IUCN Conservation Outlook Assessment 2017 **(archived)**
Finalised on 09 November 2017

Please note: this is an archived Conservation Outlook Assessment for Wadden Sea. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Wadden Sea

SITE INFORMATION

Country:
Denmark, Germany, Netherlands
Inscribed in: 2009
Criteria:
(viii) (ix) (x)

Site description:

The Wadden Sea is the largest unbroken system of intertidal sand and mud flats in the world. The site covers the Dutch Wadden Sea Conservation Area, the German Wadden Sea National Parks of Lower Saxony and Schleswig-Holstein, and most of the Danish Wadden Sea maritime conservation area. It is a large, temperate, relatively flat coastal wetland environment, formed by the intricate interactions between physical and biological factors that have given rise to a multitude of transitional habitats with tidal channels, sandy shoals, sea-grass meadows, mussel beds, sandbars, mudflats, salt marshes, estuaries, beaches and dunes. The area is home to numerous plant and animal species, including marine mammals such as the harbour seal, grey seal and harbour porpoise. Wadden Sea is one of the last remaining large-scale, intertidal ecosystems where natural processes continue to function largely undisturbed. © UNESCO

SUMMARY

2017 Conservation Outlook

Good

The Wadden Sea is a unique area in densely populated Europe, facing an large number of threats, some of which are on a global scale (climate change). At the same time the property is managed and studied by well-organised, cooperative and highly competent management authorities, being supported in this role by an active and committed NGO community and the civil society in the region. It is an example of an area that has undergone serious conservation damage in the past and continues to be faced with significant challenges, but where conservation measures being undertaken are demonstrating positive results. While significant challenges remain to be managed and the property will require continued monitoring, the conservation outlook for this property in the short-term is Good.

Current state and trend of VALUES

Good
Trend: Data Deficient

Excellent monitoring indicates that the natural values in the property are for the most part being conserved. A number of fluctuations in numbers of migratory and breeding waterbirds over the last decades have been recorded, with some important declines as well as increases, the number of declines being higher than the number of increases. More studies to determine the reasons for any declines and to understand appropriate management responses are under way. Marine mammal populations are also intensively studied and indicate positive trends.

Overall THREATS

High Threat

The list of current threats is long, but it is important to note that the

management responses to most of these threats have reduced the likelihood of damage to the values for which the property was inscribed. However, as the property is faced with so many threats, both current and potential, it is still assessed as facing a high level of threat even if this is mitigated by good management. Note that climate change and in particular the accelerated sea level rise associated with this will certainly have a great effect on natural values.

Overall PROTECTION and MANAGEMENT

Highly Effective

Protection and management protocols as well as very good cooperation between different State Parties mean that there is institutional, financial and technical capacity to cope with existing and future conservation challenges in order to maintain the values and integrity of the property. The Wadden Sea Plan is a good example in managing a number of serious threats to the property from just beyond its borders. Overall, protection and management are highly effective, though fisheries guidelines and monitoring still has to be fully implemented. Certain financial constraints exist and staffing capacity could always be improved.

FULL ASSESSMENT

Description of values

Values

World Heritage values

- **Depositional coastline of unparalleled scale and diversity**
  Criterion:(viii)

  The Wadden Sea is a depositional coastline of unparalleled scale and diversity. It is distinctive in being almost entirely a tidal flat and barrier system with only minor river influences, and an outstanding example of the large-scale development of an intricate and complex temperate-climate sandy barrier coast under conditions of rising sea-level. Highly dynamic natural processes are uninterrupted across the vast majority of the property, creating a variety of different barrier islands, channels, flats, gullies, saltmarshes and other coastal and sedimentary features (Nomination 2008; IUCN, 2009; SoOUV, 2009).

