the spread of trade and industry. Its nearness to the city of Leer means that Moormerland faces a significant population increase between 2005 and 2015. Urban sprawl and a higher density of traffic is endangering the former structure of characteristic villages, threatening to transform them into faceless collections of single family homes. Declaring new areas for settlements can threaten the historic structure of the villages and the characteristic topography of an area by affecting the historic form and distribution of agricultural land as it is allocated for development. Legislation and financial constraints associated with restoration of historic buildings often makes their restoration and re-use more difficult than building new ones. There is also a preference amongst businesses and individuals for modern, state-of-the-art buildings, but not all architects are designing new builds to a regional style. Even where this does occur, it can result in buildings with a semi-historic appearance which detract from the character of settlements and the landscape.

6.2 Agriculture

With the disbandment of smaller farms and growth of new commuter settlements, particular in Neermoor, Veenhusen and Warsingsfehn, there has been a significant change in the distribution and use of agricultural land in Moormerland over recent decades. There is continued pressure on the agricultural sector for greater efficiency of production, which requires farm consolidation and scale(?) enlargement, including the re-structuring of fields, larger machinery and bigger agricultural sheds for storage. This can result in larger roads, construction of cheap and uniform buildings, removal of landscape features, and destruction of buried archaeological remains. A decrease in the numbers of farmers and increase in the area of un-used arable land can have major effects on the maintenance of the landscape and cultural heritage.

6.3 Tourism

There are potential conflicts between tourism and the cultural heritage, for example holiday accommodation is often not built in line with the characteristic regional building identity and together with other physical elements associated with tourism they can detract from local identity, or in serious cases, destroy the character of a village or area. Development around the monastery site of Ihlow is causing conflicts between cultural heritage management, environmental protection and commercial developments.

6.4 Nature conservation

The development of nature reserves can be a threat to the landscape and cultural heritage; for example habitat creation sometimes involves digging new water structures which can destroy buried archaeological remains, or designing new small areas of woodland that can effect the openness and character of the landscape.

6.5 Industry and energy

The modern transformation of the Moormerland is being largely effected by integration of the area into the inter-regional freeway system. Industrial areas with drab steel buildings and large-scale factory sites covering several hectares have been developed in almost every community, regardless of the local landscape. Moormerland has also suffered considerable change as a result of quarrying for quartz sand. The planned extraction of quartz sand in the area of Veenhusen, with a total area of 150 ha and a volume of 25 million m³, could lead to serious destruction of the historic landscape and buried archaeological sites. Another problem is the infilling of the extraction pits with Ems mud deposits once quarrying is finished. When the pits are filled with mud there is no longer the possibility to re-open the pits for archaeological excavations of a higher technical standard.

The wide and open marshland of Moormerland and strong winds mean it is an ideal location for building wind farms and they continue to be planned and erected, not only on the Ems but increasingly in the geest area as well. Wind turbines threaten to compromise the visual amenity of the landscape, detracting from historic character and sense of place by changing the dominant viewing axis from the horizontal to the vertical. The scale of the impact is connected to the heights of the wind turbines; the higher the structure, the more negative is the effect. The Regional Program for Spatial Planning (Regionales Raumordnungsprogramm) of the county of Leer (2005) restricts the height of wind turbines to 100 m in order to preserve the landscape but construction of wind turbines also has the potential to damage any underlying archaeological remains.

6.6 Infrastructure

Increasing the size of harbour sites like Emden without understanding and consideration of the surrounding landscape and cultural values can make the original character of the land unrecognizable. They have little or no connection to the former landscape and are like completely new landscapes, where former occupation and land use is no longer visible. Development on this scale will not only have a major impact on the immediate location but will have a negative effect over a far larger area because of the openness of the landscape and contrast with the surrounding areas and villages.

7. Potentials

7.1 Settlement

The historic character of many rural villages such as Rorichum and the Fehncolonies survives. By applying new functions to old buildings, it should be possible to retain some of the characteristics of the region and there is a demand among some buyers for distinct historic houses. In the case of new buildings, it is important that the architect is aware of the historic setting of the building when designing new architectural and landscape values.

7.2 Agriculture

The whole county of Leer is classified by the Regional Program for Spatial Planning (Regionales Raumordnungsprogramm) in the category "Rural Area" (Ländlicher Raum), which will mean that this region will have a special function for agriculture, forestry, the protection of the cultural landscape, natural environment (animals and plants, soil, water, air) and recreation in this landscape. The adoption of more environmentally friendly methods of agriculture is limited in Moormerland, but there is potential for the development of this approach. The agricultural sector is willing to discuss its contribution to the maintenance of the landscape and cultural values of the area, but information, guidance and compensatory payments or other financial aid will be required for them to act.

7.3 Management of cultural heritage

Moormerland has a rich archaeological heritage, including the oldest cremation burials in north west Germany from the Neolithic period and traces of settlement from the Iron Age and Roman periods. Dwelling mounds survive from the early medieval period and dikes for land reclamation were constructed from the 12th century AD. These are highly visible features in the landscape. There are opportunities to restore elements of the cultural heritage such as the archaeological site of the monastery at Ihlow.

7.4 Tourism

In general Moormerland has a high potential for recreation and tourism because of its natural landscape and good transport connections. In the outline of the Regional Program for Spatial Planning (Regionales Raumordnungsprogramm) of the county Leer, it is recommended that tourism should be developed especially in the marshland village of Warsingsfehn. Existing co-operation with regard to tourism, public transport and economic structures could be strengthened and the links between neighbouring districts, municipal communities and

associations should be made and developed. Common strategies should be developed and realized with the counties Aurich, Friesland and Wittmund as well as with the cities of Emden and Wilhelmshaven.

Places of interest in Moormerland include the typical Fehnlandscape with its “Wieken” (canals) and flap-bridges, the sluices and the lake Boekzeteler Meer as well as the remarkable buildings like the windmill (Dutch gallery mill) in Wasingsfehn, a few historical churches, like on the dwelling mound Rorichum, the graveyard of the former cloister Boekzetelerfehn and the harbour of Oldersum. In Warsingsfehn there is a little museum of local history. Rorichum has a “Paddle and Pedal Station” which is the starting-point for boat- and bike-trips. From a tourist point of view, the possibilities for riding a bicycle are particularly important, because of the flat landscape.

The proximity to the city of Leer is also advantageous to the development of tourism in this area. Points of touristic interest close to Moormerland include the “German Fehn Route” (Deutsche Fehnroute), the town of Emden (Harbourtrip, art museums “Kunsthalle”, State Museum Ostfriesland), the historical town centre of Leer, the bog museum in Moordorf, an open air museums in Cloppenburg, as well as the water park in Hasselt. Since the Ems-Flood Barrage had been finished in 2002 the building attracts more and more tourists every year.

Tourism can offer a new economic base for the area which can lead to sustainable development and management of the landscape and cultural heritage. Well kept buildings, villages and landscapes, by which the cultural history is visible, offer a reason for people to come to area.

7.5 Nature conservation

In Moormerland, nature has to cope with ecological fragmentation which means that natural areas are isolated from each other. Historic linear landscape structures such as canals, have the potential to be used to as wildlife corridors, connecting natural areas. Working in this way gives the cultural heritage an additional value and strengthens the arguments for its maintenance and retention. Aspects of nature conservation can also be considered for the conservation of the cultural landscapes such as the extensive hedgerow areas in the south part of the Moormerland area around old geest villages such as Filsumm, Ammersumand Hollen.

7.6 Infrastructure

In the process of extending harbor sites, it should be possible to seek more attractive outcomes from planning, using the contrast between old landscapes and the new activities. The re-use of old structures or buildings for new purposes can also offer advantages and help to retain the character of an area. In Emden, a reconstruction of the old harbour area is planned, whilst the new harbour will be built on newly reclaimed land so that no older structures will be affected.

8. Sources

Author: Wolfgang Scherf

Bärenfänger, R. 1999: Wüstung Kloster Barthe bei Hesel. In: Führer zu archäologischen Denkmälern in Deutschland, Bd. 35. Ostfriesland, Stuttgart 1999, 197-199.

Bärenfänger, R. 1999: Der Plytenberg in Leer. In: Führer zu archäologischen Denkmälern in Deutschland, Bd. 35. Ostfriesland, Stuttgart 1999, 218-220.

Bundesamt für Bauwesen und Raumordnung (BBR) (2005): Raumordnungsbericht 2005. Berichte 21, Bonn 2005.

Jeschke, A. 2004: Raumplanung als vorsorgendes Instrument im Küstenmanagement. Oldenburg 2004.

Kramer, J. 1992: Küstenschutz und Binnenentwässerung zwischen Ems und Weser. In: Kramer, J. und Rohde, H., Historischer Küstenschutz, Deichbau, Inselschutz und Binnenentwässerung an Nord- und Ostsee, Stuttgart 1992, 207-240.

Landkreis Leer 2005: Regionales Raumordnungsprogramm des Landkreises Leer. Entwurf. Leer 2005.

Schwarz, W. und Stutzke, R. 1998: Archäologische Funde aus dem Landkreis Leer. Archäologische Mitteilungen aus Nordwestdeutschland, Beiheft 21, Oldenburg 1998.

Wassermann, E. 1985: Aufstrecksiedlungen in Ostfriesland. Ein Beitrag zur Erforschung der mittelalterlichen Moorkolonisation. Göttinger Geographische Abhandlungen 80. Göttingen 1985.

Overledingen, LS

1. Overview

Name:	Overledingen
Delimitation:	River Ems, rivers Leda and Jümme.
Size:	approx. 265 km ²
Origin of name:	'Land above the Leda', that is the land to the south of the River Leda
Location:	Southern East Frisia in Lower Saxony, Lower Saxony, Germany
Relationship/similarities with other cultural entities:	Similar natural and cultural landscape to the neighbouring cultural entities around the river Ems (Rheiderland, Krummhorn).
Characteristic elements and ensembles:	right-angle roads and drainage systems, linear villages and embankment-hedges, Plantation landscape, Fehn-villages, "Kübbing"-houses

2. Geology and geography

2.1 General

The Ems in the east and the rivers Leda and Jümme in the north mark the boundaries of Overledingen. Sited in Lower Saxony, Overledingen is one of four historic cultural landscapes of the administrative district of Leer, together with the Rheiderland, the Moormerland and the Lengenerland. The name Overledingen can be translated as "Land above the Leda", thus the area south of the river Leda. Nowadays the historic cultural landscape includes the communities of Westoverledingen, Westhauderfehn and Ostrhauderfehn, as well as the Nettelburg area of the town of Leer. In a north-south direction Overledingen stretches over 20 km from Leer to Burlage.

Historically speaking the Nesse-peninsula in the city of Leer also belongs to the region of Overledingen, as the bend of the river Leda was only cut through recently. The river marsh with the somewhat higher embankment bordered the watercourses in the north of the Overledingerland. The low-lying land joined this in the east. Overledingen is delimited by a Geest-ridge with in some areas extensive bog which stretch to the edge of the marshland. In the south lies the "Langholter Tief" area, the "Rote Riede", which drained the geest. Nowadays practically all the bogs have been practically drained and stripped extensively.

2.2 Present landscape

Overledingen is a plantation-landscape with hardly any relief, which has fertile areas in the form of river marshes.

From north to south a Geest-ridge runs through the middle of the communal district of Westoverledingen. Geest designates a type of land which results from Ice Age deposits and which is generally higher than the marshes. In the settlement history of northern Germany the Geest was populated earlier than the marshes, as it offered protection against storm floods. Apart from this, there was a strict division between farmers in Geest- and marsh cultures, which was not least determined by the different degrees of fertility of the area.

In the south of the Overledingerland there are a number of valley pastures, which drain the Geest and its peatlands. Nowadays the peatlands are mainly dry and drained and only survive rudimentarily. The historic settlement structures that has hardly changed up to the present, are based on the community of Westoverledingen along the Federal road (B 70), an old army-road, which links East Frisia with the Emsland and the Münsterland.

3. Landscape and settlement history

The large scale investigation of the North German mud flats, as well as to a smaller degree the Overledingen marsh, has been carried out by the Archaeological Service of the East-Frisian Association (Ostfriesische Landschaft) and the Institut für historische Küstenforschung (Institute for Historic Coastal Research) among others.

3.1 Prehistoric and Medieval Times

The origins of settlement in the Overdingerland have been little studied. From the Neolithic period, about 4.000 BC, the Geest was populated by farmers. The few archaeological finds suggest that the settlement was similar to that in the Moormerland. Here too in the marsh the settlements were built on the high embankments of the rivers, so guaranteeing a certain protection against flooding. A number of these settlements had to be abandoned in the late Middle Ages as increased flooding made them uninhabitable.

The Overledingenland belonged to the Carolingian Emsgau in the Middle Ages. In the 13th century, after being freed from rule by foreign counts, an independent Frisian regional community was established with the help of a number of Saxon communities. The venue for general meetings of the Sechzehner Rat (The Council of the Sixteen) in the Overdingerland was presumably Backemoor, situated in the north of the region. Due to the economic preconditions the Overdingerland was unable to acquire a strong position comparable to that of, for example, the Brookmerland further north, or the Harlinger- or Jeverland. A system of classic feudalism did not establish itself in Friesland.

In the 15th century Hamburg and the chieftains put an end to the area's autonomy, and Overledingerland came under the administrative rule of the ruling family Tom Brok and then to the family Focko Ukena and then the family Cirksena. Afterwards the Overledingerland merged with the county of East Frisia.

3.2 Early Modern Times

Since the 17th century the region of the Overledingerland has been marked by the strong imposition of man-made structures within the largely natural area. In connection with the strong anthropogenic demands, the currently prevailing cultural historic form of landscapes and settlements, especially in the area of peatlands, was developed. There is an impression of a natural area, largely untouched, in the Jümminger Hammrich between the rivers Leda and Jümme. Nowadays the typical image of the cultural landscape is of right-angle roads and drainage systems, linear villages and embankment-hedges, demonstrating how people tried to colonise and cultivate that fairly inhospitable land.

The unified community Rhauderfehn in Overledingen consists of ten centres, all of which had quite different and far reaching histories. The oldest part of the community is probably the village of Backemoor in the North of Rhauderfehn, which possibly was the centre of all economic activities in the Overledingerland during East Frisian autonomy.

In 1769 the community of Westrhauderfehn was founded as a fen-settlement by a number of business people, who subsequently called themselves the Rhauder-Fehn-Compagnie. The basis for the livelihood of the villages was the digging and selling of peat. The settlements were called after the bog (Fehn) Fehn-villages. Characteristic of the Fehn-village of Rhauderfehn are the long canals, used both to drain the marshland and to transport peat. The main canals are the Südwieken, which flow into the Untenende. The peat was mainly transported out in their own ships and taken to the neighbouring towns and other areas short of fuel. On the way back dung, clayey soil, excrement off the roads and other waste materials were brought along, to be used as fertiliser on the stripped areas.

A number of years before, five businessmen from Ostrhauderfehn had lodged a petition with the Prussian king. They asked for the bog-area in the north of the Overledingerland so that they could lay out a new "Fehn". On the 19th of April 1769 they received permission for the project which had already commenced. This marks the beginning of the community of Ostrhauderfehn, whose identity is marked by long canals for peat transport up to the present day.

3.3 Modern Times

In the 20th century various communal changes occurred, which in the end led to today's division of the region. Thus on the 1st of January 1973 ten communities were merged under the Lower Saxon administrative reform into the one community of Rhauderfehn. The community of Westvorledingen emerged from formerly 12 communities under the same reform. In the 1980s Ostrhauderfehn grew continuously. Up to the 31st of December 2004 all the communities belonged to the regional administration of Weser-Ems, which was dissolved on this date, due to an administrative reform.

Religious denomination in the Overledingerland is an important aspect. The majority of the people in Overledingen are Protestant. In the vicinity of the Ems there are a number of reformed communities, otherwise the Lutheran belief prevails. Occasionally you also find Free Churches or Catholics. A rather strong denominational divide runs along the south, towards the Emsland, and along the east, towards the Oldenburgian Münsterland where there are mainly Catholic areas.

4. Modern development and planning

In its environmental planning report for 2005 the Federal Office for Building and Regional Planning considered the Overledingerland to be a region which is marked by increasing population and by employment due to growth. This development leads to great demands on space and subsequent increase in traffic.

4.1 Land use

The Overledingerland has the features of a plantation-landscape, shaped by unfavourable natural and economic conditions of production. In view of the intensive agricultural use of the river marshland it is anticipated that the process of farm expansion will continue to the disadvantage of other farms. The majority of the agricultural marshes are on the banks of the rivers Leda and Jümme, however the less fertile Geest-ridge with its peatland-areas is mainly used for peat digging. At present the number of people employed in agriculture is under 14% and will decline even further in the future. This development is to be seen in the light of intensifying agriculture, which will result in larger farms and the adaptation of areas to conform to these economic constraints.

An essential basis for the preservation of the peatlands in Lower Saxony was created in 1981 and 1986 in the form of the peatland protection programme, the aims of which have been put into practise continuously since that time. The peatland protection programme was broadened with the evaluation by experts of nature protection of the peatlands. The aims of the peatland protection programme are: the protection of the peatlands as nature protection areas, the restoration to their natural state which has been stripped industrially, the protection of all the smallest peatlands and the remains of peatlands by the designation of buffer zones and the protection of the valuable raised bog grassland. Particularly worth mentioning is peatland used in agriculture as a buffer zone, for linking biotops and raised bog grassland as a special living space with a long-term development potential.

4.2 Settlement development

Fehn villages are the traditional rural settlement-forms of the 19th century that you find in the Overledingerland. The linear settlements, in which the peat-cutters settled along the transport- and drainage-routes, are characteristic for the region. Those ordinary labourers and farm girls, who worked as peat-cutters could not profit from the fruits of their labours. On the contrary: an old saying is: "Death to the first, poverty to the second, bread to the third" ("Den Eersten sien Dod, den Tweeten sien Not, den Drütten sien Brod"). Only after numerous generations can you see economic improvement and wealth, resulting in better quality houses being built. Thus the "Kübbing"-houses, a special form of bi-sectional house, so valuable in the cultural history of the area, developed, which contrast with the gulf-houses further north. However, along the Ems, scattered villages dominate, which are able to profit from the agriculture in the river marshes.

Nowadays the administrative district of Leer is characterised by a relatively low population-density of only 90 inhabitants per km². The building of the motorway A31 also simplified and improved the accessibility to the Overledingerland, although the motorway does not run directly in the catchment area. As far as Germany is concerned Overledingen is in a peripheral position although it is by no means an isolated area and commuter traffic to Emden and Leer is limited.

In terms of tourist facilities and attractions the Overledingerland is less attractive than neighbouring regions. The region belongs to the Ems-Hümmling area, which boasts generally fewer visitors than the Friesian coast. The reasons for this are the geographical location, the lack of contact to the North Sea, combined with relatively small communities and consequently the lack of a tourist focus in the region. Overledingen has neither a provincial nor a trans-regional museum. Regional museums exist in Esklum, Ihrhove and Rhauderfehn. In addition two to three monasteries can be visited, among them the monastery of Muhde. There are points of tourist interest in the region to be seen, but they are isolated points.

4.3 Industry and energy

No important industrial sites are located in the Overledingerland; Emden and Leer are more important in this respect; however only vehicle building is of importance here. In addition there are gas-pipelines, which run west-east, from Groningen to Oldenburg, Bremen and Hamburg. The numerous wind farms, which have changed the original face of the flat landscape radically, are amongst recent developments.

4.4 Infrastructure

The traditional traffic of the Overledingerland was by means of water and road. The Ems, as a federal waterway up to the estuary, is still used regularly. Many canals and inlets, which formerly used to be used for shipping peat dug in the peatlands, are nowadays used by motorboats and pleasure cruisers.

Moreover Westoverledingen is on the B70, an old army road, connecting East Frisia with the Emsland and the Münsterland. Otherwise there are no important arterial roads in the Overledingerland. Only the federal road B438 runs from north to south through the region. It is, however, important to mention the motorway connection, which links Overledingen to the transportation-network of Lower Saxony and the rest of Germany, by the completion of the A31 through the Rheiderland. This is clearly visible in the mobility of the inhabitants of Overledingen, who can reach Germany's arterial routes quickly, just as they can to the Dutch A7 to Groningen.

Overledingen's rail-connection to the railway line from Emden to Münster was already built by 1854. This line runs approximately parallel to the B70.

5. Legal and spatial planning aspects

Administratively the Overledingerland is divided into the communities, Westoverledingen, Rhauderfehn and Ostrhauderfehn, the Nettelburg area of the town of Leer, which are all subordinate to the administrative district of Leer.

The largest place is the town of Ihrhove. The community results from the merger of numerous communities under the administrative-reform of Lower Saxon in 1973. Up to the 31st of December 2004 all the communities belonged to the regional administration of Weser-Ems, today they are in the administrative district of Leer.

According to the regional planning programme of Lower Saxony Overledingen is considered as a weakly structured area without centres. The next medium-sized centres are Leer and Emden. From a regional planning point-of-view Overledingen belongs to Regional Structure Conference of East Frisia (Ostfriesische Landschaft), which however has not set up a development plan for the area yet. The Regional Council of East Frisian Area extends over

the entire governmental district (administrative districts of Wismund, Aurich, Emden and Leer). Additionally there are outline plans for the area and plans concerned with the utilisation of land of the communities as well as the development plan for the coastal line of Lower Saxony (ROKK)

6. Vulnerabilities

6.1 Settlement

The historic settlement pattern is important within this area and is vulnerable to the threat from development which alters their original layout. The historic farmsteads are already vulnerable to change of use away from traditional agricultural production. In the area of the Jümminger Hamrich between the Leda and the Jümme the historic cultural landscape has survived largely in its traditional form. The typical appearance of the culture landscape with its right-angled road and drainage systems, the linear villages and embankment-hedges survives, even though these structures are being overlaid by new estates and commercial areas. The loss of the legibility of this historical landscape and use becomes more and more evident and runs contrary to the preservation of this cultural landscape.

6.2 Agriculture

In view of international competition, the pressure to use all land optimally, resulting from globalisation, will mean adjusting the means of agricultural production to economic constraints. In this context the agricultural use of the marsh areas is problematical, as the areas are fragmented by numerous ditches and drains. An additional factor is the reduced deployment of yield increasing measures in accordance with the European RAM acre-guideline. The enlargement of the areas of production leads to many farms being abandoned and to the disappearance of traditional, small farms.

6.3 Nature conservation

Due to the increase of environmental awareness amongst the public the peat industry is driving forward projects to re-moisten, to regenerate, or to use the former turf-extraction areas for agriculture or for forestry. There is the possibility that surviving cultural historic assets will not be taken into consideration when these conservation programmes are being planned.

6.4 Industry and energy

The increase in renewable energy production, such as wind farms, has a significant impact on the historic open landscape. These changes to the landscape have a negative effect on both the natural and cultural-historic landscape of Overledingerland.

7. Potentials

7.1 Settlement

The historic settlement pattern and its associated landscape is important within this area and has potential for being a resource to encourage tourism. Careful integration of the cultural heritage into planning proposals provides the potential both for the preservation and management of the historic settlements. In the area of the Jümminger Hamrich between the Leda and the Jümme the historic cultural landscape has survived largely in its traditional form. The typical appearance with its right-angled road and drainage systems, the linear villages and embankment-hedges survives providing the opportunity to promote and protect the historic settlement pattern and its associated landscape.

7.2 Agriculture

The Overledingerland has so far maintained its settlement and landscape use adjusted to life in the Northern Lower Saxony. The so-called peat digging areas and the intensive agriculture

in the pastures alongside the rivers form the historic land use. The historic culture and tradition of the Overledingerland can be explained and displayed by the surviving historic landscape elements integrated with the museums of the area.

7.3 Tourism

There is an opportunity to diversify the already existing tourism trade and its products by offering walks and excursions. The museums provide the potential source for bringing Overledingen's history to life for the tourist industry and local population.

7.4 Nature conservation

The attempts at recreation of wet lands and moorland provide the opportunity to both integrate and manage the cultural history of the area. There is potential for the cultural heritage to be incorporated within management plans in those areas protected as nature reserves as well as those attempting to be recreated by the peat cutting industry.

7.5 Infrastructure

Within Overledingerland there is good linkage in the regional and trans-regional transport infrastructure as well as in a growing tourist infrastructure. There is the potential to exploit this infrastructure to promote the cultural heritage of the area to the more touristic areas to the north.

8. Sources

Author: Meike Levin

Behre, K.-E. (1995): Die Entstehung und Entwicklung der Natur- und Kulturlandschaft der ostfriesischen Halbinsel. In: K.-E. Behre, K.-E. & van Lengen, H. (Hrsg.): Ostfriesland. Geschichte und Gestalt einer Kulturlandschaft. Aurich 1995 (durchgesehene 3. Aufl. 1998), 5-36.

Behre, K.-E. (1999): Die Veränderungen der niedersächsischen Küstenlinien in den letzten 3000 Jahren und ihre Ursachen. Probleme der Küstenforschung im südlichen Nordseegebiet 26, 1999, 9-33.

Brandt K. (1977): Die Ergebnisse der Grabung in der Marschsiedlung Bentumersiel/Unterems in den Jahren 1971-1973. Probleme der Küstenforschung im südlichen Nordseegebiet 12, 1977, 1-32.

Bundesamt für Bauwesen und Raumordnung (BBR) (2005): Raumordnungsbericht 2005. Berichte 21, Bonn.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsischen Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz – Regierungsvertretung Oldenburg – Landesentwicklung, Raumordnung. Stand 2005.

Schwarz W. (1995): Die Urgeschichte in Ostfriesland. Leer 1995.

Schwarz W. (1995): Archäologische Quellen zur Besiedlung Ostfrieslands im frühen und hohen Mittelalter. In: Behre, K.-E. & van Lengen, H. (Hrsg.): Ostfriesland. Geschichte und Gestalt einer Kulturlandschaft. Aurich 1995 (durchgesehene 3. Aufl. 1998), 75-92.

Rheiderland, LS

1. Overview

Name:	Rheiderland
Delimitation:	River Ems, Dollart Bay, German-Dutch border, neighbouring entities Oldambt in the Netherlands, Krummhörn, Moormerland and Overledingen in Germany
Size:	approx. 650km ²
Origin of name:	Not known
Location:	East Frisia in Lower Saxony, Lower Saxony, Germany
Relationship/similarities with other cultural entities:	Similar natural landscape to the neighbouring cultural entities around the Dollart Bay, however the cultural landscape is similar to the other neighbouring entities in Lower Saxony (Krummhörn, Moormerland).
Characteristic elements and ensembles:	marshland villages, polders and straight drainage-ditches, terps and mound villages, linear villages built on dykes, brick manufacturing, area of polder princes.

2. Geology and geography

2.1 General

The Rheiderland, sited between the Ems, the Dollart and the German-Dutch border, is one of the four historic communities of the administrative district of Leer, together with the Overdingerland, the Moormerland and the Legenerland. Nowadays the German side of the region Rheiderland is composed of the communities Weener, Jemgum and Bunde as well as Bingum, a part of the city of Leer. From north to south the Rheiderland stretches 30 km from Pogum to Halte. At the widest point, between Dollart and Bingum, the region measures 20 km. The Dutch part (Reiderland) is located in the Dutch province of Groningen and is described in the cultural landscape unit of Oldambt.

The northern part of the Rheiderland is marshland, whilst the southern part is characterised by embankments of the River Ems and an accompanying sand ridge. Geologically the landscape is derived from sedimentation layers and the development of peatlands due to the rise of the sea level after the Ice Age. Due to marine incursions, not only the low lying land but also the shore land occasionally proved unsuitable for human settlements.

2.2 Present landscape

Rheiderland is a plantation-landscape, almost without relief, which thanks to alluvial marsh soil is very fertile. At present the landscape is characterised by its marshland villages and straight drainage-ditches. These marsh landscapes and polders, new territory gained by erecting dykes around marshes, are characteristic of the East Frisian landscape. Feature of this landscape are the small number of trees and the far reaching panoramic view to the horizon.

