



Oceana proposal for a Marine Protected Area

Little Belt

INTRODUCTION

Denmark's Little Belt is a marine strait located between the Jutland mainland and the island of Fyn. The Little Belt and the Great Belt together make up the Belt Sea, which along with the Sound forms the transition zone between the saltier Kattegat and the brackish Baltic Sea. Approximately 10 % of the water exchange between the Baltic Sea and Kattegat flows through the Little Belt. Its depth varies from shallow lagoons, inlets and bays, to deeper trenches averaging 35 meters, with its deepest point, "Marens Hul," at 81 meters, which is located west of Fænø. Islands and peninsulas can also be found in the area.

A relatively large Natura 2000 site exists in the southern part of Little Belt, but a narrow area in the north of the Belt remains unprotected. Even further north, at the border to Kattegat, there are two additional Natura 2000 sites. One of them, the island of Æbelø, is a conservation area where one can find various reefs, including a diverse stone reef north of the island¹. Little Belt and the area north of it also contains RAMSAR sites (wetlands

which are of international importance) and a big population of harbour porpoises. Little Belt is also an internationally important area for water birds, as it is used for breeding, wintering and staging by ducks, geese and cormorants².

Oceana conducted fieldwork in the Little Belt area in 2012 and 2013, with the use of an underwater robot, and scuba divers.

DESCRIPTION OF THE AREA

The strong current in Little Belt provides good conditions for specialized and biodiverse habitats, including macro algae and benthos. The current removes loose material, and the sea floor therefore consists mainly of hard substrates on which macro algae and benthic fauna attach themselves. Benthic fauna filters the large amount of nutrients, which flow through the water³.

The common eelgrass *Zostera marina*, which Oceana documented⁴ in the Little Belt's shallow bottoms along the coasts, is not only one of the most important ecosystems in the area, but also in the world. This type of habitat provides shelter to many species and stabilizes the seabed with its stems and roots⁵. Eelgrass meadows also store carbon, which is important for climate regulation. Unfortunately, the distribution of these meadows across Europe is declining. HELCOM has listed *Zostera* beds as near threatened in the Baltic Sea⁶, and OSPAR has listed them as threatened and/or declining wherever they occur⁷.

A century ago the horse mussel (*Modiolus modiolus*) community was thriving in several areas in the northern part of the Belt Sea. Horse mussels are important habitat builders as they form beds on soft bottoms and provide space for other organisms to attach themselves to, making these communities rich in diversity. The distribution of the horse mussel community has since declined, but it has recently been found both west and east of Samsø Island, including inside this proposed site⁸. Oceana documented clusters in several areas both north of Little Belt, near the island of Æbelø, and inside Little Belt itself (see Table 1). *Modiolus modiolus* beds are listed as vulnerable by HELCOM⁹.

In the narrow part of Little Belt, where the current is strong and water movement is high, hypoxia is absent. These vibrant conditions are suitable for a number of species, including macro algae, fish and invertebrates, which Oceana documented in the strong current, including sessile animals such as hydroids (*Tubularia* spp., *Sagartiogeton* spp. and more) and tunicates (*Ciona intestinalis* and *Dendrodoa grossularia*). Large numbers of goldsinny wrasses (*Ctenolabrus rupestris*) were also documented. Sugar kelp and other brown algae, as well as red algae and eelgrass grew in the turbulent water. For the entire list of species, see Table 1 and 3.

The shallow coastal waters, such as bays, inlets and lagoons, in Little Belt have completely different fauna. Gamborg fjord, where capturing of harbour porpoises was carried out in the old days, is home to blue mussels (*Mytilus* sp.) and fish species, including eelpout (*Zoarces viviparus*) and butterfish (*Pholis gunnellus*), among others (Table 2). There is also rich birdlife towards the end of the fjord.

Benthic fauna in the area includes the ocean quahog mussel *Arctica islandica*, which is present in high numbers in the northern part of Little Belt¹⁰, as well as *Abra-* and slender sea pen (*Virgularia mirabilis*) communities¹¹. In 2013, Oceana documented a muddy seafloor at 17 meters depth in the northern part of Little Belt that was scattered with ocean quahog mussels, some of which had been eaten by large star fish (Table 4). Muddy bottoms dominated by ocean quahog mussels are a biotope listed as critically endangered by HELCOM. This type of mussel needs salty and oxygenated water, especially in the first years of its life, but also when reproducing. Therefore oxygen deficiency is a threat to it.

The area northeast of Little Belt, Æbelø, is a wildlife reserve, since it is an important breeding and lounging area for both harbor seals and coastal birds^{12,13}. A scuba dive near the reef revealed an area full of life with sea anemones, snails, clams, crabs, star fish, fish, and macro algae (Table 5).