- **One of the last remaining natural large-scale intertidal ecosystems with natural processes continuing to function largely undisturbed**
  Criterion:(ix)

  Natural processes continue to function largely undisturbed in one of the last remaining natural large-scale intertidal ecosystems. Geological and geomorphologic features are closely entwined with biophysical processes and provide an invaluable record of the ongoing dynamic adaptation of coastal environments to global change. There is a multitude of transitional zones between land, sea and freshwater that are the basis for the species richness of the property. The productivity of biomass in the Wadden Sea is one of the highest in the world, most significantly demonstrated in the

numbers of fish, shellfish and birds supported by the property (Nomination 2008; IUCN, 2009; SoOUV, 2009).

► Key site for migratory birds

Criterion:(x)

The property is a key site for migratory birds as a staging, moulting and wintering area, providing high level of food and a low level of disturbance for some 10-12 million birds passing through the property each year (with up to 6.1 million birds present at the same time). The property is the essential stopover that enables the functioning of the East Atlantic and the African-Eurasian migratory flyways. For 43 migratory bird species the Wadden Sea supports more than 1% of the entire flyway population, and for 29 species more than 10% of their flyway population, In addition, the property supports 30 breeding bird species (Nomination 2008; IUCN, 2009; SoOUV, 2009).

► Exceptional species richness in a salt marsh

Criterion:(x)

The property protects critical habitat for about 2,700 marine species in the intertidal and subtidal zones and at least 5,000 semi-terrestrial and terrestrial species, mostly the flora and fauna of salt marshes and dunes on the islands. There are 2,300 species of flora and at least 4,200 species of fauna (Nomination 2008; IUCN, 2009; SoOUV, 2009).

Other important biodiversity values

► Important refuge for marine mammals

Marine mammals include Harbour Seal, Grey Seal, and Harbour Porpoise. After centuries of hunting, protection measures have resulted in recovery of the seal populations. The Wadden Sea now sustains approximately 20% of the North-east Atlantic subspecies of Harbour Seal: a total of 26,788 were counted in an annual survey in 2013 compared to about 4,000 thirty years earlier (Nomination 2008; IUCN, 2009; Common Wadden Sea Secretariat 2013).

Assessment information

Threats

Current Threats

High Threat

The list of current threats is long, but it is important to note that the management responses to most of these threats have reduced the likelihood of damage to the values for which the property was inscribed. However, as the property is faced with some threats with potentially even catastrophic consequences, even if the property is well-managed, there still remains a high risk of threat.

▶ War, Civil Unrest/ Military Exercises

Low Threat
Inside site
Outside site

The extent of military activities has decreased including the abandonment of exercise sites (Burbridge, 2000). Military aircraft use the area as a training ground although they have flight restrictions and take into account of the breeding and moulting times for birds and seals (CWSS 2012).

▶ Agricultural effluents

High Threat
Inside site
Outside site

Agricultural and industrial runoff into the property, including large amounts of nutrients and toxic substances was serious in the past but greatly improved through regulation. However, BirdLife (2009) note that levels of pollutants are slowly increasing again, with a large number of substances are still exceeding safe norms, including organotin compounds, PCBs and hexachlorobenzene. Furthermore, newly developed xenobiotics, such as

hormones disruptors, may have negative impacts (CWSS, 2012)

► Flight Paths

Low Threat
Inside site
Outside site

A minimum flight altitude for civil air traffic has been stipulated (Burbridge, 2000). Unfortunately, on some of the islands there is quite a lot (and possibly increasing) of air traffic. Servicing off-shore wind farms has also increased air traffic over the property. Therefore, locally the quietness of the area is considerably reduced and large flocks of birds are potentially being disturbed.

► Invasive Non-Native/ Alien Species

High Threat
Inside site
Outside site

Of some 52 known introduced species in the property, only six are considered to have a strong impact on the composition of the existing biota in the Wadden Sea. There is a basic research and control system in place to mitigate the effects of introduced species to the native biota of the Wadden Sea (IUCN, 2009), however, that needs to be supported by a strong strategy allowing for more action (CWSS, 2014). The rate of alien invasive species has increased rapidly through ballast water and aquaculture, with some replacing native species and altering the structure of habitats.

