WAGENINGEN UR
For quality of life

Wageningen IMARES

memo

To Mr. Bernard Baerends
Ministry of Agriculture, Nature and Food Quality
Direction Regional Affairs, location North
P.O. Box 30032
9700 RM Groningen

- ☑ At your request
- ☐ As agreed
- ☐ For your information
- ☐ For approval
- ☐ For further handling
- ☐ For discussion purposes
- ☐ The documents should be returned
- ☐ Thanks for the information
- ☐

FROM

dr. ir. M.J. Baptist, dr. N. Dankers, prof. dr. K. Reise, J. Enemark & G. Lüerßen

DIRECT [TELEPHONE] LINE

+31 317 48 70 68

E-MAIL

martin.baptist@wur.nl

DATE

14 November 2008

ENCLOSURE(S)

SUBJECT

IUCN evaluation Wadden Sea, request for answers

Dear Mr. Baerends,

In response to the letter of 25 september send by the IUCN World Headquarters, referring to the IUCN World Heritage evaluation mission to the Wadden Sea undertaken by Mr. Pedro Rosabal from 1-11 september 2008, we have formulated answers to the first two bullets of question 1) on justification for outstanding universal value (OUV).

Land and seascapes of the nominated property and the Wadden Sea Area including a comparative study of the OUV of the nominated property and the Danish Wadden Sea

The IUCN has requested a comparative study within the Wadden Sea itself to enhance the case of Outstanding Universal Value of the existing nomination in the broader context of the Wadden Sea. Further, an extension of Table 2.1 of the nomination document, which entails major subdivisions of the land- and seascapes of the Wadden Sea Area, has been requested to reflect the major subdivisions of landscapes and seascapes within the nominated property. The extension of Table 2.1 provides a full overview of the division of the land and seascapes for the nominated property, the Danish Wadden Sea Area and the remaining areas, a joint response has been formulated to both.

1. Land- and Seascape Types of the Nominated Property

The Wadden Sea Area is the commonly defined management area of the Trilateral Wadden Sea Cooperation for which the Wadden Sea Plan is valid, as outlined in chapters 1.e and 5.e of the nomination document. This is the area referred to in Table 2.1 of the nomination document (page 32). In Table 2.1 *Extended*, the land and seascapes within the nominated property have been calculated in conjunction with a calculation of the land and seascapes in the Danish Wadden Sea Area and areas in the Dutch and German Wadden Sea Area outside the nominated property.

Table 2.1 *Extended*: Geomorphological region of the Wadden Sea Area with major subdivisions of the land- and seascape transition (km²)

Geomorphological region	**Wadden Sea Area**	**Nominated property**	**Danish Wadden Sea Area**	**Areas in the German and Dutch Wadden Sea Area outside the nominated property**	
Salt marshes	400	280	70	50	Part of Schleswig-Holstein salt marshes
Intertidal sand and mud flats	4,700	4,145	450	105	In the river estuaries
Subtidal flats and gullies	3,700	2,340	245	1,115	River and outer river estuaries
Islands and dry sandy shoals	1,000	255	290 (incl. DK rural mainland)	455	Islands not in the nominated property
Offshore area (to about – 15 m-depth-line seaward of the islands)	4,900	2,720	490	1,690	Dutch and part of Lower Saxony offshore
Totals	**14,700**	**9,740**	**1,545**	**3,415**	

The nominated property "The Wadden Sea" encompasses the areas of the Dutch and German (Schleswig-Holstein and Lower Saxony) Wadden Sea Area under strict legal protection, as outlined in chapter 5b of the nomination document. As can be seen from the table, the large majority of the area of the intertidal sand and mudflats, and the subtidal flats and gullies, and the salt marsh area, are within the nominated property.

As outlined in chapter 3 of the nomination document, the Outstanding Universal Value of the Wadden Sea is particularly connected with the intertidal sand and mudflats and the subtidal flats and gullies of mainly unvegetated shoals divided by an intricate fractal-channel pattern fringed by salt marshes representing all stages of succession and the associated geomorphological processes, intertwined with ecological and biological processes to form the biogeomorphological interactions, which are notably strong and unique at all scales.