The farmers used to be wealthy, which is still mirrored today in the splendid single farms. In the Christian-Eberhards-Polder for instance there are wonderful single farm complexes surrounded by water with their own names, whose owners used to be called "Polder Princes". On the newer polders are found linear villages along roads and dykes with a dense ditch system.

The northern part of the Rheiderland was regained from the Dollart by means of numerous dykes and is very fertile because of the marsh soil. The Dollart originated in its present shape in the Middle Ages due to a number of storm floods. Today this roughly 100 km² sized bay is connected to the North Sea by the Dollartmouth. During the 18th and 19th centuries there were numerous attempts to gain new territory, which can still be seen in the present landscape. Dykes and marshland alternate. The settlement form is mainly that of linear villages built on dykes. Some marsh farming land is up to 1m below sea level and is used for grazing. In the south of Rheiderland there are peatlands, including the tail end of the Bourtanger Moor, which is located in the Emsland and only partially survives.

The historical structure of land use, with main settlement-concentrations inland along the old trade route Groningen-Bremen has hardly changed.

3. Landscape and settlement history

The large scale investigation of the North German mud flats and the Rheiderland marsh, by the Archaeological Service of the East-Frisian Association (Ostfriesische Landschaft) and the Institute for Historic Coastal Research among others, has added considerably to our understanding of this area.

3.1 Prehistoric and Medieval Times

Archaeological finds demonstrate that roughly 7.000 years ago Mesolithic hunters and gatherers frequented the landscape of the lower Ems consisting of peatlands, marshes, rivers and sand islands. In the Neolithic period settlements of the Funnel Beaker Culture developed in the area. It was only at the end of the Bronze Age that the marshes along the Ems were colonised. Important excavations have been undertaken in the Iron Age settlements of Jemgum and Hatzum. Farms were built in the Roman period, and trading centres developed on the elevated embankments of the Ems on tidal channels. The danger of storm floods led to the creation of the first dwelling mounds.

The Rheiderland was settled very early and continuously by Frisians. The settlements in the south, were located on the sandy soil, and in accordance with the prevailing conditions, spread out along the banks of the Ems and into the marsh. Settlement layers in both terpen and graveyards close to Oldendorp (7-9th century) are proof of later early medieval settlements. On the terpen village-like settlement groups developed. In the later Middle Ages the building of dykes led to a further heightening of the terpen with the additional material. With the additional security afforded by the dykes, inland colonisation took place with the expansion of settlements into low lying lands. In addition, the bogland in the southern Rheiderland was made usable, for example in Weenermoor and Wymeer, where narrow long strips of farmland, in accordance with the Upstreek-law were extended into the bogs, reaching lengths of more than a kilometre. The trade- and craft-settlements of Jemgum and Hatzum developed as villages with narrow streets on long terpen.

Well-fortified tower houses made of brick testify to the expulsion of foreign rulers from Friesland in the 13th century. As a result the Rheiderland, like the other Frisian areas, formed an independent self-governing territory with a council constitution. Feudal rule was unknown in these provincial communities. The principal places at the time were probably Weener and Hatzum.

In the Middle Ages the Rheiderland was oriented towards the west and Groningen's Ommelande. Only since the breakthrough of the Dollart (in 1362) which led to areas of the Rheiderland being flooded and forming a natural border to the Ommelande, did the land communities turn more strongly to the Frisian areas to the east of the Ems.

The origin of the Dollart goes back to several storm floods and inroads made by the sea which caused constant land loss on the Dollart. The eastern Dollart bay in the Netherlands was formed in the first half of the 15th century. By 1454 an emergency dyke was constructed to protect the Oldambt, leading from the stable banks of the Ems straight through the peatland area up to high Geest near Finsterwolde. The western bay may have only

originated in the 1460s. In 1509 the Cosmos and Damian Flood penetrated far inland, covering many areas of the Rheiderland with marine clay. The sea bay, which had advanced as far as the gates of Ditzum, flooded four towns, 46 villages and killed several hundred thousand people. However, the exact year of its origin is not certain.

3.2 Early Modern Times

From the end of the 16th century, the systematic recovery of land began with the construction of polders, which led to today's coast line. Between the 17th and the 20th centuries numerous other polders were constructed so that now the Dollart has shrunk to one-third of its original size. The following polders deserve mention: the Bunderpolder of 1707, the Bunder-Interessenten-Polder, the Landschaftspolder and Preusspolder of 1744 and 1752 and the Heinitzpolder of 1755. The most recent is the Kanalpolder surrounded by dykes in 1877 on the eastern side. The dykes and drainage-systems of this time still exist in today's landscape, although they are now far inland.

The economic significance of the polders is still clearly visible in the large gulf-houses. The whole of the Rheiderland was primarily devoted to agriculture and the land reclamation work became especially intensive in the middle of 18th century, due to the grain prices being high. Ditzum was important as a port. However reduced yields and competition from producers from abroad reduced profits, causing in our days the closure of numerous farms. For the people of the area nothing remained but to emigrate. Inland, some large villages (Weener, Bunde, Stapelmoor) with churches dating to the 13th century developed out of linear farm settlements.

From 1413 the Rheiderland came under the administrative rule of the ruling family Tom Brok and then to the family Focko Ukena and then the family Cirksena. The land communities only gained their autonomy once again for a short time. The Rheiderland became a part of the country of East Friesland and has shared its fortunes ever since.

In 1735 the German part of the Rheiderland was a part of the department of Emden and Leer, divided into the Bunder, the Weeniger, the Bingumer, the Jemgumer and the Dietzumer Protectorates. Then in 1859 only the departments of Weener and Leer, which became independent administrative districts in 1932 existed. The administrative district of Weener was dissolved by an order of the Prussian state ministry and was united with the administrative district of Leer.

3.3 Modern Times

The appearance of the Rheiderland underwent major changes in the 19th and 20th centuries when the Ems clay was excavated for the brickyards situated outside the dykes. Brick production influenced the further economic development of the region considerably. In order to extract clay numerous tracts of land were lowered by 1m. Bricks are still formed and fired, as they were in the past, from this clayey soil. Many of the typical brick buildings of East Friesland are built from Rheiderland bricks. Nevertheless, this could not prevent many brick manufacturers closing for economic reasons and being left to decay.

Agriculture is another important area of employment. The very fertile soil is still present. However, the area used for agriculture has dropped by nearly 2% during the last four years. Agricultural production is generally decreasing.

The construction of the motorway A31 caused far reaching changes in the cultural landscape. A west-east connection already existed during the time of the Hanse (around 1500) as a trade route between Groningen and Bremen. This trade route appears around 1863 for the first time as an Oldenburg state road on maps.

However, the Rheiderland was not only cut in two by the extension of the motorway, but this also led to changes in infrastructure. The expansion of the residential areas and industrial areas in many places has contributed to the loss of the formerly typical settlement pattern. Traditional settlement forms such as the North German linear settlements or closed marshland villages along the Ems are to be found less and less in the region.

4. Modern development and planning

In its regional planning report for 2005 the Federal Office for Building and Regional Planning lists the Rheiderland as a region which is marked by economic growth. This development has led and will lead to an increased use of space for settlements, which is accompanied by traffic growth.

4.1 Land use

The Rheiderland has the appearance of a plantation-landscape, shaped by unfavourable natural and economic conditions. In view of the intensive agricultural use of the marshy soils it can be assumed that farms sizes will increase to the disadvantage of other farms. Marshland used for arable farming is mainly on the Dollart; in the north of the Rheiderland meadowland marshes prevail and in the south there are valley meadows and moor geest. At present, the proportion of people employed in agriculture is under 34 % and will decrease even further during the course of future rural developments. This development is to be seen in connection with the intensification of agriculture which will, in view of the world-wide competition, lead to the enlargement of farms and to the adaptation of land use to economic constraints.

Aspects of the Rheiderland concerned with nature protection are apparent in the form of designated nature reserves. The Dutch part of the Dollart has been under nature protection since 1977 and has been a Ramsar-area since 1990. In 1980 the German part of the Dollart, which covers about 30% of the Dollart, was declared a protected area, provided it belongs to regional district Leer/ East Frisia. In the Rheiderland, the protected area of Saint Georgiwold and the nature reserve of Wymeer with its idyllic peatland can be found.

4.2 Settlement development

The traditional, rural settlement forms of the 19th century in the western Rheiderland are linear settlements in the form of marsh or peatland villages as well as villages along roads. However, further to the east along the Ems, this typical settlement form is replaced by scattered villages. The characteristic form of the villages on dwelling mound only appears in the north of the Rheiderland. In the entire Rheiderland you find Frisian gulf-houses, so important from the point of view of cultural history.

Today the administrative district of Leer is marked by relatively low population-density, it is about 90 inhabitants per km². The construction of the motorway A 31 simplified and improved the accessibility of the Rheiderland and therefore the mobility of the people living in the Rheiderland. Nevertheless it is still beyond the catchment area of Emden. The commuter flow to Leer is limited and negligible.

The Rheiderland as a place to live, contrasts with the North Frisian coast as a tourist area, the quality of which is based on the traditional, agricultural use of the land and on the mud flats. Although the visitor figures do fall from the north to the south considerably, the peak values still amount to approximately three million overnight stays per year.

The Rheiderland does not have either a state museum or a trans-regional one. There are two local museums in Bunde and Weener. In addition there is a monastery dating from the Middle-Ages in Jemgum and the monastery of Dünebroek. The region is also known for its large number of important churches, e.g. the Church of the Holy Cross in Bunde, the "polder church" in the Landschaftspolder or the oldest church in Midlum (around 1200) and the oldest bell tower (13th century). The church-organs, which are especially striking, were bought centuries ago by the communities and have been preserved to this day. The most significant one is the Arp Schnitger organ in St George's church in Weener.

The Rheiderland, as a historic area with its own cultural history, is home for many Frisians in whose consciousness the Rheiderland is strongly rooted. This is made clear by local associations, by Rheiderland having its own coat of arms (referring to Frisian autonomy), its own newspaper (Rheiderland – the independent newspaper) and by the companies whose area of influence takes in the whole of the Rheiderland (Ems Dollart Post).

4.3 Industry and energy

There are no significant industrial sites in the Rheiderland. Although Emden and Leer are important sites for industry, only the construction of vehicles is of significance here. In addition there are gas-pipelines which run from north to south along the motorway and east to west from Groningen to Oldenburg, Bremen and Hamburg. Further underground gas-reservoirs are planned in Jemgum and Holtgaste. The numerous wind farms are among the latest developments which have thoroughly changed the original appearance of the flat land thoroughly.

4.4 Infrastructure

Traditionally the Rheiderland was accessed in terms of traffic by water and roads (long-distance roads; motorway). Diverse harbours facilitate the crossing of the Ems. Furthermore the line Emden-Dietzum-Delfzijl operates in summer. Other former sluice-harbours, which were used to ship bricks from the brickworks, are now used by sports boats and leisure cruisers.

The motorway connecting the Rheiderland to Lower Saxony and the remainder of the German traffic-network was opened in the 1990s. The settlement picture of the region was changed considerably by the completion of the motorway A31. With a use of about 10.-20.000 vehicles per 24 hours, four motorway-accesses and a well designed country road-system the whole area is well developed. This is reflected in the mobility of the people of Rheiderland who can reach the arterial routes of Germany in a short time. Moreover the connection to the Dutch A7 to Groningen also plays a part in local access.

The railway connection of Rheiderland from the Netherlands to Overledingen was built by 1876. The north to south connection from Emden via Leer and Papenburg to the Ruhr area, built in 1854, also played a big role.

5. Legal and spatial planning aspects

Administratively Rheiderland is divided into the communities of Weener, Bunde and Jemgum as well as of Bingsum, a part of the town of Leer which are all subordinate to the administrative district of Leer. The largest place is the town of Weener. From 1885 to 1932 the administrative district of Weener existed, which included the entire Rheiderland. In their present form the communities of Bunde and Jemgum originate from the fusion of communities and villages in 2001.

According to the regional planning programme of Lower Saxony the Rheiderland is classified as a weakly structured area without centres. The next middle-sized centres are Leer and Emden. From a regional planning point-of-view the Rheiderland is part of the Regional Structure Conference of East Frisia, which has not yet submitted a development concept. The Regional Council of the east Frisian Area (Landschaftsverband Ostfriesische Landschaft) extends over the entire governmental district (administrative districts of Wismund, Aurich, Emden and Leer). In addition there are the outline plans for the area and plans concerned with the utilisation of land of the communities as well as the development plans concerning the coast line of Lower Saxony.

6. Vulnerabilities

6.1 Spatial planning

The opening of the motorway in the 1990's has created easy access to Rheiderland and will potentially lead to development pressure. Any strategic planning for future development will need to have both the natural and cultural heritage integrated into any decision making.

6.2 Settlement

The historic settlement pattern is important within this area and is vulnerable to the threat from development within the core and expansion around the perimeter especially if tourism continues to expand. The historic farmsteads are already vulnerable to change of use away from traditional agricultural production.

6.3 Agriculture

In view of international competition, the pressure to use all land optimally, resulting from globalisation, will mean adjusting the means of agricultural production to economic constraints. In this context the agricultural use of the marsh areas is problematical, as the areas are fragmented by numerous ditches and drains, consequently modern machines cannot be used. An additional factor is the reduced deployment of yield increasing measures in accordance with the European RAM acre-guideline. The enlargement of the production areas leads to many farms being abandoned and to the disappearance of traditional, small farms.

6.4 Tourism

The growing dependence of the Rheiderland on tourism can lead to an erosion of the cultural heritage of the area. For many people in the area tourist activities are an alternative to the non profit making agriculture they have abandoned. This has resulted in historic farm complexes and agricultural practices being lost to the needs of modern mass-tourism. It is essential to identify ways in which both the tourism can be promoted but still retaining the cultural history both in the landscape and structures. The lack of a state or trans-regional museum within Rheiderland could restrict the promotion of the areas cultural heritage.

6.5 Industry and energy

The increase in renewable energy production, such as wind farms, has a significant impact on the historic open landscape. In addition, it has a negative influence on the varied bird-life of the mud flats, causing many birds to be killed by the rotor blade movements. These changes to the landscape have a negative effect on both the natural and cultural-historic landscape of Rheiderland.

7. Potentials

7.1 Settlement

The historic settlement pattern and its associated landscape is important within this area and has potential for being a resource to encourage tourism. Careful integration of the cultural heritage into planning proposals provides the potential both for the preservation and management of the historic settlements. The marshland villages of the 12th century show a visible history and tradition of the Rheiderland; and are a strong link for the Frisians with their home country. The historic farmsteads have the potential to promote local agricultural production as well as to be carefully used as tourist accommodation.

7.2 Agriculture

Agriculture has been the main historic economy for this area and remains so. The area has not suffered as badly as other areas through intensification and many of the historic monuments associated with agriculture survive within the landscape. These have great potential to be promoted, protected and managed via tourism and protection via agricultural schemes. These features tell an important story for the development of this area and their value should be identified both to the local population and the incoming tourists.

7.3 Tourism

Beside the strong identification of the Rheiderland people with their native land, the cultural history of the landscape can be promoted as a tourist attraction. Thus the numerous dykes show the many century-old history of dyke-building. Now that the dykes are inland it is

possible to illustrate this type of land reclamation by means of walks and excursions on the dykes. In this fashion the tourism trade which already exists could diversify, focusing on the cultural landscape of the Rheiderland. The museums can be a further source which can promote the history of the Rheiderland.

7.4 Nature conservation

There is potential for the cultural heritage to be incorporated within management plans in those areas protected as nature reserves.

7.5 Industry and energy

The historic brick making industry within Rheiderland can become a centre for the production of traditional building material and a possible tourist attraction.

7.6 Infrastructure

Within Rheiderland there is excellent linkage in the regional and trans-regional transport infrastructure as well as in an existing tourist infrastructure, which has been operating for many years. There is the potential to exploit this infrastructure to promote the cultural heritage of the area.

8. Sources

Author: Meike Levin

Behre, K.-E. (1995): Die Entstehung und Entwicklung der Natur- und Kulturlandschaft der ostfriesischen Halbinsel. In: K.-E. Behre, K.-E. & van Lengen, H. (Hrsg.): Ostfriesland. Geschichte und Gestalt einer Kulturlandschaft. Aurich 1995 (durchgesehene 3. Aufl. 1998), 5-36.

Behre, K.-E. (1999): Die Veränderungen der niedersächsischen Küstenlinien in den letzten 3000 Jahren und ihre Ursachen. Probleme der Küstenforschung im südlichen Nordseegebiet 26, 1999, 9-33.

Brandt K. (1977): Die Ergebnisse der Grabung in der Marschsiedlung Bentumersiel/Unterems in den Jahren 1971-1973. Probleme der Küstenforschung im südlichen Nordseegebiet 12, 1977, 1-32.

Bundesamt für Bauwesen und Raumordnung (BBR) (2005): Raumordnungsbericht 2005. Berichte 21, Bonn.

Raumordnungskonzept für das niedersächsische Küstenmeer. Herausgegeben vom Niedersächsischen Ministerium für den ländlichen Raum, Ernährung, Landwirtschaft und Verbraucherschutz – Regierungsvertretung Oldenburg – Landesentwicklung, Raumordnung. Stand 2005.

Schwarz W. (1995): Die Urgeschichte in Ostfriesland. Leer 1995.

Schwarz W. (1995): Archäologische Quellen zur Besiedlung Ostfrieslands im frühen und hohen Mittelalter. In: Behre, K.-E. & van Lengen, H. (Hrsg.): Ostfriesland. Geschichte und Gestalt einer Kulturlandschaft. Aurich 1995 (durchgesehene 3. Aufl. 1998), 75-92.

Oldambt, NL

1. Overview

Name of entity:	Oldambt
Delimitation:	The Oldambt region makes up the eastern part of the province of Groningen. The area is bounded by the state border to the east. To the south the area extends to the sandy ridges of Bellingwolde and Meeden. In the west the area gives way to the peat moors of Hoogezand-Sappemeer and the sandy ridges of Slochteren and Siddeburen. The north-western part of the region, by Termunten and Woldendorp, forms the transition to the dwelling mound area of Fivelingo
Size:	30,000 ha
Location:	Province of Groningen, the Netherlands
Origin of name:	-
Relationship with other cultural entities:	The Oldambt was formed by the reclaiming land from the sea, similar to the Middelzee and the Lauwers region
Characteristic elements and ensembles:	Extensive polderland, dikes and remains of dikes, elongated villages, satellite villages, fortresses at Oudeschans, Booneschans and Nieuweschans, typical Oldambt farms with fine farm gardens.

2. Geology and geography

2.1 General

During the Saaliën glaciation, a lateral moraine developed in the area of Winschoten. Since the ice age, when the sub-stratum of the area was formed, the major changes have been during the current geological period, the Holocene. Peat formed in low-lying areas with no drainage, such as in bowl-shaped depressions in the boulder clay area. Oldambt was almost entirely covered in peat. A few traces can still be seen on the surface, the remainder has been eroded by the sea or covered with marine deposits. A system of moorland rivers, such as the Tjamme and Termunter Aa, regulated the drainage of the peat moor. The river Ems formed the northern border of the peat moor area. The formation of peat continued largely undisturbed for a long time, protected by the banks of the Ems. The peat was dug from these high banks, and the even higher sandy soil areas of Westerwolde. This caused subsidence, and in the 14th and 15th centuries led to incursions by the sea. This caused the formation of two large bays, or gulfs: the western and eastern Dollard bays (the old Oldambt and the Reiderland), separated by the Winschoten peninsula. The Dollard reached its greatest size in the 15th and early 16th centuries.

2.2 Present landscape

The current landscape consists generally of large open spaces. Much of the area is arable land, with slightly more pasture in the older polders. In these large green spaces the villages rise up like enclosed green islands. The dikes can be seen from a distance and provide useful landmarks.

3. Landscapes and settlement history

3.1 Prehistoric and Medieval Times

There are three phases in the settlement history of the Oldambt: prehistory, which ended in a period of very sparse settlement between around 1000 BC and 1000 AD, as a result of peat formation; medieval settlement up to the Dollard incursions and the phase of reclamation of the Dollard polders. Not much is known about prehistoric settlement of the Oldambt area. In the Merovingian/Carolinian period the population of the current Oldambt increased again and there were settlements both on the terps (dwelling mounds) along the Ems and on the sand and clay ridges that rose above the peat moor.

3.2 Early Modern Times

When the sea breached the bank of the Ems a bay was formed which was divided into eastern and western sections by the boulder clay and sand ridge of Winschoten. However, it is unlikely that a single storm tide was responsible for the creation of the (Great) Dollard, more probably the sea bay would have gradually expanded. Land was still being lost at quite a rate in the 15th century, particularly in the Reiderland. Work to reclaim it began at the end of the 16th century.

The Dollard was at its largest at the beginning of the 16th century. A number of settlements, both on the terps along the Ems and on the peat moor, were abandoned and perished in the waves. Some of the villages moved to higher-lying sandy ridges, forming series such as Scheemda-Midwolda-Oostwold-Finsterwolde and Meeden-Westerlee-Heiligerlee-Winschoten-Beerta.

The remains of the inundated villages still lie under the Dollard clay, at Houwingeham near Nieuweschans and Olkerke near Scheemda.

From the end of the 16th century the high silted-up salt-marshes were successfully enclosed with dikes, after earlier attempts (including one in 1454) had failed. Monasteries that had possessions in the area played an active role in the creation of the earliest polders. Among the most influential were the Norbertine monastery at Heiligerlee, established in 1230, and the Cistercian monastery in the lost village of Mentenwolde (on the site of the present-day Nieuwolda), established in 1247. This monastery was transferred in 1299 to Termunten (Grijze Monikkenklooster) because of flooding. Both these monasteries survived until the Reformation. There were also monasteries in Oosterreide, between Oostwold and Finsterwolde (the Goldhoorn monastery), and at Ganzedijk (the Palmar or Porta Major monastery), which were all lost to floods.

The Scheemderzwaag polder was enclosed in 1597. After that, reclamation work continued in the western Dollard bay with Midwolda and Scheemda (1626), the first Midwolderpolder (1675), the second Midwolderpolder (1701), Oostwolderpolder (1769), Finsterwolderpolder (1819), the Reiderwolder polders (1862 and 1874), the Johannes Kerkhovenpolder (1878) and finally the Carel Coenraadpolder in 1925. Less is known about the reclamation work on the eastern side of the Dollard. The earliest polders – such as the area to the south and east of Winschoten and Beerta - date from before 1550. In 1626 the land of Nieuweschans was reclaimed and in 1657 a dyke to Nieuweschans was built. By building the dyke, the fortification of Oudeschans lost its function. The Kroonpolder was created in 1696, the Stadspolder in 1740.

Satellite villages such as Nieuw Scheemda, Nieuwolda and Nieuw Beerta grew up around the original villages. The continuing reclamation work caused problems for the drainage of the old Dollard polders. The Termunterzijldiep (1601), which discharged at Termunterzijl, where there had been a discharging sluice back in the 13th century in the old river Munte, and the Westerwoldsche Aa formed important drainage channels. The discharging sluice in the Westerwoldsche Aa moved further and further north: in 1545 it was at Oudeschans, in

1628 at Nieuweschans, around 1700 at Oud Statenzijl and finally at Nieuwe Statenzijl when the new sluice was built in 1877.

The first blow in the Eighty Years' War was struck in 1568 at Heiligerlee, a small village near Winschoten. Count Adolf of Nassau lost his life there. In 1873 a monument was raised to him and his brother, William of Orange. Another brother, William Ludwig, had fortifications built in the border area.

In 1593 Count William Ludwig of Nassau established the stronghold of Oudeschans at a strategic point between the elongated marshes of the Boertanger moor and the Dollard, just to the south of the Booneschans fortress, which was built in 1589. Due to the continual reclamation work in the Dollard area, a new stronghold had to be built some 30 years later (in 1628): the Langakker or Nieuweschans. At the end of the 18th century, the fortress of Oudeschans fell into disrepair, and was abandoned in 1814. Nieuweschans lost its defensive role in 1882. The fortifications were in part removed; since then the village is better known as a spa. The fortifications in Oudeschans have now been partly restored.

3.3 Modern Times

The Johannes Kerkhovenpolder was created by a private company in 1878, and covers an area of around 400 hectares. It is a curiosity among the complex of Dollard polders because it was not high, silted up salt marsh that was reclaimed, but slightly lower-lying, wet mud flats. It presents a pleasing landscape, with a number of central farm buildings, rational land division, marker trees and polder dikes. The inner dike has been cut through for the access road.

Arable farming has always been more important than livestock farming in the Oldambt. There was more pasture in the older polders than in the newer ones. The cultivation of grain was important. The fertility of the naturally poor soils was improved by applying manure, digging up clay from the subsoil, applying mud and sediment from the Dollard and digging out the old dikes. By around 1900 the Oldambt had developed into one of the most advanced arable farming areas in Europe. This created a gulf between the rich farmers and poor farm labourers, who saw more and more jobs being lost to mechanisation. As a consequence East Groningen became a hotbed of communism.

The specialisation in arable farming also affected traditional farm design: arable and dairy having different requirements. The Oldambt-style farm is thus different from the other traditional farms in Groningen. In the 19th century a number of farms were built with a house across the front, culminating in the development of detached, villa-style dwelling houses. The status of the farm and its inhabitants were manifest in the large number of windows, an impressive doorstep and a landscaped garden. Sometimes an entirely new entrance hall was built in the latest style. Beautiful gardens, worthy of country estates, were created to show off the wealth of the owners. The gardens in the period 1850 – 1930 are in English style with pools, hills and winding paths. The name for this style of garden is 'Groningse slingertuun'.

4. Modern development and planning

4.1 Land use

The scaling-up of agriculture and European agriculture policy placed their stamp in the area in the 20th century. Land consolidation brought huge changes to the landscape. Part of the Oldambt, (the old "grain republic") became a "Blue Town", a new urban living environment, created around a newly-created lake.

The most profound effect on the landscape was due to the re-parcelling of land in the 1960's and 1970's. However, it was in keeping with the spirit of the age: after the Second World War Dutch agriculture focussed on increasing food production, and for a long time European policy, under the influence of Sicco Mansholt, was also concerned with optimising and increasing production.

Before that the most common form of land division consisted of long, narrow plots radiating out from the residential axis. In the Dollard polders a south to north transition from narrow strips to modern rational land division are evident. However, many of these characteristic features have largely disappeared as a result of land consolidation. In many places the plot layout is now completely different. Arable land has been transformed to intensive stock-farming, the farmers coming from other places in the Netherlands.

4.2 Settlement development

The Oldambt villages have generally managed to retain their historic character. Winschoten expanded considerably in the 20th century, particularly after the Second World War, its urban area now takes in the village of Heiligerlee and other districts.

4.3 Industry and energy

The Oldambt is entirely given over to agriculture, and apart from a few individual wind turbines there is no industry. In the area there are a few gas power stations.

4.4 Infrastructure

The Winschoterdiep was an important waterway for transporting goods around the area. In the 1980s the A7 motorway was extended from Groningen to Germany, cutting through the Oldambt.

5. Legal and spatial planning aspects

The Legal and Spatial Planning Aspects are first described in a general way, so they are relevant for all the entities in the province of Groningen. Because of the scale of the entities (covering more than one municipality), the focus is on regional policy and management. Regional policy and planning goals are also taken into account in local and sectoral policy. The regional goals and strategies are formulated following discussions with a wide variety of stakeholders and organisations.

The regional spatial plan for the province of Groningen, the Provinciaal Omgevingsplan II, is an important document in terms of integrated management of landscape and heritage. It details the objectives for regional and local policy, and issues relating to landscape and heritage. Part of the Groningen regional plan, Karakteristiek Groningen, covers the main goals for integrated landscape and heritage policy. The historic landscapes must be taken as the starting point for new developments and the diversity of landscapes must remain recognisable.

These main goals are subsequently incorporated into other plans, dealing with specific parts of the province. Regioperspectieven (long term perspectives for a region) are drawn up for the sub-regions. These perspectives culminate in gebiedsuitwerkingen (development plans for specific sub-regions).

