

Agenda Item 5.5

Implementation of the ASCOBANS Triennial
Work Plan (2007-2009)

Review of New Information on Pollution,
Underwater Sound and Disturbance

Document 63

**The Fixed Fehmarnbelt Link: Potential
Implications for Harbour Porpoises in
the Baltic Sea**

Action Requested

- Take note of the information submitted
- Comment

Submitted by

IFAW



NOTE:
**IN THE INTERESTS OF ECONOMY, DELEGATES ARE KINDLY REMINDED TO BRING THEIR OWN
COPIES OF DOCUMENTS TO THE MEETING**

The Fixed Fehmarnbelt Link

Potential Implications for Harbour Porpoises in the Baltic Sea

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1. Introduction

Nature conservation organizations are deeply concerned about one of Europe's most ambitious and controversial coastal construction projects: the Fixed Fehmarnbelt Link. After years of planning and negotiations, in September 2008 Denmark and Germany signed a bilateral treaty for the construction of a fixed link across the Fehmarnbelt in the Baltic Sea. Although a final decision has not been taken yet, the construction of a cable-stayed bridge seems to be the preferred technical solution (in alternative to an immersed tunnel). Conservationists have argued with project running bodies and national authorities on the necessity, economics and potential adverse impacts on the regional marine fauna and flora. Despite dissimilar cost and benefit assessments and largely insufficient scientific data on potential adverse environmental impacts, the treaty will be submitted for ratification by the National Parliaments in early summer 2009.

The construction of a fixed Fehmarnbelt Link leaves numerous open questions and poses serious potential risks on the Baltic harbour porpoise and other marine animals. ASCOBANS Parties and members of the Jastarnia Group in particular, have committed themselves to protect the Baltic harbour porpoise and its habitats. Consequently, the authors of this paper ask the Advisory Committee to take note of the present information and to monitor the future process carefully.

This document briefly describes the project and outlines the main environmental concerns and potential adverse impacts on the marine environment and marine life.

2. The Fehmarnbelt

The Fehmarnbelt is a sound of the Baltic Sea separating the German island Fehmarn from the Danish Lolland. The Fehmarnbelt is approximately 18 kilometers wide and has a maximum depth of 30 meters. This water passage connects the Great Belt, the Kiel Bight and the waters of the Mecklenburg Bight. The so called "Kiel-Baltic-Route" is one of the world's most crowded shipping routes with about 66.000 ships passing each year and is particularly vulnerable to the impact of shipping. Accordingly, the Baltic Sea has been designated as Particularly Sensitive Sea Area (PSSA)¹ by the International Maritime Organization (IMO) and special routing and reporting measures have been adopted to protect sensitive habitats and species in the Belts.

¹ <http://www.imo.org/>

The Fehmarnbelt is known to be a critical habitat for the Baltic harbour porpoise² and one of the most important flight routes for migrating birds. The project area includes a Special Area of Conservation (SAC) in accordance with the EU Habitats Directive. The Fehmarnbelt is furthermore a Baltic Sea Protected Area (BSPA) under HELCOM³.

3. The Fixed Link

The crossing of 19 kilometers length will include a four-lane freeway and a two-way railroad. The pylons of the cable-strayed bridge will be up to 280 meters high, about 70 piers and 4 pylons are destined to fix the bridge in the sea bed⁴. The main bridge's pylons will be anchored in water depths of 28 m below sea level. The 46 m x 88 m caissons will be fully embedded in the seabed in a depth of 28-40 m below sea level.

Time frame / relevant dates:

- 2004 start of environmental consultation procedure
- 2006 1st report on consultation procedure
- 2007 letter of intent between Denmark and Germany
- 2008 bilateral treaty between Denmark and Germany
- 2007/08 public hearing
- 2008/09 legislative procedure and ratification of the treaty by national parliaments
- 2009-2011 Environmental Impact Assessments (EIAs)
- 2011 Danish Folketing (National Parliament of Denmark) intends to adopt the construction permit
- 2012-18 construction phase
- 2018 opening of the Fehmarnbelt link

Costs & Benefits

The discussions of costs and benefits of this project have been highly controversial. The project running bodies have evaluated investments of 5.6 billion euro including the development for infrastructure connections⁵. Concerned about possible cost increase in the future, project opponents questioned this evaluation as well as the efficiency of the entire project⁶. Potential adverse impacts on the tourism industry, connecting infrastructures and ferry companies raise additional concerns.