The inter-tidal sand and mudflats of the Dutch-German Wadden Sea Area are almost all within the nominated property with the exception of a small portion in the estuaries. The portion of the sub-tidal flats and gullies, not within the nominated property, likewise include the rivers and the outer river estuaries, which do not qualify for nomination. The salt marshes outside the nominated property relate to the Schleswig-Holstein salt marshes on the inhabited halligen and the 150 meter of foreland in front of the seawalls, which are not part of the Schleswig-Holstein Wadden Sea National Park. The majority of the Dutch-German Wadden Sea Area of both these landscape types, which are considered to constitute the Wadden Sea proper and in essence constitute the Outstanding Universal Value, is hence within the nominated property.

The large majority of the area of the islands of the Dutch-German Wadden Sea Area, which qualify for inclusion (beaches, dunes and sandy shoals), are within the nominated property. The area not included concerns the inhabited parts of the islands and those islands which encompass rural areas and do not qualify for nomination. The latter islands are located primarily in the Schleswig-Holstein part.

A very large portion of the offshore belt of the Dutch-German Wadden Sea Area is within the nominated property. The areas of the offshore belt within the nominated property are those which are of essential ecological importance as (1) calving and nursing area for Harbour Porpoise, (2), being habitats for moulting common scoters and (3) hard substrate sublitoral habitat.

The German offshore belt off Sylt and Amrum is within the nominated property for its important calving and nursing habitat of Harbour Porpoises. The Dutch offshore belt is not used as intensively for calving and nursing of Harbour Porpoise. Harbour Porpoise density in summer is lower than in winter and is not concentrated on the relatively shallow (<15 m) waters close to the islands. The Dutch offshore belt has an overall much lower density of porpoises in summer than the offshore zone of Sylt and Amrum, and is as such not so important to the functioning of the Harbour Porpoise.

Furthermore, an important reason to include parts of the offshore zone in the German part of the nominated property is the presence of moulting areas for the sea duck Common Scoter. The importance of the Wadden Sea offshore belt as moulting area for Scoters is decreasing from northeast to southwest. The Dutch offshore belt is irregularly used as a moulting habitat for Common Scoters and contributing a maximum of 2,2% of the total.

Finally, the offshore zone of the nominated property includes the Borkum Reef Ground. This is the only area where geogenic hard substrates form parts of the seafloor and the area has been designated as a mixture of the habitat typs reefs and sublitoral sandbanks under the EU Habitat Directive. A comparable area cannot be found in the Dutch offshore zone.

In conclusion, the large majority of the Dutch-German Wadden Sea Area of intertidal sand and mudflats, subtidal flats and gullies and salt marshes, which are considered to constitute the Wadden Sea proper and expresses in particular its Outstanding Universal Value, is hence within the nominated property. The remaining features of the offshore zone and the islands in particular the dry sandy shoals are well represented and support the Outstanding Universal Values of the nominated property.

2. Comparison Nominated Property – Danish Wadden Sea

The Danish Wadden Sea Area is 1,545 km² of which the Conservation Area, the area designated as Nature and Wildlife Reserve by Statutory Order according to the Danish Nature Conservation Act, is 1,250 km². As set out in chapter 1.f of the nomination document, the current Danish Wadden Sea Conservation Area amounts to 12,7% of the total Wadden Sea Conservation Area.

