

BIOTOPE INFORMATION SHEET

English name: Estuaries		Code in HELCOM HUB: 1130	
Characteristic species: <i>Carex spp.</i> , <i>Chara spp.</i> , <i>Myriophyllum spp.</i> , <i>Phragmites australis</i> , <i>Potamogeton spp.</i> , <i>Ruppia spp.</i> , <i>Scirpus spp.</i> , <i>Zannichellia palustris</i> , <i>Zostera marina</i>			
Past and Current Threats (Habitat directive article 17): Construction (enlargement of harbours and marinas D03.01, dredging J02.02.02, dumping J02.11, coastal engineering J02.12), Eutrophication (H01.05), Water traffic (D03.02), Alien species (I01), Fishing (F02), Tourism (G05), Oil spills (oil spills in the sea H03.01)		Future Threats (Habitat directive article 17): Construction (enlargement of harbours and marinas D03.01, dredging J02.02.02, dumping J02.11, coastal engineering J02.12), Eutrophication (H01.05), Water traffic (D03.02), Alien species (I01), Fishing (F02), Tourism (G05), Oil spills (oil spills in the sea H03.01)	
Red List Criteria: C1	Confidence of threat assessment: M	HELCOM Red List Category:	CR Critically Endangered
Previous HELCOM Red List threat assessments			
BSEP 75 (HELCOM 1998): "3" Endangered J – Estuaries and river mouth areas		BSEP 113 (HELCOM 2007): Regions where the biotope/habitat is under threat and/or in decline: Gulf of Riga, Eastern Gotland Sea, The Southern Baltic Proper, Bay of Mecklenburg, Kiel Bay.	
Higher concern stated by:			

Habitat and Ecology

Baltic estuaries are transition zones, where riverine freshwater meets the brackish water of the sea, often forming extensive intertidal sand and mud flats. Due to wind induced backwater effects, which cause irregular tidal effects, the extent of an estuary is determined by the episodically moving mixed water body. Thus, they are always connected to the sea, but in many cases semi-enclosed. Mudflats, sandspits and/or barrier islands separate them from the sea. They can be of different shapes such as bay like river mouth areas, deltas or parts of an archipelago. The organic matter input is generally high. Especially large estuaries with restricted water exchange have an important buffering role for nutrients transported from the drainage area downstream to the Baltic Sea.

Baltic estuaries are considered to be of global importance. They are on one hand areas of high biological productivity in a brackish environment, but on the other hand also ecologically under stress, because of permanently changing physical conditions. They form important breeding, resting, and feeding sites for water birds such as Kentish plover *Charadrius alexandrinus*, black tern *Chlidonias niger*, common tern *Sterna hirundo* or mute swan *Cygnus cygnus*. The vegetation in estuaries can be very diverse, consisting of reeds, sedges and submerged plants. Estuaries are further considered to be very important spawning and nursery grounds for some marine fish species (e.g. herring) and numerous fresh water and migratory fish species.

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

Downstream part of a river valley, subject to the tide and extending from the limit of brackish waters. River estuaries are coastal inlets where, unlike 'large shallow inlets and bays' there is generally a substantial freshwater influence. The mixing of freshwater and sea water and the reduced current flows in the shelter of the estuary lead to deposition of fine sediments, often forming extensive intertidal sand and mud flats. Where the tidal currents are faster than flood tides, most sediments deposit to form a delta at the mouth of the estuary.



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Baltic river mouths, considered as an estuary subtype, have brackish water and no tide, with large wetland vegetation (helophytic) and luxurious aquatic vegetation in shallow water areas.

Plants: Benthic algal communities, *Zostera* beds e.g. *Zostera noltii* (Zosteretea) or vegetation of brackish water: *Ruppia maritima* (= *R. rostellata* (Ruppieteae)); *Spartina maritima* (Spartinetea); *Sarcocornia perennis* (Arthrocnemetea). Both species of fresh water and brackish water can be found in Baltic river mouths (*Carex* spp., *Myriophyllum* spp., *Phragmites australis*, *Potamogeton* spp., *Scirpus* spp.).

