

## BIOTOPE INFORMATION SHEET

English name: <b>Reefs</b>		Code in HELCOM HUB: <b>1170</b>	
Characteristic species: <i>Modiolus modiolus</i> , <i>Mytilus</i> spp., <i>Dreissena polymorpha</i> , sponges, moss animals, perennial macroalgae such as <i>Fucus</i> spp., <i>Laminaria/Saccharina</i> or foliose red algae ( <i>Delesseria sanguinea</i> , <i>Coccotylus/Phyllophora</i> , <i>Furcellaria lumbricalis</i> )			
Past and Current Threats (Habitat directive article 17): Eutrophication (H01.05), Fishing (F02), Construction (dredging J02.02.02, dumping J02.11), Mining and quarrying (e.g. stonefishing C01.07), Contaminant pollution (H03)		Future Threats (Habitat directive article 17): Eutrophication (H01.05), Fishing (F02), Construction (dredging J02.02.02, dumping J02.11), Contaminant pollution (H03)	
Red List Criteria: <b>C1</b>	Confidence of threat assessment: <b>L</b>	<b>HELCOM Red List Category:</b>	<b>VU Vulnerable</b>
Previous HELCOM Red List threat assessments			
BSEP 75 (1998): "3" (Endangered) 2.1 Rocky bottoms 2.1.1 Soft rock bottoms 2.1.1.2 Sublittoral photic zone 2.1.1.2.3 Sublittoral soft rock reefs of the photic zone with little or no macrophyte vegetation 2.1.1.3 Hydrolittoral 2.1.1.3.3 Hydrolittoral soft rock reefs with or without macrophyte vegetation 2.1.2 Solid rock bottoms 2.1.2.2 Sublittoral photic zone 2.1.2.2.3 Sublittoral solid rock reefs of the photic zone with or without macrophyte vegetation 2.1.2.3 Hydrolittoral 2.1.2.3.3 Hydrolittoral solid rock reefs with or without macrophyte vegetation 2.2 Stony bottoms 2.2.2 Sublittoral photic zone 2.2.2.3 Sublittoral stony reefs of the photic zone with or without macrophyte vegetation		BSEP 113 (2007): Regions where the biotope/habitat is under threat and/or in decline: The Bothnian Sea, Åland Sea, Archipelago Sea, Gulf of Finland, The Southern Baltic Proper.	
Higher concern stated by:			

### Habitat and Ecology

Reefs are ridges of solid rock or accumulations of coarse mineral substrata protruding above the level bottoms and found entirely below or extending partly above the surface of the water (HELCOM, 1998). Further, compact sessile mussel beds of the hydrolittoral and sublittoral are considered as reefs. Reefs at great depth are typically characterized by sparse epibenthic communities.

Although the common mussel (*Mytilus edulis*) occurs throughout most of the Baltic Sea area, the horse mussel (*Modiolus modiolus*) is common in the Kattegat and the zebra mussel (*Dreissena polymorpha*) in coastal lagoons and estuaries. All of them form dense colonies and often create multi-layered beds on hard or soft substrata. They act as substratum themselves for other animals and macrophytes. The animal and plant communities of reefs vary with the salinity, light penetration and exposition to water motion. Algal zonation is a characteristic feature for reefs.

Reefs are of Baltic-wide importance and are in many cases hot spots for the biodiversity. They provide shelter for many aquatic animals (fish, invertebrates), and they are important feeding grounds for birds.

## BIOTOPE INFORMATION SHEET

---

The benthic flora is often rich and may include threatened and/or declining plant species.

Definition of the habitat according to the 'Interpretation manual of European Union Habitats' EUR27:

Reefs can be either biogenic concretions or of geogenic origin. They are hard compact substrata on solid and soft bottoms, which arise from the sea floor in the sublittoral and littoral zone. Reefs may support a zonation of benthic communities of algae and animal species as well as concretions and corallogenic concretions.

