

# Flounder

## (*Platichthys flesus*)

### Summary

|  |                                |
|--|--------------------------------|
| <b>Size (total length)</b>                 | 51 cm (Wheeler, 1987)          |
| <b>Lifespan</b>                            | -                              |
| <b>Size of maturity</b>                    | 25 – 35 cm                     |
| <b>Fecundity</b>                           | >1 million eggs (Déniel, 1981) |
| <b>Reproductive frequency</b>              | Annual                         |
| <b>Capture methods</b>                     | Bycatch – trawls and nets      |
| <b>Minimum Conservation Reference Size</b> | 27 cm                          |
| <b>Fishing Season</b>                      | Jan – Apr peak as bycatch      |



### Description

The European flounder (*Platichthys flesus*) is widely distributed along the coasts of Europe from Norway to the Mediterranean and can be found on all British and Irish coasts (Pizzolla, 2005). It is a shallow-water, bottom-living flatfish that lives on muddy and sandy bottoms from the tideline to 55 m (Wheeler, 1978). Flounder spend most of their lives in estuaries and are the only known species of flatfish that inhabit freshwater (Wheeler, 1978). In cooler northern waters, flounder are known to travel further up rivers than populations situated in southern parts of the species' distribution (Wheeler, 1978).

Flounder feed in the intertidal zone, moving onto mudflats at high tide and retreating to deeper water off the mudbank at low tide (Dando, 2011). Adults feed on a range of bottom dwelling invertebrates such as cockles, worms and crustaceans. Younger fish concentrate on smaller crustaceans such as fairy shrimps and sandhoppers (Wheeler, 1978).

### Reproductive Life history

Flounder typically migrate from their estuaries to their offshore spawning grounds in late January to February each year (Dando and Ling, 1980; Sims et al., 2004; Hartley, 1940; Wheeler, 1978). However, the timing of the spawning migration is not fixed and can vary based upon temperature. In years when sea temperatures are cooler, by up to 2°C, flounder migrate to their spawning grounds up to two months earlier than in warmer years (Sims et al., 2004). Spawning grounds can be as far as 300 km (162 nautical miles) offshore but are more commonly around 30 km (16 nautical miles) (Munroe, 2010). On average the spawning season lasts around 28 days with peak spawning activity taking place in March (Van der veer et al., 1991; Dando, 2011). Over the spawning period females release their eggs in batches and in total over one million eggs may be released (Déniel, 1981).

Spent flounder return to their estuaries and shallow inshore waters to feed throughout the summer and do not return to sea until the next spawning season (Hartley, 1940).

Eggs hatch 6-7 days after fertilisation (Hutchinson and Hawkins, 2004 cited in O'neil, 2012) and the planktonic larvae are carried by tidal currents to estuarine nursery grounds (van der veer et al., 1991). Larvae enter estuaries and rivers from April to May and begin metamorphosis before settling on the seabed at 1.5 – 3 cm in length (Van der Veer et al., 1991; Wheeler, 1978). Larval migration into the estuaries is thought to stop by the end of May due to the emergence of coelenterates (jellyfish, anemones and corals) which heavily predate on larval flounder (Van der Veer, 1985).

Growth is dependent on temperature not food intake and in general young flounder reach between 5-11 cm in their first year, 11-20 cm at two years and 20 – 30 cm in their third year (van der veer et al., 1991; de Vlas, 1979). As adults, flounder normally attain a length of 51 cm (Wheeler, 1978). Newly settled flounder are at risk of predation from crustaceans, mainly the brown shrimp (*Crangon crangon*) whilst fish aged 1-2 years are commonly predated on by birds such as the cormorant (Van der Veer and Bergman, 1987; Summers, 1979). A study in Scotland found overwintering cormorants targeted flounder as their main source of food, making up 85% of their diet (Summers, 1979).

Flounder exhibit high site fidelity, not moving more than 200 m in estuaries until they migrate to spawn (Dando, 2011). Smaller fish travel further upstream in the summer but remain in the lower parts during the winter as they are easily displaced by strong water flow. Adult flounder remain in estuarine habitats for around 11 months of the year; however, they can be found offshore outside the spawning period after heavy rainfall (Sims et al., 2004; Hartley, 1947).

## Size of maturity (SOM)

Size of maturity (SOM) is often used to help establish an appropriate Minimum Conservation Reference Size (MCRS) to ensure individuals can reproduce at least once before capture. For finfish, SOM is commonly accepted as the total length (L) at which 50% of a population are mature and is referred to as the  $L_{50}$ . Maturity in finfish is determined by the classification of gonad development based on macroscopic (external appearance of the gonad) or microscopic (histology) methods. Histological techniques (analysis of microscopic morphological features) provide the most accurate results, but it is a time consuming and expensive process. Maturity classification based on the external appearance of the gonad is quick, simple, and cheap however, it is not as accurate as histology and results may be subjective (Brown-Peterson et al., 2011).

Due to the lack of commercial interest in flounder there is very limited knowledge concerning its size at maturity. One study undertaken in the Humber Estuary, North-East England, between 1982-1983 found flounder reach 50% maturity between 25-28 cm in length, estimated at 26.5 cm with males maturing at a slightly smaller size (n=36) (Lart, 1986). Specimens were found to mature at 3 years of age with 52% of females and 85% of males sampled mature at age 3. No fish younger than 3 years old were found with maturing gonads and all specimens greater than 3 years were mature.