► Livestock Farming / Grazing

Low Threat
Inside site
Outside site

Inappropriate cow and sheep grazing practices could be affecting salt marsh species composition and regeneration. The impact has been reduced considerably already during the last 25 years; Grazing of mainland salt marshes is carried out as part of coastal defence measures, or, in some areas, to aim for an enhanced biodiversity and heterogeneity of salt marshes (CWSS 2014)There are many, also recent studies on grazing effects in the saltmarshes (e.g. Nolte, 2013; Wanner, 2013).

► Fishing / Harvesting Aquatic Resources

High Threat
Inside site
Outside site

Important fisheries are blue mussel and shrimp, and cockle fisheries in the past (other fisheries are smaller and not (yet) a big threat). These have been regulated including the establishment of permanently (albeit rather small yet) closed areas (IUCN, 2009). However, shellfish, the main food for many bird species, has been seriously depleted. One of the causes is the bottom-dredging fishery. Large fishing vessels scrape their nets along the sea floor, destroying biodiversity-rich communities. The mechanical cockle fishery has wreaked havoc in the Dutch Wadden Sea in particular. Its activities have now been restrained, but were responsible among other things for the loss of 15,000 Oystercatchers. Recent studies on the impact of the cockle fishery concluded that the area of mudflats containing sufficient shellfish for feeding Knots decreased by fifty-five percent between 1996 and 2005. During the same period, Knot numbers decreased by forty-two percent. The shrimp fishery, which is increasing each year, is also responsible for a large bycatch of young fish, young shrimp and other invertebrates. Also a number of fish species with slow growth (rays and sharks) and reef building animals such as Sabellaria has disappeared in the Wadden Sea, the shrimp fishery most probably being responsible. In the Dutch Wadden Sea, the large-scale industrial cockle fishing has been banned, and the reduction and transition of other bottom dredging fisheries (mussels, shrimps) to more sustainable methods is in progress. (BirdLife, 2009).

► Shipping Lanes

High Threat
Inside site
Outside site

International and smaller ports and harbours directly adjacent to the property and shipping lines close to and through the property open up a threat of maritime pollution. Access to the harbours and maintenance of navigation channels is subject to an integrated planning system including sediment management, both to maintain the shipping routes and to avoid environmental impacts to the marine and coastal ecosystems. However, it is

clear that the deepening of the navigation channels also has an impact on the site, which should be kept as small as possible. Also there is a tendency to modify and/or enlarge harbours, with some impact on the property, which must be reduced as much as possible. Designation as an IMO Particularly Sensitive Sea Area (PSSA) and implementation of a shipping Traffic Management System and emergency contingency plans are state of the art, but shipping will continue to be a significant risk for the foreseeable future (IUCN, 2009). Due to intensive wind farm development in the North Sea outside the Wadden Sea there is clearly an increase in the risk for shipping accidents which would then have an impact on the site. Industrial plants such as power or chemical plants are close to the site in some areas.

► Renewable Energy

High Threat
Inside site
Outside site

No construction of new wind turbines is allowed within the property, although a barrier of off-shore wind-farms occurs just outside of the property. Submarine cables to the wind farms are also placed within the property although these are said to cause only temporary impact (IUCN, 2009). The impact is already being reduced by bundling cables in fewer routes and with higher capacities. However, there might be a limit for the number of cables being acceptable in the property. All in all, the region around the Wadden Sea can provide large amounts of renewable energy, but it is very important (and possible) to do this with careful planning, which should respect all the natural values and should keep the landscape beautiful. (WWF, 2012)