Clarifications:

- "Hard compact substrata" are: rocks (including soft rock, e.g. chalk), boulders and cobbles (generally >64 mm in diameter).
- "Biogenic concretions" are defined as: concretions, encrustations, corallogenic concretions and bivalve mussel beds originating from dead or living animals, i.e. biogenic hard bottoms which supply habitats for epibiotic species.
- "Geogenic origin" means: reefs formed by non biogenic substrata.
- "Arise from the sea floor" means: the reef is topographically distinct from the surrounding seafloor.
- "Sublittoral and littoral zone" means: the reefs may extend from the sublittoral uninterrupted into the intertidal (littoral) zone or may only occur in the sublittoral zone, including deep water areas such as the bathyal.
- Such hard substrata that are covered by a thin and mobile veneer of sediment are classed as reefs if the associated biota are dependent on the hard substratum rather than the overlying sediment.
- Where an uninterrupted zonation of sublittoral and littoral communities exist, the integrity of the ecological unit should be respected in the selection of sites.
- A variety of subtidal topographic features are included in this habitat complex such as: Hydrothermal vent habitats, sea mounts, vertical rock walls, horizontal ledges, overhangs, pinnacles, gullies, ridges, sloping or flat bed rock, broken rock and boulder and cobble fields.

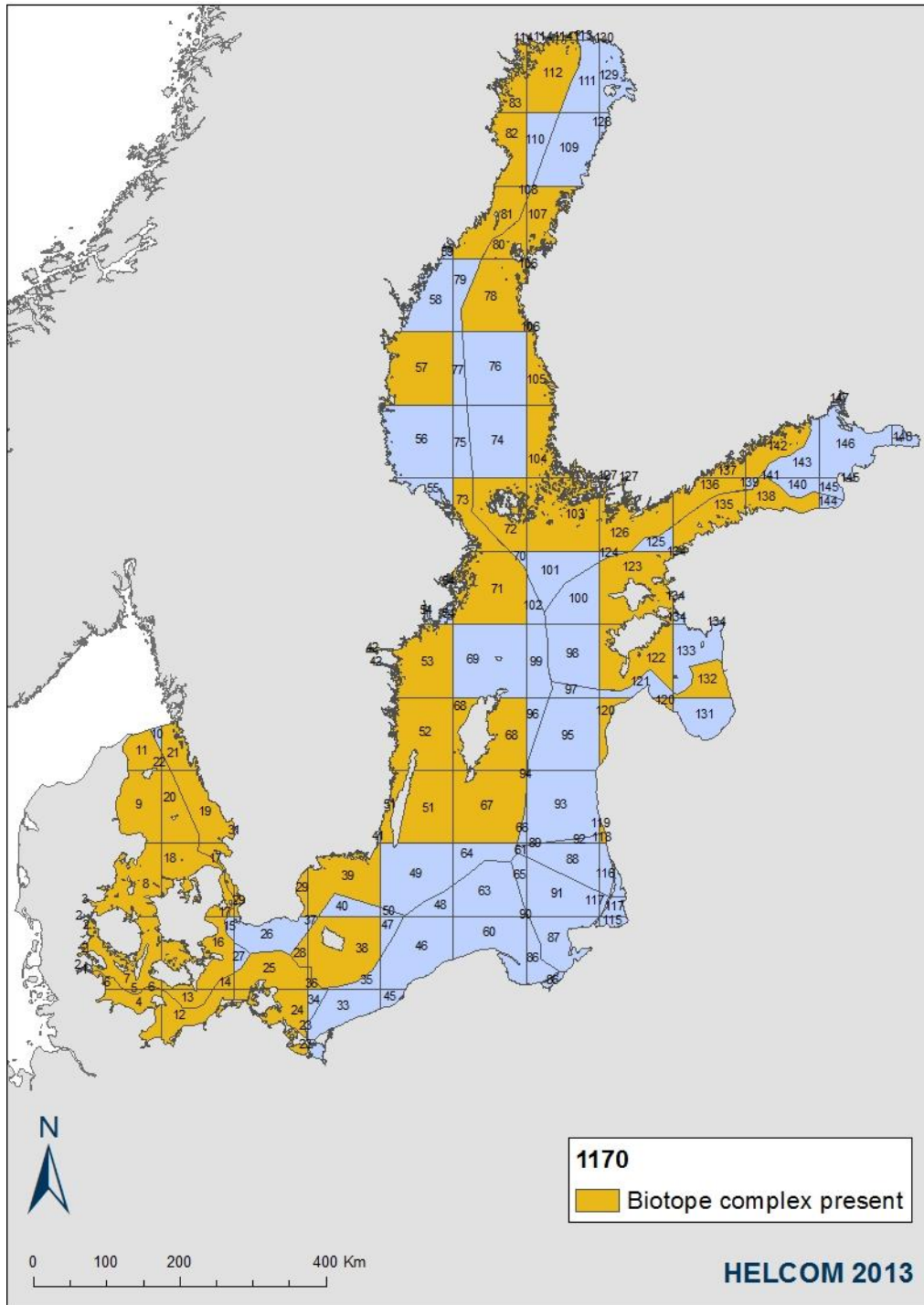
Plants: A large variety of red, brown and green algae (some living on the leaves of other algae).