The proponents, on the other hand, are convinced that the “Fehmarnlink” will offer substantial benefits for Europe’s economic development as well as for the regions connected.

² A. Gilles, H. Kerr, K. Lehnert, M. Scheidat & U. Siebert 2008. Harbour porpoises – abundance estimates and seasonal distribution patterns. In: K. Wollny-Goerke & K. Eskildsen (Eds.) Marine mammals and seabirds in front of offshore wind energy. MINOS – Marine warm-blooded animals in North and Baltic Seas. Teubner.

³ http://www.helcom.fi/environment2/biodiv/en_GB/bspas/?u4.highlight=bspa

⁴ www.fehmarnlink.com

⁵ http://www.hk24.de/produktmarken/standortpolitik/anhaengsel/Version_englisch_final.pdf

⁶ Vieregg – Rössler GmbH Innovative Verkehrsberatung 2009. Gutachterliche Stellungnahme zu den aktuellen Verkehrsprognosen und Kostenkalkulationen der geplanten festen Fehmarnbelt-Querung. NABU Naturschutzbund Deutschland e.V.

Environmental Consultation

A first environmental assessment was published by the Federal Ministry of Transport, Building and Urban Affairs (Germany) and the Ministry of Transport and Energy (Denmark) in 2006⁷. The environmental consultation report is largely inadequate with respect to most of the species affected. The report recognises that the Fehmarnbelt is a breeding area for harbour porpoises and a spawning area for cod and herring. Nevertheless, the report declares that the Fehmarnbelt project would not have any serious adverse impacts on the marine fauna, neither on harbour porpoises and the local population of harbour seals, nor on the regional fish stocks. A coalition of National NGOs and other stakeholders⁸ has questioned the environmental assessments conducted so far and is considering taking the matter to court.

The German Federal Agency for Nature Conservation was not directly involved in former impact assessments and pointed out that knowledge about the negative effects on harbour porpoises, common- or harbour seals, as well as migrating birds, is still deficient⁹.

4. Legislative Framework

Due to its geographic characteristics and its special hydrographic conditions, the Baltic Sea is particularly vulnerable to anthropogenic pressures. The Range States are required through several multilateral environmental agreements and European legislation to protect the Baltic Sea, and the Baltic harbour porpoise in particular.

Helsinki Convention

All States bordering the Baltic Sea and the European Community have signed the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention). The Baltic Sea Action Plan (BSAP) is an ambitious program for restoring the good ecological status of the Baltic marine environment by 2021. Moreover, in 2007 Parties to the Helsinki Convention committed to improve the conservation status of the Baltic harbour porpoise by 2015 (HELCOM Ministerial Meeting)¹⁰. The Fehmarnbelt has also been designated as a Baltic Sea Protected Area (BSPA ID 180).

International Maritime Organization (IMO)

The IMO is a specialized agency of the United Nations which is competent for regulating all aspects related to commercial shipping, including maritime safety and marine environmental protection. Large parts of the Fehmarnbelt constitute an international shipping route regulated exclusively by the IMO¹¹. In 2005 IMO declared the Baltic Sea area a Particularly Sensitive Sea Area (PSSA).

⁷ <http://www.sundogbaelt.dk/femern>

⁸ www.beltquerung.info

⁹ http://wallnau.nabu.de/beltquerung/fixed_link_fehmarn_belt/

¹⁰ HELCOM BIO 6/2008. U. Verfassung 2008. Review and discussion on draft contributions for the HELCOM BIO Report – Chapter 4, Harbour Porpoise

¹¹ http://www.bsh.de/en/Marine_uses/Industry/CONTIS_maps/BalticSeaMaritimeFeaturesAndDefense.pdf

Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS)

In 2002 ASCOBANS Parties have adopted the regional Conservation Plan for Harbour Porpoise in the Baltic Sea (Jastarnia Plan) which aims to restore the population of harbour porpoises in the Baltic Sea to at least 80% of its carrying capacity level.

The EU Habitats Directive

Harbour porpoises are strictly protected under the Habitats Directive. They are listed in Annex II among the species for which EU Member States must establish Special Areas of Conservation (SACs) in order to conserve their habitats. The Fehmarnbelt has been designated as a SAC in 2004 (SAC DE 1322-301)¹². In addition, all species of cetaceans are listed in ANNEX IV for which EU Member States must establish a system of “strict protection”, avoiding, among other things, “deliberate disturbance”.