Little Belt is a high density area for harbour porpoises (*Phocoena phocoena*)¹⁴, a species that is currently listed in the EU Habitats Directive annexes, which means that Denmark is obligated to protect it.

PROPOSAL

Oceana's proposal includes both a wider area in the south of Little Belt, the narrow part where the current is strong, and the area north of the Belt. The most northern part of the site reaches into the Great Belt and to the western coast of the island Samsø. The proposal ties together a number of protected areas, including Natura 2000 sites and wildlife reserves.

Several important species and vulnerable, near threatened or critically endangered communities, like *Zostera* meadows, *Modiolus modiolus*-community and *Arctica islandica* biotope (Table 6), are present in the area, which should therefore be better protected from human activities. Little Belt's high density of harbour porpoise makes it even more important to protect it from anthropogenic threats.

There is local support from municipalities bordering Little Belt to protect it, and the area is popular among divers and recreational anglers. A coalition of several Danish NGOs, including Oceana, has recently published a report, proposing protection for the Little Belt and the surrounding areas¹⁵.



Oarweed (*Laminaria digitata*) and red algae. Little Belt, Denmark. © OCEANA/ Carlos Suárez

POSSIBLE THREATS AND MANAGEMENT PROPOSALS

Oxygen depletion occurs regularly in the inner waters of Denmark, and this is particularly a problem in the southern part of the Little Belt, where it tends to be intensive and last longer than in more open waters¹⁶.

Eutrophication and pollution in the Belt Sea is a particular threat to the *Zostera marina* eelgrass community. To improve water quality, sanctions and interventions to cope with nutrients loading have been made by the authorities, but eutrophication and pollution are still a problem.

Mussel dredging occurs, even inside N2000 sites¹⁷, and is a major threat to the targeted blue mussels and the associated benthic fauna and sea grass meadows. When an area is dredged for mussels, it is turned into a desert, where only very few species can live. In addition, when dredging the seabed bottom materials swirl up, causing a release of nutrients and hazardous substances back into the water column, and thereby worsening the poor state of the water.

Harbour porpoises are often caught as fisheries by-catch and actions should be undertaken to minimize this threat. Other threats towards them are pollution, habitat destruction, food depletion, underwater noise, marine constructions, and shipping¹⁸.

A management plan should address all the aforementioned threats, with particular attention to the threatened and declining communities and species.

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Moon jellyfish (*Aurelia aurita*) and eelgrass (*Zostera marina*). Little Belt, Denmark. © OCEANA/ Carlos Suárez

SPECIES LIST FOR LITTLE BELT

Table 1: List of species in the Little Belt proposal area in 2012, listed by depth and threat category.

Depth (m)	Species
19-22	PORIFERA
	<i>Haliclona oculata</i>
	CNIDARIA
	<i>Abietinaria abietina</i>
	<i>Aurelia aurita</i>
	<i>Campanulariidae</i> sp.
	<i>Halecium halecinum</i>
	<i>Sagartiogeton undatus</i>
	ANNELIDA
	<i>Nereis</i> sp.
	<i>Pomatoceros triqueter</i>
	<i>Scoloplos</i> cf. <i>armiger</i>
	MOLLUSCA
	<i>Arctica islandica</i>
	<i>Buccinidae</i> sp.
	<i>Buccinum undatum</i>
	<i>Cardiidae</i> sp.
	<i>Modiolus modiolus</i> (Vulnerable, HELCOM 2013)
	<i>Mya</i> cf. <i>truncata</i>
	<i>Mytilus</i> sp.
	<i>Parvicardium ovale</i>
	CRUSTACEA
	<i>Balanus</i> sp.
	<i>Carcinus maenas</i>
	<i>Orchestia</i> cf. <i>gammarellus</i>
	<i>Pagurus bernhardus</i>
	BRYOZOA
	<i>Flustra foliacea</i>
	<i>Semibalanus balanoides</i>
	ECHINODERMATA
	<i>Asterias rubens</i>
	<i>Echinocyamus</i> cf. <i>pusillus</i>
<i>Ophiura albida</i>	
<i>Ophiura</i> sp.	
<i>Psammechinus miliaris</i>	
<i>Strongylocentrotus</i> cf. <i>droebachiensis</i>	

Table 1: List of species in the Little Belt proposal area in 2012, listed by depth and threat category.

