

SYMPOSIUM REPORT

Bright Future?

Harbour porpoises in the Wadden Sea

11 April 2019
Wilhelmshaven, Germany



Introduction

The trilateral symposium “Bright Future? Harbour porpoises in the Wadden Sea” aimed to highlight and further explore the role of this small and common whale in the Wadden Sea ecosystem. This symposium was organized by the Common Wadden Sea Secretariat and the UNESCO World Heritage Visitors Center with the support of the Danish Ministry for Environment and Food, the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Dutch Ministry of Agriculture, Nature and Food Quality as part of the annual ‘Harbour Porpoise Days’ in Wilhelmshaven.

Background

In a letter dated 5 October 2017, the Advisory Committee of the UN Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS) approached the trilateral Wadden Sea Cooperation (TWSC) with the request to further include the harbour porpoise under the TWSC and to foster a stronger cooperation with ASCOBANS. The ASCOBANS Advisory Committee noted that harbour porpoises were increasingly being registered in the tidal channels and estuaries of the Wadden Sea and appeared to be an integral part of this ecosystem. Therefore, ASCOBANS stated that it would

“welcome the inclusion of the harbour porpoise under the Trilateral Cooperation on the Protection of the Wadden Sea, as well as a stronger cooperation between ASCOBANS and the Trilateral Cooperation, specifically regarding the implementation of the ASCOBANS Conservation Plan for Harbour Porpoises (*Phocoena phocoena* L.) in the North Sea.” ASCOBANS further noted that in its view “one helpful step in achieving this would be the development of the current Trilateral Seal Expert Group into a Trilateral Marine Mammal Expert Group that would include small cetaceans in its remit.”

To address this, this scientific symposium and a subsequent trilateral workshop were organized in Wilhelmshaven on 11 and 12 April 2019. The overall aim was to collect and evaluate information on the specific ecological role of harbour porpoises in the Wadden Sea, also with regard to the adjacent North Sea waters. Based on the gathered knowledge further conservation activities would be discussed on trilateral level.

Presentations

The symposium was opened by three speakers, representing the hosts and ASCOBANS: **Rüdiger Strepel**, Executive Secretary of the Common Wadden Sea Secretariat (CWSS), **Roger Staves** from the UNESCO Wadden Sea World Heritage Visitor Centre and **Jenny Renell**, ASCOBANS Coordinator. Mr Strepel welcomed all participants and thanked them for being part of this effort to share knowledge of the ecology, monitoring methods and potential threats, and, as a second step during the subsequent workshop scheduled for the next day, to produce recommendations for the protection of these unique whales.

Mr Staves emphasized the increasing interest that harbor porpoises have raised among the local public and visitors to the Wadden Sea during the last decade. He stated that this year, on the special occasion of the 10-year anniversary of the Wadden Sea World Heritage, various regional players had jointly organized the well-received Harbour Porpoise Days. The activities and events included touristic activities such as whale watching trips, but also this scientific symposium to stress the importance of scientific research as a basis for conservation activities.

Ms Renell highlighted the role of transboundary cooperation in applying effective measures to successfully tackle threats and achieve a favorable conservation status of this small cetacean. She also noted that the ASCOBANS Conservation Plan for Harbour Porpoises in the North Sea was valid for the Wadden Sea area.

The six presentations of the symposium focused on the population status, monitoring and potential threats to harbour porpoises in the Wadden Sea and adjacent waters.

Opening the succession of presentations, **Meike Scheidat** from the Wageningen Marine Research provided insights into conservation status of the harbour porpoise conservation status in the Wadden Sea and the likelihood of a whole group of organisms becoming extinct in the future. In order to assess this, information on the abundance, distribution, habitat and impact of threats were needed. Studies on the population size of harbour porpoises in the North Sea had shown increasing numbers in the Wadden Sea since 1994. However, the Wadden Sea was considered a difficult area for shipboard monitoring due to the shifting tides, but also for aerial monitoring due to bird protection measures. Ms Scheidat furthermore stressed that harbour porpoises had a high metabolic rate, resulting in high food demands, mainly for fish. She speculated that the presence of harbour porpoises in the Wadden Sea was linked to the tidal currents: tides pooled groups of fish, giving the porpoises the advantage of being able to locate them easily by using their echolocating system. Porpoises produce high frequency sounds (clicks) that bounce on any object allowing them to locate prey and navigate. Ms Scheidat noted that there was not enough information available to assess the conservation status of the harbour porpoise in the Wadden Sea with certainty. Paintings from the early 1900s suggested that they were far more abundant in those days than today. Explaining that the Wadden Sea World Heritage covered a part of the area that the harbour porpoises used, she strongly emphasized the need to monitor and manage threats in what was after all an area of global importance.