For example, the Landschapsontwikkelingsplan Noord Groningen (Landscape Development Plan for N. Groningen) deals with protection of the landscape and heritage and the integration of new developments. These plans are drawn up in consultation with the main sectors and various local and regional organisations (public bodies and NGOs).

In Oldambt the province participates in a gebiedsuitwerking, dealing with protection of the landscape and heritage and incorporating new developments like the Blauwe Stad. These plans are drawn up in consultation with the main sectors and various local and regional organisations (public bodies and NGOs).

6. Vulnerabilities

6.1 Settlement

Many historic settlements are under pressure from new development which makes their historic layout vulnerable. In general the landscape is not seen as attractive by visitors, except for some historic settlements like Termunterzijl, Oudeschans and Nieuweschans. The large, monumental farmyards and houses with front gardens in English landscape style are typical of this sub region, but, are difficult and expensive to maintain.

6.2 Tourism

The area is relatively unknown due to its isolated position and cultural heritage is underexploited.

6.3 Nature conservation

The coastline with the sea dike and the areas around Polder Breebaart and Punt van Reide are better known for nature and wildlife. The cultural heritage of this area can be viewed as less important and therefore is vulnerable to negative impacts resulting from nature conservation such as the creation of biotopes.

6.4 Industry and energy

The lack of new economic activity makes it difficult to find new users for the monumental farmhouses leaving them vulnerable to neglect.

7. Potentials

7.1 Spatial planning

Careful integration of cultural heritage within the various conservation, management and development plans for the area provides the potential for both the protection and promotion of cultural heritage.

7.2 Settlement

The historic settlement pattern both in the form of surviving historic villages and the important 19th century farmhouses (and their gardens) provide an important resource for tourism and contribute to the local populations sense of place.

7.3 Agriculture

Because of a lack of economic development the landscape has been well conserved and gives a fine example of 19th century agricultural prosperity.

7.4 Tourism

The fortresses are potential focal points for interpretation and the promotion of tourism. This could also be tied in with the surviving historic settlement pattern and the exploitation of the historic waterways for leisure activities.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden

Provincie Groningen, 2000, Provinciaal Omgevingsplan, Koersen op Karakter, Groningen

Fivelingo, NL

1. Overview

Name of entity:	Fivelingo
Delimitation:	The area to the north east of the city of Groningen, from the Punt van Reide to the vicinity of the former mouth of the Hunze
Size:	±65.000 hectares
Location:	Province of Groningen
Origin of name:	Fivelingo refers to the river Fivel which shaped the area
Relationship/similarities with other cultural entities:	Fivelingo is somewhat similar to the reclaimed land in the Middelzee
Characteristic elements and ensembles:	Open area, predominantly grassland with small dwelling mounds (terps) and ribbon settlements. Extensive dikes and waterways both natural and man made.

2. Geology and geography

2.1 General

During the penultimate (Saale) ice age, the ice cap reached the Netherlands. Geologists have distinguished five different phases under the ice cap cover. During the first four phases the area which is now Fivelingo was under the ice and a stratum of boulder clay was deposited. In the final phase, after a period of thaw, the ice front advanced to Winschoten, Onstwedde and the Hasseberg. The boulder clay stratum was forced upwards, along with older deposits. At the end of the ice age, when the icecap had already melted, the boulder clay landscape was eroded to form broad valleys, which later became the Fivelboezem and Hunzeboezem (Fivel and Hunze bays).

In the Holocene period, around 600 BC, the sea extended its influence and formed large sea bays on either side of the rolling hills to the north of the town of Groningen: the Hunzeboezem to the west and the Fivelboezem to the east. Vast tidal flats developed with salt marshes, mud flats, and gullies. People began to settle the highest areas on the salt marsh embankments, and over time had to raise the height of the settlements to protect them against floods. The Fivelboezem gradually silted up and the salt marshes expanded on the seaward side. Heavy clay was deposited in the interspersed salt marsh basins, in contrast with the light sediment of sand and loam on the higher embankments. The settlement and oxidation of the peat strata continually increased the difference in height between the former salt marshes and the hills behind them.

2.2 Present landscape

The moraines still remain as high points in the landscape as a remnant of the Pleistocene era. The higher sand embankments are recognisable by the settlements built on them, like the villages of Harkstede-Slochteren-Siddeburen. The salt marsh area itself is in continuous use as pasture and arable land. Over the last 20 years, during the re-allotment of land, many trees have been planted in the Groningen landscape, where it had previously been open landscape.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Stone axes found near Slochteren and Siddeburen date from the Neolithic era. In the 1980's an excavation on the dwelling mound of Heveskesklooster revealed a megalith burial chamber. The extensive formation of peat bogs after the Neolithic period would have made it very difficult in much of the area to find suitable sites for settlement. However, once the Fivelboezem silted up, people were able to settle on the higher areas. A series of terp villages rose up on the salt marsh embankments on either side of the Fivelboezem, just as they had on the southern bank of the Ems. This embankment housed a long line of settlements, which were raised to counter the risk of flooding. These terps can still be found in the German part of the Reiderland and in the district between Termunten and Delfzijl, but they have disappeared from the Dollard area. Remains of some (uninhabited) terps can still be found at the Punt van Reide.

Presumably the salt marshes were originally used for summer grazing or small-scale arable farming. The first permanent inhabitants settled on the top of the salt marsh embankments. Later, as the storm tides grew more frequent and dangerous, people started to build dwelling mounds – the terps (or wierden). Individual dwelling mounds quickly grew into communal village mounds. Eenum, Eenumhoogte and Farmsum are among the oldest settlements in the region.

In the period around the beginning of the Christian era, there was a growing and thriving community on the terp settlements, who developed a barter system with the Romans. The terp dwellers were by now almost entirely dependent on cattle farming: only small areas were suitable for arable farming, as the crops could not withstand sea-water inundation. Small arable fields (valgen) were laid out on the flanks of the terps. From the 4th to the 7th century AD, the formation of new salt marsh embankments along the coast reduced drainage, and gradually cut off the Fivel. Some terps were abandoned during this period.

The terp farms were built with the living quarters in the centre and the farm lower down, providing easy access to the surrounding pastures. Often an "ox road" (ossenweg) was created at the foot of the village terp to connect with neighbouring farms. Numerous terps have been found to have this kind of road. For a terp village it was important to have a navigable route to the nearest watercourse. Consequently almost all terp villages had a reedy lake (maar or riet). These waterways had a meandering course, as they often used an existing stream to create the lake. Sometimes it is possible to tell from the shape of the terp that it is an ancient trading settlement. The farming terps are usually round, while the trading villages were elongated. Stedum is an example of a trading terp of this kind. The river Fivel provided a communication route. Nearby Loppersum also developed from the early Middle Ages into an elongated trading settlement.

3.2 Early Modern Times

In the 12th and 13th centuries a number of monasteries were founded in the province. The monks worked with the local people to build dikes and bring new land into cultivation. Of the many monasteries in the region, Bloemhof was probably the most influential.

For centuries influential houses played an important role in rural areas, in the province of Groningen as elsewhere. The ruling families operated from strongholds, originally fortified manor houses, known as borgen. There is evidence in the remaining structures of centuries of renovation and alteration. Many, but not all, were demolished in the 19th century: the 17th century Rensumaborg is still standing in Uithuizermeeden, as is the (pre-1400) Menkemaborg in Uithuizen and the Fraylemaborg near Slochteren.

When the Fivelboezem began to silt up in the Early Middle Ages, particularly on the western side, a new series of villages were established, from Stedum in the south to Oldorp in the north. From the 12th century onwards dikes were gradually built around the rest of the bay. In 1444 a final dike was built from Godlinze to the coastal embankments at Uithuizermeeden and Roodeschool, after which the sea could no longer exert its influence on the Fivelboezem.

Further land reclamation took place in stages from 1718 (Oostpolder and Polder Vierburen) to 1944 (Emmapolder). In addition to sea dikes the Fivelingo also has two dikes to protect the lower-lying areas from the tides, the Wolddijk and the Graauwe Dijk (Grey Dike) of the Duurswold.

The creation of the dikes also marked the beginning of large-scale water management: an artificial runoff was built from the Winneweer to the river Delf (now the Damsterdiep) near present-day Delfzijl. The dike settlement of Garrelsw eer was established on the Delf dike. After obtaining market, mint and toll rights in 1057, Garrelsw eer developed into a trading centre. Dams with discharging sluices (zijlen) were built at Westeremden and Appingedam. These sluices, for discharging superfluous water from the bays, were an important element in water management. The construction of a discharging sluice often triggered the establishment of a new settlement, such as Zijldijk. When a new sluice was built an organisation, the zijkvest, was set up to maintain it.

3.3 Modern Times

Dikes were being built around parts of the high-lying, silted-up salt marshes right into the 20th century, to transform them into agricultural land. In the 19th century agriculture was accompanied by rapid industrialisation. Brickworks were established on the Damsterdiep, in Garrelsw eer, Wirdum, Appingedam and Delfzijl. Permanent brickworks and tile kilns were set up in places where the raw material (sticky clay) or fuel (peat) were readily available, and where there were suitable transport facilities. The Damsterdiep was practically ideal. The works produced the characteristic red Groningen bricks.

Between 1840 and 1940 the large-scale levelling of old terps and settlements had an enormous influence on the entire Groningen salt-marsh area. The fertile soil excavated from the terps was brought by boat to fertilise the poor sandy soils in the Groningen and Drenthe peatlands (veenkoloniën).

4. Modern development and planning

4.1 Land use

The dikes created a lot of new land which then had to be prepared for agricultural use. Many old and once natural watercourses were incorporated into the rigid pattern of land divisions, producing the characteristic blocks of land that define the area. The farmers ploughed around the heavily contoured land to accelerate the drainage. This resulted in the characteristic bolle akkers (convex fields) or kruinige percelen (crowned plots).

4.2 Settlement development

The area is characterised by the terp villages. Some of them are protected by the Historic Buildings and Monument Act like Marsum, Biessum, Spijk, Stedum and Loppersum. Most have seen new housing development since the Second World War, but still retain their characteristic features in the landscape. Places like Appingedam and Delfzijl have developed into urban centres and provide services to the region.

4.3 Industry and energy

The majority of regional and supra-regional activity is currently found along the coast at Eemshaven and Delfzijl. Formerly economic activity centred on the river Delf, which became the Damsterdiep. The construction of the Ems canal and the train line laid the foundations for growth in the 20th century, in the form of the Brons Motor Factory (1906), the co-operative strawboard factory at Eendracht (1908) and urban expansion. The dwelling mound (wierde) villages of Solwerd, Opwierde, Farmsum, Heveskes and Weiwerd were eventually incorporated into the new developments. Large-scale port development made Delfzijl the third largest seaport in the Netherlands. Inside the dikes the countryside between the terp villages of Farmsum and Borgsw eer has become an extensive industrial zone including a soda factory and an aluminium plant. The next step in the development of the region as a

port and industrial area began around 1970, with the construction of the port at Eemshaven. Large sections of the port zone are still to be developed.

Natural gas is another important aspect of the region's economy. The village of Slochteren is known for the discovery of gas in 1959. Natural gas is extracted from great depths at 30 sites throughout the Duurswold.

4.4 Infrastructure

During industrialisation rail and waterways grew up around Fivelingo. After the Second World War, however, the peripheral position of the area ensured that more jobs were lost than gained. For many years the state has actively pursued employment schemes in the area. The lack of economic development means the area has never had a motorway. The two most important roads are the Eemshavenweg and the N33, from Assen to the Eemshaven in Delfzijl.

5. Legal and spatial planning aspects

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6. Vulnerabilities

6.1 Settlement

The historic settlement pattern is under threat from modern development and expansion. The larger communities are expanding and in some cases have already incorporated several dwelling mound villages. Within the smaller historic villages there are pressures for new buildings and expansion on the edge of the settlements.

6.2 Agriculture

The intensification of agriculture has resulted in significant changes to the historic landscape with original creek lines incorporated into the present regular field pattern. The intensification means that buried archaeological deposits are vulnerable to ploughing. New investments in biogas plants have resulted in the visible landscape being significantly altered.

6.3 Tourism

Agricultural intensification means that access to some cultural assets is becoming difficult.

6.4 Industry and energy

The industrial development of Delfzijl and Eemsmond with extensive harbour developments such as oil refinery, electricity plants and other industrial buildings create a threat to the below ground archaeological deposits as well as having a significant impact on the visible character of the landscape.

7. Potentials

7.1 Settlement

The surviving historic settlement pattern, especially those on dwelling mounds, some of which are protected by law, provide the potential for the promotion of both tourism and sense of place to the local population. Careful development within historic cores should be used to enhance the settlement.

7.2 Tourism

The historic landscape has the potential to be attractive for tourism, especially for cultural heritage tours, and leisure activities associated with the waterways. Footpaths along the inlets, dikes and between and through the historic settlements provide potential for tourism as well as local recreation. In the village of Zeerijp there is an archeological information point, which provides information on the area. The presence of the small villages on dwelling mounds - wierdedorpen - with old Romanesque churches, interspersed among the inlets and lakes of the open landscape have great potential for tourism.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden

Provincie Groningen, 2000, Provinciaal Omgevingsplan, Koersen op Karakter, Groningen

Schiermonnikoog, NL

1. Overview

Name of entity:	Schiermonnikoog
Delimitation:	Island in the Wadden Sea.
Size:	3900 ha
Location:	Province of Fryslân
Origin of name:	Island of the Grey Monks – the Cistercians
Relationship with other cultural entities:	Relationship with Ameland and Borkum (Germany), neighbour islands
Characteristic elements and ensembles:	The island consist mainly of dunes with one village on the west side, duck decoy, lighthouses

2. Geology and geography

2.1 General

Schiermonnikoog is one of the Friesian Wadden Sea islands off the northern coast of the Netherlands that separate the Wadden Sea and the North Sea. The landscape developed after the last ice age, rising sea levels, coupled with a higher fresh groundwater level, led to the development of a zone parallel to the coast in which peat was able to develop on a large scale. Clay and sand were deposited on this peat layer facing the sea, whilst the peat on the landward side spread out over the more elevated sandy areas. As a consequence of the flooding of the Straits of Dover, the sea current changed direction and began to run more in parallel with the coast. This gave rise to a series of low-lying dune ridges, broken by rivers flowing into the sea. As a result of later marine incursions, the peat behind the ridges was eroded and the ridges were divided up into smaller pieces: the Wadden Sea Islands.

Schiermonnikoog bears all the evidence for having developed in a dynamic coastal area, with erosion in some areas and deposition in others due to the strong sea current having a major influence on the form the island has taken. Like Terschelling and Ameland, Schiermonnikoog is an elongated island that becomes narrower at the eastern end, with a village sheltering in the dunes. In addition the island has an area of reclaimed saltmarsh, hook-shaped sandbars on the western side and extensive dunes and saltmarsh flats on the eastern side. Due to the processes of accretion and erosion the island is continually subject to erosion on the western side, with a distinct tendency for the island to shift eastwards. The coastal protection scheme allows these natural processes to take place only on the west and east sides of the island.

2.2 Present landscape

Schiermonnikoog is the smallest of the inhabited Wadden Sea islands and has undergone numerous changes due to the continuing erosion on the western side. Like the other Wadden Sea Islands it comprises sand with a few salt marshes.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The name of the island – “Island of the Grey Monks” - comes from the original owners, the Cistercian monastery of Klaarkamp. “Schiere” stands for the grey habit worn by the monks. The monks were the first settlers of Schiermonnikoog, they cultivated the ground for agriculture and worked on the land. In 1638 the monastery fell into private hands.

3.2 Early Modern Times

Agricultural activity on Schiermonnikoog is limited and consists mainly of livestock farming, with the cultivation of vegetables and cereals, both for human and animal consumption. The farms are sited on the edge of the salt marsh and the village. Apart from agriculture, fishing and whaling were an important source of income for the islanders. Whale jawbones in the village, forming a portal over a footpath, provide a reminder of the islanders’ former involvement in the whaling industry. As on many other Wadden Sea islands, there is also a duck decoy on Schiermonnikoog, consisting of a lake, the cage-pond and one or more tunnels. The area is surrounded by a wood or swamp forest where ducks can rest on the water and take refuge from the wind.

The history of Schiermonnikoog is that of a continuous battle against the sea. In 1717 the church in the former village of Westerburen had to be relocated. The move proved, however, to be short-lived, for in 1760 the church came under renewed marine threat. In 1762 a third church was built and the area around this was laid out in the regular plots that remain characteristic of the village to the present day. Westerburen is the only planned village on the Wadden Sea islands. The island also has an old lighthouse, known as the Water Tower, and a new lighthouse was built in 1854. As a result of the natural shifting of the island, the old lighthouse became too widely separated from the sea and a new one had to be built. The old lighthouse was subsequently used as a water tower and now also serves as a radio mast.

3.3 Modern Times

At the end of the 19th century a forest was planted on the island, both for timber production and in order to prevent the dunes from eroding. Schiermonnikoog also has a cemetery, the Vredehof, established in 1917 as a burial place for drowned sailors washed up in the First World War. Another element of the Schiermonnikoog landscape is the Wasserman Bunker, constructed during the Second World War. At the start of the Second World War the island was owned by the German Count Von Bernstorff; after the war it was confiscated. Since then it has been administered by the State Property Department, which transferred the dunes and the non-empoldered salt-marshes to the Society for the Preservation of Nature in the Netherlands.

An important development was the advent of tourism in the 19th century, with Schiermonnikoog being one of the first Dutch Wadden Sea islands where this took place. The German Wadden Sea islands were already developed for tourism in the 18th century. The accessibility of the Dutch Wadden Sea islands has been an important factor in the development of beach tourism. In the mid-19th century it took four and half hours to reach Schiermonnikoog by boat, preceded by a stagecoach journey from Groningen. The earliest facilities were designed mainly for rich guests and largely consisted of a spa. The pure sea air was particularly commended. The first seaside hotel was built on Schiermonnikoog in 1887. Despite its excellent location, with which it made its name amongst its mainly German guests, the hotel did not last long: in 1925 it disappeared beneath the waves. By then the first guesthouses had appeared. One of the first guesthouse operators on the island was a former policeman, Sake van der Werf. His guesthouse turned out to be so profitable that he was able to build a substantial hotel in the middle of the village, later followed by a hotel on the sea. The hotels and guesthouses were followed by holiday houses, villas, campsites and bungalow parks. Particularly since the 1960s, there has been an exponential growth in long-stay recreation on all the Wadden Sea islands.

Like the other Wadden Sea islands, Schiermonnikoog remains locked in a continual struggle with the sea. The centuries-old battle against accretion and especially the erosion of land, whereby the island appears to be “walking”, continues unabated.

4. Modern development and planning

4.1 Land use

With regard to agricultural activity on the island, there is virtually no scope to increase the area under production. Schiermonnikoog has clearly indicated that its priorities lie with nature, the landscape and cultural history.

4.2 Settlement development

With regard to housing the assumption is that at least 40 homes will need to be added by the end of 2010 for people having social and economic ties to Schiermonnikoog. A high proportion of the employment on Schiermonnikoog is directly or indirectly related to leisure. Building these houses will require an extension of the village into the open landscape of either the polder or the dunes

4.3 Industry and energy

There is one small business park, Melle Grietjespad, which contains a number of small companies, most of them related to tourism.

4.4 Infrastructure

The number of paved roads for cars is very limited and visitors are restricted from bringing their cars to the island. The island, like Vlieland, is very quiet in terms of traffic. There is a network of cycle and walking paths. In terms of traffic, the Structure Plan of Schiermonnikoog allows for the extension of the recreational path on the eastern side of the Westerplas.

5. Legal and spatial planning aspects

Schiermonnikoog is a National Park but the village is not part of the formal park area. The formal management plan of the National Park was developed with the inhabitants of the island and it of course influences many aspects of life on the island.

The general Legal and Spatial Planning Aspects are described in a general way, as they are relevant for all the cultural entities in the province of Fryslân. Because of the scale of the entities (most cover more than one municipality), the focus is on regional policy and management. Besides that, goals of regional policy and planning are taken into account by local and sector policy. The regional goals and strategies are always formulated after consultation with sectors, stakeholders and organisations.

The regional spatial plan for the province of Fryslân, called Streekplan, is an important document in terms of the integrated management of landscape and heritage. This plan comes up with the objectives for regional and local policy, also on issues of landscape and heritage. At this moment (mid 2006) the province of Fryslân is finalising her new regional spatial plan. The essential qualities of the different landscapes of Fryslân are described. These qualities are seen as important and are taken into account in all kinds of decisions. Recognition of the essential qualities in the landscapes, or strengthening them is a main objective. The plan (Streekplan) emphasise the need for protection and protection by development.

In provincial (spatial) policy, the Frisian islands have a special position because of their very specific situation. The landscapes, the nature and the cultural heritage is highly valued, and the space for development is limited. The general policy on development is to look for opportunities for improving the quality of the existing supply, instead of a further extending it.

6. Vulnerabilities

6.1 Settlement

The expansion of tourism is resulting in added pressure to expand the settlement pattern on the island with the possibility of altering its historic character. The re-use of the buildings on the farmyards doesn't always fit in to the historic character of the island.

6.2 Agriculture

Agriculture remains an important part of the economy of Schiermonnikoog, although there is the potential for decline in this sector. The scale of the farms is small and as a result they need to look for alternative supplementary incomes, frequently via tourism. The challenge remains to look for new means to keep sustainable agriculture on the islands.

6.3 Tourism

The development of tourism over the last decades has resulted in changes to the village on the island. The island houses a campground, a ferry pier, a tidal harbour for small vessels and approximately 15 hotels and hundreds of vacation houses and apartments. The nature of the accommodation is also becoming redundant as new forms of tourist accommodation are wanted. Lack of investments in the quality of the tourist infrastructure by entrepreneurs can lead to a decline of the tourist economy.

6.4 Nature conservation

Nature protection is important on the island and measures for nature protection can sometimes be in conflict with the existing landscape values.

6.5 Natural processes

A continual process of erosion is taking place which threatens cultural heritage assets on the island.

7. Potentials

7.1 Settlement

The village on Schiermonnikoog was planned with small streets and small houses, which is well preserved. Its character should be preserved and promoted.

7.2 Agriculture

The growing awareness of the importance of the local agricultural economy for the landscape and heritage should be encouraged with the potential of promoting local produce and retaining historic farming methods.

7.3 Tourism

The policy for sustainable tourism for the Wadden Sea islands supports some growth in tourism on Schiermonnikoog. The tourists are seeking higher quality and diversity in the accommodation and activities on offer and this provides great potential for the management, promotion and preservation of the cultural heritage of the island. The good accessibility of many parts of the island both by foot or cycle provide the potential for the creation of cultural heritage routes or integrated cultural heritage and natural environment trails.

7.4 Nature conservation

Nature protection is important on the island and provides the potential to create integrated management plans for the protection and promotion of both the natural environment and cultural heritage.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden

Provincie Fryslan, 2006, Streekplan. Leeuwarden

Provincie Groningen, 2000, Provinciaal Omgevingsplan, Koersen op Karakter, Groningen

Husingo, NL

1. Overview

Name of entity:	Husingo
Delimitation:	Coastal marsh
Size:	Approximately 15 x 18 km, 270,000 ha.
Location:	Province of Groningen, Nederland
Origin of name:	Named after the river Hunze
Relationship with other cultural entities:	The area is comparable to Westergo in Friesland

Characteristic elements and ensembles:

Husingo comprises several Cultural Heritage areas surrounded by former marine bays. Winding ditches trace the courses of former mud flat creeks, and the position of the long lines of dwelling mounds on the salt marsh embankments also indicate the former coastline of the Wadden Sea.

2. Geology and geography

2.1 General

The oldest salt marsh area, which includes Middag-Humsterland, lay above the Pleistocene sandy plains of the Westerkwartier. When the first people arrived c.600 BC, the salt marsh was bordered by a broad coastal embankment at the level of present-day Garnwerd and Zoutkamp. To the south of Garnwerd the coastal embankment gave way to the raised left bank of Hunze. The salt marsh area expanded northward in phases as the seaward salt marshes developed. The gradual rise in sea level meant that the level of the newly-formed salt marshes was always a little higher than the old ones. The Niekerk-Zuurdijk salt marsh embankment was formed roughly between 550 and 50 BC. From 300 to 600 AD the embankment followed the line of Ulrum-Leens-Wehe, while heavy sticky clay was deposited in the area behind it. In the succeeding centuries the coastal area of the region underwent many changes. The Hunze estuary silted up, while the marine bay of the Lauwers began to develop. This dynamic coastal process, in which one bay became land as another bay developed, is typical of the northern coastal area. Incursions from the Lauwerszee from the 7th century, changed the salt marsh area into islands and peninsulas, separated by streams. One of these streams reached the lower reaches of the Hunze, which then, instead of flowing north, struck off to the west. This part of the Hunze became known as the Reitdiep. Light clay was deposited on the islands and peninsulas. The old mouth of the Hunze was finally cut off entirely by the salt marsh embankment of Pieterburen and Westernieland.

2.2 Present landscape

Due to the dikes the Husingo landscape is now unaffected by the sea, the area having lost its dynamism when the Lauwers was cut off. The dikes on the Wadden coast were brought up to the delta level, and all tidal action ceased. The open landscape is characterised by its many dikes and meandering waterways.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The salt marshes were first inhabited around 600 BC. Initially the farmers living on the higher sandy land used the salt marshes as summer pasture. Later people were drawn by the fertile clay soils to settle permanently on the salt marshes, choosing the highest points for their farmhouses. The embankments along the Hunze were the most suitable for settlement. The first settlements were along a line running from Adorp, Winsum, and Baflo to Warffum, and another from Dorkwerd, Garnwerd and Ezinge to Houwerzijl. Around 500 BC the area suffered increased flooding. This heralded the first phase of the raising of dwelling mounds, using household waste, manure and salt marsh turf.

Farms were built on the flanks of the mounds, with the living area towards the centre and the working areas lower down. This made it easy to move between the farm buildings and the surrounding pastures. Sometimes an "ox road" was created at the foot of the village mound to connect up the different farms. A well would be dug at the top of the mound to provide water for drinking and fire fighting. The region of dwelling mounds – wierden – flourished in Roman times, leading to population growth and increasing demand for land.

3.2 Early Modern Times

Until around 1000 AD the mound dwellers tried to ward off the threat of flooding by increasing the height of the mounds. After that date they began to build dikes, not just around the villages, but also to protect the surrounding agricultural land from inundation with seawater. But the dikes brought problems as well as benefits. They made it more difficult to drain off excess water.

In Hunsingo the history of reclamation began with the construction of ring dikes around the old agricultural villages. The first dikes were built around the centres / core areas of Middag and Humsterland in the eleventh or twelfth century. The Marne area, to the north of the Reitdiep, is also thought to have had a ring dike. The oldest continuous sea dike along the North Groningen coast dates back to around 1200. When the dike was built the original mouth of the Hunze was already entirely silted up.

The construction of the dike in turn led to the development of new settlements, which were not on mounds, and owed their existence to the proximity of the dike itself, a drainage sluice, or a road. It was not unusual for roads to be built on the remains of an old dike. Villages built beside discharging sluices (zijlen) include Schouwerzijl, Houwerzijl, Munnikezijl, Kommerzijl, Lauwerzijl, Niezijl en Pieterzijl. Dike villages in the region include Den Andel, Den Ham, Kleine Huisjes, Kloosterburen, Molenrij, Pieterburen, Den Hoorn, Westernieland/Kaakhorn and Zuurdijk.

The Medieval period saw the development of the settlement pattern which still characterises the landscape today. Only a few villages and neighbourhoods have been created since then, in response to new reclamation works. In the eighth century the Ommelanden (the surrounding area) of Groningen was converted to Christianity. This led to the building of a church in the centre of many of the mound villages, often in the place of the former source of drinking water, the *dobbe* (well). In a number of cases a small ditch was dug around the churchyard of the mound to replace the well. The well could only be replaced once the villagers had secured another adequate source of fresh water. Thus the construction of the churches and the disappearance of the wells must have been after the dikes were built, when there was enough fresh water in the ditches.