► Tourism/ visitors/ recreation

High Threat
Inside site
Outside site

Approximately 20 million tourists stay overnight and 30-40 million day trippers visit the Wadden Sea region, mainly on the islands and the coastal areas on the mainland (IUCN, 2009), other tourism statistics provided in Europarc (2012). The major part of the tourism activity and infrastructure takes place outside the Wadden Sea. A tourism development strategy for the World Heritage destinations (property and adjacent areas on the mainland

and islands) has been developed. Tourism activities are comprehensively regulated including specific management frameworks in all three states; e.g. visitor information and guidance, zoning, closure of sensitive areas, and guided walks to experience the area (PROWAD, 2014; CWSS, 2014). However, increased visitor pressure has led to the development of a more static coastline and increased disturbance, and may be one of the causes for the detriment of breeding populations of species such as Little Tern, Kentish Plover and Sandwich Tern (BirdLife, 2009).
To summarize, tourism in the Wadden Sea today has quite a big impact, but this has developed over many decades and was not caused by the inscription of the property. Overall (with some local exceptions) the impact is acceptable as of today, but there are risks if the number of tourists would considerably increase.

► Storms/Flooding, Temperature extremes

Very High Threat
Inside site, throughout(>50%)
Outside site

Past and to some extent present interference with the natural dynamics of the Wadden Sea system means that it has lost much of its resilience and flexibility to adapt to the impacts of climate change, including rising sea level, temperature change and natural disasters including flooding of sandbanks and salt marshes, all of which is already occurring. Increasing storm tides, for example, wash away Sandwich Tern nests (BirdLife, 2009). It is positive that the Wadden Sea countries have agreed on a “Trilateral Climate Change Adapation Strategy” (CWSS, 2014), and that some local and regional initiatives are on the way to search for nature friendly and sustainable methods to prepare for sea level rise and to start pilot projects (WWF, 2014). Climate change and in particular the associated sea level rise is considered the biggest threat for the Wadden Sea in the long term, with the potential to have severe impact.

► Hunting (commercial/subsistence)

Low Threat
Inside site, localised(<5%)
Outside site

Hunting has been or will be phased out in almost the entire Dutch and

German Conservation Areas (Burbridge, 2000). Hunting is still allowed in large parts of the Danish Conservation Area (Miljøstyrelsen, 2017). It is noted that hunting is especially damaging in Denmark, causing disturbance, particularly in high tide roosting areas (BirdLife, 2009). The current extent and effect of hunting pressure and disturbance is unknown.

► Oil/ Gas exploration/development

Low Threat
Inside site, localised(<5%)
Outside site

No new exploitation installations for oil and gas are permitted in the property. One existing installation, the Mittelplate was excised from the property. An independent research and monitoring programme has been conducted at Mittelplate in the Schleswig-Holstein Wadden Sea to assess its ecological impact and no negative effects have been found in an extensive area surrounding the platform (IUCN, 2009). However, there is obviously large scale damage to the natural beauty and the wilderness appearance of the site. Subsidence as a result of gas extraction in the Dutch part of the Wadden Sea is expected (BirdLife, 2009) but is fully compensated in tidal area and salt marshes by natural sedimentation (as monitoring since 1965 has shown) (CWSS, 2012). However, considering that due to sea level rise the Wadden Sea may face a sediment deficit in the longer term, the sediment which compensates now the subsidence will later be missing in the site,

Potential Threats

Low Threat

New dikes and harbours, which could severely impact the property, are currently unlikely to be approved. Potential threats also include new invasions of alien species and pathogens, and catastrophic oil spills, but risk assessment plans are in place.

► Dams/ Water Management or Use

Very Low Threat

Inside site
Outside site

Further embankments are not allowed and areas of legal conservation have been extended and amended; the large majority of the Wadden Sea Area has been designated as Natura 2000 areas in the framework of the EU Habitat and Bird Directives and hence been subject to the stipulations of Art. 6 of the Habitat Directive (Burbridge, 2000). However, new dikes are still in the realm of possible for reasons of overriding public interest and if no alternatives can be found. However, all in all it seems very unlikely that ideas for such constructions would really be brought forward.

