# SPECIES INFORMATION SHEET *Scophthalmus maximus*

| English name: **Turbot** | Scientific name: ***Scophthalmus maximus*** | |
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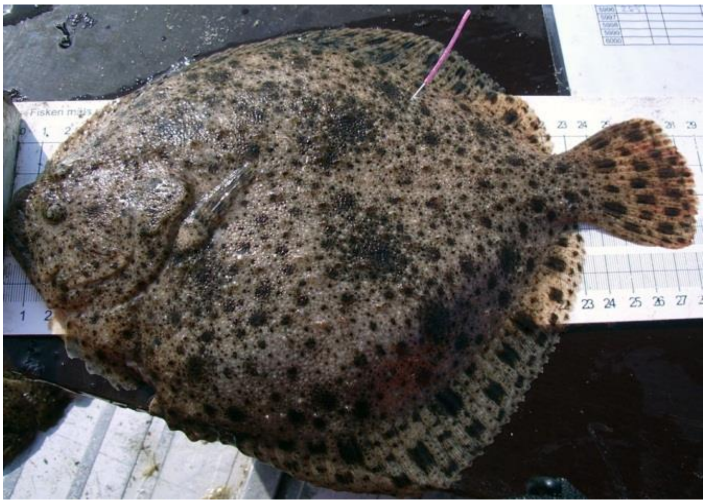
| Taxonomical group:<br>Class: Actinopterygii<br>Order: Pleuronectiformes<br>Family: Scopthalmidae | Species authority:<br>Linnaeus, 1758 | |
| Subspecies, Variations, Synonyms: *Psetta maxima* | Generation length: 8.5 years | |
| Past and current threats (Habitats Directive article 17 codes): Fishing (F02), Eutrophication (H01.05) | Future threats (Habitats Directive article 17 codes): Fishing (F02), Eutrophication (H01.05) | |
| IUCN Criteria:<br>**A2bd** | **HELCOM Red List Category:** | **NT**<br>**Near Threatened** |
| Global / European IUCN Red List Category<br>NE/NE | Habitats Directive:<br>Annex II, V | |
| Previous HELCOM Red List Category (2007): DD | | |
| Protection and Red List status in HELCOM countries:<br>Denmark: –/–<br>Estonia: –/**LC**<br>Finland: –/**DD**<br>Germany: –/***** (Not threatened, Baltic Sea)<br>Latvia: *Protected by commercial fishing rules (closed season, minimal landing size) and gear regulation*. / –<br>Lithuania: *Protected from fishing during spawning time 1st of June to 31st of July.* / –<br>Poland: *Protected from fishing during spawning time 1st of June to 31st of July, minimum landing size 30cm.* / –<br>Russia: –/–<br>Sweden: *Protected from fishing during spawning time 1st of June to 31st of July in ICES SD 25, 26 and 28 south of 56,50N. A no-take area at Gotska Sandön implemented in 2005.Minimum landing size of 30 cm.* / **LC** | | |

## Distribution and status in the Baltic Sea region

Turbot (*Scophthalmus maximus*) is a coastal species commonly occurring in the northeast Atlantic, throughout the Mediterranean and along the European coasts to the Arctic Circle. In the Baltic Sea it is frequent up to the Åland Sea.

