



## **Scophthalmus rhombus, Brill**

Bruno Chanet

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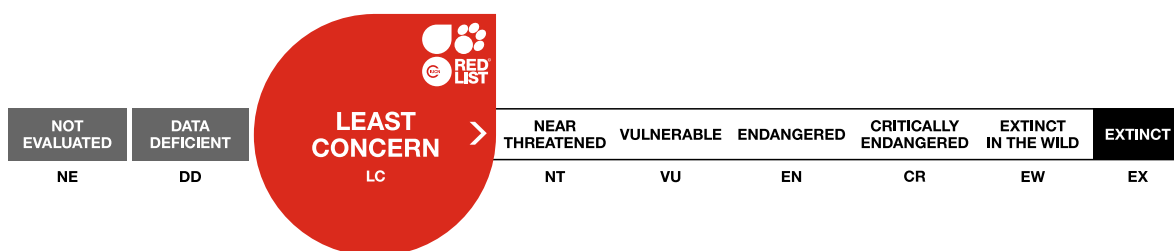
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## *Scophthalmus rhombus*, Brill

Assessment by: Cardinale, M., Chanet, B., Martínez Portela, P., Munroe, T.A., Nimmegeers, S., Vansteenbrugge, L. & Turan, C.



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## Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Pleuronectiformes	Scophthalmidae

**Scientific Name:** *Scophthalmus rhombus* (Linnaeus, 1758)

**Synonym(s):**

- *Pleuronectes rhombus* Linnaeus, 1758
- *Rhombus laevis* Turton, 1802

**Regional Assessments:**

- Europe
- Mediterranean

**Common Name(s):**

- English: Brill
- French: Barbue
- Spanish; Castilian: Corujo
- Dutch; Flemish: Griet
- German: Glattbutt
- Portuguese: Rodovalho
- Turkish: Çivisiz Kalkan

**Taxonomic Notes:**

Based on recent genetics studies, the taxonomic status of this species in the Black and Marmara seas is somewhat uncertain. According to Turan *et al.* (2019), *Scophthalmus rhombus* is a distinct species in the region, but Firdin *et al.* (2020) concluded it is not distinct from *S. maximus* in the region. For purposes of this assessment, and based on past literature (e.g., Giragosov *et al.* 2012), *S. rhombus*, though rare, is considered to represent a distinct species in the Black and Marmara seas.

## Assessment Information

**Red List Category & Criteria:** Least Concern [ver 3.1](#)

**Year Published:** 2021

**Date Assessed:** December 10, 2020

**Justification:**

This widely distributed, demersal species occurs in estuaries and inshore habitats to depths on the continental shelf. The estimated generation length is 7 years. It is taken in commercial fisheries in much of its range. Relative biomass in the North Sea, Skagerrak/Kattegat and English Channel stock has increased since the time series low in 1997 and has stabilized in the most recent years. Though uncertain due to limitations of the available data, the Baltic Sea stock appears to have increased from 2001 and now fluctuates around a 10-year average. Little is known on the subpopulation status off the Iberian Peninsula, although some overexploitation has occurred in the fisheries that catch this species off Spain. It has a naturally low abundance in the Mediterranean Sea. Though quantified data are

limited, this species has declined in the Black Sea due to overfishing and habitat degradation. A global-level population decline approaching a Near Threatened or threatened level is not indicated at this time; therefore, it is listed as Least Concern with recommendations to improve fisheries management, to increase nearshore habitat protections in the Black Sea, and to collect data on its status off the Iberian Peninsula. Resolution of mismatches in total allowable catch limits in the North Sea fishing areas is needed to prevent overexploitation, and continued improvement in data collection will also help to improve the reliability of biomass estimates.

## Geographic Range

### Range Description:

This species is distributed in the eastern Atlantic from off southern Iceland and Norway (near the Lofotes at about 64°N) to about 30°N off Western Sahara (Munroe and Chanet 2016). It also occurs throughout the Mediterranean Sea, including the Adriatic Sea (Arneri *et al.* 2001, Pranovi *et al.* 2001, Dulčić and Glamuzina 2006), the Gulf of Lion (Letourneur *et al.* 2001, Dumay *et al.* 2004) and the Sea of Marmara (Keskin and Eryilmaz 2010). It also inhabits the Black Sea and the Azov Sea. Previous records from the east Levant basin (Egypt, Israel, Lebanon, Syria and Mediterranean Sea coast of Turkey) are apparently erroneous (Golani 1996). The depth range is 4-80 metres (Nielsen 1986, Bauchot 1987, van der Hammen *et al.* 2013).