► Commercial/ Industrial Areas

Very Low Threat
Inside site
Outside site

Construction of new harbours and industrial facilities in the areas under conservation are not allowed unless for imperative reasons of overriding public interest and if no alternatives can be found (Burbridge, 2000). Given that e.g. there are already many harbours existing close to the site, it seems very unlikely that ideas for such constructions will be brought forward.

Protection and management

Assessing Protection and Management

► Relationships with local people

Mostly Effective

Local communities are strongly committed to nature conservation through environmental education and nature based tourism activities, and an exceptional level of public consultation was undertaken when preparing the nomination. Conservation efforts are also strongly supported by regional governments, by almost all municipalities and by local and regional NGOs who provide significant volunteer support to management activities (IUCN, 2009).

► Legal framework

Highly Effective

The property includes mostly protected areas legally established by federal or state decrees. A small part of the nominated property (0.25%) is under private ownership. Management of private lands is regulated by existing protective measures and entirely embedded in the trilateral protection and management scheme according to the Joint Declaration on the Protection of the Wadden Sea in conjunction with the Trilateral Wadden Sea Plan, which represents a planning and management framework for the whole area (IUCN, 2009). Very important is the European backing by e.g. the Bird and the Habitat Directive, and the legal implementation of the trilateral decisions on the national and the regional level.

► Enforcement

Mostly Effective

There is effective law enforcement via local police, coastguards and naval police forces through an integrated system of patrolling and inspection (IUCN, 2009). Fishing vessel movement is partly collected using VMS data, however it is unclear if this is done in real-time (facilitating fisheries enforcement) or collected later (CWSS, 2016). Overall the management is actively pursuing effective enforcement, however, there are still few official rangers/wardens and many warden activities are undertaken by volunteers or employees of NGOs.

► Integration into regional and national planning systems

Highly Effective

The Wadden Sea Plan was officially adopted in 1997 and updated in 2010 and is a politically binding document and constitutes the common framework for the protection and sustainable management of the property as an ecological entity. The implementation of the plan is done by the standing bodies of the Trilateral Wadden Sea Cooperation through the Ministerial Council and a Wadden Sea Board which oversees operational aspects of implementation and ensures effective coordination of the different tiers of management, and being advised in this role by a regional stakeholder forum and by Nature NGOs. The Common Wadden Sea Secretariat (CWSS) is tasked

with the daily implementation of the Wadden Sea Plan, coordination of the activities in the framework of the plan and a regular review of its implementation (IUCN, 2009).

► Management system

Highly Effective

The collective management effort is somewhat complex (involving several different associations and/or organisations) but in many ways exemplary, creating true and functional cooperation between the three countries at different levels (CWSS, 2016). The cooperation is long-standing and predates the World Heritage nomination, the Trilateral Wadden Sea Cooperation (TWSC) was established in 1978. The actual management is handled by the Common Wadden Sea Secretariat (CWSS). The Wadden Sea Plan and the Integrated Coastal Zone Management (ICZM) Strategy, prepared to address recommendations from the European Parliament on coastal zone conservation and management, provide a framework for managing the area. There are specific management plans for the different protected areas within the property (IUCN, 2009). Work towards a single integrated management plan (SIMP) has been started, a roadmap and actual development onset of the SIMP is expected in early 2018 (CWSS, 2016). The Danish National Park will get a new plan in 2018, prioritizing World Heritage objectives (CWSS, 2016).

► Management effectiveness

Highly Effective

The management is effective and adaptive, and supported by large-scale monitoring data. There are some challenges concerning fisheries monitoring and management, due to intersecting responsibilities and commercial fisheries management in the three countries. Currently there are separate plans and guidelines in effect in the three countries, but the management is working towards a single integrated management plan. The current management is adequate to maintain the property’s OUV.