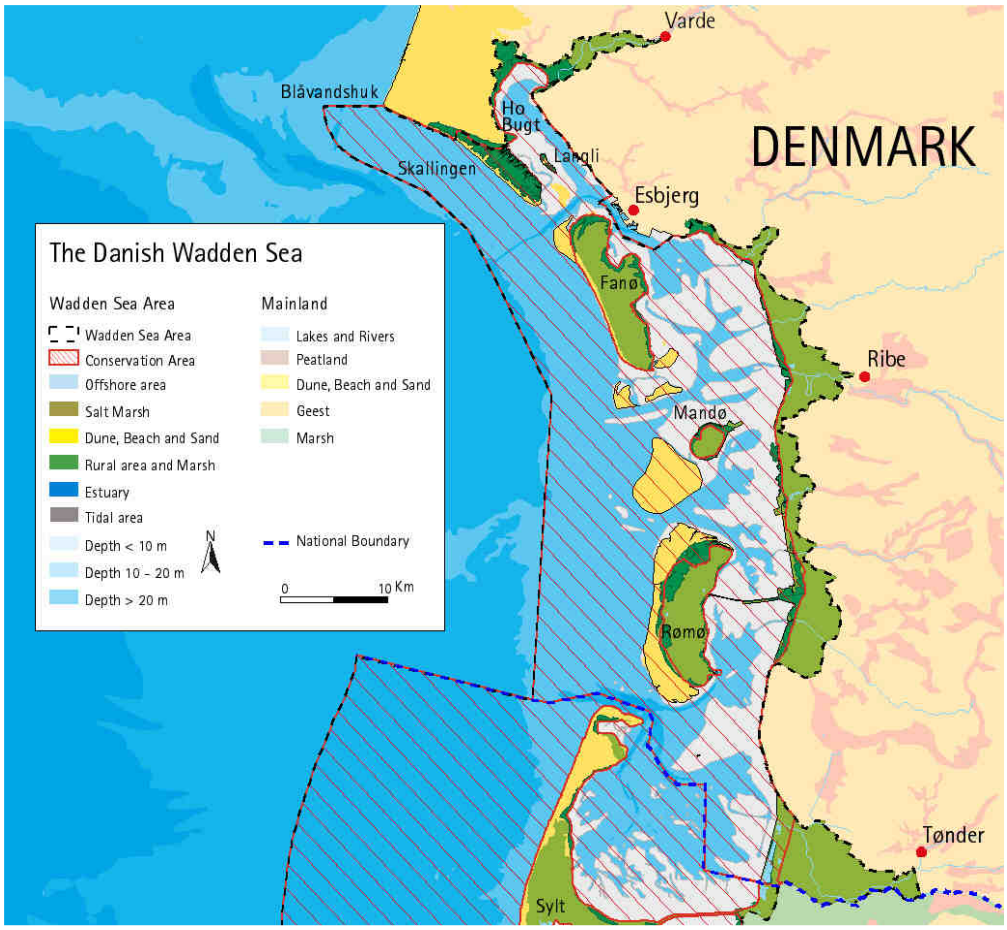

Figure 3: The Danish Wadden Sea Area and Conservation Area

It has recently been decided by the Danish Parliament to designate the Danish Wadden Sea including the islands and adjacent fresh water marshes as a national park in accordance with the Danish National Park Act. It is anticipated that the national park will be established in 2010 after an extended public consultation preceding the designation.

The Danish Wadden Sea is located at the northern end of the Wadden Sea. The most northern part is receiving naturally an ample supply of sediment from the adjacent coast to the north, allowing the area not only to keep up with sea level rise but exhibiting partly a progressive coastal development. As a corollary, strong measures of coastal defence were not necessary.

As outlined in the nomination document, chapter 2.a, page 32f the entire Wadden Sea may be divided geographically into a southern, central and northern sub-region. The Danish part belongs to the northern Wadden Sea with about one third of that sub-region. The Danish Wadden Sea is not a natural physiographic entity. Instead, the border between Denmark and Germany cuts right through a tidal basin, not following a physical divide. The Danish Wadden Sea may be viewed as an extension of the North Frisian Wadden Sea tapering gradually towards its northern end. The total freshwater inflow is low. The main river, Varde Å, has a catchment area of 1,055 km² and the total volume of water transported during a half-tidal cycle is 10^6 m³. This estuary is only slightly modified by coastal engineering.