The advent of Christianity also brought monasteries to the region: Selwerd, Kloosterburen, Nijenklooster and Aduard. Of these, the Cistercian Aduard monastery, founded in 1192, was the most influential. The monks and lay brothers worked on the surrounding land and introduced water management. It is thought that the monks contributed to the dike building around Middag and Humsterland. A new dike required good drainage, and the Aduarderdiep was dug to drain off the excess rainwater in Hunsingo, it discharged through a sluice into the

Reitdiep. It was the Aduard monks who took the initiative to set up the zijlvesten or sluice committees: fourteenth and fifteenth century water boards run by the abbot.

Little is known about medieval agriculture in the region, but we can assume that the farms throughout the region were mixed (livestock and arable). Presumably the low-lying areas like Middag and Humsterland were more suited to livestock farming, whereas in the north, particularly on the fairly high salt marsh embankments, there would be more arable. Production was intensified in the eighteenth and nineteenth centuries.

3.3 Modern Times

From around 1700 the accretion process was accelerated by land reclamation works. The Noordpolder was drained in 1811, followed by the Uithuizerpolder (1827), the Eemspolder (1876), the Lauwerpolder (1892), the Julianapolder (1924) and finally the Linthorst Homanpolder (1940). In the eighteenth and nineteenth centuries several areas were reclaimed around the estuary of the Reitdiep in the Lauwerszee, such as the Zuurdijkster polders and the Old and New Ruigezandster polders.

The Reitdiep, which provided access from Groningen to the sea, is the most important waterway in Hunsingo, but its meandering course proved difficult for shipping. To improve the situation some of the more extreme meanders to the west of Winsum (1629) and Sauwerd (1669) were cut off. The old riverbed, called het Oude Diepje, is still recognisable in the landscape as a channel with a continuous broad ditch.

Many of the old fortified houses (borgen) have disappeared. Some estates are still recognisable in the shape of canals and planting. Sometimes there is now a farm of the same name in place of the former estate house; for example de Aldringaheert at Feerwerd, and de Englumheerd and Jensema at Oldehove. Surviving borgen include Verhildersum at Leens, Allersma at Ezinge and Piloursema at Den Ham.

Large-scale commercial levelling works between 1840 and 1945 left practically none of the dwelling mounds intact. The fertile soil from the mounds was used to fertilise agricultural areas elsewhere. The existing waterway access was used to transport the soil, although in one instance a new waterway was dug especially. Some of the mounds were completely levelled, others only partially. In the latter case clear differences in height became increasingly apparent between the dug and undug elements.

The brick industry grew up around the Reitdiep and is typical of the region. The heavy, lime-free claypan soil deposited between 300 and 600 AD was the ideal raw material for the typical red Groningen brick.

From the start of the 19th century the “agriculturalist’s method” was used for reclamation, whereby pits were dug in the salt marsh to collect silt. During the mass unemployment in 1935 land reclamation work was stepped up: dams were built of wicker and posts to enclose areas of 400 by 400 metres.

The farmers on the seaward side had a legal right to take possession of the first 300 metres of the newly-reclaimed land, and the first option to buy the next. The main aim was to obtain extra land for agriculture. Polders formed by land reclamation in recent centuries include the Negenboeren, Juliana and Hornhuister polders. Changing economic requirements and increasing environmental concern for the Wadden Sea have brought land reclamation to a halt.

4. Modern development and planning

4.1 Land use

The land was predominantly used for agriculture. In recent decades more land has been required for nature development, and the area around the Lauwersmeer has many hectares of new nature reserves.

4.2 Settlement

The settlements have remained small. There has been only limited expansion, except the places Winsum and Zuidhorn. The village Pieterburen has become a tourist centre because of the seal centre and as a starting point of a long distant footpath called Pieterpad.

4.3 Industry and energy

The closure of the Lauwerszee in 1969 meant the end of the fish auction in Zoutkamp. The harbour activities have moved to Lauwersoog. Groningen is known for natural gas extraction. The largest natural gas deposit in the region is at Grijpskerk. Gas extraction has led to subsidence, particularly in the east, where more water now has to be pumped away.

4.4 Infrastructure

Many roads are built on the winding routes of the old dikes and connect the 'wierdedorpen'. Due to its isolated position the area has no major roads.

5. Legal and Spatial Planning Aspects

The Legal and Spatial Planning Aspects are described here in a generalised way, as they are relevant to all the cultural entities in the province of Groningen. Due to the scale of the entities (which cover more than one municipality), the focus is on regional policy and management. However, the goals of the regional policy and planning strategy are taken into account by the local sector planning policy. The regional goals and strategies are formulated after discussion with a wide range of stakeholders and organisations.

The regional spatial plan for the province of Groningen, the Provinciaal Omgevingsplan II, is an important document in terms of the integrated management of the landscape and heritage. It details the objectives for regional and local policy, and issues relating to landscape and heritage. Part of the Groningen regional plan, the Karakteristiek Groningen, covers the main goals for integrated landscape and heritage policy. The actual (historical) landscapes must be taken as the starting point for new developments and the diversity of landscapes must remain recognisable. These main goals are subsequently incorporated into other plans, dealing with specific parts of the province.

Regioperspectieven (long term perspectives for a region) are drawn up for the sub-regions. These perspectives culminate in gebiedsuitwerkingen (development plans for specific sub-regions). For example, the Landschapsontwikkelingsplan Noord Groningen (Landscape Development Plan for N. Groningen) deals with protection of the landscape and heritage and the integration of new developments. These plans are drawn up in consultation with the main sectors and various local and regional organisations (public bodies and NGOs).

6. Vulnerabilities

6.1 Settlement

Following the destruction of many of the dwelling mounds during the large scale levelling programmes from the 1840's through to 1945 the few surviving dwelling mounds need to be carefully protected.

6.2 Agriculture

Agricultural practices have resulted in the loss of structures such as the old fortified houses and the destruction of many earthworks, in particular dwelling mounds through levelling and ploughing. Cultivation continues to place buried archaeological remains at risk.

6.3 Nature conservation

The new areas of nature reserves such as around the Lauwersmeer can cause damage to cultural heritage assets if these are not considered at an early stage in the management plans for the reserves.

6.4 Industry and energy

Gas extraction has led to subsidence in some areas and this will cause erosion and damage to cultural heritage assets.

7. Potentials

7.1 Spatial planning

The regional spatial plan for the province of Groningen, the Provinciaal Omgevingsplan II, is an important document in terms of integrated management of landscape and heritage and should be used to both promote and manage the cultural heritage assets of Hunsingo.

7.2 Settlement

The varying pattern of the historic villages and towns is mostly intact and protected. However there is the opportunity via planning requirements to promote the historic environment through careful development in the appropriate style for each settlement.

7.3 Agriculture

Nature conservation offers opportunities to integrate conservation of the natural environment and historic landscape to provide further attractions to cyclists, walkers and riders. The areas cultural heritage is well-suited for increasing the local resident's sense-of-place and for strengthening Hunsingo's image for marketing purposes.

7.4 Management of cultural heritage

Hunsingo has a rich archaeological heritage from the prehistoric period onwards with the large number of dwelling mounds fortified houses and estates, villages and dykes, mostly now surviving only as below ground archaeological deposits, or visible in the layout of the landscape.

7.5 Tourism

The surviving small dwelling mound (wierde) villages (some of which have protected status) like Eenrum, Winsum, Obergum, Oostum, Garnwerd, Ezinge, Saaksum and Niehove, in particular those with old Romanesque churches set amongst lakes, are ideal for promoting the cultural heritage of the region.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden

Provincie Groningen, 2000, Provinciaal Omgevingsplan, Koersen op Karakter, Groningen

Lauwers, NL

1. Overview

Name of entity:	Lauwers
Delimitation:	The Lauwers region is located in northeastern Friesland and northwestern Groningen. The area consists of marine clay polders in the flood plains area of the River Lauwers and the former Lauwerszee, part of the Wadden Sea
Size:	±31.000 ha
Location:	Province of Fryslân and Groningen
Origin of name:	Named after the river Lauwers
Relationship with other cultural entities:	Middelzee and Fivelingo, also former estuaries
Characteristic elements and ensembles:	Land reclamation: open wetland with dykes, surrounded by earlier reclaimed land. Former fishery villages, dyke villages, dwelling mounds, sluice villages, rivers and waterways

2. Geology and geography

2.1 General

Lauwers is sited on the northern side of the boulder clay plateau known as the Drenthe Plateau, where a low-lying area was created by erosion where the Lauwers River flowed through the region. At the end of the last Ice Age the climate became warmer and more humid, leading to the melting of the ice caps and a rise in the sea level. Groundwater levels rose at the same time, leading to the formation of swamps in parallel with the former coastline, in which peat formed. The continuing rise in sea level, combined with the deposition of silts, obstructed the formation of clay on the seaward side, whilst the peat-bog extended ever further inland. In the early Middle Ages the sea penetrated into the land ever more deeply and large tracts of peat were washed away. The mouth of the Lauwers was scoured out to form a broad estuary known as the Lauwerszee. Clay walls or natural levees developed along the rivers. With the subsidence of the peatlands on the other side, these levees came to assume a considerable height. In many areas these were subsequently cut away for brick production. In areas where the peat was not eroded away, marine clay was deposited on top of the peat. Part of these salt marshes and clay-on-peat areas were empoldered, thereby reducing the size of the Lauwerszee. In 1969 a barrier dam was constructed, putting an end to this inland sea.

2.2 Present landscape

The landscape is of an open arable land with dykes, which together with the field patterns tell the story of land reclamation. The heart of the entity, the former estuary of the Lauwers is still a wetland.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The Lauwerszee has been in existence since the 7th-8th century. Until the 11th century most of the area comprised this inland sea. Many rivers like the Lauwers and the Reitdiep discharged their water in the sea. Inhabitants of the surrounding areas used the water for fishing and transport.

3.2 Early Modern Times

The sea defences on the western side of the former Lauwerszee, which protect the Oostergo area from flooding, date from the 11th century. To the south of the former Lauwerszee the dykes largely date from the 13th century and were mainly constructed by the Gerkes Monastery. A sea dike was constructed from Noordhorn to Grijpskerk in the province of Groningen and from there to Stroobos, and across the western levee of the Lauwers to Burum, Kollum and Wijgeest. Later a series of new dykes were constructed further to the north.

The land consolidation in the area ranges from irregular, block-shaped plots in the vicinity of Kollum and Burum, to regularly shaped rectangles in the most recent polders. Burum is the oldest part of the Lauwers region to have been brought under cultivation, the numerous winding ditches which form part of this landscape are the remnants of old creeks. The Lauwers region contains various kinds of villages. Burum and Gerkesklooster are earth mound villages, Kollumerpomp and Warfstermolen are dyke villages and then there are a number of villages that grew up near locks. Zoutkamp is a former fishing village which became a fortress during the Tachtigjarige Oorlog. The village was cut off from the sea when the Lauwermeer dike, a barrier dam, was constructed in 1969. Other fishing villages include Oostmahorn and Lauwersoog, the latter has a new fishery harbour with a fish market.

Many rivers used to flow into the Lauwerszee: the Reitdiep at Zoutkamp, the Lauwers at Munnkezijl, the Dokkumer Ee at Dokkumer Nieuwe Zijlen and the Zuider Ee at Zumazijl.

Around 1580 a Spanish ruler (stadhouder) had a waterway excavated between Leeuwarden and Groningen, known as the Kolonelsdiep, which was expanded in the 20th century to form the Prinses Margriet Canal. In the mid-17th century the Strobosser boat canal was excavated between the Dokkumerdiep at Dokkum and the Kolonelsdiep at Stroobos. The Dokkumerdiep was traditionally an important inland navigation route. Nowadays, after straightening work and the construction of locks, it is known as the Dokkumer Grootdiep. Like the Lauwersmeer with its gullies, former salt marshes and flats, the Strobosser boat canal and the Prinses Margriet Canal are important and prominent cultural-historical features that illustrate the origins of the area. After the Reitdiep was dammed in 1877, locks were constructed at Zoutkamp and in 1920 at Lammerburen, the latter in combination with a pumping station (the Waterwolf). The Lauwerszee barrier dam also contains an extensive lock complex. The Lauwerszee therefore contains numerous important hydrological engineering structures. The sea dykes, secondary dykes and lock complexes are important and prominent cultural-historical features.

3.3 Modern Times

The former Lauwersmeer estuary was sealed off from the Wadden Sea by a dam in 1969. It is kept at a constant level of one metre below Amsterdam Ordnance Datum. As a consequence the former salt marshes and sand-flats have dried up. The main gullies are however still navigable water. Part of this area is used for agriculture, part for military training exercises and the remainder for woodlands and nature conservation areas. A harbour was constructed near the locks, and this is also the site of the most recent village in the Netherlands: Lauwersoog. Clay continues to be extracted along the Dokkumer Grootdiep for brickmaking, where there is also a surviving brick factory.

4. Modern development and planning

4.1 Land use

Agriculture is an import sector in the local economy. In this area farming is still profitable but there is a continuing need for re-structuring and enlargement. This process can threaten the typical patterns of land use and the farm yards and buildings. Parts of the area are managed by nature organizations.

4.2 Settlement development

The settlements are small in the region and there is a tendency for the young people to move away and the houses to be bought by elderly people. This has an impact on the viability of the villages. The sub region is an area with a small economic base. Tourism is concentrated around the Lauwerslake, at several locations there is overnight accommodation (bungalows and even complete new-build semi-historical style houses) and facilities like yachting-marinas and restaurants. In the surrounding area the appreciation of the area is rising, but there is only a very small tourist economy.

4.3 Industry and energy

The wide open space of the Lauwers area is conducive to industries like telecommunication towers and windfarms. There are already wind turbines beside some farmhouses in Lauwersoog; in Groningen wind turbines are restricted to harbour areas. Near Grijpskerk and Anjum gas extraction sites are located, where gas is extracted from beneath the Wadden Sea. Business is mainly local oriented and is concentrated near the villages, with the exception of the shrimp industry in Zoutkamp.

4.4 Infrastructure

The dykes are used for transport. There are mainly only local roads, with a single major road on the barrier dam.

5. Legal and spatial planning aspects

The centre of the entity, the Lauwerslake, is a national park, with a separate management plan. The Lauwers straddles two provinces, Fryslân and Groningen.

The regional spatial plan for the province of Fryslân, called the Streekplan, is an important document for integrated management of landscape and heritage. This plan provides objectives for regional and local policy, as well as covering issues of landscape and heritage. The Fryslân Streekplan is currently being updated. The essential qualities of the different landscapes of Fryslân are described and those qualities which are seen as important and should be taken into account in all kinds of decisions are identified. This recognition of the essential qualities in the landscapes, is an objective of the spatial plan. The plan (Streekplan) emphasise the need for protection and protection by development. A document called Nota Erfgoed (Heritage Plan) covers the responsibilities for the different aspects of cultural heritage.

The regional spatial plan for the province of Groningen, called Provinciaal Omgevingsplan II, is an important document in the integrated management of landscape and heritage. This identifies objectives for regional and local policy, as well as covering issues of landscape and heritage. Part of this regional plan for the province of Groningen is called 'Karakteristiek Groningen'. In this section the main goals for integrated landscape and heritage policy are formulated. The actual (historical) landscapes are so-called 'starting points' for new developments and the diversity of landscapes should be recognizable. These main goals are translated in other plans, dealing with specific parts of the province.

For the sub regions 'regioperspectieven' (a long term perspective for a region) have been developed.

6. Vulnerabilities

6.1 Settlement

The range of settlement types are vulnerable to change or expansion. The increase in tourism brings pressure for new development within the historic cores or on the edge of existing settlements.

6.2 Agriculture

Agriculture is still a profitable industry but there is continuing pressure to increase production. This process can threaten the historic patterns of land use and the farm yards and buildings.

6.3 Tourism

There is only a very small tourist economy but this is beginning to expand. In and directly around the National Park Lauwersmeer, the recreation facilities for tourism are expanding rapidly. On the borders of the area developments in tourism and recreation, mainly on a small scale, are occurring. For example, alongside the village of Oostmahorn a large holiday home park with new historical style houses and layout has developed, called Esonstad. If the cultural heritage of the area is not integrated into these initiatives negative impacts on the landscape and heritage can take place.

6.4 Industry and energy

Gas extraction, wind turbines and large buildings can have an adverse effect on both the visual amenity of the historic landscape and the buried cultural heritage. The qualities of parts of this landscape are its openness, its quietness and its darkness and these are at threat from continuing industrial growth.

7. Potentials

7.1 Settlement

The range of historic settlements, including earth mound villages, dyke villages, lock villages and fishing villages provide an important range of settlements which have the potential to promote the diverse occupation history of the Lauwers entity.

7.2 Agriculture

The cultural history of the settlements and landscapes of this area are identified in different initiatives, regional and local, and the potential for both promotion and management of the area should be exploited.

7.3 Tourism

The visible history of water management through the ages is an important strength of the landscape. The Lauwers is still feeding the (former) sea bay Lauwers sea. The Lauwers is the border river between the provinces of Groningen and Fryslân. The lake is still a significant element in the water-management of both provinces. The many dikes, and the natural and manmade waterways demonstrate the history of habitation and cultivation of this area. The historical development of embanking and reclamation of the sea estuary throughout the centuries is still visible. As with the contrast between the natural landscape in the former sea area and the historical developments on the banks, these provide an important part of the history of the area and could be promoted via tourism. The story of the monastery of Gerkes Klooster is an important example and could be used as a focal point interpreting the story of this area.

7.4 Nature conservation

There are opportunities to improve the relationship between Lauwers and its former sea estuary by promoting the historic landscape and cultural history of the area in an integrated manner with nature conservation and tourism.

7.5 Industry and energy

Development of traditional industries such as fisheries, brick and pottery manufacturing, provides opportunities to strengthen the economy and encourage local tourism.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden

Provincie Fryslan, 2006, Streekplan. Leeuwarden

Provincie Groningen, 2000, Provinciaal Omgevingsplan, Koersen op Karakter, Groningen

Oostergo, NL

1. Overview

Name of entity:	Oostergo
Delimitation:	Oostergo is bordered by the Wadden Sea in the north, and by the eastern Middlezee dike in the west. The Lauwerszee and river Lauwers form the eastern border. The southern border runs over the Boorne dike to Oldeboorn and then along the Stroobos canal
Size:	Approx. 36.000 ha.
Location:	Province of Fryslân, the Netherlands
Origin of name:	The north part of Fryslân was bisected by the Middel Sea. The island on the east side is Oostergo (Oost means east)
Relationship with other cultural entities:	Related to Westergo, Middelzee and Lauwers
Characteristic elements and ensembles:	Open area with salt marsh embankments on which there were mound (terp) villages at 2-3 kilometre intervals. Very open landscape; dwelling mounds in curved rows, structures of water ways, (former) seawalls and locks; historic field patterns; natural water courses, medieval town centres and village like Leeuwarden and Dokkum, historic farm buildings, stone houses (zaalstinsen).

2. Geology and geography

2.1 General

The Oostergo landscape was formed in the Holocene period, (the current geological period). Around the higher sandy area of the Frisian Wouden and the peat moors of the Lage Midden a broad band of clay was deposited, measuring up to 10k wide in the north, and gradually narrowing towards the south. The river Boorne, which rises in the sand and peat areas of south-east Friesland, formerly turned northward to the west of Aldeboorn and discharged into the Wadden Sea. The Oostergo landscape is bordered on two sides by large estuaries: the Boorne (Middelzee) and the Lauwers (Lauwerszee). Marine clay was deposited along the inlets. The ridge thus formed by the sea is now a salt marsh embankment.

2.2 Present landscape

Oostergo has an open landscape with high dikes offering protection from the sea. The accretion of land at the coast is a continuing natural process.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The earliest permanent settlement was around 600 BC, when people moved into the coastal area from the Drenthe plateau. The first inhabitants settled on the highest points: the salt marsh embankments and high banks of the streams. Initially they lived directly on the ground-surface of the embankments. Over time however, as sea level rose and flooding increased, the dwellings had to be raised. Mounds were created from whatever came to hand; household refuse, manure, clay and turf, and gradually the first dwelling mounds (terpen or wierden) were constructed from c. 500 BC. The place-name "wier(de)" also means

an artificially raised dwelling place. A number of terp villages in Oostergo have the suffix -wier(de), such as Metslawier, Niawier and Poppingawier. Initially the terps accommodated individual dwellings, but over time they grew together into raised villages. The oldest form of village terp consisted of round, separate terps with plots radiating out from them, and sometimes a ditch around the foot of the mound. Examples of such round terps include Foudgum, Hogebeintum, Brantgum and Oostrum. From around 700 – 800 AD a different kind of terp developed as a trading terp. At this date the Frisian coast was at the crossroads of several important European trade routes, so trade flourished. The trading terps were largely found on the banks of a stream, just behind the coast: examples include Aldeboarn on the Boorne and the old centres of Leeuwarden and Dokkum on either side of the Dokkumer Ee. This type of terp had an elongated shape with buildings along a central road.

3.2 Early Modern Times

The construction of a continuous sea dike around Oostergo stopped most of the regular flooding of the land, so it was no longer necessary to live solely on the high salt marsh ridges. From around the 12th century it was also possible to live on the lower-lying salt marsh plains. The arable fields were still on the higher embankments and the flanks of the terps. The poorer, wetter land around the terp was used for pasture and hayfields. In the lowest-lying areas, south of Anjum, there are duck decoys, sometimes as many as four close together.

The continuous dike along the Middelzee and the Wadden Sea was probably built around 1100 AD. It ran from Deersum via Irnsum, Roordahuizen, Leeuwarden, Stiens, Holwerd, Wierum and Oostmahorn to Engwierum. If salt marshes outside the dikes were silted up sufficiently, they were sometimes also reclaimed and farmed. Once a new dike was built further seawards, the old dike lost its purpose, and was often dug out. Monasteries established in the area from 1100 onwards played an active role in dike building and land reclamation in Oostergo, particularly Mariëngaarde near Hallum and the Gerkes monastery in the Lauwerszee area. In addition to reclaiming land from the sea, land was also reclaimed in Oostergo by drying out pools. There are three such small drained pools south of Leeuwarden: the Hempensermeer and Greate Wergeastermeer polders and the Lytse Mar polder east of Wergea. These polders were pumped dry in the 17th and 18th centuries and are characterised by a very regular rectangular fieldscape that is typical of reclaimed land.

Initially surplus water from the adjoining land in Oostergo was discharged into the Middelzee. After the polders were made, a quay was built on the Oostergo side along the Zwette, the ditch marking the border between Oostergo and Westergo. This made drainage toward the Middelzee impossible, so the drainage point was moved to Dokkum. A number of waterways, such as the Huijumervaart and the Heerenwegstervaart, were dug to solve the drainage problem. Where a stream or waterway discharged into the sea a discharging sluice or zijk was built in the dike. The reclamation of the Bildt meant that an important Oostergo sluice in Oude Leije had to be moved twice. The polder water has been discharged at Nieuwe Bildtzijk since the 18th century.

In the medieval period peat was dug on a large scale in Oostergo to extract salt. The dug areas have a distorted soil profile and are still recognisable in the landscape as elongated lower lying areas, particularly in De Kolken south of Anjum, and between Wetzens, Jouswier and Oostrum, where large areas of peat were extracted. In addition to peat extraction, clay was also taken in some areas to make bricks. Initially these were used only to build monasteries and churches, but later they were also used for noble houses, and later still for farms.

While agriculture was still the most important source of income, the increase in trade meant the development of towns. Dokkum arose where the Dokkumer Ee flowed into an inlet of the Lauwerszee: the present day Dokkumer Grootdiep. Two terps were built on the northern side of the watercourse which now form the centre of the town. In the 12th century the Norbertine Bonifacius Abbey was built on the northern terp, which is now the Markt. After the

Reformation at the end of the 16th century the Abbey was demolished. The veneration of Boniface, the missionary and bishop who was murdered near Dokkum in 754, received a boost in 1925 when the St Boniface Chapel and garden were built on the south side of the town.

Leeuwarden lies where the (Dokkumer) Ee once flowed into the Middelzee. There are three terps in the centre of the town which formed the original urban area: the Oldehove terp, and the terps at the level of the Kleine and Grote Hoogstraat, which lay on either side of the Ee. From 1200 to 1500 the town expanded significantly, becoming the provincial capital in 1504. It was also significant that Leeuwarden became the seat of the stadhouder of Friesland. From 1584 to 1747 the stadhouders lived in the court on the Hofplein.

3.3 Modern Times

In the 19th century Leeuwarden became an increasingly important road and rail hub. As a result it enjoyed modest industrial growth, with the emphasis on the agricultural sector. New districts were created outside the historic centre for the growing population.

Waterways were still the major transport routes in Friesland until well into the 19th century. Streams and rivers had been used to transport goods since the earliest occupation of the area. Many of these small waterways were later straightened, or made into canals. A number of major canals were created for heavier traffic. Most of these were originally natural watercourses which were made into boat canals in the mid-17th century. This involved widening and deepening the channel and creating towpaths. Large-scale commercial levelling works between 1840 and 1945 left practically none of the dwelling mounds intact. The fertile soil from the mounds was used to fertilise agricultural areas elsewhere. To transport the soil the original terp channel was dredged or a new one was dug, so that the terp was connected to the network of major waterways in the area. Oostergo also has a network of roads. The roads traditionally follow the course of the old dikes over the banks, beside gullies and streams, as these were the highest and driest parts in the area.

Land acquisition was tackled systematically from the start of the 19th century. Pits were dug in the salt marsh to catch the silt and mud-flat sediment. Once they were full the silt was spread over the marsh, and the process was repeated until the marsh was high enough above water-level. Large-scale reclamation work was undertaken in 1935, during the time of mass unemployment. A method was adopted which was then common practice in Schleswig Holstein, and seems to have come directly from Vierlingh. Brushwood fences were made to enclose "sediment fields" of 400 by 400 metres. Channels were dug every five metres in these fields, and the deposited silt was excavated twice a year and spread on the field. Each field also had two major ditches parallel to the dike. All the channels emptied into these major ditches, so that the sediment field was drained at ebb tide and plants could take a good hold. The plants used to encourage this development were mainly glasswort, salt-marsh grass and cord grass.

It is thought that there are no surviving mounds left in Oostergo that were built for defensive stone houses (stinsen), except perhaps the mound of the former Jongemastate in Rauwerd. There are also no surviving tower houses left in Oostergo. In the 14th and 15th centuries hall houses (zaalstinsen) were also built, which were more comfortable to live in than the stone towers. From the 16th century onwards the stone houses gradually lost their defensive role and became largely status symbols; they were often converted into stately homes with estates. Although many country estates in Oostergo were given the title "state", they were not all developed from the original stone stinsen. Fine estates of gardens and forests were laid out around many of the stately houses in the 17th and 18th centuries.

4. Modern development and planning

4.1 Land use

Oostergo is predominantly under grassland and maize used for livestock farming. The coastal areas heavy marine clay is more suitable for potato growing.

4.2 Settlement development

There are two large towns in Oostergo, Leeuwarden and Dokkum, both have expanded since the Second World War and exert a great deal of influence on their surroundings. As the provincial capital Leeuwarden has many of the regional institutions such as hospitals, colleges, cultural institutions and business activities. Locations for new build neighbourhoods are in the south and east of the town. In the northern part development has already taken place in the district 'Bullepolder'.

4.3 Industry and energy

Industry is largely agriculture-based. The harbour activities at Dokkum are more of a tourist attraction. Leeuwarden is largely a service centre and has no heavy industry.

4.4 Infrastructure

Leeuwarden is at the hub of water, road and rail routes. There is a planned ring road on the west and southern part of the city of Leeuwarden. A new road has also been built from Dokkum to Drachten, the Centrale Axis.

5. Legal and spatial planning aspects

The Legal and Spatial Planning Aspects are described here in a generalised way, as they are relevant to all the entities in the province of Fryslân. Because of the scale of the cultural entities (most cover more than one municipality) the focus is on regional policy and management. However the goals of regional policy and planning are taken into account by local sector policy. The regional goals and strategies are formulated after discussion with a wide range of sectors, stakeholders and organisations.