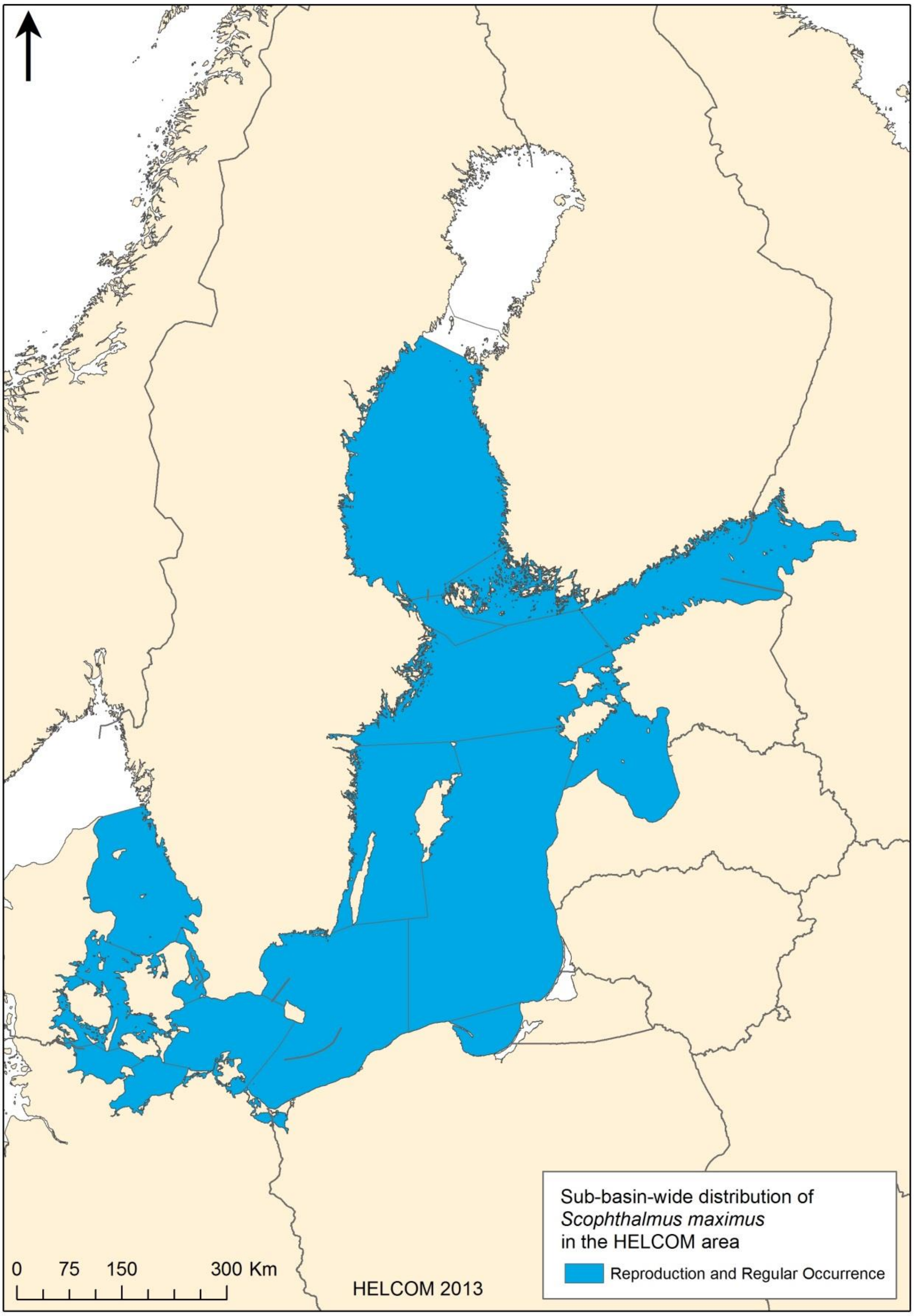


Turbot. Photo by Susanne Tärnlund, Swedish University of Agricultural Sciences.

Turbot is locally of great economic importance, especially to the coastal fishery. The main part of turbot fishery takes place in the southern and western part of the Baltic Sea within the Danish and German fisheries. The fishery directed towards turbot escalated in the early 1990s in eastern Gotland basin and Gdansk bay due to Polish, Russian and Swedish gillnet fishery (ICES 2011) and total landings in the Baltic Sea exceeded 1000 tonnes. Since 1995 however, the total landings of turbot in the Baltic Sea decreased and amounted to 300 tonnes in 2010 (ICES 2011). Also catch per unit effort from commercial gillnet fishery in the Baltic Sea show decreasing trends; in Latvia and Lithuania there is more than 60% decrease, in Russia the decrease is 20% while in Sweden the downward trend turned in 2003 and the catch per unit effort is higher today than in the mid-1990s. In Estonia annual coastal gill-net monitoring indicates that there is strong fluctuation of size in year classes, and, therefore, abundance fluctuates considerably. ICES Baltic International Trawl Survey do not show any decrease but this survey is not good for monitoring turbot (ICES 2012). In the Kattegat ICES International Bottom Trawl Survey shows a decrease of large fishes (>30cm) of 65% during the assessment period 1985–2011. However, compared to the level in the beginning of the series the decrease is only 20%. Looking over the whole 19th century, however, the Kattegat turbot is depleted, and only 5 % of the historical stock is left (Cardinale et al 2009).

## Distribution map

The map shows the sub-basins in the HELCOM area where the species is known to occur regularly and to reproduce (HELCOM 2012).



## Habitat and ecology

In spring both juvenile and adult turbots move to the coast and in winter they migrate towards deeper water, although seldom deeper than 70 m (30 m in central Baltic) (Florin 2005). Spawning takes place in summer in shallow waters (10–40 m, 10–15 m in the central Baltic) and after metamorphosis the post larvae settle at the bottom in even shallower waters closer to shore (down to one meter depth) (Florin 2005). In addition to this general migration pattern the depth distribution changes continuously with size and age in such a way that older and larger turbot are found in increasingly deeper waters (Florin 2005).