Jonas Teilmann from the Aarhus University presented information on the movements of satellite-tagged porpoises and provided an outline of potential future monitoring in the Danish Wadden Sea. Individuals that were tagged near the island of Rømø stayed around the Danish Wadden Sea and moved on average 5 km per day, whereas individuals tagged elsewhere had shown a larger range of movement (18 km per day). With the help of a sensor attached temporarily to the head of the porpoise it had been possible to monitor their echolocating system by measuring the click rate variation and the resulting behaviour of the porpoise e.g. when hunting for prey or reacting to disturbances such as loud sounds from ships. Mr Teilmann highlighted the disturbance of porpoises by marine traffic with practical examples.

Holger Haslob from the Thünen Institute of Sea Fisheries showed the stock indices for selected forage fish in the German Wadden Sea. This demersal young fish survey had started in the Netherlands in the 1960s with Germany joining in the 1970s. The aim of the programme had been to examine the abundance and distribution of demersal fish, shrimp and epibenthos. Mr. Haslob noted that the populations of prey species for harbour porpoises in the Wadden Sea underwent heavy fluctuations but he supposed a generally declining trend. As potential causes of this negative trend, he listed effects of climate change, fisheries, changing migratory routes due to blocked passageways and loss of spawning habitats (e.g. due to dredging activities). Harbour porpoises needed a high quantity of food and had a preference for high-quality food, which meant fatter fish.

Ursula Siebert from the Institute for Terrestrial and Aquatic Wildlife Research talked about anthropogenic activities and their effects. Harbour porpoises could be considered as sentinels in our waters; they may provide an early warning of the condition of the ecosystem. Therefore, she proposed a sufficient monitoring system in order to discern changes in mortality and potential causes in advance. Some of the causes of mortality already known were chemical pollution and marine litter, fisheries food depletion and bycatch, noise pollution and other anthropogenic stress. Ms Siebert noted that harbour porpoises in the North Sea had been found to have more parasitic pneumonia and chronic diseases, apparently due to a high exposure to anthropogenic effects which reduced their immune defence. Individuals found dead in the region were younger than in other areas (and had often not yet reached sexual maturity). Further steps towards understanding the effect of threats on the population level were collaborating with researchers from different disciplines, from national and international programmes, gathering seasonal and temporal datasets to be able to develop corresponding models. Ms Siebert stated that the correct interpretation and differentiation between natural and anthropogenic effects was of major importance.

Mardik Leopold from Wageningen Marine Research began his presentation by asking the following question: “Is the Wadden Sea a warm bath or a dangerous desert for harbour porpoises?”. He stated that the animals prefer cold waters. The thickness of their blubber fluctuated with water temperature as well as their body weight. He stated that during summer porpoises feed less and the targeted fish species had less nutritional value. Juveniles needed approx. 2 kg of fish per day, mainly small fish like gobies. To cover their nutritional necessities during growth the animals needed to feed on bigger fish. Mr Leopold explained that adults preferred cod, whiting and sand eels with a needed overall supply of approx. five kg per day. He echoed Mr Haslob by pointing to the continuous decline of fish stocks in the Wadden Sea.

He also highlighted the fact that in the Dutch Wadden Sea it had been reported that one of five dead porpoises had been killed by a grey seal. He concluded, with the slightly provocative statement, that for the time being the Wadden Sea seemed not only to be too warm for the porpoise, but also offered an insufficient food supply and was a very dangerous place due to grey seal predation.

Mr **Joseph Schnitzler** from the Institute for Terrestrial and Aquatic Wildlife Research delivered a presentation on “Effects of underwater noise related to offshore windfarms in the German North Sea on Harbour porpoises”. The North Sea offered good conditions for building windfarms, which represented an important contribution to achieving the European renewable energy targets. Nevertheless, legal instruments such as the EU Habitats Directive, prohibited any action that could harm the harbour porpoise. Legally binding threshold levels for underwater noise had been set. Nevertheless, harbour porpoises were exposed to intermittent sounds and there could be cumulative sound energy levels from multiple exposures. He speculated that these may cause injuries such as the temporary hearing threshold shifts (TTS). Corresponding research allowed the reconstruction of sound propagation to be able to calculate the distance at which the animal was exposed to the threshold level. Mr. Schnitzler concluded that the best way to protect harbour porpoises from TTS injuries was to implement a combination of three measures: previous deterrence, mild starting phase of any activities and noise mitigation.