The regional spatial plan for the province of Fryslân, (the Streekplan), is an important document in terms of integrated management of landscape and heritage. This plan details the objectives for regional and local policy, and issues relating to landscape and heritage. The provincial planning vision for North-East Fryslân centres on exploiting and reinforcing of the special qualities of the area, to provide a social and economic boost to the region. The construction of the Central Axis will start to connect the region to the main road network, and reinforce the central position of the regional town of Dokkum.

6. Vulnerabilities

6.1 Spatial planning

The open space, skyline and structure of the historical cities, towns and villages are very vulnerable to ill informed planning for new housing and industry. This is especially the case in and around Leeuwarden and on a smaller scale in Dokkum.

6.2 Settlement

The growth in the population of the former terp villages often means extending rather than developing in the existing residential areas. Allowing new developments to blend in with their surroundings demands a great deal of care and investment. Industrial estates are often built on the fringes of the main urban areas. The construction of the Central Axis will provide opportunities as well as threats. There are no surviving mounds left in Oostergo that were built for defensive stone houses (stinsen), or surviving tower houses.

6.3 Agriculture

The historic field pattern, natural watercourses and the historic farm buildings are vulnerable due to agriculture developments. Many of the smaller settlements that had been on mounds have already been lost to agricultural improvements. In rural areas the province aims to combine sustainable prospects for agriculture with a more extensive range of activities and

services. It is anticipated that agricultural production will be scaled up considerably, particularly in the clay area. Continued agricultural practices will disturb or destroy buried archaeological deposits.

7. Potentials

7.1 Spatial planning

The proposed residential and industrial development should consider the cultural heritage, both in terms of recording prior to development and management of known sites. Within the historic core of the towns and cities careful planning should protect the historic layout and surviving buildings.

7.2 Settlement

Some of the historic settlements survive and these could be promoted for tourism. The dispersed settlement pattern of small villages and farmsteads have the potential to be promoted via tourism for their cultural heritage. The historic settlement patterns, now largely lost to modern agriculture could be promoted via museums etc. Well designed conversions and extensions can allow historic buildings to fulfill the demand for new housing and small scale industrial uses.

7.3 Agriculture

Sustainable agriculture in relation to meadowland, migrating birds and cultural historical elements contribute to the development of tourism. There is potential for disused agricultural buildings to be used for new housing, holiday accommodation or new small scale industrial enterprises and for development of locally specific brands of agricultural products.

7.4 Tourism

The area has clear potential for landscape and cultural history tourism. Using historic buildings and farmhouses for accommodation, old paths for walking and cycling and old water ways for pleasure shipping is already practised and should be promoted further. The restoration and management of cultural features will encourage a wider interest via tourism in the area. One of the most striking features of Oostergo is the dike system which has the potential to be promoted as a significant tourist attraction especially for walkers and cyclists.

7.5 Cultural heritage

The restoration and development of area specific features such as the former shrimp catching and processing in Wierum, brick producing in Oostrum and the old garden from Jongemastate in Rard provide the opportunity to exploit the areas cultural heritage.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden
Provincie Fryslan, 2006, Streekplan. Leeuwarden

Ameland, NL

1. Overview

Name of entity:	Ameland
Delimitation:	Island in the Wadden Sea
Size:	8500 ha
Location:	Province of Fryslan
Origin of name:	Not known
Relationship with other cultural entities:	Relationship with Terschelling and Schiermonnikoog, neighbouring islands
Characteristic elements and ensembles:	The island consists of dunes with on the south side the polder (former marsh) a string of four settlements in the area between the dunes and polder.

2. Geology and geography

2.1 General

Ameland is one of the Frisian Wadden Sea islands off the northern coast of the Netherlands that separate the Wadden Sea from the North Sea. The natural landscape arose from a rise in the sea level after the last ice age. Since the rise in sea level was accompanied by a higher fresh groundwater level, a zone was created parallel to the coast in which peat was able to develop on a large scale. Clay and sand were deposited on this peat layer facing the sea, while the peat on the landward side spread out over the more elevated sandy areas. After the flooding of the Strait of Dover, the sea current changed direction and began to run more closely in line with the coast. This gave rise to a series of low-lying dune ridges, interrupted here and there by rivers flowing into the sea. As a result of later incursions by the sea, the peat behind the ridges was washed away and the ridges were divided up into smaller pieces: the Wadden Islands.

Ameland still forms part of a dynamic coastal area, where the erosion in some areas and deposition in other areas due to the strong sea current have had a major influence on the form of the island. Like Terschelling and Schiermonnikoog, Ameland is an elongated island that becomes narrower towards the east, with a number of villages sheltering in the dunes. The structure of the islands corresponds closely with that of the East Frisian islands. In addition the island has an area of reclaimed salt marsh, hook-shaped sandbars on the western side and extensive dunes and salt marsh flats on the eastern side. Dykes were built around the polders of Ameland in the 19th century, however, the island also has an area that has not been enclosed by dykes and which is therefore submerged at high water. This area, the Nieuwlandsreid, is only separated from the sea by a summer dyke.

Efforts are made to control the process of accretion and erosion as the island is continually subject to erosion on the western side and has a perceptible tendency to shift to the east; over the past three centuries there has been an eastward shift of one kilometre per century.

From 1943 onwards some 200 wells became exposed on the beach to the west of Hollum, belonging to the hamlet of Sier, that was engulfed by dunes in the 15th century. This locality has since been reclaimed by the sea again.

2.2 Present landscape

The island has four villages in the lee of the dunes, from east to west; Buren, Nes, Ballum and Hollum. Historically each village had its own salt marsh polder. On the eastern side of the island there is an area of dunes, one of which, the Oerd, is 24 metres high.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The first reference to Ameland dates from the ninth century. The island was an individual domain for a long time, over which the landed gentry of Cammingha held sway. The castle belonging to the Cammingha family in Ballum was demolished in 1829. Agricultural activity on Ameland consisted mainly of livestock farming, with the cultivation of vegetables and cereals, both for human and cattle consumption. The row of villages and the dunes were separated by areas used as hayfields. The cultivated land on Ameland was concentrated in farmland around the villages, such as Hollum and Ballum. Seepage from the dunes resulted in standing water, giving rise to a boggy and peaty area.

3.2 Early Modern Times

Beside agriculture as a main activity, the inhabitants of Ameland worked as fishermen, sailors and in whaling. Whale jawbones in Hollum museum and at Burgemeester Walda School are a tangible reminder of the areas links to the whaling industry. There are two duck decoys on Ameland, consisting of a lake, the cage-pond and one or more tunnels. The area is surrounded by a wood where ducks can rest on the water and take refuge from the wind. These areas provide a contrast in green to the dunes. Decoys are used in order to catch wild fowl.

3.3 Modern Times

In the late 19th and early 20th century, agriculture, with the introduction of fertilisers and the commercial availability of animal feed, became more productive and concentrated increasingly on dairy farming. In 1889 a woodland, the Nesserbosch, was planted, both for timber production and in order to attempt to prevent the dunes from blowing away.

The first re-allotment of land in the Netherlands took place on Ameland in 1924 when the highly fragmented and tiny lots were substantially enlarged and made more equal in size. The former arable fields were converted into meadows, the water level in the polder was lowered substantially and the drainage was improved by cutting drainage channels. New roads were also constructed and old dykes cut away. Within this process characteristic farmhouses were built in the polders of Hollum and Ballum; before the re-allotment farmers still operated out of the villages.

Like the other Wadden islands, Ameland remains locked in a continual struggle with the sea. The centuries-old battle with erosion, and to a lesser extent accretion, of land, whereby the island appears to be “walking”, continues but in a more controlled way. In particular on the far eastern side of the island the natural geomorphological processes are allowed to continue.

For a long time agriculture was the most important source of income for the island. In the 19th century tourism gradually became more important. In comparison with the German Wadden islands, tourism on the Dutch Wadden islands developed relatively late; Ameland did not obtain its first beach bathhouse until 1853. Poor accessibility was probably the main reason why tourism took so long to develop. Ameland's accessibility improved when the sealed road from Holwerd to Dokkum and Leeuwarden was constructed in 1854.

During the 20th century holidays became increasingly affordable. The growing number of tourists resulted in all sorts of alterations to the landscape, such as the construction of holiday homes, campsites and camping farms, as well as cycle-paths, footpaths and bridleways.

4. Modern development and planning

4.1 Land use

The land is used for agriculture purposes with a big influence from the commercial tourist sector. An accessible landscape is important for the tourist industry.

4.2 Settlement development

Like the other Wadden islands, tourism is the most important industry on Ameland. The municipality of Ameland is trying to intensify the tourist sector.

4.3. Industry and energy

Except for local stores, there is no industrial activity on Ameland. There is one gas extraction plant in the dune area on the eastern side.

4.4 Infrastructure

Besides connections from east to west and the routes to the beach and villages, the infrastructure in the dunes is concentrated on bicycle and footpaths.

5. Legal and Spatial Planning Aspects

The Legal and Spatial Planning Aspects are described here in a generalised way, as they are relevant to all the entities in the province of Fryslan. Because of the scale of the cultural entities (most cover more than one municipality) the focus is on regional policy and management. However the goals of regional policy and planning are taken into account by local sector policy. The regional goals and strategies are formulated after discussion with a wide range of sectors, stakeholders and organisations.

The regional spatial plan for the province of Fryslan, called Streekplan, is an important document for the integrated management of landscape and heritage. This plan contains objectives for regional and local policy, and covers issues of landscape and heritage. At present (mid 2006) the province of Fryslan is in the process of finalising a new regional spatial plan. The essential qualities of the different landscapes of Fryslan are described within this planning document. These qualities are seen as important and should be taken into account when considering planning and policy decisions. The recognition of these essential qualities in the landscapes, or strengthening it, is a main objective. The plan (Streekplan) emphasises the need for protection and protection by development.

In provincial (spatial) policy, the Frisian islands have a special position because of their very specific situation. Their landscapes, nature and cultural heritage are highly valued, whilst the space for development is limited. The general vision on development in the area is to look for opportunities for higher quality within the existing supply, instead of further expansion of development.

Ameland has its own zoning plan.

6. Vulnerabilities

6.1 Settlement

Whilst, historically agricultural land use was connected to the villages, the layout and structure of the villages in relation to the surrounding rural area is becoming less typical as a result of developments to meet the housing demands of the local population.

6.2 Agriculture

The continuation of the agricultural sector is important for landscape and nature, but whilst agriculture is still a part of the economy of Ameland, it is in decline. The scale of the agricultural businesses is small so the farmers have to look for additional income through farm diversification, for example into tourism. Unfortunately, the re-use of the buildings on these farmyards doesn't always fit the character of the typical landscapes of the island. Farmland nature conservation management through land re-allocation plans such as the 1996 Land Allocation with Administrative Character (RAK) can also have a negative impact on the historic character of the old polders by the creation of natural areas. The challenge remains to look for new ways of ensuring the continuation of sustainable agriculture on the island which protects, maintains and enhances the landscape for both the natural and cultural heritage

6.3 Tourism

The island of Ameland retains much of its historic character partly as a result of its isolation, but the development of tourism over the last few decades has already had a negative impact on the landscape. Extensions to properties to provide tourist accommodation are visible in the open landscape and in the villages, and cycle paths, holiday homes and campsites have all had a negative impact. There is a serious demand for upgrading the quality and diversity of accommodation for tourism on the island, but a lack of investment in the quality of tourist infrastructure threatens Ameland's tourist economy and could lead to a decline which would affect the positive management of the landscape and cultural heritage of the island.

6.4 Nature conservation

Nature protection is important on Ameland but in the recent past, nature conservation measures were sometimes in conflict with existing landscape values; for example old field patterns have been changed to provide a more natural environment with a subsequent loss of cultural value.

6.5 Industry and energy

At present, there are two locations for exploiting natural gas: the dune region of Hollum on West Ameland which is not being used, and the nature area of the Oerd on East Ameland where production began in 1986. The drilling rig and associated structures have a visual impact on the landscape but the exploitation of gas also causes subsidence with the potential for significant consequences for coastal defences, nature and landscape conservation.

7. Potentials

7.1 Settlement

Many of the tangible memories of the islands wealthy and unique past have been preserved; for example many of the monumental commanders houses in Hollum. There are 220 protected monuments or visually distinctive houses on the island and the structure of the old villages in relation to the surrounding rural area has been maintained as a result of an active village renovation policy; including appropriate building renovations, tree planting and characteristic paving which has helped to preserve the character of the four villages. Three of these, Hollum, Ballum and Nes are protected heritage villages. Opportunities to strengthen the historic connections between the development of the island's villages and surrounding rural landscapes can be provided by measures of protection, spatial planning or

interpretation and education. Knowledge and promotion of the island's cultural heritage among decision makers, planners and architects, could be used to inform the design of new structures and buildings.

7.2 Agriculture

Natural and logistical restrictions prevent an intensification of production on the island but there are possibilities for a combination of agriculture, tourism and recreation, such as the present cheese farm in the Ballumer polders. Farmland nature conservation through re-allocation plans like the 1996 Land Allocation with Administrative Character (RAK) management area, include protective management options for historic landscape features.

7.3 Tourism

On Ameland there is a strong demand from tourists for well maintained (historical) landscapes and cultural heritage which means there is an opportunity for investment in the quality of tourism infrastructure, from which landscape and heritage can then benefit. This potential should be nurtured, and regional and local policies such as the policy for sustainable tourism for the Wadden Sea Islands supports some growth in tourism on Ameland, particularly in relation to quality and diversity. Sustainable growth could come from the combination of farming and tourism/recreation and this sort of activity might also provide opportunities for the appropriate re-use of historic farm buildings.

Good accessibility to many parts of Ameland by foot or bike is an important benefit for tourism on the island. 100 kilometers of cycle track run through the islands diverse landscapes and there are cycle hire shops in all four villages. Ameland has six museums, including the Cultural-historical Museum Sorgdrager that illustrates the Ameland culture, and one nature centre offering various activities for tourists and school groups. In addition to the Tourist Offices (VVV's) and together with other historic buildings such as the lighthouse, mills, restored firehouse in Nes, churches and free standing towers, these could be used as focal points for the distribution of tourist information and integrated interpretation material, such as self-guided routes and trails around Ameland's historic and natural landscapes. Tourism is currently concentrated in the villages and dunes but there are opportunities to relieve the pressure on these areas by encouraging visits to the other parts of the island such as the polders, which offer space and an attractive historic landscape to explore.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden

Provincie Fryslan, 2006, Streekplan. Leeuwarden

Terschelling, NL

1. Overview

Name of entity:	Terschelling
Delimitation:	Island in the Wadden Sea
Size:	8935 ha
Location:	Province of Fryslân
Origin of name:	Not known
Relationship with other cultural entities:	Relationship with Ameland and Vlieland, neighbour islands
Characteristic elements and ensembles:	The island consist of dunes with a string of settlement on the east-west line and polders (former salt marshes) south of it, dwelling mounds, duck decoys, lighthouses

2. Geology and geography

2.1 General

Terschelling is one of the Frisian Wadden Sea islands off the northern coast of the Netherlands that separate the Wadden Sea and the North Sea. The natural landscape arose from an elevation of the sea level after the last ice age. The rise in sea level was accompanied by a corresponding rise in fresh groundwater level and the creation of a zone parallel to the coast where peat was able to develop on a large scale. Clay and sand were deposited on this peat layer facing the sea, while the peat on the landward side spread out over the more elevated sandy areas. As a result of the flooding of the Strait of Dover, the sea current changed direction and began to run more in parallel with the coast. This gave rise to a series of low-lying dune ridges, broken by rivers flowing into the sea. Following later marine incursions, the peat behind the ridges was eroded and the ridges were divided up into smaller pieces: the Wadden Sea Islands. Terschelling is characteristic of islands in a dynamic coastal area, with erosion in some areas and deposition in others. The islands shape is also determined by the strong sea current.

Like the East Frisian Wadden Sea islands of Schiermonnikoog and Ameland, Terschelling is an elongated island which becomes narrower to the east, with villages sheltering in the dunes. In addition the island has an area of reclaimed salt marsh, hook-shaped sandbars on the western side and extensive dunes and salt marsh flats on the eastern side. The open salt marshes have been protected in many places by a dyke against flooding from the Wadden Sea, but Terschelling also has an area without dykes and submerged at high water. There is a detailed policy for the coastal protection for the eastern and western parts, and dynamic coastal management is practised, enabling the natural process of erosion and accretion to take place. Like the other islands, Terschelling has a natural tendency to shift to the east.

2.2 Present landscape

At 30 km in length Terschelling is the longest of the Frisian Wadden Sea islands. Its strategic location means that Terschelling has been involved in numerous wars, in which both the villages and ships were repeatedly burnt.

The island has seven villages and a number of earth-mound settlements in the salt marsh area. The village of West-Terschelling has traditionally been a settlement for fishermen, pilots and captains and mariners. The other villages of Oosterend, Hoorn, Lies, Formerum, Landerum and Midsland lie in the lee of the dunes on an old beach ridge and are more agricultural in nature. The structure of the villages of Formerum and Midsland is reminiscent of the geest villages in North Holland, with a road running along the foot of the beach ridge. In addition there are a number of small earth-mound settlements in the salt marsh area, such as Kaart, Kinnum and Seeryp. West-Terschelling and Midsland are densely populated, while the other villages have lower-density housing.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Agricultural activity on Terschelling consisted mainly of livestock farming, with the cultivation of vegetables and cereals, both for human and cattle consumption. The vegetables and cereals were cultivated around the built-up areas on the sand ridges. The row of villages and the dunes were separated by areas used as hayfields, since the seepage from the dunes gave rise to a boggy and peaty area. These haylands on Terschelling were surrounded by alder groves. The trees were often planted on the damp side of ditches, so that the precious agricultural land could be used as efficiently as possible. On Terschelling there are remains of two hill fortifications, near Oosterend and Lies. Both of these were built by the Friesian family, Popma. The activities of the Popma's in eastern Terschelling prove the agricultural and maritime importance of this part of the island.

Additional income was also earned from the duck-decoys, of which seven still survive. A duck decoy consists of a lake, the cage-pond and one or more tunnels. The area is surrounded by a wood or swamp forest where ducks can rest on the water and take refuge from the wind. The size of the demarcated area varies, as do the shape and layout of the cages. There are various types of decoy, characteristic of North Holland, the island of Texel, Friesland and Terschelling itself. The latter two types provided a model for the cages on the German Wadden Sea islands.

3.2 Early Modern Times

For a long time agriculture formed an important but restricted source of income for the island population. There were however other means of making a living. From Hanseatic times the Wadden Sea area lay on the most important maritime trade routes. The switch in focus of trading activity around the Zuiderzee from the east to the west coast saw the emergence of towns such as Hoorn and Amsterdam. West-Terschelling benefited from this relocation of trade, since the shipping route to the North Sea ran via the Vlie channel between Terschelling and Vlieland. Seafarers and pilots settled in the area. The provisioning and pilotage of ships became an important activity for Terschelling, as they were in Vlieland, and West-Terschelling, in particular, was able to develop into a port. The economic boom of the Golden Age is reflected in the characteristic Commodore's houses of former ship's captains. West-Terschelling is also the site of the Brandaris lighthouse, which dates from 1594 and is the oldest surviving lighthouse in the Netherlands. The Brandaris was built at the expense of the States of Holland, after the former light beacon was engulfed by the sea. A special feature of this lighthouse is the cemetery located at its foot, the images and inscriptions on the gravestones provide a reminder of the past maritime connections of the local population. As late as 1874 Terschelling was still producing most of the mariners for the Dutch merchant navy. Terschelling's close links with merchant shipping and fishing resulted in the establishment in 1875 of the Willem Barentsz nautical school (college). This, together with the central location of the island, mean that a number of important nautical services have been established on Terschelling, such as the navigation channel marking service, the Traffic management on the Brandaris lighthouse, which is also the Wadden Sea Central Incident calling post

3.3 Modern Times

At the end of the 19th and in the early 20th century, with the introduction of fertilisers and the commercial availability of animal feed, agriculture became more productive. Agriculture on Terschelling then came to concentrate increasingly on dairy farming. Terschelling has a number of farms built between 1850 and 1930 that are unique in terms of both shape and layout. These are of the head and trunk type, a highly characteristic feature of which is the laterally protruding saddle roof, known locally as a schúntsje.

Land re-allotment took place between 1947 and 1950, when the highly fragmented and small plots were substantially enlarged and made more equal in size. The former arable fields were converted into meadows, the water level in the polder was substantially reduced and the drainage was improved by the installation of drainage channels. New roads were also constructed and old dykes cut away. Characteristic of the present island economy is the cranberry. The cranberry washed ashore by chance in the 19th century and then took root on a massive scale in the damp dune valleys. The fruit is used in all sorts of local Terschelling products, such as cranberry wine. The dune valleys where it is commercially grown require special management. This resulted in substantial changes to the landscape during this period. The land re-allotment also meant that a large part of the characteristic Terschelling haylands was lost.

4. Modern development and planning

4.1 Land use

At the end of the 19th century there were approximately 240 farms on Terschelling. At present there are still around 20 operational dairy farms, which maintain all the agricultural land.

4.2 Settlement development

Tourism became an increasingly important factor in the 20th century. Of the Dutch Wadden Sea islands, Terschelling was very much a latecomer in the tourism field; with agriculture and maritime business long remaining the most important sources of income for the island. However, nowadays tourism is the most important economic activity on the island and the municipality of Terschelling wishes to intensify tourism activities. There are many tourist bungalows and camping-sites on the island, particularly along the border line between the dunes and the villages. Due to the developments in tourism part of the old houses were converted to second (tourist) homes. Nowadays it is a struggle to find appropriate places to build new houses for the local population.

4.3 Industry and energy

The business sector is locally orientated and largely determined by the tourist sector. There are only very small industrial activities.

4.4 Infrastructure

The main road is west to east. Apart from the paved roads to the beach and in the villages the infrastructure consists mainly of bicycle roads. The good accessibility of many parts of the island by foot or bike is especially important for tourism benefits, where necessary new connections made.

5. Legal and spatial planning aspects

The Legal and Spatial Planning Aspects are described in a general way, as these are relevant to all the cultural entities in the province of Fryslân. Due to the scale of the cultural entities (which cover more than one municipality), the focus is on regional policy and

management. However, the goals of the regional policy and planning strategy are taken into account by the local sector planning policy. The regional goals and strategies are formulated after discussion with a wide range of stakeholders and organisations.

The regional spatial plan for the province of Fryslân, called Streekplan, is an important document in terms of the integrated management of landscape and heritage. This plan presents objectives for regional and local policy, as well as considering issues of landscape and heritage. At this moment (mid 2006) the province of Fryslân is finalising her new regional spatial plan. The essential qualities of the different landscapes of Fryslân are described. These qualities are seen as important and should be taken into account when making planning decisions. The recognition of the essential qualities of the landscapes, and the strengthening of them, is a primary objective. The plan (Streekplan) emphasises the need for protection of the historic landscape and protection by development.

In provincial (spatial) policy, the Frisian islands have a special position because of their very specific situation. The landscapes, the nature and the cultural heritage is highly valued, and the space for development is limited. The general policy for further development is to look for opportunities for improving the quality of the existing supply, instead of further expansion. Terschelling has a specific zoning plan and a regional management plan for the areas of national interest.

6. Vulnerabilities

6.1 Settlement

The expansion of tourism has resulted in a large number of properties becoming second homes or holiday properties. This results in added pressure to expand the settlements with the threat of altering their historic character. The re-use of buildings on the farmyards doesn't always fit in to the historic character of the island.

6.2 Agriculture

Agriculture is an important part of the economy of Terschelling, although it is in decline. In the recent past, agricultural improvements have significantly altered the historic field pattern. The scale of the farms is small and as a result they need to look for alternative supplementary incomes, frequently via tourism. The challenge remains to look for new ways to maintain sustainable agriculture on the island.

6.3 Tourism

The development of tourism over the last decades has resulted in significant changes to the landscape. The major expansion of tourist accommodation is more visible in the open landscape south of the villages and has significantly changed the settlement pattern. The existing holiday accommodation is also becoming redundant as new forms of tourist accommodation are wanted. Lack of investment in the quality of the tourist infrastructure by entrepreneurs can lead to a decline in the tourist economy, as is being seen in the area behind the dunes, with a potential impact on the maintenance of the historic landscape and cultural heritage.

6.4 Nature conservation

Nature protection is important on the island and measures for nature protection, such as the removal of field boundaries, have sometimes been in conflict with existing values of the historic landscape.

6.5 Natural processes

A continual process of erosion is taking place which threatens cultural heritage assets on the island.

7. Potentials

7.1 Settlement

Trade, fishery and agricultural land use, and early tourism, have left their marks in the character of villages and fields. The many dispersed farms and small villages on Terschelling with their varied character are well preserved.

7.2 Agriculture

The growing awareness of the importance of the local agricultural economy for the landscape and heritage should be encouraged with the potential of promoting local produce and retaining historic farming methods.

7.3 Tourism

The policy for sustainable tourism for the Wadden Sea islands supports some growth in the quality and diversity of tourism on Terschelling. Tourists are seeking higher quality and wider choice in the holiday accommodation and activities provided and this provides great potential both for the management, promotion and preservation of the cultural heritage of the island. The good accessibility of many parts of the island both by foot or cycle provide the potential for the creation of cultural heritage routes or integrated cultural heritage and natural environment trails. Overall, more than 40% of the employment on the Dutch Wadden Sea islands is directly related to tourism providing a major opportunity to promote the cultural heritage of the island.

7.4 Nature conservation

Nature protection is important on the island and these areas provide the potential for integrated management planning, for the protection, enhancement and promotion of both the natural environment and cultural heritage. The islands duck decoys are a good example of where this could apply.

7.5 Marine history

The bay of West-Terschelling with its lighthouse (de Brandaris) is unique. It is the only harbour in a natural bay in the Netherlands. The island of Terschelling is working on upgrading the harbour and ferry area of West Terschelling. There is the potential for the cultural heritage of the area to benefit from these investments.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden
Provincie Fryslan, 2006, Streekplan. Leeuwarden
Provincie Groningen, 2000, Provinciaal Omgevingsplan, Koersen op Karakter, Groningen

Middelzee, NL

1. Overview

Name of entity:	Middelzee
Delimitation:	The east dyke of Westergo and the west dyke of Oostergo, in the north by the coastline
Size:	Approx. 17,000 ha.
Location:	Province of Fryslân
Origin of name	The name "Middelzee" only came into use around 1500. Before that the names Boorne, Bordine or Bordena, meaning border, were used as far back as the 8th century.
Relationship with other cultural entities:	As a marine bay, the area has similarities to the Lauwers and the Dollard
Characteristic elements and ensembles:	The former Middelzee bay is still recognisable in the landscape due to the old seawalls of Westergo and Oostergo. The area is an open landscape with cross dikes which indicate the phases of silting up. Rectangular large-scaled structured landscape; Oude en Nieuwe Bildtdijk with typical housing on the old sea wall; 't Bildt" farm buildings, sluice villages

2. Geology and geography

2.1 General

The landscape of the Middelzee and the Marne originally consisted of a number of bays. Around 500 BC the Middelzee was an estuarine bay of the river Boorne separating Oostergo from Westergo. Over time this inlet found its way deeper and deeper inland. A western branch originated c.1000 AD in the neighbourhood of Bolsward, on the Marne. The northern part of Westergo was at that time entirely surrounded by water, or at least by salt marshes which were submerged at high tide.

2.2 Present landscape

The landscape is open and predominantly agricultural. The various cross dikes are visible in the landscape, as are the former sea dikes, which now have an important role in carrying traffic.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The first dikes in Oostergo and Westergo were built in the 11th century. At the same time the Middelzee and the Marne bay began to silt up. Bit by bit the old sea inlets were surrounded by dikes and transformed into agricultural land. Reclamation began once an area had become sufficiently silted up, and the dike would form a dam across the land. For reclamation in this area, the dikes of the old land formed the basis for new barrages. Land was reclaimed in one of two ways. The residents created local embankments that ran parallel to the Middelzee dikes. The Piksharnedijk to the west of Goutum is such an embankment. More important, however, were the dikes laid across the Middelzee dikes, which dammed up

parts of the channel. With the construction of each new dike to seaward, the previous dike lost its function as a sea dike and became a sleeper or inner dike – a second line of defence.