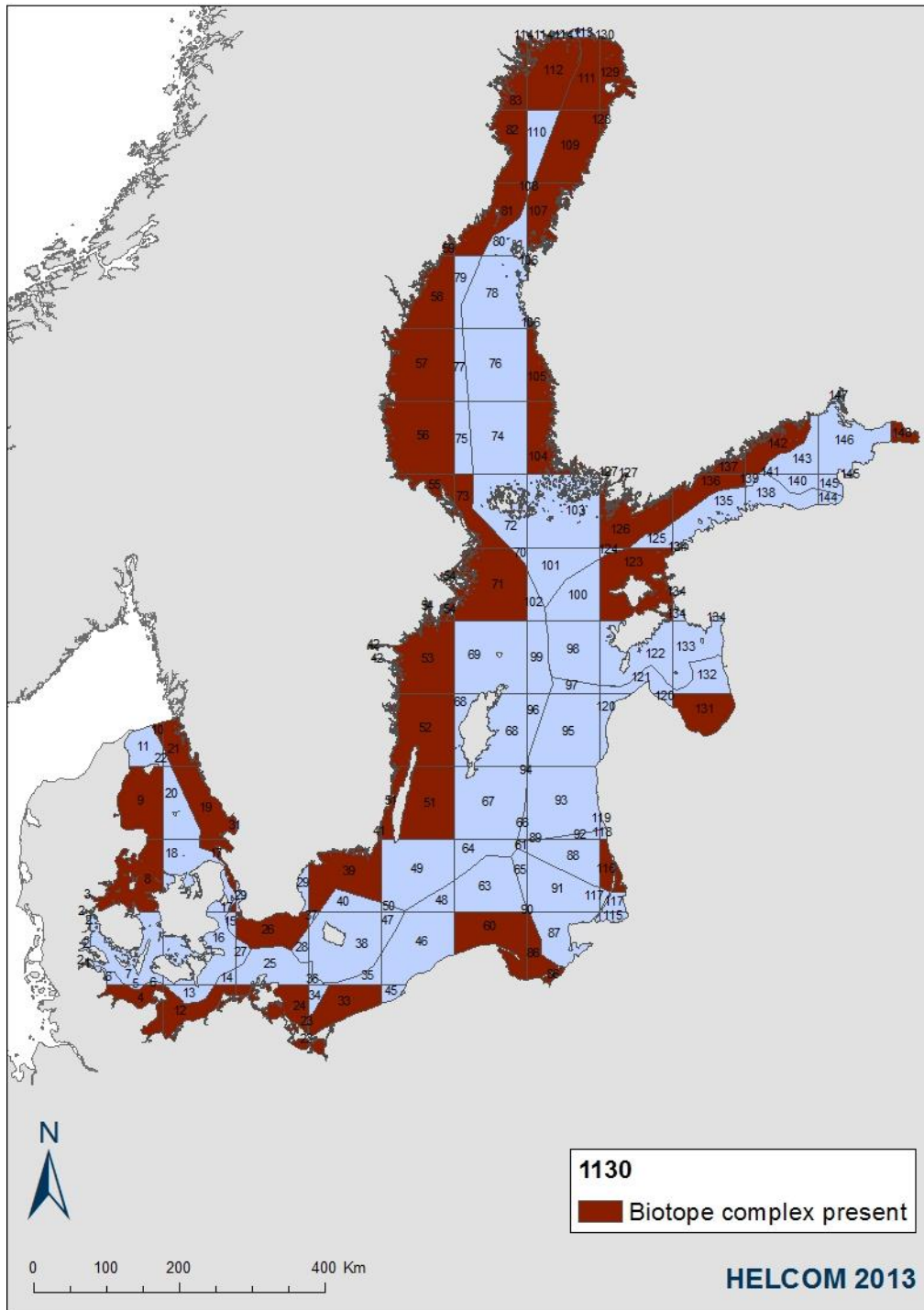
Animals: Invertebrate benthic communities; important feeding areas for many birds.

An estuary forms an ecological unit with the surrounding terrestrial coastal habitat types. In terms of nature conservation, these different habitat types should not be separated, and this reality must be taken into account during the selection of sites.

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Distribution and status in the Baltic Sea region

Estuaries are present in the entire Baltic Sea area. Examples of river mouth areas in **Denmark:** Gudenåen-Randers Fjord, Horsens Fjord, Vejle Fjord, Kolding Fjord **Sweden:** Bräkneån, Hagbyån, Virån, Loftaån, **Finland:** Porvoonjoki river mouth area, Kymijoki river mouth area, Merikarvianjoki, Aurajoki river mouth area, **Russia:** Neva estuary, **Germany:** Trave estuary, Warnow estuary, Peene mouth area. The known occurrences of the estuary biotope complex in a 100x100 km grid (Naturvårdverket 2011, EUNIS Database, HELCOM 1998)



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Description of Major threats

Estuaries have historically been preferred areas for settlement and later on for international trade. Therefore, they have always been under human pressure by both usage of the catchment area and the shoreline and by changes of the marine biotopes.