The Marine Strategy Framework Directive (MSFD)

The 2008 MSFD seeks to achieve or maintain good environmental status in the marine environment by 2020 at the latest. Member States are requested to protect the marine environment from all forms of pollution, including underwater noise. Member States are also required to set up environmental targets and programme of measures to achieve the good environmental status taking into account pressures and impacts listed in Annex III. Table 2 of the Annex includes, inter alia, physical loss (e.g., smothering by man-made constructions, disposal of dredge material; sealing by permanent constructions); physical disturbance (e.g., underwater noise from shipping and other underwater acoustic equipment); interference with hydrological processes and other impacts resulting from offshore construction activities.

5. Potential Cumulative Impacts on Marine Mammals

Marine life is under increasing pressure from several anthropogenic impacts, such as pollution, fisheries, shipping and various forms of industrial activities. These human impacts could well interact with each other with cumulative detrimental consequences for marine mammals and cetaceans in particular.

Underwater noise

Cetaceans are highly reliant on their hearing for echolocation and communication. The construction phase of more than eight years for the Fehmarnbelt Link will generate numerous noise-producing activities.

Pile-driving activities are of special concern as they generate very high sound pressure levels and are rather broad-band (20 Hz - > 20 kHz). The well-established impulse pile-driving technique produces very strong impulsive underwater noise with peak sound

¹² The European Commission confirmed Germany’s designation in November 2007, see: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:012:0383:0677:EN:PDF>.

pressures of more than 200 dB re 1 μ Pa at a distance of 750 m from the sound source¹³. Several investigations give reasons to the assumption that these sound levels could have detrimental consequences for cetaceans. Sound pressures of 200 dB re 1 μ Pa have been shown to cause temporary threshold shifts in harbour porpoises; masking effects and behavioral changes of animals could be observed far below¹⁴. With respect to the massive construction of a cable-stayed bridge, the pile-driving activities will be enormous. Current mitigation measures, such as bubble curtains or coated tubes are still in development and non-feasible in sea areas with high flow velocities.

Extensive seismic activities are needed to explore the seabed in prearrangement of the project. The applied sparker technique generates an acoustic impulse by discharging an electrical pulse between electrodes located on the tips and a ground point on the sparker body. Maximum sound pressures could reach 220 dB re 1 μ Pa¹⁵.

Propeller-driven ships have become the most dominant source of man-made low-frequency noise throughout world's oceans. Shipping noise interacts with sounds made by many species of cetaceans across a broad range of frequencies and particularly between 20 Hz – 1 kHz. The acoustic range of harbour porpoises varies from 0.2 – 180 kHz¹⁶. Masking and displacement effects have to be expected due to increased shipping during the construction phase.

Although we do not know much about collisions of harbour porpoises with ships, an increased number of ships during the construction phase could increase the risk of ship collisions with cetaceans.

Habitat Deterioration

Long-lasting noise-producing activities could cause porpoises to leave the critical habitat of the Fehmarnbelt which constitutes an all-season feeding and upbringing area for the Western Baltic population¹⁷. This area is supposed to be a transitional corridor between the Western Baltic and the critically endangered Baltic Proper population.

Scientists are concerned that the dredging activities could cloud the water column for years. Those activities would directly affect the seabed and will result in a spill of a certain part of the handled amounts of seabed material, with detrimental impacts on marine flora and fauna, in particular marine mammals, banks of common mussels and

¹³ T. Neumann, J. Gabriel, K.-H. Elmer, K. Betke (2005): Influence on the Marine Environment by Noise Emissions from Offshore Wind Farms – Sound Propagation and Measures for Noise Reduction. DEWI Magazin No. 27.

¹⁴ Lucke, K., Lepper, P.A., Blanchet, M.A., Hoeve, B., Everaarts, E., van Elk, N. & Siebert, U. 2008. Auditory Studies on Harbour Porpoises in Relation to Offshore Wind Turbines. ASCOBANS AC 15/DOC 42.