The creation of the polders began to the east of Bolsward. The first enclosure of part of the Middelzee was the Skieppeleane/Jonge Dijk to the north-east of the village of Nijland. This dike was built at the beginning of the 11th century, enabling the cultivation of the Marlan. The exact position of the seaward Middelzee dike to the south of the Marlan is uncertain. The reclamation of this area made the low-lying peat moors to the south of the Marlan safe from flooding. Shortly after that the Hartwert-Kliuw dike was built, closing off the Middelzee inlet in the direction of Waaxens. The next barrier, at the start of the 12th century, was the Nijlandsdijk/Lage Dijk between Grootewierum and Scharnegoutum. Around 1240 the Krinserarm was embanked on a level with Easterwierrum and Raerd. This short dike closed off the south-western arm of the Middelzee. In the 13th century the process of silting up accelerated as the Zuiderzee was formed. Around 35 years later the Boksumerdyk was built eight kilometres north of the Krinserarm, claiming approximately 2500 hectares of new land from the sea. The Skrédyk, from Beetgumermolen to Stiens followed around 1300. This was the last dike in the reclamation of the Middelzee. The reclaimed lands were used largely as pasture.

The new lands of the Middelzee have never been heavily populated as most of the land was divided between the existing settlements sited on the old land. The settlement pattern in these areas still largely consists of dispersed buildings. With the exception of the village of Nijland, the farms tend to be located along the old dikes. Part of the new land was reclaimed by the monasteries sited on the edges of the Middelzee, such as those at Thabor and Nije. The amount of new land available to them was limited, because the surrounding villages were keen to use the new land themselves. However, the monasteries obtained their estates through dike breaches and floods; if an owner could not afford to restore a dike after a breach, the monasteries took over the land. The Krinserarm dike was built entirely by a monastery. The Bloemkamp monastery was founded around 1190 on reclaimed land.

3.2 Early Modern Times

The area continued to silt up, allowing more polders to be created. These new lands however no longer belonged to Oostergo or Westergo: instead a new community was formed: the Bildt. This area was reclaimed under the regime of the Duke of Saxony. Around 1500 he appropriated the lands outside the dikes and concluded an agreement with four Dutch nobles to enclose the area with dikes and prepare it for use. The first dike in the Bildt was the Oude Bildtdijk, which enclosed the old Bildt. In 1600 the Nieuwe Bildtdijk and the Koedijk were built and the Nieuw Bildt polder was formed. These two dikes became sleeper dikes when the Poldijk and Noorderleegdijk were built in 1715 and 1754, to enclose the Oude Bildtpollen and the Nieuwe Bildtpollen. According to Frisian tradition, several inner dikes were also built to provide protection if the seaward dike was breached. The new lands of the Bildt proved ideal for arable farming, particularly for seed potatoes.

A number of waterways were dug for the drainage of the Marne bay and the Middelzee. In the southern polders these waterways often have an irregular course, while a network of straight waterways was created in the Bildt. In places where small drainage channels crossed a sea dike, a sluice or zijk was created to discharge the water. As more and more dikes were built this type of sluice was found increasingly in the middle of the countryside, by a former sea dike where the channel once emptied into the sea. For example, at Oude Leije there was an important Oostergo sluice, which discharged polder water into the Middelzee. After the reclamation of the Bildt the sluice had to be moved further seawards in the Oude Bildtdijk/Koedijk, and the village of Bildtzijk grew up around it. However, as the Bildt continued to silt up, the sluice quickly fell out of use, and in the next reclamation phase a new sluice was built in an extension to the old drainage ditch. In the end there were three sluices in a row, each with its associated village: Oude Leije, Oude Bildtzijk and Nieuwe Bildtzijk. The sluice at Nieuwe Bildtzijk is still used to discharge excess polder water. Both Oostergo and

Westergo had been in the habit of discharging water into the Middelzee, but drainage became a problem as the water turned into land. The Zwette was dug to form a boundary between Oostergo and Westergo. Westergo could still discharge water here: however as the dike was on the Oostergo side, the discharge point for Oostergo had to be moved to the Wadden Sea. In the 17th century the Zwette was widened to become a boat canal.

In contrast to the southern lands of the Middelzee, there are new settlements in the Bildt. As well as the ribbon developments along the roads several new villages have developed. The villages in this area take various forms. Sometimes a sluice would attract economic activity and typical sluice villages like Oude Bildtzijl grew up around them. In the Oud Bildt there are linear settlements sited along the central road, the Middelweg, or at crossroads. Three settlements were established from west to east along this road: Wijngaarden, Altoena and Kijfhoek. Wijngaarden and Kijfhoek are named after the South Holland homes of the nobles who ran the reclamation works in the Bildt. The place names changed over time to the names of the parishes, giving us the present-day Sint Jacobiparochie, Sint Annaparochie and Lieve Vrouwenparochie.

3.3 Modern Times

The former Middelzee which includes the Bildt, is a primarily agricultural area and has been traditionally used, managed and maintained on agricultural lines. It has been undeveloped for a long time and therefore still open. However, there has been a military airfield in the north of the Middelzee for some decades.

4. Modern development and planning

4.1 Land use

The south of the area is largely used for livestock farming and the north for arable cultivation with a specialisation in seed potatoes. Agriculture is a vital sector in the area, still capable of growth and innovation.

4.2 Settlement development

In the south, except in the village of Nijland, the dwellings are dispersed as a consequence of land division. The land newly reclaimed from the sea was added to existing villages. Leeuwarden has recently expanded further west to reach into the Middelzee area. Further expansion is anticipated.

The Bildt is the only place where new settlements have been built, and these are small, planned, new-build projects.

4.3 Industry and energy

In such an agricultural area, industry and energy sources tend to be agriculturally related. Wind turbines are set up at farms. There are business parks close to Leeuwarden, within the cultural entity of the Middelzee.

4.4 Infrastructure

The dikes now serve as roads. This makes them stand out in the landscape. A new provincial road is planned towards the Bildt. There is an active military airfield to the west of Leeuwarden, used by fighter jets, which causes noise nuisance.

5. Legal and spatial planning aspects

The Legal and Spatial Planning Aspects are described in a general way, as these are relevant to all the cultural entities in the province of Fryslân. Due to the scale of the cultural entities (which cover more than one municipality), the focus is on regional policy and management. However, the goals of the regional policy and planning strategy are taken into account by the local sector planning policy. The regional goals and strategies are formulated after discussion with a wide range of stakeholders and organisations.

The regional spatial plan for the province of Fryslân, called Streekplan, is an important document in terms of the integrated management of landscape and heritage. This plan presents objectives for regional and local policy, as well as considering issues of landscape and heritage. At this moment (mid 2006) the province of Fryslân is finalising her new regional spatial plan. The essential qualities of the different landscapes of Fryslân are described. These qualities are seen as important and should be taken into account when making planning decisions. The recognition of the essential qualities of the landscapes, and the strengthening of them, is a primary objective. The plan (Streekplan) emphasises the need for protection of the historic landscape and protection by development.

Chapters are devoted to landscape and to heritage. Both stress the importance of careful planning. Municipal councils are specifically asked to take landscape and heritage values into account. Extra emphasis is placed on zones beside major roads and the incorporation of large infrastructural works and radio masts. The plan also emphasises that there must be scope for new developments, such as horticulture zones, new business sites, larger residential areas, station areas, rural estates in urban expansion areas, certain large quality arrangements, new nature areas and large recreation parks. By imposing high quality standards on these developments, we create new landscape and heritage qualities for the future. Creating and maintaining new landscapes is primarily a development task for local councils.

6. Vulnerabilities

6.1 Spatial planning

The planned landscape of the Middelzee area is vulnerable to random spatial developments in housing, industry and intensive agriculture.

6.2 Settlement

The structure of the historic villages and their skyline are easily damaged by inappropriate development. On the Oude – en de Nieuwe Bildtdijk the maintenance of the typical housing in the slope of the sea wall and the method of construction of new houses are issues of concern.

6.3 Agriculture

Large concentrations of greenhouses can have a substantial negative impact upon the historic landscape and buried archaeology. The maintenance of the open character of the Middelzee area is vulnerable, especially along the borders with Westergo and Oostergo into the south (Leeuwarden West already forms a visual barrier).

6.4 Industry and energy

Wind farms in the western part of Leeuwarden endanger the open landscape.

7. Potentials

7.1 Spatial planning

Careful strategic planning has the potential to design large scale developments within the existing landscape respecting the historic layout.

7.2 Settlement

A range of settlement types from dispersed farmsteads to sluice villages have developed within the area. These have potential both for their historic development and their tourism potential.

7.3 Agriculture

A strong agricultural sector has the potential to conserve the vastness and structure of the landscape. The two Bildtdijken should keep their exclusive appearance and spatial surroundings being an unique feature in the whole Wadden Sea area.

7.4 Tourism

Developing of landscape and cultural tourism has real potentials as this area is so different compared with the other areas along the coast. In particular the re-use of historic buildings like houses and farm buildings should be enhanced. The area's specific history of land consolidation may be used in the broader perspective of cultural tourism along the Wadden Sea coast.

7.5 Nature conservation

In the north, just behind the dike, are the mud flats of northern Friesland, an area of high nature value visited by waterbirds. The integration of nature conservation and heritage conservation provides significant potential for both the protection, management and promotion of the cultural heritage.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden
Provincie Fryslan, 2006, Streekplan. Leeuwarden

Westergo, NL

1. Overview

Name of entity:	Westergo
Delimitation:	The Westergo area is bordered to the north and west by the Wadden Sea and the Ijsselmeer, the shallow lake formed when the Zuider Zee was closed off from the sea by a dam. The southern and eastern boundaries are formed by a system of dikes and a number of small lakes and waterways
Size:	Approx. 42,000 ha.
Location:	Province of Fryslân
Origin of name:	The north part of Fryslân was separated by the Middel Sea. The island on the west side is Westergo
Relationship with other cultural entities:	Adjacent to Oostergo and Middelzee, linked to Wieringen by the Ijsselmeer Dam.
Characteristic elements and ensembles:	Westergo contains the most extensive collection of dwelling mounds (terpen and wierden) in the Netherlands. Clustered dwelling mounds and in rows; dense groupings of water ways and former seawalls; historic field patterns, in particular radiating out from around dwelling mounds; very open landscape; medieval town centres and villages, Romanesque churches, historic farming buildings, brick houses (stinzen)

2. Geology and geography

2.1 General

The history of the area dates back to the last ice age, when the glacial melt-waters caused rising sea-levels, in turn pushing up groundwater levels. This caused peat to develop in a zone parallel to the coast. On the seaward side of this peatland a line of barrier bars and islands developed. These were subsequently breached by the sea in a number of places, breaking them up into smaller units, forming the Wadden Sea islands. The area between the barrier islands and the peatland was an intertidal zone of sand flats, tidal channels and salt marshes, which were inundated by seawater twice a day.

When the first inhabitants colonised the area there was a creek which penetrated deep inland, into which the river Boorne flowed. This creek slowly silted up and a new sound was created, the Middelzee, which served as an estuary for the Boorne. Sediments were deposited along the banks of channels, forming low levees. Behind these banks were lower-lying, relatively flat expanses of mudflats. To the north of Westergo a number of long salt marsh banks can be seen in the landscape running parallel to the coastline. Through this accretion of sediments the coastline has shifted a number of times in a northward direction. The most southerly salt marsh bank is therefore the oldest; those lying further north are increasingly younger. The transitional zone between the sea clay landscape and the peat landscape lies to the south of Westergo.

2.2 Present landscape

The current Westergo landscape is characterised by open fields, and many waterways and dykes. It is still relatively isolated, with poor connections to the national road network, particularly in the south-eastern part of the area because of many lakes. There are few main highways.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The earliest settlements were on the highest areas of land: the elevated (supratidal) salt marsh flats in the south-east, the salt marsh banks in the north and the levees along the Middelzee, the Marne and the smaller creeks. As soon as enough sediment had accumulated to raise a salt marsh high enough for it to become dry land, it appears to have been settled. However, the continuation in rising sea levels made it necessary to further artificially raise the ground level of these settlements. The sites were built up by adding manure and clay sods to create dwelling mounds, called 'terps'. The terp villages in the southern part of Westergo often have an irregular field pattern and the farms are dispersed over the area. In the northern part of Westergo, the field pattern is more regular and rectangular. Some of these terps were located on levees along creeks or sea inlets so that boats could moor alongside them. These terps, which have an oblong shape with buildings along both sides of a long road, were built for trading purposes, as opposed to the older dwelling mounds which were constructed primarily for farmsteads. Many terps lost their *raison d'être* when dikes were built.

One of the most striking features of the cultural history of Westergo is its dike system. This area contains the oldest dikes in the Netherlands. The first dikes were low and built to protect a farm or a few arable fields. In the 10th century increasingly large areas were surrounded by ring dikes: the *memmepolders*, or 'mother polders'. Creeks within the enclosed ring were dammed and fitted with sluiceways to control drainage. These mother polders then formed a basis from which additional areas of land were enclosed by dikes, which were built perpendicular to the older dikes around the mother polders. As this extensive system of dikes grew, many of the earlier dikes lost their function as sea defences and became 'sleeping dikes', or back dikes. A sleeping dike is a flood barrier that is only needed if the primary water-retaining structure, the sea dike, is breached. Many sleeping dikes have fallen into disrepair over the years and have been dismantled. Nevertheless, some remain and are still visible in the landscape, such as the Griene Dijk and the Slachtedijk.

Clay was excavated from other sites for the manufacture of bricks. These sites are still marked out in the landscape by the abrupt differences in ground level between the excavated areas and the surrounding land. 'Crown-shaped plots' can be seen in some places. These were created by digging up the soil from the edges of the plot depositing it in the middle to improve drainage and to spread the risk of crop failure: in wet years the highest parts of the arable plots produced the greatest yield; in dry years the lower areas were more productive. In Westergo livestock farming has always been the principal agricultural activity. Arable farming was only possible on the elevated, drier salt marsh banks.

3.2 Early Modern Times

The dikes were originally built to keep out the sea, but from the 11th and 12th centuries onwards they were built to reclaim land. Before this time parts of Westergo were regularly inundated by the sea and areas of land were washed away. The results of these attacks on the coastline area are clearly visible in the irregular, notched shape of the Zuider Zee coastline. In other places the dikes were breached, leaving behind pools scoured out by the seawater as it gushed through the breach. The dikes were repaired by rerouting them around the pools and so in time they acquired a winding and bendy shape. The function of the trading terp villages, which lost their open connection by water with the Wadden Sea

because of the construction of continuous dikes and reclamation of the sea inlets, was taken over by the dam and lock villages (zijldorpen) which grew up around the dike locks (zijlen). In total about 700 dwelling mounds and terp villages were built in Westergo. At the end of the Late medieval period there were five towns in Westergo: Bolsward, Workum, Harlingen, Franeker and Hindeloopen. These towns still have their well kept, historic town centres.

From the 19th century the dwelling mounds or terps were quarried as a source of rich soil to fertilise the arable fields. The buildings on them were often demolished and rebuilt after the mound had been excavated. Only the steep cuttings and fragmented remnants of the villages are still visible in the landscape, evidence of the large-scale excavations.

Westergo has not only fought a running battle with the sea; controlling the water inland has also presented a problem. After the construction of the dikes, natural drainage was no longer possible, and numerous canals, such as the Zwette, were dug. In addition natural watercourses were adapted and sluices built. In the south-west a number of shallow lakes were reclaimed by pumping out the water. There are three large and several small reclaimed lakes. The regular small-scale field pattern of the larger reclaimed lakes are in clear contrast to the surrounding irregular, rectangular field patterns.

For a long time, water was an important means of transport. The natural landscape contained a fine network of channels, gullies and creeks, some of which were connected and used for drainage and navigation. In the 17th century a network of through waterways (trekvaarten) were built. Existing canals between the main towns were widened and deepened and towpaths constructed along one or both sides, e.g. the Harlingertrekvaart. For a long time overland transport was limited to unpaved roads on the dikes, the towpaths and the higher parts of the salt marsh banks, but at the end of the 19th century the country roads were supplemented with not only a rail network but also a number of tramways and local railways. However, the tramways and local railways soon fell into disuse when buses and lorries appeared on the scene. The routes of many of these tramways and railway lines can still be seen in the landscape in the form of railway embankments and the lines of field boundaries.

An important cultural and historical feature of Westergo are the brick houses (steenhuizen or stinsen). Originally these were single defensible brick towers, built on mounds (stinswier) and surrounded by a moat and an earth rampart. They initially served as places of refuge, but later on more habitable buildings were built (zaalstinsen). The only three remaining examples of these early brick buildings have been converted into country houses.

3.3 Modern Times

In many places the original field pattern has been altered or lost as a result of land re-allotment schemes carried out during the 20th century. As transport technology developed at a rapid pace during the 20th century, land transport gained in importance at the expense of water, in spite of the enlargement of some of the major canals connecting the harbour town Harlingen with Leeuwarden and Groningen (van Harinxmakanaal). Many new roads were built, but the numerous lakes and waterways outside the entity, have always hampered the expansion of the road network. Most of the old brick buildings (the stinsen) have been demolished to make way for farms. However, many of the old moats have left their imprint in the landscape, and tall trees still mark the locations of these early towers and manor houses.

4. Modern development and planning

4.1 Land use

Most of the land in Westergo is under agriculture, specializing in dairy farming. In the northern part of Westergo near Berlikum there is a concentration of greenhouse farming. The area was, and is, very suitable for agriculture and planners anticipate that agriculture will remain the principal land use activity.

4.2 Settlement development

The villages on dwelling mounds are still recognizable. Nearly all the villages and the historical towns have new building developments on the fringe, some of which badly fit into the old structure and landscape. However, more attention is now paid to planning and building developments so that they integrate better into the cultural and natural landscape.

4.3 Industry and energy

Near the old towns, particularly the harbour town of Harlingen, business and industrial parks have developed. Between Harlingen and Franeker the strip along the canal has been progressively infilled with industrial buildings. In addition, the larger villages all have their own business-parks.

The open landscape, combined with the windy climate, makes Westergo a suitable area for wind-generated energy. Early policy encouraged the erection of individual small wind turbines near farmsteads. This policy has changed to the encouragement of concentrations of windmills in wind-farms.

Industry was originally agriculturally-based, but this link is becoming less important. The harbour of Harlingen is the location for a few big companies and a gas transition plant.

4.4 Infrastructure

The highway from Leeuwarden to Harlingen and the motorway from Harlingen to the enclosure dike (Afsluitdijk) are the most important transport links, being the fastest connection with Amsterdam and the surrounding area. There are two rail connections within the entity: Leeuwarden-Harlingen and Leeuwarden-Sneek, mainly used for passenger transport. As in the past, waterways are still important in this area, but apart from the main canal from Leeuwarden-Harlingen, they are now particularly significant for tourist traffic.

5. Legal and spatial planning aspects

The Legal and Spatial Planning Aspects are described in a general way, as these are relevant to all the cultural entities in the province of Fryslân. Due to the scale of the cultural entities (which cover more than one municipality), the focus is on regional policy and management. However, the goals of the regional policy and planning strategy are taken into account by the local sector planning policy. The regional goals and strategies are formulated after discussion with a wide range of stakeholders and organisations.

The regional spatial plan for the province of Fryslân, called Streekplan, is an important document in terms of the integrated management of landscape and heritage. This plan presents objectives for regional and local policy, as well as considering issues of landscape and heritage. At this moment (mid 2006) the province of Fryslân is finalising her new regional spatial plan. The essential qualities of the different landscapes of Fryslân are described. These qualities are seen as important and should be taken into account when making planning decisions. The recognition of the essential qualities of the landscapes, and the strengthening of them, is a primary objective. The plan (Streekplan) emphasises the need for protection of the historic landscape and protection by development.

6. Vulnerabilities

6.1 Spatial planning

The open space, skyline and structure of the historical cities, towns and villages are very vulnerable to ill informed planning for new housing and industry. This is especially the case in the economic development zone between Harlingen and Franeker and in the cities themselves (i.e. the extension of the harbour of Harlingen).

6.2 Settlement

The social economic situation makes industrial development a priority in the region; specifically in the Harlingen-Franeker area, which is part of the Westergozone, and in Leeuwarden. In the Westergozone the focus of new housing and industrial development should be Harlingen and Franeker, both of which should remain identifiable as separate towns. Other settlements have room to further develop their industrial and housing estates resulting in a loss of agricultural land. New housing also requires more space. Cultural assets within these areas will be vulnerable to change. Many of the smaller settlements that had been on mounds have already been lost to agricultural improvements.

6.3 Agriculture

The historic field pattern, natural watercourses and the historic farm buildings are vulnerable due to agriculture developments. Within the framework of landscape core qualities there is room for large-scale agriculture and more intensive farming (greenhouse horticulture) with the associated innovative systems. Changes in the agricultural sector will bring new forms of building (new building mass) and the release of valuable farm buildings. The latter will be vulnerable to change and will require new creative uses while conserving the building's characteristic features.

6.4 Energy and Industry

The move towards wind power with more concentrated wind turbines may pose a threat to below ground archaeological deposits and the visual amenity of the wider landscape.

7. Potentials

7.1 Spatial planning

The proposed residential and industrial development should consider the cultural heritage, both in terms of recording prior to development and management of known sites. Within the historic core of the towns and cities careful planning should protect the historic layout and surviving buildings.

7.2 Settlement

Many historic settlements survive and these could be promoted for tourism. The dispersed settlement pattern of small villages and farmsteads have the potential to be promoted via tourism for their cultural heritage.

7.3 Agriculture

Sustainable agriculture in relation to meadowland, migrating birds and cultural historical elements contribute to the development of tourism. There is potential for disused agricultural buildings to be used for new housing, holiday accommodation or new small scale industrial enterprises.

7.4 Tourism

The area has clear potential for landscape and cultural history tourism. The use of historic buildings and farmhouses for accommodation, old paths for walking and cycling and old water ways for pleasure shipping is already practised and should be promoted further. The restoration and management of cultural features will encourage a wider interest via tourism in

the area. One of the most striking features of Westergo is the dike system which has the potential to be promoted as a significant tourist attraction especially for walkers and cyclists.

7.5 Maritime history

The specific qualities of Harlingen as a port can be used to promote the maritime history of the area. This could be linked with the important canal system which can be promoted via tourism.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden
Provincie Fryslan, 2006, Streekplan. Leeuwarden

Vlieland, NL

1. Overview

Name of entity:	Vlieland
Delimitation:	Island in the Wadden Sea
Size:	4022 ha
Location:	Province of Fryslân
Origin of name:	Related to the river Vlie
Relationship with other cultural entities:	Relationship with Texel and Terschelling, neighbour islands
Characteristic elements and ensembles:	The island consist purely of dunes with a settlement on the south-east side, duck decoy, lighthouse

2. Geology and geography

2.1 General

Vlieland is one of the Frisian Wadden Sea islands off the northern coast of the Netherlands that separate the Wadden Sea and the North Sea. The natural landscape rose above sea-level after the last ice age. Since the rise in sea level was accompanied by a higher fresh groundwater level, there developed a zone parallel to the coast in which peat was able to develop on a large scale. Clay and sand were deposited on this peat layer facing the sea, while the peat on the landward side spread out over the more elevated sandy areas. As a result of the flooding of the Strait of Dover, the sea currents changed direction and began to run more parallel with the coast. This gave rise to a series of low-lying dune ridges, broken by rivers flowing into the sea. As a result of later incursions by the sea, the peat behind the ridges was eliminated and the ridges were divided up into smaller pieces, forming the Wadden Sea Islands. Vlieland bears the evidence for a dynamic coastal area, where the erosion in some areas and depositions in others, due to the strong sea currents have had a major influence on the form the island has taken. Unlike the other three inhabited Friesian Wadden Sea islands, Vlieland does not have any salt-marsh polders. The island consists almost entirely of dunes, with a hamlet on the north-eastern side.

2.2 Present landscape

On the other Wadden Sea islands the sand flats, main village and ferry causeway are on the western side of the island and the extended beach and dunes on the east, on Vlieland this is the other way round. The village is in the eastern part of the island, and the natural landscape, in the form of an extensive, barren plain and an elongated, narrow strip of dunes, in the west and middle. The large quantities of sand on this Vliehors flat and the prevailing westerly winds led to the formation of the highest dune on the Wadden Sea islands: the 40-metre high Vuurboetsduin, on which the lighthouse has been built.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The earliest documentary reference to Vlieland is for 1317. For many centuries Vlieland had two villages, but as a result of coastal erosion the village of West-Vlieland slipped into the sea in the early 18th century. Vlieland was formed thanks to intensive interaction between natural forces and human action. People made use of the possibilities afforded by coastal erosion and the deposition of sediment. The sand dunes were stabilised by means of artificial planting and extra coastal defences were added where the dune belt was particularly low or narrow. The island is subject to erosion for almost the entire length of its North Sea coast, and short breakwaters have been built along this coast in order to protect it.

3.2 Early Modern Times

In the 17th century the village of Oost-Vlieland grew because of the large number of ships anchored in the lee of Vlieland waiting for favourable winds. Vlieland played an important role in pilotage and provisioning for these vessels. A lighthouse was built on the island to aid the passage of these ships. There are a number of 17th-century properties in the village, including the Tromphuis, which was formerly owned by the Admiralty and is now furnished as a museum. In the 18th century the village of West-Vlieland slipped into the sea.

Apart from shipping, important sources of income for the island economy were the maritime trade and fishing, plus such activities as beachcombing and smuggling. In contrast to the other islands, the lack of suitable agricultural means that there is no farming practised on Vlieland. The importance of maritime activities to the local economy changed with the opening of the North Sea Canal (1876) and the advent of steam-shipping. After a severe depression, the emphasis shifted from the 1920s onwards to tourism. In addition, the military exercise grounds of the Ministry of Defence provide work for some 20% of the current labour force.

There is a duck decoy at Vianens Vallei on Vlieland, consisting of a lake, the cage-pond and one or more tunnels. The area is surrounded by a wood or swamp forest where ducks can rest on the water and take refuge from the wind. These areas provide a contrast of green within the dune landscape. Decoys were used in order to catch wild duck and similar fowl. Wildfowl trapping was a traditional activity of cultural-historical value and the decoys represent unusual, historic elements of the landscape where peace and space are highly important.

3.3 Modern Times

On the western side of the island, against the large sandflat known as the Vliehors, are the Kroons' Polders. These formed in the early 20th-century and are now a nature reserve. The Vliehors sandflat itself is a military training area. Like the other Wadden Sea islands, Vlieland remains locked in a struggle with the sea. The centuries-old battle against accretion and especially the erosion of land, whereby the island appears to be "walking", continues unabated. However, the principal danger to the village of the Oost-Vlieland was not water but sand, which used to drift into the village, especially in winter. Around the turn of the last century the situation became untenable. For the symbolic sum of one guilder the municipality sold its wasteland to the National Forest Service, which undertook the planting of a woodland to stabilise the sand. After some searching and experimentation with the right tree species for the previously treeless island, a wide belt of trees was planted around the village between the two World Wars. Virtually all the land outside the residential area is still owned by the National Forest Service.

4. Modern development and planning

4.1 Land use

The island of Vlieland differs from the other islands in the Dutch Wadden Sea. It is small and it has an almost totally natural landscape. There are no marshland polders, and only one very small area of agricultural land on the island.