► Implementation of Committee decisions and recommendations

Highly Effective

Recommendations in Committee Decision 33COM 8B.4 to prepare an

extension to include the Danish Wadden Sea, to undertake a tourism strategy, to improve monitoring of invasive species and to cooperate with other sites along the East Atlantic flyway have been mostly fulfilled. The Danish Wadden Sea was inscribed (in 2014), the Tourism Strategy adopted (in February 2014) and the East Atlantic Flyway cooperation has made extensive progress through active effort by the management. The alien species issue, while making some progress (a trilateral working group has been installed and a draft strategic framework is being developed) is still lacking. This is due to the fact that the problem is multifaceted, especially stopping new alien species to become established and eradicating existing alien species. The current goal is to finalize the framework and start the implementation in 2018.

Recommendations in the Committee Decision 38COM 8B.13 (Request No. 5) to prepare an implementation plan to enhance the conservation and management in the Danish part has been undertaken. The Danish National Park is being evaluated in 2016-2017 and a new updated plan will be accepted by the end of 2018 (CWSS, 2014).

Recommendations in the Committee Decision 38COM 8B.13 (Request No. 6) to implement a single integrated management plan (SIMP) and to strengthen the implementation of coordinated management have been undertaken. The current timeline will result in a formal decision on the development of the SIMP in spring 2018 (Trilateral Governmental Conference), which will provide the necessary institutional support and funding to start developing the SIMP in mid-2018 (CWSS, 2016).

Recommendations in the Committee Decision 38COM 8B.13 (Request No. 7) to extend the monitoring of impacts of fisheries and to ensure protection from detrimental impacts have been started in the form of a trilateral Framework of Sustainable Fisheries (adopted in 2014) listing several important principles. There is also a basic fisheries monitoring in place (using VMS, logbooks and a black box approach). However, the actual implementation on the Committee Decision still lacks a clear timetable and /or a roadmap for implementation, as well as more clearly defined targets, methods and dependencies between detrimental effects, species, biotopes and fishing methods.

Recommendations in the Committee Decision 38COM 8B.13 (Request No. 8) to submit a joint report on the State of Conservation of the property has been

fulfilled in November 2016.

► Boundaries

Highly Effective

The site has been recently (2014) extended and now also includes area in Denmark. Clear maps detailing property boundaries are publicly available for the whole transboundary property. The management have all necessary boundary data to adequately maintain the property's OUV. A navigation system used for commercial and recreational boasts in the Wadden Sea has geo-referenced information on the boundaries of all existing protected areas and the restrictions associated to each of them (IUCN, 2009).

► Sustainable finance

Mostly Effective

The nominated property is well supported in terms of human and financial resources (IUCN, 2009). However, in daily life there is still a serious underfunding in terms of e.g. warden activities of the area, coordinating the educational activities (IWSS), or the capacity to develop pilot projects with the purpose of both restoring lost nature and preparing for the sea level rise.

► Staff training and development

Highly Effective

Existing staff working directly in the protected areas within the property include over 200 permanent positions covering technical experts, scientist and rangers. These permanent staff positions are complemented by over 200 additional staff funded by NGOs and local governments. Staff are mostly highly qualified and subject of on-going training programmes to enhance their effectiveness (IUCN, 2009). However, the number of wardens could be increased.

► Sustainable use

Mostly Effective

North Sea fish have for a long time been subject to strong fishery pressure, and after large fish had disappeared, fisheries in the Wadden Sea focused on shellfish and shrimp. This has affected the benthos in general: native oysters

and Sabellaria reefs have vanished, in some areas, subtidal mussels are mostly confined to culture lots, and intertidal beds are intermittently strongly decimated, while catches of shrimp have been sustained. Industrial cockle fishery has recently been banned completely. There seems to be a large potential for fish and shellfish recovery but management efforts are still in their infancy (Wolff et al., 2010). The management are taking important steps to improve and integrate fisheries management with conservation goals, including adopting specific trilateral policy principles (in 2014), however the implementation (in combination with connected monitoring schemes) still has to take full effect (Jager, 2015; CWSS 2016). Monitoring data for the hunting effort and the effect of hunting disturbance on migrating, staging and wintering birds in the Danish part is not available, but hunting could negatively affect shorebirds (BirdLife, 2009; Madsen et al, 1995; Madsen, 1998).