### Country Occurrence:

**Native, Extant (resident):** Albania; Belgium; Bosnia and Herzegovina; Bulgaria; Croatia; Cyprus; Denmark; Faroe Islands; France; Georgia; Germany; Gibraltar; Greece; Iceland; Ireland; Italy; Malta; Monaco; Montenegro; Morocco; Netherlands; Norway; Portugal; Romania; Russian Federation; Slovenia; Spain; Turkey; Ukraine; United Kingdom; Western Sahara

### FAO Marine Fishing Areas:

**Native:** Atlantic - northeast

**Native:** Atlantic - eastern central

**Native:** Mediterranean and Black Sea

# Distribution Map

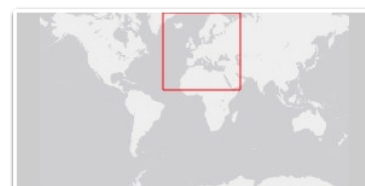
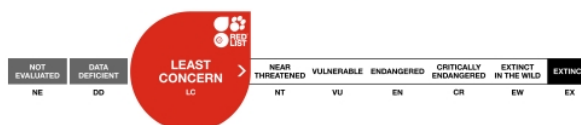


## Legend

EXTANT (RESIDENT)

Compiled by:

IUCN Marine Biodiversity Unit/GMSA 2020



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

## Population

This species generally occurs in low abundance throughout its range. Early demersal stages have highly specific habitat requirements, and abundance may be determined by the size of the nursery grounds (Rijnsdorp *et al.* 1992, Gibson 1994, van der Veer *et al.* 2000). This species is similar to Turbot, *Scophthalmus maximus*, and hybridization has been documented between the two species in the North Sea. It is suspected that hybridization may have been increased due to farmed Turbot released in the 1990s and 2000s for the purposes of stock enhancement (Maroso *et al.* 2018).

**Atlantic:** At least three stocks occur in the Atlantic: the North Sea, Skagerrak/Kattegat and English Channel, the Baltic Sea and the Iberian Peninsula.

The highest landings in the Atlantic are taken from the North Sea. The relative biomass has been estimated for the stock located in the North Sea, Skagerrak/Kattegat and English Channel (Subarea 4 and divisions 3.a and 7.d-e) for the years 1987-2019. Relative biomass has increased overall since the time series low in 1997 and has stabilized in the most recent years. However, some level of uncertainty is associated with these estimates as this is a data-limited stock. Fishing mortality has been below the sustainability target since the late 2000s and spawning stock biomass has been above the target since the late 1990s (ICES WGNSSK 2020).

The genetic structure of this species is homogeneous (Vandamme *et al.* 2020). The abundance is naturally lower in the Baltic Sea compared to that in other parts of the northeast Atlantic. Baltic Sea stock (subdivisions 22-32) abundance has been estimated for the years 2001-2019 based on a fishery independent trawl survey. The time series low occurred in 2001 and has increased overall to the terminal year (2019), with the most recent period of increase occurring since 2016. However, the surveys do not cover this species adequately, so these abundance estimates are made with some uncertainty. The stock assessment is data-limited and fishing pressure is not well understood, but demersal effort by German and Danish fleets is known to have been stable since at least 2009. Total annual landings have remained relatively low since 1970 with some fluctuation over time (ICES 2020).

Data are limited on the status of the subpopulation off the Iberian Peninsula. In Portugal, landings per unit effort of this species from 1992 to 2005 was variable over time with a slightly decreasing trend (Teixeira and Cabral 2009). There has been overexploitation in the fisheries that catch this species off Spain; however, Turbot (*Scophthalmus maximus*) has a higher value than does *S. rhombus*, and therefore, fishing pressure is somewhat lower for *S. rhombus* (P. Martinez pers. comm. 2020).

**Mediterranean Sea:** Subpopulation data are limited for the Mediterranean. This species occurs in lower abundance and has a relatively patchy occurrence in this region as compared to the North Atlantic. It is naturally scarce in the Mediterranean (P. Martinez pers. comm. 2020).

**Black Sea:** *Scophthalmus rhombus* can easily be confused with *S. maximus* in the Black Sea region (Turan *et al.* 2019). This species is historically very rare in the northern Black Sea (Giragosov *et al.* 2012, Giragosov 2013). It is naturally rare in Turkish waters of the Sea of Marmara and in the western Black Sea. It is occasionally taken in fisheries in low numbers and lumped with landings of the more common and target species, Turbot (*Scophthalmus maeoticus/maximus*). Quantified subpopulation trend data are not available for this species, but anecdotal reports indicate abundance has declined due to

overfishing and habitat degradation. Declines of Turbot due to overfishing across the Black Sea are well-documented (Turan *et al.* 2016).

**Current Population Trend:** Stable

## **Habitat and Ecology (see Appendix for additional information)**

This demersal species typically occurs in nearshore waters on sandy bottoms and less frequently on mud and gravel substrates. Adults occur on the inner continental shelf on sandy bottom. Juveniles inhabit sandy bottoms in shallow, inshore areas including meso- and polyhaline regions of estuaries and lagoons (Jones 1974). Adults are less common inshore than immature individuals (Chanet and Branellec 2008, Vinagre *et al.* 2011). Adults congregate during the spawning season in some parts of its range. Successful recruitment requires significant availability of specific habitats, especially estuaries (ICES 2013). Spawning occurs between 5 to 40 m depth (Caputo *et al.* 2001). The maximum total length is 90 cm, but most individuals commonly reach sizes to 45 cm (Munroe and Chanet 2016). The length-weight relationship is reported in Silva *et al.* (2013).