4.2 Settlement development

The only surviving village (there had been two villages in the medieval and early modern period) is sited on the Wadden side with a harbour. Most of the villages on the other islands have developed on higher grounds, on the transition between the dune zone and the marshland. However the history of habitation and cultivation of Vlieland differs from the other islands, giving it its own unique character and the feeling of a place apart from the rest of the world. The wide views, quietness and darkness are mentioned as parts of the island's unique selling points. Trade and fishery have left their marks in the village, which is well kept, with many historic structures. The first major extension to the village was built in the forest, only recent houses are built on the north side on the higher grounds (dunes). The good accessibility of many parts of the island by foot or bike is an additional benefit to the tourism of the area. Tourist accommodation is in the form of hotels and a lot of bungalows, which have their impact on the dune landscape.

4.3 Industry and energy

Overall, more than 40% of the employment on the Dutch Wadden Sea islands is directly related to tourism. On Vlieland tourism forms the principal basis of the economy.

4.4 Infrastructure

Visitor's cars are not allowed on the island, there is a high density of bicycles and footpaths.

5. Legal and spatial planning aspects

The Legal and Spatial Planning Aspects are described in a general way, as these are relevant to all the cultural entities in the province of Fryslân. Due to the scale of the cultural entities (which cover more than one municipality), the focus is on regional policy and management. However, the goals of the regional policy and planning strategy are taken into account by the local sector planning policy. The regional goals and strategies are formulated after discussion with a wide range of stakeholders and organisations.

The regional spatial plan for the province of Fryslân, called Streekplan, is an important document in terms of the integrated management of landscape and heritage. This plan presents objectives for regional and local policy, as well as considering issues of landscape and heritage. At this moment (mid 2006) the province of Fryslân is finalising her new regional spatial plan. The essential qualities of the different landscapes of Fryslân are described. These qualities are seen as important and should be taken into account when making planning decisions. The recognition of the essential qualities of the landscapes, and the strengthening of them, is a primary objective. The plan (Streekplan) emphasises the need for protection of the historic landscape and protection by development.

In provincial (spatial) policy, the Frisian islands have a special position because of their very specific situation. The landscapes, the nature and the cultural heritage is highly valued, and the space for development is limited. The general vision for developments on the island is to look for opportunities for improving the quality of the existing supply, instead of a further extension of it.

6. Vulnerabilities

6.1 Settlement

Vlieland only contains a single surviving settlement, Oost-Vlieland, which is under pressure to expand with the growth of tourism on the island. This could detract from the historic core of the settlement if development is not carefully planned.

6.2 Tourism

In some locations there is a need for upgrading and widening the quality and appeal of the tourist accommodation. Discussion has started on how to design and build recreational housing in the dunes. On Vlieland tourism is almost the only basis for the economy which is therefore rather fragile. Lack of investments in the quality of the tourist infrastructure can lead to a decline of the tourist economy and therefore a threat to the maintenance of the landscape and the cultural heritage of the island.

7. Potentials

7.1 Settlement

The settlement on the east side of the island, Oost-Vlieland, provides a centre for tourism. Careful control of new buildings and expansion should protect the historic core which retains its historic authenticity

7.2 Tourism

The island of Vlieland is a popular place for family tourism. There is an opportunity for investment in the quality of the landscape and cultural heritage as this is seen to be important in attracting tourists. The policy for sustainable tourism for the Wadden Sea islands supports the objectives of quality and diversity. The cultural heritage of the island and in particular its maritime history, provides opportunities for the creation of cycle tours or walks around the island, especially when these are integrated with promotion of the natural environment.

7.3 Maritime history

The settlement of Oost-Vlieland, developed as an early trading and fishing centre providing the early economy of the island. The trading and fishing industry provide a source for the potential promotion of the maritime history of the area.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden
Provincie Fryslan, 2006, Streekplan. Leeuwarden

Texel, NL

1. Overview

Name of entity:	Texel
Delimitation:	Island, neighbouring entities Vlieland, Kop van Noord-Holland
Size:	16.000 ha
Location:	Province of Noord-Holland
Origin of name:	First annotation as Insula Texla in the Middle Ages
Relationship with other cultural entities:	Connected with Wieringen, both islands have a core of glacial till
Characteristic elements and ensembles:	Glacial till relief, sheep sheds, turf-banks

2. Geology and geography

2.1 General

Texel differs from the other Wadden Sea islands in that the core of the island consists of glacial till, deposited during the penultimate glaciation when large parts of the Netherlands were covered by ice. After the last ice age, about 10,000 years ago, the surrounding areas underwent considerable physical changes, but the glacial till deposit remained firmly in place and has shaped much of the coastline of the northern Netherlands. The island subsequently grew in size through the accretion of sand around the till deposit and the formation of sand flats.

2.2 Present landscape

The natural dynamics of the sea environment around Texel continue undiminished. The Noorderhaaks sand flat is currently moving in an easterly direction and will probably eventually connect with Texel. The island is growing. The present landscape on the island of Texel is one of dunes, pastureland, woods and polders.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The highest point of Texel outside the dunes area is the Hooge Berg near Den Burg (15 m), the centre of the glacial till deposit. The Hooge Berg has always attracted human interest, partly because of its proximity to the sea, and scattered archaeological finds are evidence of human activity in the Palaeolithic and Mesolithic periods. The site may have been permanently occupied since the Middle Bronze Age, and for a long period the main form of subsistence was agriculture and fishing. Den Burg is thought to be Viking in origin, with the central circular ring thought to date to this period. The outer ring is a bulwark dating from the 14th century.

3.2 Early Modern Times

The appearance of the present-day island of Texel has been shaped partly by natural processes and partly by human action. The island increased in size because a sand dike (1629–30) was built between the original island, which consisted mainly of low hills of glacial

till and cover sand, and the dune island of Eijerland. The salt marsh to the east was surrounded by a dike and reclaimed in 1835 (the Eijerland Polder). Subsequently, in 1855, a new sand dike was built further out towards the sea beyond the first dike, but in 1858 this second dike was breached by the sea in three places. One of these openings, the Slufter (meaning a tidal creek or sea inlet), still exists today. To the south-west of the island lie a series of curved sand banks with dunes and an adjoining sand flat, the Hors. In the 1930s the Hors expanded as the Onrust sand flat, which had formed in front of the entrance to the Marsdiep channel, moved to the east and came to rest against Texel. A process of accretion was also set in motion on the eastern side of the island and an area of salt marsh was formed, which was gradually raised by the deposition of sediments and eventually became dry land. These salt meadows make good agricultural land, and in 1847 they were enclosed and reclaimed to create the Prins Hendrik Polder.

The island's inhabitants used the landscape for agricultural activities. The old land was cultivated in small fields, whereas the new polders were divided up into regular parcels. Besides agriculture, the inhabitants were also active in fishing and providing supplies and storage for shipping.

Specific features of the island are the schapeboeten, or sheep sheds – which recall the importance of sheep farming to the area – and the turf-banks (tuunwallen), which are walls built from grass turf, usually about a metre high. They date from the seventeenth or eighteenth century. This method of field division was only used on the higher ground where the water level was too low for ditches.

The settlements on Texel are mostly in the form of linear settlement, such as Den Hoorn. Den Burg is an exception; it is situated in the centre of the island and therefore assumed the role of core settlement. Most of the oldest buildings on Texel are found in Den Burg, such as the 15th century Reformed Church, the Oudheidkamer (Museum of Antiquities) and several fine 17th century houses. Texel also has a seaport, Oudeschild. For a short time Oudeschild was a naval port, until this role was taken over by Den Helder. The harbour dates back to 1780, but long before that merchant ships used to wait in the anchorage off Texel for favourable winds. The presence of the Marsdiep channel, which allowed large ships to set sail when the wind was favourable, provided an enormous boost to the island economy. The wells of Brakenstein farm at the foot of the Hooge Berg provided water to provision the ships, including those of the East India Company. The Schilsloot canal was dug early in the 17th century to facilitate transport of the water barrels, which were carried by rowing boat from the wells to the ships. The proximity of the Marsdiep channel was also of strategic military importance and the Oude Schans fortification to the east of Oudeschild, which dates from the Eighty Years War, has had a long and active history.

3.3 Modern Times

The landscape that we see now on the island has been transformed by careful landscape planning, because 100 years ago it was a largely open landscape. At that time the newly established National Forest Service (Staatsbosbeheer) was granted 3000 hectares of land on Texel and planted part of this with trees. The resulting woods now contribute to the variety of the landscape.

4. Modern development and planning

4.1 Land use

On the island of Texel there has been a long tradition of agriculture. The great variety in the shape of the fields, woods and other plots of land that emerged over time on Texel has been greatly diminished by the land consolidation projects carried out in the 20th century. The process of field enlargement is still ongoing and agriculture is still the main economic base for the island. The old land, the dunes and the shore have been restored to a natural state. The Wadden Sea is widely recognised as a special environment and is likely to be nominated as a World Heritage area.

4.2 Settlement development

The islands of the Wadden Sea, because of their beauty, are extensively protected by legislation. A lot of the settlements are protected as monuments, which means that there are no large-scale building works near the villages or in adjoining fields. The influence of tourism can be seen in a village like De Koog where all the houses have been converted to hotels, second homes etc, leading to widely varying seasonal population and employment levels.

4.3 Industry and energy

Beside agriculture and tourism there are no other important industries on Texel. Apart from a few wind turbines near farmsteads there are no energy-creation sources on the island.

4.4 Infrastructure

There is a single main road on the island from the harbour to De Cocksdorp, with side roads connecting to this and there are no congestion problems on the island. The tourism industry is supplied with an excellent pattern of paths for cycling and walking.

5. Legal and spatial planning aspects

The Legal and Spatial Planning Aspects are described in a general way, as these are relevant to all the cultural entities in the province of Noord Holland. Due to the scale of the entities (which cover more than one municipality), the focus is on regional policy and management. However, the goals of the regional policy and planning strategy are taken into account by the local sector planning policy. The regional goals and strategies are formulated after discussion with a wide range of stakeholders and organisations.

In October 2004, the Province of Noord-Holland put into force the Development Perspective of the sub region Noord-Holland-noord in the framework of the regional spatial planning. The area of the Hooge Berg and up to the north east is designated as a Landscape Pearl because of its very special landscape and cultural history.

The landscape and cultural history of the area should be the leading principle in the management and development of the area. Limited development of housing and industry is allowed on a local level. Quality tourism is to be promoted, however there should be no increase in overall numbers. Agriculture should be continued in a sustainable way. The rest of the agricultural part of the island is designated as an area for maintenance and development of agriculture, taking into account the landscape and cultural history values. The dunes and beach area are protected for nature conservation.

6. Vulnerabilities

6.1 Settlement

The expansion of tourism over the last few decades has clearly impacted on the historic settlement pattern of Texel. New build and extensions have had an impact on the visual impact of the historic settlements, although the general settlement pattern survives.

6.2 Agriculture

The historic fieldscape has largely disappeared since the 1960's as a result of boundary loss, through the process of consolidation and field enlargement which is still continuing. Many historic landscape features such as turf banks are threatened by modern agricultural land-use.

6.3 Tourism

The agricultural decline on the island due to the small scale of the farms has led to the need for diversification. This has resulted in inappropriate reuse of farm structures which do not fit

in well with the historic landscape. The development of large holiday parks directly behind the dunes is of considerable concern for its impact both on potential buried deposits and on the historic landscape. The increase in tourism has led to many houses being converted to hotels or being second homes resulting in a fluctuating population throughout the year.

7. Potentials

7.1 Spatial planning

Regional spatial policy has identified the Hooze Berg as a 'landscape pearl' which provides the opportunity to promote cultural heritage management and promotion.

7.2 Settlement

The settlement pattern with its varying pattern of historic villages and towns is mostly intact and protected. However there is the opportunity via planning requirements to promote the Cultural Heritage through careful development in the appropriate style for each settlement.

7.3 Agriculture

The rural development provides the opportunity to continue and promote historic farming practices which would both provide further income for the farmers, a tourist attraction and protect the historic landscape features. This could largely be based around the Texel Sheep. The promotion of the Texel sheep and historic farming practices could promote and increase the protection and management of historic landscape features such as turf banks and aisled sheep sheds.

7.4 Management of cultural heritage

Texel has a rich archaeological heritage from the prehistoric period onwards with the important Viking and later settlement at Den Burg, the port at Oudeschild, fortification of Oude Schans and the other historic settlements. The promotion of the Texel sheep and historic farming practices could increase the protection and management of historic landscape features such as turf banks and aisled sheep sheds. The fortified structures on the island and the Georgian uprising also have the potential for promotion.

7.5 Tourism

Texel already has a thriving tourism industry and there is potential to further promote the Cultural Heritage through the existing network of cycle routes, walking routes etc. There is the potential to use the historic Texel breed of sheep to promote products made from the animals which could also encourage the continuation of the historic farming methods. The different settlement types would also provide an interesting tourist route

7.6 Maritime history

The maritime history from the Viking period, through the construction of the port facility at Oudeschild and the relationship with the East India Company the maritime history of Texel has a high potential for promotion of the cultural heritage of the island.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden

Provincie Noord-Holland, 2004, Ontwikkelen met kwaliteit, ruimtelijke samenhang op uitvoeringgericht, (streekplan) Ontwikkelingsbeeld Noord-Holland Noord. Haarlem

Wieringen, NL

1. Overview

Name of entity:	Wieringen
Delimitation:	Former Island, neighbouring entities Texel, Kop van Noord-Holland
Size:	16,900 ha
Location:	Province of Noord-Holland
Origin of name:	Derive from the Frisian word "Wird" which means height
Relationship with other cultural entities:	Connected with Texel, both islands have a core of glacial till
Characteristic elements and ensembles:	Glacial till relief, duck decoys, eel grass, seaweed/eelgrass dikes, Romanesque churches, sod-banks and Pleistocene beaches, 'cloche' farmhouses

2. Geology and geography

2.1 General

Like Texel, the island of Wieringen differs from the other Wadden Sea islands in that the island consists of a Pleistocene core. Wieringen was not actually a Wadden Sea island, but a Zuiderzee island. Like the former islands of Urk, Schokland and Marken, Wieringen has no offshore bars, dunes or beaches. Before the island was connected to the mainland, the old island consisted of a Pleistocene core on a somewhat smaller scale than that at Texel. This layer of glacial till was deposited during the penultimate ice age when large parts of the Netherlands were covered by glaciers. While the surrounding areas underwent considerable physical changes after the last ice age, about 10,000 years ago, this till deposit remained firmly in place and thus determined much of the coastline of the northern Netherlands. In the Roman period almost the entire northern half of the province of Noord-Holland was covered by peat. This peatland stretched far into the present province of Friesland, broken only by the river Vlie, which at that time was a narrow channel connecting Lake Flevo with the North Sea. The higher ground of Wieringen rose above the peat landscape and was consequently inhabited from the earliest times onwards.

2.2 Present landscape

The structure of the former island is still recognizable. The land is higher than that of the surrounding polders. In addition the composition of the soil is derived from the glacial till.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The higher ground of Wieringen island was inhabited from the earliest times onwards. Finds from the Viking Age (c. 800-1100 AD) include two silver hoards, indicating that Wieringen was an emporium or trading place in Early Medieval times.

In the medieval period the landscape around Wieringen was characterised by the disappearance of large areas of peat. The human population played a significant role in this process. Farmers moved from the higher ground such as Wieringen into the fenland to reclaim it for agricultural use and also cut peat turfs to burn as fuel. By draining the area and burning off the peat the farmers reduced the ground level by several metres within a

relatively short time-span. This made it much easier for the sea to penetrate into the area. In the 12th century storms broke up and carried away large areas of the peat deposits between Friesland and Noord-Holland. The present-day IJssel and Wieringen lakes and the Marsdiep channel were created at this time. During this period the inhabitants were continually forced to adapt to new conditions. They had to abandon some places because they could not be defended against the sea; in other places they were able to take measures to protect their homesteads against the water. Wieringen provided a secure refuge within this dynamic natural environment.

3.2 Early Modern Times

The inhabitants of the small island of Wieringen were farmers and fishers. As on Texel, they built tuunwallen, sod banks, as their field boundaries. For its size, the island contained a large number of settlements, harbour and fishing towns like Den Oever. Den Oever, where the modern Barrier Dam begins and the Stevin lock and sluices are situated, is the main harbour, having taken over this role from De Haukes. In addition, the island has several farming settlements: Hippolytushoef, Oosterland, Westerland and Stroe.

Apart from agriculture, the island was known for two specific activities. First, the harvesting of eelgrass (*Zostera marina*), which was used as thatch, as litter or bedding for livestock and as a material for building dikes. The dike along the southern coast of the island still consists partly of eelgrass. When it became popular as a filling for mattresses, the eelgrass harvest became one of the principal industries on the island. A few of the old eelgrass warehouses still stand today. This industry came to an end in the 1930s when disease all but wiped out the eelgrass beds. The second activity concerns ducks. In the seventeenth century there were 15 duck decoys on the island, which were used to trap wild ducks for the table. Two still remain. Domestic ducks were also kept for their down and to supply eggs. Duck farming was concentrated around De Haukes and was closely tied to the fishing industry because the ducks were fed with undersized fish that could not be sold.

A special feature of both Texel and Wieringen is the type of farmhouse found on these islands. It is a variant of the Noord-Holland stolpboerderij or 'cloche' house, known for its pyramid-shaped roof that covers both the living quarters and the livestock shed in one building. In the farmhouses on the island, the barn is housed within the square base of the pyramid. However, not all the living space and livestock stalls can be accommodated in this space and these sometimes are housed in extensions built onto the sides. Experts say that this is an older form. One of the unique characteristics of a Wieringen farmhouse is the high wooden rear wall of the barn. Another special feature is the chimney by the threshing floor at the corner of the working area and the living quarters, where fires could be made for cooking livestock feed and heating washing water.

3.3 Modern Times

By building a succession of dikes the inhabitants were able to reclaim land from the sea, piece by piece. When Lake Wieringen was drained, Wieringen lost its island character, and when the IJssel dike was built it even became a stopover place between Noord-Holland and Friesland. Den Oever is now the most important town on the island, for two reasons. First, when Lake Amstel was enclosed by dikes in 1924 the old harbour of De Haukes became less accessible and the fishing fleet chose to move to Den Oever and use it as their home port. Secondly, during the construction of the Barrier Dam many of the labourers, who came mainly from East Groningen and the peat harvesting region of the northern Netherlands (the Veenkoloniën), settled in Den Oever. The migration resulted in a growth of non-churchgoing inhabitants and the small church of Den Oever gradually fell into disuse. In the second half of the twentieth century it was dismantled and rebuilt in the Zuider Zee Museum in Enkhuizen.

The rolling glacial till ridges of Wieringen are still recognisable. However, most traces of the old field pattern have been largely effaced by the land consolidation projects of the 1930s, and almost all the tuunwallen (sod-banks) were removed in the complete remodelling of the landscape during these projects. In a remarkable turnaround, a number of new tuunwallen have recently been built as part of a new rural land development project.

4. Modern development and planning

4.1 Land use

Wieringen has managed to retain its agricultural character. In recent years plans have been made to enhance the islands historic character through the creation of a large lake on its southern border, between the old island and the former Wieringermeer (now polder).

4.2 Settlement development

Wieringen contains a lot of villages within a small area, a characteristic of the landscape. These largely retain their historic character. Only Den Oever has been extended in recent decades. In the new plan Wieringerrandmeer there are a lot of new houses planned on the edge of Wieringen outside the island.

4.3 Industry and energy

Den Oever is famous for its role in the fishing industry. Part of the fishing fleet from the former Zuiderzee is stationed in Den Oever.

4.4 Infrastructure

The island Wieringen provides the connection with the province of Fryslân by the Barrier Dam (Afsluitdijk), which is important for regional development. In the northern region this is a very important connection.

5. Legal and spatial planning aspects

The Legal and Spatial Planning Aspects are described in a general way, as these are relevant to all the cultural entities in the province of Noord Holland. Due to the scale of the entities (which cover more than one municipality), the focus is on regional policy and management. However, the goals of the regional policy and planning strategy are taken into account by the local sector planning policy. The regional goals and strategies are formulated after discussion with a wide range of stakeholders and organisations.

In October 2004 the Province of Noord Holland adopted the development perspective of the sub region Noord Holland within the framework of the regional spatial planning. Wieringen is designated as a Landscape Pearl because of its very special landscape and cultural history as a former island with a core of glacial till like Texel. The landscape and cultural history heritage has the lead in local developments concerning housing and industry. Quality tourism is to be promoted. Agriculture should be continued in a sustainable way. The main road between Den Helder and Den Oever crossing Wieringen needs improvement.

6. Vulnerabilities

6.1 Spatial planning

Unless it is carefully planned, the creation of a lake on the southern side of Wieringen could damage the old eelgrass sea wall. Improving the main road across the island is potentially a big threat as the island is small and the road already has a significant negative impact on the landscape.

6.2 Settlement

Development within the historic settlements on the area of the original island needs to carefully consider the nature of the built heritage and where possible compliment it.

6.3 Agriculture

The land consolidation project of the 1930's have caused extensive damage to the historic landscape. Although this has now ceased there needs to be careful planning in trying to restore some of the historic landscape and its individual features.

6.4 Tourism

A significant increase in tourism could have a detrimental effect on the historic settlement pattern and landscape. The pressure for second homes and tourist accommodation, in particular new lake side tourist centres, will need to be carefully managed.

7. Potentials

7.1 Spatial planning

The creation of the new lake provides opportunities for the recreation of the sea walls and possibly other landscape features on the island edge. Careful design and planning could provide the opportunity to improve the visual impact of the main road across the island.

7.2 Settlement

Sensitive re-use of historic building and careful design of limited new local housing and industry has the potential to contribute positively to the existing landscape of the former island. The historic settlement pattern also provides the opportunity for the creation of cycle routes following historic trails.

7.3 Agriculture

Sustainable agriculture is important for keeping the existing landscape values and to provide opportunity to restore historic landscape features (e.g. tuunwallen, duck decoys).

7.4 Tourism

The main potential of Wieringen is the tourism value of the landscape and cultural history. This should be developed taking into account the return to life as an island, with a new shore and new relations with the surrounding area. The unique history of eel grass use, the characteristic farmhouses, duck decoys and duck farming and the use of the island during the Viking period are important themes for tourist information and interpretation.

7.5 Industry and energy

Den Oever has potential for the promotion of the historic fish industry of the former island.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden

Provincie Noord-Holland, 2004, Ontwikkelen met kwaliteit, ruimtelijke samenhang op uitvoeringgericht, (streekplan) Ontwikkelingsbeeld Noord-Holland Noord. Haarlem

Kop Noord-Holland, NL

1. Overview

Name of entity: Kop van Noord-Holland

Delimitation: Neighbouring entities Wieringen, Texel

Size: 25,000 ha

Location: Province of Noord-Holland

Origin of name: Most northern part of the province of Noord-Holland

Relationship with other cultural entities:

Connected with the entities on the mainland of Groningen and Fryslân

Characteristic elements and ensembles:

Marshland, sea dykes and polders. Open landscape, large water courses, (former) seawalls, polders with large scaled rectangle field patterns, modern fortifications, 'cloche' farmhouses

2. Geology and geography

2.1 General

The boundary of the Wadden Sea region of the mainland Kop Noord-Holland is hard to define, but the southern boundary is taken to be the Westfriese Omringdijk. This part of the present-day county of Noord-Holland first arose after the last ice age. Following the period of Roman occupation the whole of the northern part of the Noord-Holland peninsula became covered with a layer of peat, with the hills of Texel and Wieringen rising above this fenland area. The protective barrier island, which was probably inhabited, lay a few kilometres to the west of the present coastline. The fens drained in an eastwards direction via the Marsdiep channel, which was then a tributary of the Vlie.

2.2 Present landscape

The area is divided in two parts, the western portion comprising sand and sand-dunes, whilst the eastern part is marsh. The marsh is characterized by dykes and waterways.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

Evidence for occupation of the area in the Neolithic period can be found on the headland of the Noord-Holland peninsula, e.g. in the Groet Polder and in the Zijpe en Haze Polder. These Neolithic sites contain the remains of settlements of the Funnel Beaker culture and the Single Grave culture and are exceptionally important because they reveal adaptations made by the inhabitants to the marine environment. The condition of the finds are so special that Groet Polder is being considered for nomination to the World Heritage List. The fens were subsequently occupied by people moving in from the surrounding areas during the Merovingian period (c. 450-700 AD), including the present islands of Texel and Wieringen, as well as probably from the area to the south of Rekere (which has now disappeared beneath the sea). The first settlements in the fens, which date from this period, were located along the Marsdiep channel, the Rekere and along the fen river Middenleek in the vicinity of the modern town of Medemblik. In the Carolingian period the settlements in the area were concentrated in four main locations: on Texel, on Wieringen, in northern West-Friesland

(between Andijk, Schagen and Medemblik) and a smaller concentration in the area around Den Helder.

At this time Texel was still linked to the mainland. The barrier island between Bergen and Texel was only breached later by the Zijpe, the Heersdiep channel and a tidal inlet to the south of Texel, which would later link up with the Marsdiep channel. This gradual erosion was due not only to the rising sea level, but also partly as a result of human actions. The inhabitants moved into the fenland from the higher ground in order to reclaim it for arable farming. By draining the peatland, they set two processes in motion: the lowering of soil-levels and the oxidation of organic remains within the peat. These two processes led to a rapid lowering of the ground level, which made it easier for the sea to penetrate into the area. Eventually, in the area between the two tidal inlets, mainly to the west of the present coastline, only two islands remained: Callantsoog and Huisduinen.

3.2 Early Modern Times

During the sixteenth century the inhabitants of Kop van Noord-Holland were able to construct more sustainable dikes. They experimented tirelessly with draining polders and a considerable area of land was reclaimed from the sea. During this period the top of the Noord-Holland peninsula was a tidal flat; large quantities of sand were washed in through the inlets and deposited over the area. In Koegraspolder, these sand deposits are still at surface level. In the sixteenth century the Zijpe and Heersdiep inlets silted up, but the Marsdiep channel remained open and became wider and deeper. The Marsdiep became an increasingly important channel for marine activities and was therefore of strategic significance, as evidenced by the construction at this time of fortifications on both sides of channel.

Various attempts were made to reclaim the tidal flat behind the Zijpe inlet. This was finally achieved in 1597 after which more than 6500 hectares of sandy soils in the Zijpe and Haze Polder were improved for agricultural use. Farms were built along three routes through the polder. The most impressive of these is the eastern axis, the Groote Sloot canal, with its fine examples of farmhouses with pyramid-shaped roofs, the so called 'cloche' farmhouses (stolpboerderij).

3.3 Modern Times

The Noordhollands Canal, built in 1819–1825, fits perfectly into the landscape pattern of the Zijpe and Hazepolder. The Koegraspolder lies to the north of the Zijpe Polder. The dikes surrounding this polder were built in 1817, just before the construction of the canal. The Anna Paulowna Polder was reclaimed in 1847, just after the canal was finished. Both these polders are divided up into regular parcels. The Waard- en Groet Polder, reclaimed in 1844, presents the same picture.

The fortress of Helder, now Den Helder, a naval port since 1781, lies on the most northerly tip of the area. During the Anglo-Russian Invasion of 1799, part of the French Revolutionary Wars, Den Helder was controlled for a short period by the allies. The coastal defense batteries overlooking the Marsdiep were the only sizeable weapons to defend Den Helder, the invasion therefore took place from the landward side.

During the period when The Netherlands were part of the French Empire (1810-1813), Napoleon Bonaparte decreed that a ring of forts should be constructed and the coastal batteries extended to the south. This fortified ring, which includes LaSalle (Erfprins), Morland (Kijkduin), IÉcluse (Dirks Admiraal), Oostoever (orig. Dugommier) and Westoever forts, is unique and forms an important element in the international heritage of Europe.

4. Modern development and planning

4.1 Land use

The large fields in the relatively young polders still contain high quality agricultural land and farming remains the primary land use to this day. Most of the land is used to cultivate bulbs. In the spring the extensive fields of flowering bulbs attract large numbers of visitors, many of them from abroad.

4.2 Settlement development

The biggest settlement in this area is Den Helder. In the 1990's international agreements and the fall of the iron curtain led to large-scale unemployment for Den Helder and the adjacent region. New economic opportunities must deliver new jobs in the near future.