The Danish Wadden Sea: The barrier islands Fanø, Mandø and Rømø with the high sands and the mainland. In the far distance, the German island Sylt can be distinguished (Photo: Svend Tougaard).

The Danish Wadden Sea has no features which makes it distinct from the other parts of the Wadden Sea. The barrier along the outer coast is formed by two elongated islands, Rømø and Fanø, and Skallingen peninsula with some high sands in between. Skallingen peninsula in the north is of a rather recent origin but has an eroding beach with high dunes very similar to the long sandy spits on the island of Sylt just south of the Danish border. Rømø and Fanø have wide accreting beaches with low dune ridges, resembling the coastal configuration of the western part of Eiderstedt peninsula at the southern edge of the northern Wadden Sea as well as the barrier island in the southern Wadden Sea. A particularly wide beach has developed at the island of Rømø. This is a result of the southward drift of sediment from eroding moraine deposits (Hornsrev) submerged in the North Sea just north of the Danish Wadden Sea. This sediment drift ends at the island of Rømø and there provides an example for a growing beach and new dune development in spite of sea level rise.

Conspicuous are the dynamic high sands in the Danish part of the Wadden Sea, which again are similar to the ones further south between the German island Amrum and Eiderstedt peninsula. The tidal waters pass through four inlets of which the largest and deepest one, the Lister Dyb, is dissected by the Danish-German border. Tidal range decreases from about 2 m in the south (List tidal basin) to 1.3 m in the north (Ho Bugt). As in all other parts of the Wadden Sea, the tidal flats are mainly sandy. Muddy flats are confined to the most sheltered areas, mostly fringing the salt marshes along the mainland. Similar to the adjacent North Frisian Wadden Sea in Germany, extensive seagrass beds abound, and mussel beds around low tide level are well developed in the Lister Dyb and Grådyb tidal basins.

As a special feature of the northern sub-region of the Wadden Sea, the lagoon cockle *Cerastoderma glaucum* occurs in salt marsh creeks and in sheltered seagrass beds with some cover of water throughout low tide period. This sister species to the otherwise wide-spread common cockle *C. edule* on tidal flats occurs in a few semi-isolated patches scattered throughout the Danish and North Frisian Wadden Sea. Connection between these patches as well as to more distant populations elsewhere along European coasts is probably maintained by migrant birds which carry the adhesive eggs of this bivalve over long distances.

Interspersed in the backbarrier tidal area of the Danish Wadden Sea are the small islets Langli, Mandø and Jordsand. These resemble the halligen of the adjacent North Frisian Wadden Sea, however, Mandø has been protected in part by a dike, while Jordsand gradually eroded away and since 1998 only a bare high sand has taken its place. On the other hand, the high Koresand seaward of Mandø may eventually give rise to a new barrier island, provided this development will not be reversed by the expected acceleration in sea level rise.

At the leeside of Skallingen peninsula, a large and natural salt marsh extends which has been closely studied. It developed on a high sand plain at the onset of the last century with the pioneering plants *Salicornia* and *Puccinellia*. Accretion rates were highest at the landward and seaward edges, leaving a central depression with high salinities during evaporation in summer. Then gradually meandering creeks formed, drained the central area and this allowed for vegetation development there as well. The marsh is partly grazed by domestic sheep but otherwise is in a natural state. At the mainland near the town of Ribe, a different type of natural salt marsh development is ongoing (Råhede). This is an interesting example for alternating effects of erosion and deposition. The edge of the marsh is eroded by the prevailing waves. In front of the emerging cliff of about 0.5 m in height, a runnel parallel to the cliff is developing and creates a sandy ridge on its seaward side. Once this ridge has grown up to high tide level, pioneer vegetation begins to accrete fine material and a new salt marsh is growing up in front of the old one. In the course of time the new marsh merges with the old one and waves create a new cliff on its seaward side. This process repeats and a regular pattern of ridges at distances of about hundred meters emerges at a time scale of a few decades. In the Danish Wadden Sea, such recent and ongoing salt marsh developments can be observed along parts of the mainland coast because land claim operations have been less intensive than in the other regions of the Wadden Sea.