Plenary discussion

During the plenary discussion, participants asked the presenters for additional information and exchanged in more detail knowledge of the ecological role, abundance, behaviour and potential threats that the harbour porpoises face in the Wadden Sea, as well as on the status and options for monitoring and research that could improve the understanding of porpoise dynamics.

It was emphasized that the occurrence of harbour porpoises had varied in the Wadden Sea over recent decades. After a peak time around the 1950s the species had almost disappeared by the 1970s when more

frequent sightings had again been recorded. Nevertheless, more information was needed on the factors that influenced the variation of their distribution within the Wadden Sea and the adjacent North Sea waters.

Harbour porpoises were highly mobile and actively looked for food. They made use of their echolocation system to locate prey, to avoid obstacles and to navigate. The temporary or permanent damage of this system affected the animals severely. Causes of such damage could be the exposure to strong and constant sounds as well as diseases. The plenary noted the importance of research to identify the causes of damage and to evaluate if a threat originated from natural sources or if it was human-induced.

The plenary discussed and noted that more information on the reaction of harbour porpoises to passing ships, wind turbines and other sources of underwater noise was needed in order to recommend effective and feasible measures. Acoustic experiments and models would enhance the understanding of porpoises' behaviour. It was considered that an exposure over a threshold sound level may induce them to stop foraging for food or could disturb them in such way as to make them unable to “see” obstacles like fishing nets and therefore make them more vulnerable to bycatch and exposing them to other accidents (ship strike).

The abundance of fish was noted as very variable. Besides the varying abundance of fish, other factors may affect the presence and movement of harbour porpoises, such as fish migration, as well as variations in timing of fish egg settlement due to climate change. The presenters stated that harbour porpoises were to some extent able to adapt their diet to those prey species available. But if the abundance of fish kept declining, harbour porpoises in the Wadden Sea could face a serious problem. An analysis of the relationship between the total fishing effort and the biomass to the occurrence of harbour porpoises was considered as useful in investigating potential population development. The great importance of gathering information on fish ecology and fisheries biology was emphasized, since available fish data originated only from stock assessments.

The feeding patterns of harbour porpoises varied with the seasons. During autumn they needed to feed enough to build a thick blubber to insulate them from winter conditions. The animals had an expandable stomach and could ingest 95% of their daily food requirement during only one meal. Data from animals in captivity had shown that injured individuals needed even 30% more food than healthy animals. Not only the quantity of food was important, but also the quality. Fatty fish provided more caloric input. Harbour porpoise metabolism was high, and the animals' weight was closely linked to variations in the amount and quality of food. Research ideas that emerged during the discussion were to investigate the effect of fisheries on the density of harbour porpoises and other marine mammals. Another idea was to further investigate fish larvae settlement in the Wadden Sea also in relation to water temperature.

Some additional threats requiring further investigation were identified: chemical pollutions from rivers, marine micro litter and offshore construction. Furthermore, the poorly investigated impact of dumped ammunition in the Wadden Sea was considered as insufficient. The influence of pharmaceuticals on marine mammals had not been studied yet to any extent. Ms Siebert stated that some effects by the various substance classes might only be noticed at a stage when it was difficult to change course.

During the discussion it was suggested to concentrate not only on PCBs and their impact on reproductive success, but to investigate the whole picture of chemical components since other substance classes might be even more threatening. Cumulative impacts in individuals were considered as difficult to investigate since it was unlikely to get a complete and accurate overview. Therefore, it was suggested to monitor the potential impacts for example on fecundity.

The audience was interested to learn that grey seals preyed on healthy and large harbour porpoise individuals. It was suggested that this might happen in particular when the attacked porpoises were resting and had entered a lethargic state, or when they were distracted due to hunting activities.

Even though in general the conditions in the Wadden Sea did not appear ideal for harbour porpoises, there were obviously some characteristics of the area that induced them to actively swim into and stay in the area. Especially in light of the fact that the Wadden Sea, as a World Heritage site, was of global importance and Denmark, Germany and the Netherlands, were bound by the World Heritage Convention, they shared the proud responsibility to appropriately monitor and manage all the elements that made this area unique, also as a habitat for harbour porpoises.

Closing

Mr Stempel closed the symposium, summing up the results of the day’s presentations and discussions and thanking all the presenters, participants and co-organizers.