Animals- Reef-forming species: Bivalves e.g. *Modiolus modiolus*, *Mytilus* spp., *Dreissena polymorpha*). non reef forming species: Typical groups are hydroids, ascidians, cirripedia (barnacles), bryozoans and molluscs as well as diverse mobile species of crustaceans and fish.

## BIOTOPE INFORMATION SHEET

### Distribution and status in the Baltic Sea region

The distribution map indicates the area in the 100x100 km grid where biotope is known to occur (Naturvårdverket 2011, EUNIS Database)



## BIOTOPE INFORMATION SHEET

### Description of Major threats

Reefs are threatened by eutrophication both due to decreasing light penetration and also by increased siltation rates. Fishing poses a threat to reefs as fish are often abundant around reefs. Fishing gear can get entangled on reefs and can also cause direct physical harm to the epibenthic reef community. In the southern and western parts of the Baltic Sea, stone fishing has historically threatened the integrity of reefs. Contaminant pollution from various hazardous substances threaten the quality of reefs, as the often characteristic filtering mussels can be adversely affected by high levels of hazardous substances.

### Assessment justification

C1

Reefs in the southern and western parts of the Baltic Sea are assumed to have experienced a very strong quality decline during the past 50 years. Fishing activities have affected the epibenthic communities and reef associated fish stocks have declined. The physical integrity of the reefs has also been compromised due to historical stone fishing practices and other mining and construction activities.

In the northern Baltic Sea reefs have experienced a moderately severe quality decline mainly due to eutrophication. These reefs are mainly of geogenic origin, and are often covered by macroscopic epibenthic communities dominated by *Mytilus* spp. Within the photic zone, the algal zonation is a typical feature of the reefs. Eutrophication has decreased the water transparency and in many regions the algal zonation is not as distinct and the maximum depth has decreased.

### Recommendations for actions to conserve the biotope

The restoration of natural conditions where the habitat type was degraded due to e.g. bottom excavation would help to improve the conservation status of this natural habitat type. It is also essential to introduce ecologically sound fishing methods which do not harm the habitat.

### Common names

Denmark: Rev, Estonia: -, Finland: Riutat, Germany: Riffe, Latvia: -, Lithuania: -, Poland: -, Russia: -, Sweden: Rev

### References

- European Commission. 2007. Guidelines for the establishment of the Natura 2000 network in the marine environment. Application of the Habitats and Birds Directives. Appendix 1: Marine Habitat types definitions.  
[http://ec.europa.eu/environment/nature/natura2000/marine/docs/appendix\\_1\\_habitat.pdf](http://ec.europa.eu/environment/nature/natura2000/marine/docs/appendix_1_habitat.pdf)
- HELCOM (1998). Red List of marine and coastal biotopes and biotopes complexes of the Baltic Sea, Belt Sea and Kattegat. Baltic Sea Environmental Proceedings No. 75. Helsinki Commission, Helsinki. 115pp. Available at: <http://www.helcom.fi/stc/files/Publications/Proceedings/bsep75.pdf>
- Naturvårdsverket (2011) Vägledning för svenska naturtyper i habitatdirektivets bilaga 1, Blottade sand- och lerbottnar. Available at: [http://www.naturvardsverket.se/upload/stod-i-miljoarbetet/vagledning/natura-2000/naturtyper/kust-och-hav/vl\\_1170\\_Rev.pdf](http://www.naturvardsverket.se/upload/stod-i-miljoarbetet/vagledning/natura-2000/naturtyper/kust-och-hav/vl_1170_Rev.pdf). (Viewed July 19 2013)
- EUNIS Database. <http://eunis.eea.europa.eu/habitats.jsp> (Viewed July 19 2013)