The Danish Wadden Sea: Knudedyb between the Fanø and Mandø in the direction of Mandø and the mainland (Photo: Svend Tougaard)

Another feature of the Danish Wadden Sea are two well developed Pleistocene cliffs where moraine deposits of the last but one glacial period are eroding. These provide an interesting glance into the distant past of the North Sea coast. In the central and southern sub-regions, such cliffs are nowadays positioned further inland because of extensive marsh development in front after the rapid postglacial sea level rise had declined to its present rate.

The values that are unique to the Wadden Sea and of outstanding universal value are extensively described and justified in the nomination, in particular in chapter 3. As outlined in chapter 3.b (Proposed Statement of Outstanding Universal Value) the Wadden Sea forms the largest unbroken system of tidal sand and mud flats worldwide with natural dynamic processes proceeding in a widely unimpaired natural state.

It is an outstanding example of the Holocene development of a sandy coast under conditions of rising sea level and is unique in that it is the only extensive tidal flat and barrier island depositional system in the World. Its geological and geomorphological features are closely entwined with biophysical process and provide an invaluable record of the ongoing dynamic adaptation of coastal environments to global change. The high primary and secondary production in the Wadden Sea helps to sustain species of birds, fish and crustaceans and seals well beyond its

borders. The rich and diverse habitats are of outstanding international importance as an essential habitat for migratory water birds.

The Danish Wadden Sea is an integral part of the northern sub-region of the Wadden Sea which is defined by the occurrence of a well developed outer barrier composed of islands and high sands, an extensive tidal area with some scattered marshy islets interspersed of which some become submerged during storm tides because they have remained undefended by high seawalls. A biologically outstanding feature are the large intertidal seagrass beds, the largest within Europe, which extend both in the German and the Danish part of the northern Wadden Sea and complement each other. The Danish Wadden Sea is a natural marvel but has no unique attributes setting it apart from the nominated Wadden Sea area or conversely, the nominated area lacks no natural values which are universally outstanding for the entire Wadden Sea region.

In conclusion, all the outstanding universal values that are found within the nominated property are equally found within the Danish Wadden Sea. As set out in the nomination dossier chapter 1.f and further substantiated by the above Table 2.1 *Extended*, the nominated property includes all elements necessary to express its Outstanding Universal Value and is of adequate size to ensure the complete representation of the features and processes which convey the property's significance.

References:

Bartholdy J 1980 Sediments and dynamics in the Varde Å estuary. Geografisk Tidsskrift 80:64-71.

Bartholdy J, Pejrup M 1994 Holocene evolution of the Danish Wadden Sea. Senckenbergiana Maritima 24:187-209.

Hennig, V., 2001. An evaluation of available knowledge on the necessity of undisturbed moulting sites for seaducks in the offshore area, in order to investigate the possibilities for creating such undisturbed moulting sites. Hamburg, University of Hamburg. Report – Wadden Sea Plan Project 35.

Jacobsen NK 1993 Shoreline development and sea-level rise in the Danish Wadden Sea. J Coast Res 9: 721-729.

Jacobsen NK 1998 The high sands of the Danish Wadden Sea – especially the ebb-tide delta, Søren Jessens Sande, and its incorporation with the island of Fanø. J Coast Res 14:175-184.

Jensen KT 1992 Macrozoobenthos on an intertidal mudflat in the Danish Wadden Sea: comparisons of surveys made in the 1930s, 1940s and 1980s. Helgol Meeresunters 46:363-376.

Jespersen M, Rasmussen E 1994 Koresand – die Entwicklung eines Außensandes vor dem dänischen Wattenmeer. Die Küste 56:79-91.

Reise K 2003 Metapopulation structure in the lagoon cockle *Cerastoderma lamarcki* in the northern Wadden Sea. Helgol Mar Res 56:252-258.