Changes in the hydrodynamic conditions of estuaries due to deepening of the navigational channels for large ships and technical constructions, such as dams, cascades and river bank control, have severe adverse effects on estuaries. The hydrodynamics of estuaries has changed also due to construction of rivers and the loss of natural flood dynamics. Other severe physical pressures and threats are mainly caused by shipping, construction or enlargement of harbours and marinas in the river mouths (European Commission 2007b). Physical alteration of the geological formations or the flow regime can potentially change the communities living in the area.

Eutrophication and pollution by drainage from farming and forestry and other sources, such as traffic and industry, potentially cause severe deterioration of the quality of the biotope complex. Other threats can be caused by introduction of non-indigenous, invasive species, unsustainable fishery and tourism as well as oil spills and construction of breakwaters. The environmental conditions in river mouths depend highly on inflows from local point sources as well as from the whole catchment area, estuaries are therefore closely related to human activities on land (European Commission 2007b).

Assessment justification

C1

Major estuaries in completely pristine condition are nearly unknown in the Baltic Sea area. During the considered time period of 50 years, the quality decline has been very severe on nearly all estuaries in the Baltic Sea region.

Harbours, cities and other construction activities have altered several estuaries already in historical times. However, during the last 50 years the anthropogenic pressure has increased markedly. The usage intensity of harbours has increased markedly, resulting in more direct disturbance from the marine traffic and also in an increased necessity for dredging the areas. Dredging, dumping of dredge spoils and other construction activities have altered the hydrodynamic conditions of estuaries.

The flow of many rivers has been altered by damming up-stream which also affects the hydrodynamic conditions of the estuary adversely, as the natural flood rhythm is lost and its intensity decreased. Pressures from construction and marine traffic are estimated to remain at the same level or possibly increase during the coming decades. Moreover, the length of pristine or near-pristine shores of estuaries or estuaries in a natural or near natural state is steadily decreasing.

During the assessment period, the quality of estuaries has also decreased due to increasing pollution loads. Some pollution sources can be located in the estuary area, but most point- and diffuse pollution sources are found in the drainage area of the rivers. During the past 50 years the nutrient run-off from drainage areas of nearly all estuaries has increased markedly due to an increased usage of chemical fertilizers, the nutrient run-off from municipalities waste water has also increased. Eutrophication of estuaries due to an increased run-off of nutrients from the drainage area, results in an expansion of reed beds in the estuary that changes the natural composition of organism communities.

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Recommendations for actions to conserve the biotope

One of the main solutions to stop and reverse degradation of the estuaries is a general protection of this natural habitat type by law. River mouth areas that still remain in a natural state with unregulated water flow up-stream need to become strictly protected sites. Further, programs and measures are needed to maintain or restore natural conditions along the whole course of the rivers, which e.g. allow natural erosion and temporary flooding of river banks. Additional beneficial protective measures for estuaries include restriction of the further deepening of shipping channels, construction of new port facilities and marinas, regulation of fisheries, control of the growing tourism and harmful recreational activities.

A drastic reduction of nutrient and pollution loads in the catchment area of estuarine rivers would support the improvement of the environmental situation of the whole Baltic marine area. The introduction of ecologically sound fishing and farming methods is essential in order to reach a more favourable conservation status of the natural habitat type.

EU Member States are obliged to take all appropriate steps to avoid further deterioration of estuaries. This includes the obligation to protect this natural habitat type within the Natura 2000 network, and thus to designate as many SACs as necessary to guarantee a favourable conservation status for estuaries. Member States have to follow Article 6 (3) of the Habitats Directive. Plans and projects which are not directly connected with or necessary to the management of a Natura 2000 site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications.

Common names

Denmark: Flodmundinger, Estonia: -, Finland: Jokisuistot, Germany: Ästuare, Latvia: -, Lithuania: -, Poland: -, Russia: -, Sweden: Estuarier

References

- European Commission. (2007a). 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
- European Commission (2007b). Guidelines for the establishment of the Natura 2000 network in the marine environment. Application of the Habitats and Birds Directives. (EU interpretation manual)
 Available at:
http://ec.europa.eu/environment/nature/natura2000/marine/docs/marine_guidelines.pdf (viewed 4 June 2013)
- HELCOM (1998). Red List of Marine and Coastal Biotopes and Biotope Complexes of the Baltic Sea, Belt Sea and Kattegat - Including a comprehensive description and classification system for all Baltic Marine and Coastal Biotopes. HELCOM-Baltic Sea Environment Proceedings 75, Helsinki Commission. 115 pp.
- 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_1130_Estuarier.pdf. (Viewed 19.7.2013).
- EUNIS Database. <http://eunis.eea.europa.eu/habitats.jsp> (Viewed 19.7.2013).