► Education and interpretation programs

Mostly Effective

Well targeted education and interpretation programmes (IUCN, 2009). However, there is a lack of coordination of the educational network and support for it from the trilateral level. The “International Wadden Sea School” (IWSS) has been established to support this network on a permanent basis in cooperation with the WWF (CWSS, 2014).

► Tourism and visitation management

Highly Effective

A Sustainable Tourism Strategy has been developed to enhance the cooperation between tourism and nature conservation to protect and maintain the OUV (PROWAD, 2012; CWSS, 2014) Over 50 good interpretation centres exist. There is also an action plan accompanying the tourism strategy.

► Monitoring

Highly Effective

There is a harmonized and coordinated Trilateral Monitoring and Assessment Programme which provide regular reports on the progress in implementation the targets of the Wadden Sea Plan and a scientific assessment of the ecological status of the property (CWSS, 2013; CWSS, 2016). Monitoring of

the extent and effects of fisheries is still being developed (CWSS, 2016). The entire property is subject to active planning, management and monitoring, in national and international contexts, and with an exceptional level of integration and harmonized approach between the three countries involved in the management of the Wadden Sea (IUCN, 2009).

▶ Research

Highly Effective

One reason for the OUV of the property was given as “It is also one of the best-studied coastal areas on the planet, providing lessons of wider scientific importance for wetland and coastal management of international importance” (SoOUV, 2009). Tremendous amount of research is ongoing on in the area, including research and modelling applied on climate change predictions in the Wadden Sea (IUCN, 2009). The management has been quite effective in getting research done in key management areas.

Overall assessment of protection and management

Highly Effective

Protection and management protocols as well as very good cooperation between different State Parties mean that there is institutional, financial and technical capacity to cope with existing and future conservation challenges in order to maintain the values and integrity of the property. The Wadden Sea Plan is a good example in managing a number of serious threats to the property from just beyond its borders. Overall, protection and management are highly effective, though fisheries guidelines and monitoring still has to be fully implemented. Certain financial constraints exist and staffing capacity could always be improved.

▶ Assessment of the effectiveness of protection and management in addressing threats outside the site

Highly Effective

Given the scale of threats outside the site (fisheries, oil and gas extraction, shipping, wind farms) management tools to mitigate the threats posed to the property are state of the art.

► Best practice examples

The Wadden Sea Plan is a good example in managing a number of serious threats to the property from just beyond its borders.

State and trend of values

Assessing the current state and trend of values

World Heritage values

► Depositional coastline of unparalleled scale and diversity

Good
Trend:Stable

These processes are continuing despite considerable interference in the past (prior to inscription) (IUCN, 2009). However, due to sea level rise there is serious concern for this value in the long run.

► One of the last remaining natural large-scale intertidal ecosystems with natural processes continuing to function largely undisturbed

Good
Trend:Stable

These processes are continuing despite considerable interference in the past (prior to inscription) (IUCN, 2009), but to a much more limited extent today. However, to keep the Wadden Sea healthy despite sea level rise, nature restoration projects will be necessary. With the first projects such as the opening of summer dikes it was possible to achieve success in restoring some of the natural dynamic processes (CWSS, 2010).