Depth (m)	Species
	TUNICATA
	<i>Ciona intestinalis</i>
	<i>Dendrodoa grossularia</i>
	FISH
	<i>Myoxocephalus scorpius</i>
	<i>Pholis gunnellus</i>
	<i>Pleuronectes platessa</i>
	<i>Pleuronectidae</i> sp.
13-16	CNIDARIA
	<i>Abietinaria abietina</i>
	<i>Aurelia aurita</i>
	<i>Cyanea</i> cf. <i>capillata</i>
	<i>Cyanea</i> cf. <i>lamarckii</i>
	<i>Eutonina indicans</i>
	MOLLUSCA
	<i>Arctica islandica</i>
	<i>Modiolus modiolus</i> (Vulnerable, HELCOM 2013)
	<i>Mytilus</i> sp.
	CRUSTACEA
	<i>Balanus crenatus</i>
	<i>Balanus</i> sp.
	<i>Carcinus maenas</i>
	<i>Pagurus bernhardus</i>
	BRYOZOA
	<i>Electra crustulenta</i>
	<i>Flustra foliacea</i>
	<i>Securiflustra securifrons</i>
	ECHINODERMATA
	<i>Asterias rubens</i>
	TUNICATA
	<i>Ciona intestinalis</i>
	FISH
	<i>Agonus cataphractus</i>
	<i>Ctenolabrus rupestris</i>
	<i>Pholis gunnellus</i>
	<i>Pleuronectes platessa</i>

Table 1: List of species in the Little Belt proposal area in 2012, listed by depth and threat category.

Depth (m)	Species
	<i>Pomatoschistus microps</i>
	<i>Zoarces viviparus</i>
	PHAEOPHYCEAE
	<i>Laminaria latissima</i>
	ANGIOSPERMAE
	<i>Zostera marina</i> (only pieces found)
6-10	CNIDARIA
	<i>Actinia equina</i>
	<i>Aurelia aurita</i>
	<i>Cyanea capillata</i>
	<i>Laomedea cf. flexuosa</i>
	<i>Metridium senile</i>
	<i>Obelia geniculata</i>
	<i>Sagartiogeton laceratus</i>
	<i>Tubularia larynx</i>
	ANNELIDA
	<i>Arenicola marina</i>
	<i>Pomatoceros triqueter</i>
	<i>Spirorbis spirorbis</i>
	MOLLUSCA
	<i>Arctica islandica</i>
	<i>Buccinum undatum</i>
	<i>Ensis</i> sp.
	<i>Littorina littorea</i>
	<i>Modiolus modiolus</i> (Vulnerable, HELCOM 2013)
	<i>Mytilus</i> sp.
	<i>Pododesmus patelliformis</i>
	<i>Testudinalia testudinalis</i>
	CRUSTACEA
	<i>Balanus balanus</i>
	<i>Balanus crenatus</i>
	<i>Balanus improvisus</i>
	<i>Carcinus maenas</i>
	BRYOZOA
	<i>Electra pilosa</i>
	<i>Flustra foliacea</i>
	<i>Membranipora membranacea</i>

Table 1: List of species in the Little Belt proposal area in 2012, listed by depth and threat category.

Depth (m)	Species
	ECHINODERMATA
	<i>Asterias rubens</i>
	<i>Psammechinus miliaris</i>
	<i>Strongylocentrotus cf. droebachiensis</i>
	TUNICATA
	<i>Dendrodoa grossularia</i>
	<i>Molgula cf. citrina</i>
	FISH
	<i>Ctenolabrus rupestris</i>
	<i>Gobiusculus flavescens</i>
	<i>Myoxocephalus scorpius</i>
	<i>Pholis gunnellus</i>
	<i>Pomatoschistus microps</i>
	<i>Zoarces cf. viviparus</i>
	MAMMALIA
	<i>Phocoena phocoena</i> (ANNEX II and V)
	RHODOPHYCEAE
	<i>Delesseria sanguinea</i>
	<i>Hildenbrandia rubra</i>
	<i>Lithothamnion glaciale</i>
	<i>Phycodrys rubens</i>
	PHAEOPHYCEAE
	<i>Fucus serratus</i>
	<i>Fucus vesiculosus</i>
	<i>Halosiphon tomentosus</i>
	<i>Laminaria digitata</i>
	<i>Laminaria latissima</i>
	ANGIOSPERMAE
	<i>Zostera marina</i> (Near threatened, HELCOM 2013)

Table 2: List of species recorded at 6 meters depth in Gødborg fjord, in Little Belt, 2013.

Species	
CNIDARIA	
<i>Aurelia aurita</i>	
MOLLUSCA	
<i>Mytilus</i> sp. cf.	
CRUSTACEA	
<i>Balanus</i> sp.	<i>Carcinus maenas</i>
ECHINODERMATA	
<i>Asterias rubens</i>	
FISH	
<i>Pholis gunnellus</i>	<i>Zoarces viviparus</i>

Table 3: List of species recorded at Søspegderne in the narrow part of Little Belt, in depths ranging from 6 to 19 meters, 2013. Threat category is listed in brackets.