In the Mediterranean, length at maturity is 38.5 cm for females and 25.5 cm for males (Tsikliras and Stergiou 2014). Growth rate is fast overall but is slower in individuals inhabiting the northern parts of its distribution; maturation is also attained at shorter lengths for Brill occurring in northern waters (ICES 2013). In the North Sea, maximum age is 16 years for males and 22 years for females. Age at maturity is 1 year for males and 2 years for females (van der Hammen *et al.* 2013). Natural mortality has not been estimated for individuals inhabiting the North Sea (ICES 2019). Turbot (*Scophthalmus maximus*), which is somewhat larger but similar to *S. rhombus* in distribution, ecology and morphology, has an estimated generation length of 9 years based on an age at first maturity of 3-4 years and an assumed natural mortality of 0.2. If this same estimate of natural mortality is applied as a proxy for *S. rhombus*, which has an age at maturity of 2 years, then the estimated generation length for this species is 7 years when applying the following equation recommended by the IUCN Red List methods:  $1/\text{adult mortality} + \text{age of first reproduction}$ .

**Systems:** Marine

## **Use and Trade**

This species is taken in commercial fisheries with beach seines, trammel nets, longlines and trawls. In the North Sea, this species is retained as bycatch in fisheries that primarily target Sole and Plaice. It is a candidate for aquaculture development in southern Europe and the Mediterranean (Hachero-Cruzado *et al.* 2007).

## **Threats (see Appendix for additional information)**

Overexploitation may cause declines in areas of heavy fishing pressure, such as in the Black Sea, but global-level declines approaching a threatened or Near Threatened level are not indicated at this time. Major threats to this species in the Black Sea include overfishing and habitat degradation due to pollution (Turan *et al.* 2016).

## **Conservation Actions (see Appendix for additional information)**

The total allowable catch (TAC) limit for this species is set by the European Union. However, this TAC is

combined for Turbot and Brill. The International Council for the Exploration of the Sea (ICES) advised that Turbot and Brill should be managed using single-species TACs covering an area appropriate to the relevant stock distribution. Available fisheries independent surveys have a low catchability for large flatfish. Therefore, Dutch scientists and fishers have initiated an industry survey, which could give a more appropriate index as input for the assessment (ICES WGNSSK 2020).

Improvements in fisheries management of Turbot and Brill in the Black Sea are needed. Protections against nearshore habitat degradation are also necessary (Turan *et al.* 2016).

This species was regionally assessed as Least Concern in the Mediterranean in 2008 and regionally assessed as Least Concern in Europe in 2013.

## Credits

<b>Assessor(s):</b>	Cardinale, M., Chanut, B., Martínez Portela, P., Munroe, T.A., Nimmegeers, S., Vansteenbrugge, L. & Turan, C.
<b>Reviewer(s):</b>	Linardich, C.
<b>Facilitator(s) and Compiler(s):</b>	Linardich, C.



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## Appendix

### Habitats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Habitat	Season	Suitability	Major Importance?
9. Marine Neritic -> 9.3. Marine Neritic - Subtidal Loose Rock/pebble/gravel	Resident	Suitable	Yes
9. Marine Neritic -> 9.4. Marine Neritic - Subtidal Sandy	Resident	Suitable	Yes
9. Marine Neritic -> 9.5. Marine Neritic - Subtidal Sandy-Mud	Resident	Suitable	Yes
9. Marine Neritic -> 9.6. Marine Neritic - Subtidal Muddy	Resident	Suitable	Yes
9. Marine Neritic -> 9.10. Marine Neritic - Estuaries	Resident	Suitable	Yes

### Use and Trade

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

End Use	Local	National	International
Food - human	No	Yes	No

### Threats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Threat	Timing	Scope	Severity	Impact Score
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.2. Intentional use: (large scale) [harvest]	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.4. Unintentional effects: (large scale) [harvest]	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
9. Pollution -> 9.2. Industrial & military effluents -> 9.2.3. Type Unknown/Unrecorded	Ongoing	Minority (50%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

### Conservation Actions in Place

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Action in Place
In-place species management

<b>Conservation Action in Place</b>
Harvest management plan: Yes

## Conservation Actions Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

<b>Conservation Action Needed</b>
2. Land/water management -> 2.3. Habitat & natural process restoration
3. Species management -> 3.1. Species management -> 3.1.1. Harvest management

## Research Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

<b>Research Needed</b>
1. Research -> 1.1. Taxonomy
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.2. Harvest level trends

## Additional Data Fields

<b>Distribution</b>
Lower depth limit (m): 80
Upper depth limit (m): 4
<b>Population</b>
Population severely fragmented: Unknown
<b>Habitats and Ecology</b>
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 7

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