► Key site for migratory birds

Low Concern
Trend:Data Deficient

Monitoring of all the bird species in the property is quite thorough (e.g. Ens et al., 2009; Laursen et al., 2010; Hôtker et al., 2010; van Roomen et al., 2012; Koffijberg , 2015; Blew et al, 2016; Thorup et al, 2016) and have identified a

number of declining trends for about half of the bird species, whereas the other half seem to be fluctuating or increasing. While there could be cause for concern for some migratory bird species, further data is required to identify the causes and understand if they could be changed by changes in management to the property. Factors inside the property potentially impacting breeding, migrating and wintering birds negatively include indirect effects of fisheries activity (available food resources) and direct effects of human disturbance (incl. hunting) and predation (especially during the breeding season).

► Exceptional species richness in a salt marsh

Low Concern
Trend:Stable

No indication of change in species richness since inscription in 2009. Much baseline data (e.g. Marencic, 2009; Wolf et al., 2010). However, some salt marshes, particularly on the mainland coast, are in a rather bad shape, in particular due to heavy coastal engineering impacts such as strong drainage systems. Restoration projects as part of the daily management of the competent authorities are required for those sites and could certainly increase species richness there.

Summary of the Values

► Assessment of the current state and trend of World Heritage values

Good

Trend: Data Deficient

Excellent monitoring indicates that the natural values in the property are for the most part being conserved. A number of fluctuations in numbers of migratory and breeding waterbirds over the last decades have been recorded, with some important declines as well as increases, the number of declines being higher than the number of increases. More studies to determine the reasons for any declines and to understand appropriate management responses are under way. Marine mammal populations are also intensively studied and indicate positive trends.

► Assessment of the current state and trend of other important biodiversity values

Good

Trend: Data Deficient

Marine mammal populations are also intensively studied and indicate positive trends. The Wadden Sea now sustains approximately 20% of the North-east Atlantic subspecies of harbour seals: a total of 26,788 were counted in an annual survey in 2013, compared to about 4,000 thirty years earlier (IUCN, 2009). While seal populations go through periodic fluctuations due to virus epidemics (e.g. in 1988 and 2002), the population of the harbour seal has shown a rapid recovery. The grey seal, having been disappeared already in the past, has returned to the Wadden Sea and is now also showing good numbers again. The overall trend for seals is positive (CWSS, 2010; Trilateral Seal Management Plan 2012-2016).

Additional information

Benefits

Understanding Benefits

► Outdoor recreation and tourism

Beneficiaries include local and regional businesses that rely on tourism, and the tourists themselves. The property is visited by over 10 million visitors annually (30-40 million day-trippers). Mudflat-walking, mostly guided, has become popular among tourists.

► Wilderness and iconic features

While it is difficult to consider the property as true “wilderness” (seeing that man-made structures can be perceived from much of the area), at the same time large areas of muddy sandflats with no perceptible human influence still exist. In a European context this is very rare and is of great value in a

regional context.

▶ **Importance for research**

The property has been inscribed as “one of the best-studied coastal areas on the planet, providing lessons of wider scientific importance for wetland and coastal management of international importance”.

▶ **Fishing areas and conservation of fish stocks**

Area is an essential reserve for fish spawning and continues to be used for fisheries (molluscs, shrimps). Present fisheries should be better monitored and the effect on the property’s values minimized.

▶ **Carbon sequestration**

Large areas of undeveloped coastal land with continuing sedimentation processes provide environmental services in flood reduction (including lessons learned) and probably contribute to climate change mitigation.

Summary of benefits

This large area of undeveloped or little developed coastal and marine habitats provides a wide array of benefits to the large numbers of people which live within or just outside of the property or which come as visitors. In addition to nature conservation and wilderness values, the property provides a wide range of ecosystem services, furnishes a wealth of scientific knowledge, experiences with nature restoration and climate adaptation measures, and provides jobs, particularly through tourism but also from fisheries, park management, research and education.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects

1	Common Wadden Sea Secretariat	Wadden Sea flyway initiative
2	Common Wadden Sea Secretariat	Protect and Prosper - Sustainable tourism in the Wadden Sea
3	.	Numerous research and conservation projects are undertaken in the property by the three State Parties, too numerous to list here.

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