4.3 Industry and energy

The largest part of the area is used by agricultural industries but other important industries include tourism, fishing and the naval base.

4.4 Infrastructure

The infrastructure of Kop Noord-Holland is connected by two main roads and one railroad. All the roads come together in Den Helder. Only the ferry to Texel departs from Den Helder.

5. Legal and spatial planning aspects

The Legal and Spatial Planning Aspects are described in a general way, as these are relevant to all the cultural entities in the province of Noord Holland. Due to the scale of the entities (which cover more than one municipality), the focus is on regional policy and management. However, the goals of the regional policy and planning strategy are taken into account by the local sector planning policy. The regional goals and strategies are formulated after discussion with a wide range of stakeholders and organisations.

In October 2004 the Province of Noord-Holland adopted the Development Perspective of the sub region Noord-Holland-noord within the framework for regional spatial planning. Agriculture continues to be the primary function, with opportunities to develop in scale and in new directions, but with regard to maintaining the quality of the landscape and cultural heritage of the area. In particular the expansion of flower bulb cultivation is considered to be important. In a large part of the area wind energy is regarded as a favoured means of energy production. Housing and industry can be developed in a concentrated way at selected locations, again with due regard to the landscape and cultural heritage. Den Helder will keep its naval identity.

The implementation of the Valletta treaty is likely to enhance aspects of heritage within the planning policy process. As a consequence, archaeological assessments or evaluations will be compulsory for most development plans

6. Vulnerabilities

6.1 Settlement

Expansion of settlement is a threat to the existing settlement pattern. The sky line of the settlement and the historic core at Den Helder, and its naval identity are vulnerable to new development.

6.2 Agriculture

Intensification and expansion of the bulb growing industry is a potential threat to below ground archaeological deposits. The industry requires large, flat land parcels, and its

expansion could also lead to the loss of field boundaries and other historic landscape features.

6.3 Industry and energy

The visible historic landscape is vulnerable to the expansion of wind power which could significantly alter the visual amenity of the wider landscape. Only carefully located and designed concentrations of wind turbines (e.g. around Den Helder) should be allowed. Construction of wind turbines could also lead to the destruction of below ground archaeological remains.

7. Potentials

7.1 Settlement

The tourism sector can exploit the historic settlement pattern by promoting the use of former farm houses and villages for tourist accommodation. New developments within Den Helder should take the opportunity to maintain the historic skyline and enhance the historic core of the naval port.

7.2 Agriculture

The robust structure of the landscape can accommodate agricultural change which does not generally affect the characteristic openness of the area. The careful expansion of agriculture should provide opportunities to manage the historic landscape and buried archaeological deposits in a sustainable manner.

7.3 Tourism

The area has a robust landscape structure of large water courses and former sea walls which could be utilized to enhance visitor access to the landscape and cultural heritage, including its prehistoric settlements, early modern land reclamation, historic farmhouses and existing agricultural landscape. This could be achieved through the development of cycle and walking routes, and the use of historic waterways, providing visitors with the opportunity to combine appreciation of both the natural environment and the historic landscape.

7.4 Maritime history

Den Helder's naval history and the Napoleonic fortifications of the area are of great importance and ideal for further promotion to tourists and to the local inhabitants and workforce.

8. Sources

Marrewijk, D & A.J. Haartsen, 2002, Waddenland Het landschap en cultureel erfgoed in de Waddenzeeregio, Ministerie van Landbouw, Natuurbeheer en Visserij / Noordboek, Leeuwarden

Provincie Noord-Holland, 2004, Ontwikkelen met kwaliteit, ruimtelijke samenhang op uitvoeringgericht, (streekplan) Ontwikkelingsbeeld Noord-Holland Noord. Haarlem

The Wash, UK

1. Overview

- Name:** The Wash
- Delimitation:** The estuarine embayment of The Wash and its maritime influenced hinterlands, as depicted in Figure 1.
- Size:** ~2,450 km²
- Location – map:** The Wash and its hinterlands on the eastern coast of England; shared between the counties of Cambridgeshire, Lincolnshire and Norfolk; United Kingdom
- Origin of name:** What was aptly named Metaris A Estuarium – a bay with tidal marshes and mudflats – back in Alexander the Great's day started to become known as The Wash much later on. The first true recorded use of the word Wysche or Waashe was used in the sixteenth century and described only the tidal areas of the Rivers Welland and Nene. A century on the area was referred to as The Washes being a 'a very large arme' of the German Ocean. All old accounts refer to the great body of water that then flowed away on a tide to reveal dry land of great danger.
- Relationship/similarities with other cultural entities:**
The project entity area has an intricate relationship with the adjacent fenland area, which also reaching back through the years was influenced by being tidal or from sudden inundation from the sea and rivers. The deeper fen becomes more peat like in character than that incorporated in this project area and in the most southern reaches there are true hill forms where historic towns such as Warboys and the cathedral settlement of Ely sit, which were once surrounded by a waterland as isles in the Fens. The similarities between The Wash and Wadden Sea in their cultural landscape evolution, is one of the main reasons for sharing experiences through the Lancwad Plan Project. For example, in more recent history the use of duck decoys in Alter Koog within the Nordstrand entity of Schleswig-Holstein are similar to those that was used all around The Wash, and still exist today for example at Friskney in Lincolnshire.
- Characteristic elements and ensembles:**
Evidence of prehistoric and medieval life including for example, Roman crop marks and Iron Age salterns; settlement patterns relating to uplands in the east and higher inner fenland ridges; Norman building programme evidence in churches and castles; maritime and farming sectors evident throughout including evidence of land reclamation and drainage in lower lying areas of western and southern reaches of area.

2. Geology and geography

2.1 General

In its current form, The Wash is an embayment of the North Sea, the largest estuarine system in the UK today. The hinterlands behind the sea embankments were once part of this system, and a much larger area of marsh and fenland, known as the Fens, which spread as far south as beyond Ely in Cambridgeshire. The five rivers that drain into The Wash today – Rivers Steeping, Witham, Welland, Nene and Great Ouse - drain over 12% of England. There used to be other rivers that now have been channelled into these five remaining estuaries.

Within the entity project area the hinterlands still reflect their maritime past, as do the historic settlements of the area. Severe storms and associated flooding have punctuated the social history of this area, and its landscape. It has been progressively submerged by rising seas over the last 10-12,000 years. Offshore there are submerged peat and land surfaces, with associated human artefacts. The submerged sediments are basically continuous with the reclaimed areas of the Fens, although in places early deposits have been eroded by deep channels. It is likely that there are historic wrecks preserved beneath the seabed, but these remain undiscovered due to the shifting nature of the sands and mud of The Wash.

2.2 Present landscape

The Wash entity area is split into two distinct landscapes, one representing the wilder, more naturalised vista which is defined by the North Sea, saltmarsh, mud flats and five river estuaries, which then reaches the foot of a sea embankment. On the other side is a landscape manicured by man, dominated by a rural appearance on the whole with church spires, mill towers and the odd other tall structure punctuating the skyline. There are scattered market towns that follow the lines of old transport routes and identify slighter higher ground, with the historic ports towns of Boston, Spalding, Wisbech and King's Lynn being the major settlements with the outlying seaside towns of Hunstanton and Skegness guarding the mouth of The Wash with their golden beaches.

The hinterlands of The Wash vary from east to west in character with over two-thirds being somewhat similar in character and the most eastern edge evolving into a quite different character. In the western, southern reaches through to just above King's Lynn there is little relief greatly above sea level, being flat and on a wider scoping range, generally open. The main vertical elements relate to settlements and farmsteads, such as shelter belts, church steeples, industrial buildings and an increasing number of wind turbines; and the odd remaining duck decoy. Many waterways of varying size criss-cross the land of large agricultural and horticultural fields. There is little livestock associated with this area; the odd sheep grazing harvested brassica fields and cattle out near the open, wild Wash where they wander the saltmarsh in the summer. Farm reservoir banks, old sea and river embankments, and salterns are the only true undulation in the landscape. The older settlements tend to be linear following old trading routes or droves.

Whereas the eastern hinterlands of Norfolk, north of King's Lynn, do have relief features in the form of cliffs at Hunstanton which reappear near Wolferton village within Sandringham Estate. There is a gentle undulating landscape that is predominately farmland but of a more intimate scale than the open landscape around the corner of The Wash towards the west. Trees and woodlands feature much more greatly here, and the church spires are lost much more easily amongst the hills and woods. In part, this area has been nationally designated as an Area of Outstanding Natural Beauty, which is a landscape based designation which includes placing statutory duties on relevant bodies to ensure it maintains its character and beauty. Remnant sea banks do not tell the story of the land here, but Norman Keeps make a hint towards past landscapes.

3. Landscape and settlement history

3.1 Prehistoric and Medieval Times

The Wash and its hinterland are made up of many metres of sediments that have been gradually deposited since Mesolithic times (from around 5400 BC) due to a combination of estuarine and freshwater conditions reflecting periodic sea level rise and fall across the original dry, wooded basin landscape. Across and within the deposits of the Fens lies a record of human history, showing evidence of Neolithic, Bronze Age, Iron Age and Roman habitation, industry and communications. Archaeological treasures include: pottery, flints and ceremonial monuments of Neolithic age (4500-2000 BC) and Bronze Age field systems, settlements and round burial barrows. During the Iron Age and Roman period a salt production industry developed around The Wash. The evidence shows there was a second coming of salt making in the Medieval times, no evidence has been found as of yet covering the Saxon period.

Within the light and comparatively fertile chalk soils of north west Norfolk there has been human settlements with cultivation evidence right back to the Bronze and Iron Age, which continued through the Roman times, particularly being influenced by the fact that it ran near a major military route north to Brancaster and Holme. Throughout the Medieval times the settlement pattern centred on commons and greens which proliferated along the rising ground heading east, and in some cases settlement concentrated on military or commercial centres, such as Castle Rising, or ecclesiastical centres such as the Cluniac priory of Castle Acre. By the late Medieval period, there was a widening of sheep walks and warrens which were both subject to manorial control.

The silt-based Fens, which stretch from King's Lynn towards Boston have a long settlement history going back to the Romano-British period and beyond. Roman settlement saw the first attempts of land drainage, when the sea level was about twenty feet lower than now with the marshy coast being sheltered by offshore banks and shoals. Monastic institutions played an important role from the 7th century onwards, due to undertaking large scale drainage works. The associated religious settlements were established on the fen edge or on isles, such as Crowland and Ely just outside of The Wash project area.

The sea level started to rise in about the second century with the fenland lagoon silting up quickly. The settled fen, otherwise known as the town lands, with a variety of villages and larger towns, mostly being medieval in origin with fine medieval churches, formed an arc around The Wash. These are either positioned on higher grounds of the courser material or on navigable rivers where they performed as either inland ports or coastal ports, such as Wisbech and Boston. This pattern of settlement was largely created by a pastoral economy with large irregular enclosures around villages and the fen edge, with embankments happening on either side in the marshes towards The Wash and in the fen on the opposite side of the ridge. Some of the names of these settlement are English in origin and others illustrate relations with neighbouring North Sea countries, such as Skirbeck and Wrangle relating back to Danish conquerors. Towns such as Boston and King's Lynn flourished in the medieval times through trade with mainland Europe, wool in particular.

This mass of trade of importing wine, timber, cloth and stockfish; exporting wool, cloth and grain saw smaller ports expanding all along the coast from Skegness to Wainfleet, to Surfleet to Gedney through to Cambridgeshire and Norfolk. This trade was underpinned by the great religious houses of the area, who owned large sheep flocks, and had land for saltmaking and fisheries fleets.

The 13th century saw a time of change with periods of dramatic sea rise and tidal surges overtopping the banks to reshape the coast and reduce the grazing to summertime only. The Medieval defensive clay banks of this time are still misnamed today as 'Roman'. Natural drainage deteriorated because the gradient lessened and large drainage projects of the inland areas were thwarted by 'intercommoning' practices.

3.2 Early Modern Times

The area was gravely impacted upon by the deteriorating climate and the plague. Ports declined due to the migration of new technologies and industries from the power of the urban guilds' restrictive control and due to the demise of diplomatic relations with the European Low Countries. Another factor in the decline of such towns related to sources of salt with greater purity being marketed elsewhere. This saw towns like King's Lynn and Boston become market towns by the 16th century, instead of being the previously important regional trade centres of times before, and various smaller havens went into total decay.

By the mid to late 16th century the process of coastal reclamation had begun with small sites at Gibraltar Point south of Skegness, and a new drain being cut in Boston called the Maud Foster in 1568. But these were nothing in comparison to the changes driven by the 4th Earl of Bedford and his engineer Sir Cornelius Vermuyden, and in some cases Sir Philibert Vernatti. With a Royal Charter from Charles I, they made drowned land 'fit for tillage and pasture', which had previously been under monastic control. This was the start of seeing the area change from grassland and water dominated landscape to one we associate with more today, a highly cultivated and managed one. Other major players in this change included the Earl of Lindsey. Drains such as Vernatt's in the Spalding area, and the South Forty Foot cutting from Kesteven to Boston area saw huge areas of common land drained, and coastal embankments saw large areas reclaimed from the sea, such as 1,120 acres at Tydd St Mary on the Nene estuary in 1632. By 1660, 17,374 acres had been embanked from Gedney to Moulton, and the whole of Bicker Haven cut off from the sea.

Fewer large scale drainage works occurred throughout the 1700s, although many improvements were made to those that had happened previously including the straightening of water courses. The efficiency of gravity drainage decreased further in this time and so the use of wind pumps became essential. This had major implications for the Fens skyline, as can be seen in Figure 6 below.

With the drainage and reclamation small farmsteads started to appear outside of the townland belt of settlement, and drove ways, known as 'The Smeeth' were created running along the cultivated fields to the coastal marshes. Most buildings in the open, inland fen are post 1750. The productivity of the reclaimed soils soon saw the development of extensive areas of high grade arable cultivation, over summer grazing, and it is still the dominate land use today.

Within north west Norfolk on the chalklands tree cover had been greatly removed by the 17th century, which saw a change in building materials. There is a general dominance of flint from the chalk and carstone from the greensand ridge being used within buildings. Within the valley bottoms open-field systems continued to be unenclosed into the 18th century, whereas enclosure was largely complete up on the poorer and more acidic soils of the greensand ridge and chalklands by the 18th century. It is on the uplands that large estates formed, which the area is still famous for today, such as Sandringham and Houghton.

3.3 Modern Times

John Rennie, engineered one of the last great drainage actions of the 19th century that saw over 40,000 acres drained of the East, West and Wildmore Fens in 1801-1814 north of Boston. By 1866, steam pumps were introduced to this area, having been installed much earlier to more southern reaches of the Deeping Fens south of Spalding in 1827. The impact steam pumps had on the landscape was not only visual but also of an auditory nature. Larger pumps and associated housing were introduced as sea-levels continued to rise throughout the area, and water management structures still feature in the landscape today, and some of the old steam pumps provide an opportunity for socio-economic activities through acting as visitor attractions for the area, such as the Pinchbeck Engine and the open days ran by the Internal Drainage Boards, for example, the Lindsey Marsh Drainage Board's Historic Land Drainage Working Demonstration days.

Coastal reclamations continued into the 20th century, with the last occurring north of Boston between Freiston and Butterwick in the late 1970s/early 1980s. We have now seen a reversal of this process at that exact site, with a managed realignment being undertaken for flood risk management reasons, resulting in the creation of 80 hectares of saltmarsh and several saline lagoons that support a new visitor attraction, Freiston Shore Nature Reserve.

The A52 is the main trunk road between Boston and Skegness which even today has many curves and sharp corners, probably reflecting what was once a causeway that followed either an embankment or the townland upper silt ridge. The settlement pattern within The Wash hinterlands only truly began to alter with the development of new roads such as the A17 and A47, which has resulted in the townlands settlements spreading along the routes.

The dispersed farmsteads of the 19th century tend to be red/buff brick dwellings, with the mud and stud walling that once was used almost in none existence. The roofs are tiled with red pan-tiles or more commonly Welsh slate. The field patterns that surround these farmsteads are ancient, semi-regular relating to the aforementioned 'The Smeeth' or drove roads.

Duck decoys also sprang up around The Wash, some of the best in the country and some of these still feature in the landscape today but many were lost as farming became more intensified. These remain the only tree cover other than shelterbelts. Fields further inland become dominated by vast rectilinear patterns within straight roads and drainage features, where boundaries are defined by ditches and drains, rarely hedgerows.

Whereas, over on the eastern section of The Wash area in north west Norfolk the fields are enclosed by thorn hedges and it is greatly defined by vast estates which developed in the 18th and 19th century with large boundary flint and brick walls, lodge buildings and parkland plantations. The actual estate houses vary in style and are often concealed from view within the large scale geometric enclosed landscape. There is greater tree cover in this landscape with large woodland blocks.

4. Modern development and planning

4.1 Land use

The predominant use of the area still remains to be agriculture and horticulture. The intensification period in the last 50 years has seen changes for the landscape – further straightening of field systems, grubbing out of older sea embankments for more tillage land and less livestock. But in very recent times, there has been a creep back towards 'slower', less intensified farming with the re-introduction of livestock, organic farmers with grassland reappearing. It is unlikely this will affect the whole area but it brings back some diversity to the landscape that had, in part, been lost. Also changes in support for farming communities has resulted in landscape impacts, such as crop coverage being different and agri-environment schemes supporting the protection and enhancement of some characterising elements of the landscape.

4.2 Settlement development

Increased tourism, either related to *in situ* or transient visitors, and people moving from the south into the area for a slower pace of life and cheaper housing, is helping secure an increase in the need for development in the area. The supporting infrastructure along major roads is also increasing, and gradually what once were independent settlements seem to be merging. Some of this development works with the local character of the buildings, and some does not. In the eastern section, moving towards north Norfolk, second homes becomes more of an issue where there are villages that only come to life at the weekend or at holiday times. Various policies within local planning and policy documents have been developed for these honey-pot areas to help curb this phenomenon and build a more sustainable type of tourism, whereas in other parts of the entity this is not as of yet an area of concern.

4.3 Industry and energy

In recent years there has been an increased use of the area for energy generation including gas powered stations, to even more recently modern wind turbines (2005-6). At present these all seem to centre on the southern section of The Wash hinterlands. The development of offshore wind turbines is also new to the area, although the actual turbines are not allowed within The Wash, they are being built off the coast of Skegness near the mouth of the embayment, and proposals to cable the extremely large windfarms through The Wash are currently under consideration. There are implications for the onshore landscape, as well as the offshore seascape, in terms of national electricity grid connections needing to be enlarged. There are also various large processing and packaging plants relating to produce grown from the land scattered throughout the area, but with a particularly high concentration around Spalding. Often they are alongside the major trunk roads, as there is little serviced by rail. Haulage companies have proliferated in the area.

4.4 Infrastructure

There are no motorways crossing the area. The major northerly trunk road into Norfolk, the A17, cuts right through the entity including various bridges crossing the rivers, one of which at Sutton Bridge is a historic listed structure. The other major road is the A52 cutting through the western side. There is a noticeable increase in traffic in the spring and summer relating to tourism. No ferries sail from the ports, but the commercial ports of Boston, Sutton Bridge and King's Lynn see much shipping traffic of container goods, timber and the like. Boston and King's Lynn also still support fishing fleets that harvest shellfish, in the most part, from The Wash. The port of Wisbech is further inland on the River Nene, and as well as still being commercially active, it has developed as a yacht harbour for smaller craft with a series of wooden pontoons along the historic quayside. There also used to be an active, commercial port at Fosdyke on the River Welland, but a thriving yacht yard has now replaced it. There are works underway to join-up various rivers and waterways to make it possible to travel between them, presently including linking the River Witham with the South Forty Foot Drain in Boston.

5. Legal and spatial planning aspects

There are a suite of statutory plans that relate to this area at various levels.

These include:

The Wash embayment is a highly designated site from international level to a local one. Designations include Ramsar, European Marine Site, Special Protected Area, Special Area of Conservation, Site of Special Scientific Interest, National Nature Reserve and Local Nature Reserve. All of these lie within legislation relating to nature conservation from global agreements on wetlands, to European birds and wildlife protection, to national and local considerations.

Part of the entity falls within a national landscape designation of an Area of Outstanding Natural Beauty (AONB). This designation seeks to ensure the conservation of natural beauty within landscape, and the North Coast AONB is part of a national network of sites alongside National Parks that protect precious areas. As of 2000, it became a statutory duty for relevant local authorities or conservation boards to prepare and deliver a management plan for these sites.

Two Regional Spatial Strategies/Plans for East of England and East Midlands – these include such framework policies as; to protect and enhance the region's natural and cultural assets, and; that new developments respect and enhance local character. These policies seek to influence local planning authorities, amongst others;

The Wash Estuary Strategy Group is a non-statutory partnership that practices Integrated Coastal Zone Management and works to deliver sustainable development principles in the area through influencing others and taking direct action. They produced the Wash Estuary Management Plan (2nd edition) through fully engaging with the local communities and stakeholders in the area to develop policies that set out an agreed holistic framework for the

area, including for cultural assets – historic environment and landscape. This has resulted in further action, including developing spatial planning tools for the cultural landscape and assets of the area.

Local district/borough plans for East Lindsey, Boston, South Holland, Fenland and King's Lynn & West Norfolk. There is a process at the moment from moving from Local Plans in the planning authority areas to Local Development Frameworks (LDF) which engages the local community much more in local decision-making. LDFs will be supported by a body of evidence, and most planning authorities will include a Landscape Character Assessment and a Historic Landscape Characterisation report. Hopefully in The Wash area this will include the characterisation report being developed for this entity through the Lancewad Plan Project. It is also the local planning authorities who designate conservation areas within cultural townscapes, which aims to ensure the historic character of a townscape is maintained which also ensures the townscapes influence on the wider cultural landscape is maintained.

There are 128 Scheduled Ancient Monuments and 2,168 listed buildings and structures. 'Scheduling' is for nationally important sites and monuments that are given legal protection. English Heritage takes the lead in identifying which should be placed on the schedule by the Secretary of State for Culture, Media and Sport. The current legislation, the Ancient Monuments and Archaeological Areas Act 1979, supports a formal system of Scheduled Monument Consent for any work to a designated monument. Scheduling is the only legal protection specifically for archaeological sites. 'Listing' helps protect the best architectural heritage, and when a building is listed it is placed on the 'special architectural or historic interest' list compiled by the Secretary of State for Culture, Media and Sport under the Planning (Listed Buildings and Conservation Areas) Act 1990, based on advice from English Heritage. Both of these systems are under Governmental review, and a White Paper called Heritage Review is currently being consulted on, and so things may change.

6. Vulnerabilities

Climate change and the push by central Government to meet renewable energy targets and reductions in carbon dioxide emissions are seeing a large increase in applications for windfarms in the area. There is a need for a greater strategic view in terms of the landscape capacity instead of a site by site process, which some of the planning authorities have undertaken. Cultural character and heritage assets need to be a material consideration in the development of such guidance not just proximity to urban areas. This should also be the tact for traditional power station developments. Climate change also presents a direct threat to the cultural landscape in terms of sea level rise, ocean acidification and more storm events. All three may squeeze certain landscape elements out of existence and the cultural activities they support, and storms may drastically alter coast lines, cause flood and wind damage with more acid causing erosion of archaeological and built elements.

Farming continues to be an issue and an opportunity for cultural land and seascapes. The loss of family businesses with the increase in large agri-businesses can lead to yet more old embankments being lost and curvi-linear features representing old creek systems. Larger plough machinery can cause damage to ground based defining elements, such as salterns. Also the change from growing traditional crops to biomass fuels may be a particularly issue in the future, as it is already starting to be in other parts of the adjacent areas. Continued growth of associated infrastructure is gradually degrading areas, including it getting larger in scale such as glasshouses, and/or, packing sheds made out of box profile sheeting instead of traditional materials, and it is often the associated industries that are infilling along the major highways between settlements.

Increased development within settlements or piecemeal throughout the rural reaches, not only can depreciate the distinctiveness of an area if done insensitively, but puts greater pressure on natural resources including water and the need for greater protection from natural events. Greater efficiency in drainage causes desiccation of ancient monuments

within the landscape and more stringent flood risk tools can chip away at character through reducing the tidal influences in historic ports or via rock armour being placed in front of cliff lines.

Inappropriate tourism driven developments gradually redefines an area, so old Victorian resorts lose that connection, or the drive for marinas and economic regeneration leads to distinctive, historic quayside becoming the same as every other café culture waterfront within the country. These issues are currently on the horizon for the area, and may not be the end point if the decision-makers take cultural land, urban and seascapes as a serious material consideration, particularly as it may give the edge over other visitor destinations.

Conservation legislation in itself can be a barrier to ensuring that cultural assets within a landscape are managed proactively through placing too much red tape between the best intentions of an owner and the ability to achieve it. This can, and has, resulted in neglect as being the easiest option.

7. Potentials

The cultural heritage infrastructure, as part of the whole areas green infrastructure, offers opportunities for socio-economic regeneration and risk management. By restoring more of the historic landscape by re-introducing wet fenland and flood plains at appropriate sites in the inland sections of the area, sustainable fluvial flood risk could be achieved alongside biodiversity gain, economic regeneration and social access to the area. This kind of risk management can also be used at the coast. Within The Wash entity, a coastal management realignment has already seen a reintroduction of an earlier Victorian sea embankment and hotel, providing more sustainable flood risk. It has also created a local nature reserve which is supporting on average of 60,000 visitors per year, which has seen an increase in spend at local historic public houses and other businesses.

The numerous waterways and historic sea embankments also provide a huge network that could be integrated better into the local communities and visitors accessing the countryside and appreciating the cultural landscape of the area. In so doing it would place value on them and lead to better management. This in part is being realised through the Fens Waterways Link Project, which is a long-term vision to re-connect the cathedral cities of Lincoln, Peterborough and Ely via navigable historic waterways, which includes linking up with Boston, Wisbech and King's Lynn.

Agri-environment schemes can re-introduce, enhance or protect various elements that define local distinctiveness within the cultural landscapes. Other resources can support communities to rebuild elements of their local environment, such as restoring historic structures that define the skyline for miles around, or, awareness raising activities with land owners of the importance and opportunities that the sea embankment network offer in an area with few rights of way.

Strategic spatial planning tools for the area are being developed through the Lancewad Plan project for the cultural landscape, which will identify further issues and actions for the area through working with the local stakeholders using various character maps that have been produced. A spatial coastal zone management plan through the fully revised second edition Wash Estuary Management Plan already sets out policies regarding the landscape and historic environment. And it has now been recognised that an integrated Green Infrastructure Master Plan to take into account the growth in the area will further help sustain the special qualities of the area. The review of The Wash Shoreline Management Plan, which is the long-term policy setting document for flood risk management and coastal protection, also offers an opportunity to influence future management of the area. All of these can provide an evidence basis for planning guidance and appropriate development control decision-making.

Through promoting and implementing these tools and opportunities at various levels, horizontally and vertically, it should ensure that the cultural landscape of The Wash is allowed to continue to evolve but in a sensitive manner that respects its history – socially and naturally.

8. Sources

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General literature:

Roberts, B. K. & Wrathmell, S. (2000): An atlas of rural settlement in England.

Bennett, S. & Bennett, N. (1993): An historical atlas of Lincolnshire.

Heaton, A. (2001): Duck Decoys.

Sir Payne-Gallwey, R. (1886): Book of Duck Decoys, their construction, management and history.

Countryside Agency (1999) Countryside Character, Volume 4: East Midlands and Volume 5: East of England. Fenland Survey: an essay in landscape and persistence.

Hall, D & Coles, J.M. (1994): English Heritage Archaeological Report.

Robinson, D. (1981): The Book of the Lincolnshire Seaside.

The Norfolk Coast Partnership (2004): Norfolk Coast Area of Outstanding Natural Beauty Management, first edition.

Hallam, H. E. (1965): Settlement and Society: a study of the early Agrarian history of south Lincolnshire.

Hoskins, W. G. (1977, 2nd ed.): The making of the English countryside.

Wash Estuary Strategy Group (2004): Wash Estuary Management Plan, second edition.