Males are smaller than females and their growth curve in the Baltic Sea level out close to 30 cm although individuals up to half a meter can be found. Females mature at about the age of four years while males are ready to mate a year earlier (Florin 2005). In the Baltic maturity is reached already at a size of 20 cm for females and 15 cm for males while on the Swedish west coast mature females and males are probably about 30 and 25 cm, respectively.

Turbot, like most flatfishes, is a marine species but has the capacity to survive and reproduce at varying salinity. Eggs from the Belt Sea have an optimal development at 15 psu while eggs from the North Sea have an optimum between 20 psu and 35 psu and do not survive in the lower salinities of the Baltic (Florin 2005). Eggs from east of Gotland develop without increased mortality down to 7 psu (Nissling et al. 2006) and some eggs even hatch at 5.5 psu. Interestingly, although flatfish eggs are normally pelagic, turbot eggs are not buoyant at salinities below 20 psu and the eggs from Baltic Sea turbot are thus demersal (Nissling et al. 2006).

The genetic data show no structure for the turbot within the Baltic Sea according to Nielsen et al. (2004) and Florin & Höglund (2007), although the former study discovered a difference between the Baltic Sea and Kattegat with a hybrid zone in the Belt Sea. Tagging studies from different parts of the Baltic Sea all show that turbot have high spawning area fidelity and that 95% of the fishes move less than 30 km from tagging site although few individual specimens show displacements of hundreds of kms (Aneer & Westin 1990, Florin & Franzen 2010).

Turbot is a visual daylight predator foraging on highly mobile prey. They often leave the bottom to hunt in the open water column. Turbots have large mouths, compared to other flatfishes, thus allowing them to forage on macrofauna (>1mm) from the beginning of their benthic life. Juvenile turbots less than or equal to 30 mm consume mainly amphipods, while >30 mm turbots also eats mysid shrimps and fish (Florin 2005). For adult turbots herring, sandeels and gobies are important food items (ICES 2011).

## Description of major threats

High fishing pressure, especially on large females is a major threat to turbots in the HELCOM area. Destruction of nursery areas as well as hypoxia in deeper overwintering areas due to increased eutrophication is also detrimental for the turbot.

## Assessment justification

Data from Russian fishery in the Gdansk bay show high estimates of abundance 1995–2000. After that the same data show suddenly a 4-fold decrease, an increasing trend 2001–2009 and at the end of the time series a 20% decrease compared to the beginning of the time series (Data from D. Ustups Latvia, chair of WKFLABA 2010). Data from commercial gillnet fishery in Latvia in the eastern Gotland basin show decrease in catch per unit effort (cpue) from 1996 to 2011 with 60–70% (Data shown during ICES 2012, Didzis Ustups, Latvian Institute of Food Safety, Animal Health and Environment "BIOR"). Data from Polish fishery in Gdansk Bay show a decrease in gillnet cpue of 68% between 1995–2004 (Draganik et al.

2005). Unfortunately no data are available for later years to see if this decrease has changed as it had for Russian data in the same area. Cpue statistics in gillnet in Sweden show that the stocks in Hanö Bay and the eastern Gotland basin have not decreased when considering the whole time series. In Estonia annual coastal gill-net monitoring indicates that there is strong fluctuation of size in year classes, and, therefore, abundance fluctuates considerably. Baltic International Trawl Survey does not show any decrease but this survey is not good for monitoring turbot (ICES 2012). International Bottom Trawl Survey shows a decrease of large fishes (>30cm) in the Kattegat of 65% during the assessment period 1985–2011. However, compared to the level in the beginning of the series the decrease is only 20%. Looking over the whole 19th century however the Kattegat turbot is depleted and only 5% of historical stock left (Cardinale et al 2009).

Giving equal weight to all data sources and all areas gives an average decrease of just around 30% with a worst estimate of 50% and a best estimate of 10%. This would result in VU but if more weight is given to data from Bornholm and Gdansk basin where the turbot is more numerous than in peripheral parts of the distribution area, the most probable decrease will be less than 30%. Immigration from outside the area is unlikely to help the situation of this species since turbot outside the area lacks the adaptation to the low salinity within the Baltic Sea and is most likely not able to reproduce here. Therefore the species is categorized as NT according to the A2b and A2d criteria.

## Recommendations for actions to conserve the species

There is a need for a management plan to regulate the fishery in the HELCOM area. Possible actions could be area or time specific protection of spawning and nursery areas or a limit in maximal mesh size to protect the biggest females. In addition important spawning and nursery areas should be protected from exploitation.

## Common names

D: Steinbutt; DK: Pighvarre; EST: kammeljas; FI: Piikkikampela GB: Topknot; PL: Skarp; LV: Akmeņplekste, āte; LT: Otas; RUS: Tjurbo; SE: Piggvar

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