¹⁵ <http://www.hydroacoustics.com/library/catalogos/AAE/Squid.pdf>

¹⁶ Kastelein, R. A., Bunskoek, P. and Hagedoorn, M. 2002. Audiogram of a harbor porpoise (*Phocoena phocoena*) measured with narrow-band frequency-modulated signals. *J. Acoust. Soc. Am.* 112.

¹⁷ J. Teilmann, S. Sveegard, R. Dietz, I.K. Petersen, P. Berggren & G. Desportes 2008. High density areas for harbour porpoises in Danish waters. NERI Technical Report 657, 2008.

hydrophytes. This impact would be especially dramatic in the case of an immersed tunnel construction¹⁸.

Harbour porpoises are quite opportunistic with respect to the choice of their prey. In the Baltic Sea they feed predominantly on pelagic schooling fish species (herring, sprat) and epibenthic species (cod, gobies). Prey depletion is an expected problem in the construction area due to massive water clouding, underwater noise, increased shipping activities and reduced freshwater influx from the North Sea. The Fehmarnbelt region is an important spawning area for several fish species (e.g. cod and herring)¹⁹. Detrimental impacts on the local fish stocks could not be excluded.

The extent of marine pollution in the form of fuel, oil, chemicals, sewages, etc. rising from the construction process could additionally endanger the Fehmarnbelt region.

6. Other Potential Impacts

The semi-enclosed Baltic Sea is highly reliant on regular influx of North Sea water. The Fehmarnbelt constitutes the main transition area between the Baltic and the North Sea and is important for the influx of oxygenic and salty water. A reduced water flow through the Fehmarnbelt could increase the oxygen deficiency already observed in large parts of the Baltic Sea. The piers and pylons of the cable-stayed bridge could cause the dispersion of flowing water masses from the West and intercept the Eastern basins from water supply. 73 % of the effluent Baltic water flows via Fehmarnbelt into the Kattegat²⁰. The Leibniz Institute for Baltic research is commissioned to investigate potential impacts of the construction. Oceanographers are seriously concerned about the “blocking effects” of the bridge²¹.

The Fehmarnbelt constitutes one of Europe’s most important flight routes for birds. Approximately 90 millions migratory birds use this route each year, inter alia 20 millions water birds. At night and in bad weather conditions thousands of birds could fall victim to collisions with the cable-stayed bridge.

The immense dredging activities would furthermore be the death sentence for countless benthic living animals.

The Fehmarnbelt is one of the world’s most crowded shipping routes with about 66.000 ships passing each year. Narrowing down this bottleneck of international shipping routes – the construction of a cable-strayed bridge envisages three shipping corridors of 700

¹⁸ Environmental Consultation Report 2006. A Fixed Link across the Fehmarnbelt and the Environment. Federal Ministry of Transport, Building and Urban Affairs, Germany, Ministry of Transport and Energy Denmark.

¹⁹ http://www.liv.ac.uk/inexfish/publications/reports/WP2_final/D2_Appendix%20B.pdf

²⁰ Matthäus, W. (1996b): Temperatur, Salzgehalt und Dichte der Ostsee. In: Rheinheimer, G.(Ed.): Meereskunde der Ostsee. 2. Auflage, Springer-Verlag, Berlin, Heidelberg.

²¹ <http://www.ad-hoc-news.de/Politik-News/13083517/rss> [German language only]

meters width – could considerably increase the risk of ship collisions²². Oil spills and other disaster scenarios could be the result.

7. Conclusions

We believe that the Fixed Fehmarnbelt Link project may have serious detrimental impacts on the Baltic harbour porpoise, in particular on the critically endangered Baltic Proper population. Many environmental aspects are still unaccounted for. Therefore, we ask the ASCOBANS Advisory Committee to:

- Closely monitor the Environmental Impact Assessments process (2009-2011) as well as subsequent construction phases;
- Assess potential impacts which are in contradiction to ASCOBANS goals and recommend effective mitigation measures;
- Prepare a position statement on potential implications for harbour porpoises and other cetaceans;
- Invite the Parties involved to prevent and eliminate possible adverse impacts caused by the project implementation;
- Require the IMO to investigate the potential impact of the project on maritime safety;
- Bring this information to the attention of all bodies potentially concerned with the construction of the fixed Fehmarnbelt Link, including the EC and HELCOM.

²² Investigation of Technical Solutions, Phase 2 Report, COWI-Lahmeyer JV, January 1999