Species	
PORIFERA	
<i>Halichondria panicea</i>	<i>Haliclona oculata</i>
CNIDARIA	
<i>Aurelia aurita</i>	<i>Sagartiogeton laceratus</i>
<i>Cyanea capillata</i>	<i>Sagartiogeton undatus</i>
<i>Eutonina indicans</i>	<i>Tubularia indivisa</i>
<i>Metridium senile</i>	<i>Tubularia larynx</i>
<i>Obelia geniculata</i>	<i>Urticina felina</i>
<i>Sagartia troglodytes</i>	
MOLLUSCA	
<i>Buccinum undatum</i>	<i>Modiolus modiolus</i> (Vulnerable, HELCOM 2013)
<i>Ensis</i> sp.	<i>Mytilus</i> sp.
<i>Lucinoma borealis</i>	
CRUSTACEA	
<i>Balanus</i> sp.	
BRYOZOA	
<i>Electra pilosa</i>	<i>Flustra foliacea</i>
<i>Electra</i> sp.	<i>Securiflustra securifrons</i>
ECHINODERMATA	
<i>Asterias rubens</i>	
TUNICATA	
<i>Ciona intestinalis</i>	<i>Dendrodoa grossularia</i>

Table 3: List of species recorded at Søspejderne in the narrow part of Little Belt, in depths ranging from 6 to 19 meters, 2013. Threat category is listed in brackets.

Species	
FISH	
<i>Agonus cataphractus</i>	<i>Myoxocephalus scorpius</i>
<i>Ctenolabrus rupestris</i>	<i>Zoarces viviparus</i>
<i>Gadidae</i> sp.	
PHAEOPHYCEAE	
<i>Chorda filum</i>	<i>Laminaria latissima</i>
<i>Laminaria digitata</i>	<i>Laminaria</i> sp.
RHODOPHYCEAE	
<i>Delesseria sanguinea</i>	<i>Phycodrys rubens</i>
<i>Dilsea carnosa</i>	
ANGIOSPERMAE	
<i>Zostera marina</i> (Near threatened, HELCOM 2013)	

Table 4: List of species recorded in the northern part of Little Belt on 17 meters depth, 2013. Threat category is listed in brackets.

Species	
CNIDARIA	
<i>Aurelia aurita</i>	<i>Laomedea flexuosa</i>
MOLLUSCA	
<i>Arctica islandica</i>	
ECHINODERMATA	
<i>Asterias rubens</i>	<i>Ophiura albida</i>
BRYOZOA	
<i>Electra pilosa</i>	
PHAEOPHYCEAE	
<i>Laminaria digitata</i>	

Table 5: List of species recorded at Æbelø on 4 meters depth, 2013. Threat category is listed in brackets.

Species	
PORIFERA	
<i>Halichondria</i> sp. cf.	<i>Halichondria panicea</i>
CNIDARIA	
<i>Hydractinia echinata</i>	<i>Sagartia</i> cf. <i>troglodytes</i>
<i>Obelia geniculata</i>	<i>Stomphia coccinea</i>
MOLLUSCA	
<i>Ensis</i> sp.	<i>Scrobicularia plana</i>
<i>Littorina littorea</i>	
CRUSTACEA	
<i>Balanus balanus</i>	<i>Pagurus bernhardus</i>
<i>Carcinus maenas</i>	
ECHINODERMATA	
<i>Asterias rubens</i>	
BRYOZOA	
<i>Electra</i> sp.	
FISH	
<i>Gobius niger</i>	<i>Pomatoschistus pictus</i>
<i>Pomatoschistus minutus</i>	<i>Zoarces viviparus</i>
PHAEOPHYCEAE	
<i>Chorda filum</i>	<i>Laminaria latissima</i>
<i>Halosiphon tomentosus</i>	
RHODOPHYCEAE	
<i>Delesseria</i> cf. <i>sanguinea</i>	
ANGIOSPERMAE	
<i>Zostera marina</i> (Near threatened, HELCOM 2013)	

Table 6: List of habitats and communities in the Little Belt proposal area in 2012 and 2013, and their threat category.

Habitats and communities	Red list category
<i>Arctica islandica</i> biotope	Critically endangered (HELCOM 2013)
<i>Modiolus modiolus</i> beds	Vulnerable (HELCOM 2013)
<i>Zostera marina</i> meadow	Near threatened (HELCOM 2013)