A much earlier study in 1937 analysed flounders in the River Tamar and River Lynher, Plymouth, and found the average length of sea-caught female and male flounder during the spawning season was 34.6 cm and 28 cm respectively (Hartley, 1940). Males were also found to mature in their fourth and fifth winters, up to two years later than male flounder analysed in German waters (Hartley, 1940).

In the Bay of Biscay female flounder were found to be mature at 4 years at an average length of 30 cm whereas males matured at 3 years old averaging 24.7 cm in length (Déniel, 1981).

Based on the limited data, of which one study provided an estimated range for 50% size at maturity, flounder mature between 25 cm to 35 cm. In the Southern IFC district the Minimum Conservation Reference Size (MCRS) for flounder is 27 cm.

## Southern IFCA Fishery

### Fishing activity

Flounder is not a commercially important species in the Southern IFC district and as such is not a targeted species. Commercial fisheries do exist in other European countries including in Danish and Baltic waters (Munroe, 2010). Small numbers of flounder are caught as bycatch within the District, mainly in demersal fisheries targeting plaice and sole (ICES, 2019). Flounder are more likely to be caught when they are travelling between their estuaries and offshore spawning grounds from January to April.

### Recreational

Flounder is a popular fish amongst recreational anglers. Most flounder fishing takes place from the shores of estuaries and near-by beaches, but charter boats also offer fishing trips in the winter season when the flounder leave the estuaries to spawn. Poole Harbour used to be renowned for flounder and supported a large targeted recreational fishery. Fish could be caught throughout the year, but the main season typically ran from the end of November to the end of February, peaking in December and January. Over the last 10 plus years the flounder population has declined, and the recreational fishery has diminished (IFCO Mayne, personal communication, April 12, 2021). Multiple theories have been attributed to the decline of flounder populations around the country, but more research is required to identify the cause(s).

## Landings & Value of Fishery

Landings of flounder into ports within the Southern IFC district from 2005 to 2019 have periodically ranged between 0.6 tonnes to almost 5 tonnes per a year (fig 1\*). In 2019 just under 1 tonne of flounder was landed at a value of £924, which was the lowest landings since 2013 when half a tonne at £694 was landed. Landings increased to above 3 tonnes per year between 2015 and 2017 before returning to 1 tonne in 2018.

\*these figures represent vessels that land into ports in the Southern IFC district, some of which would have fished outside the district and be >12 metres in length.

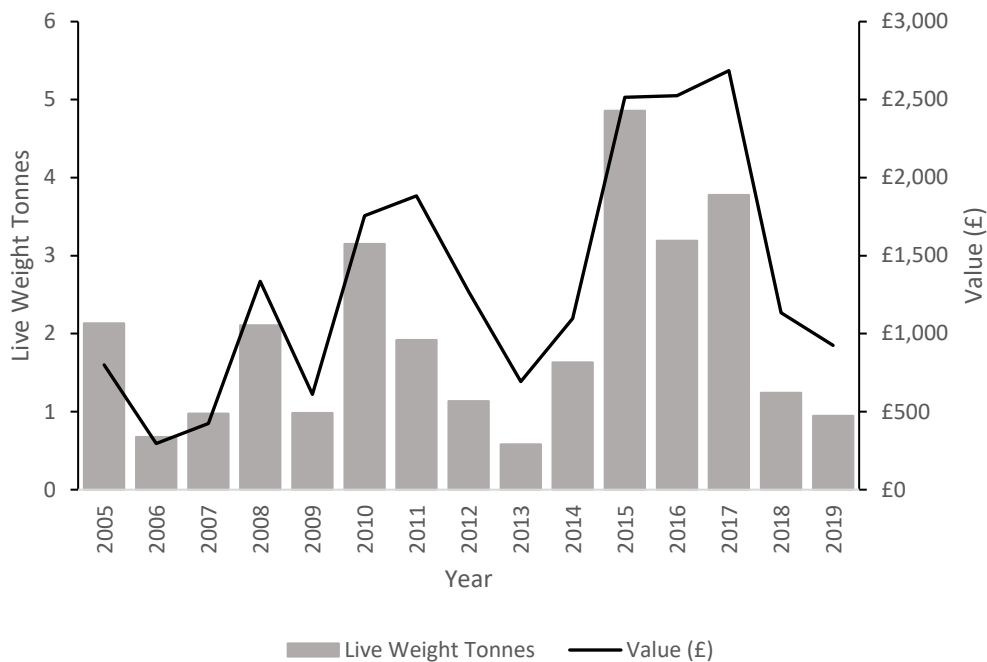


Figure 1. Landings of flounder (*Platichthys flesus*) in the Southern IFC district from 2005 to 2019. Data sourced from the Marine Management Organisation (MMO)

Stock data is limited for flounder in the English Channel however, the latest stock assessment of flounder in the North Sea found that fishing pressure is low and the biomass is stable (ICES, 2019).

## Associated management

Flounder caught within the Southern IFC district is primarily managed by a Minimum Conservation Reference Size (MCRS) of 27 cm (total length) under the Minimum Fish Sizes byelaw. There is no minimum length restriction imposed for flounder by the European Commission however a minimum size of 27 cm is enforced by two other IFCA's, North Wales and by the States of Jersey (table 1).

There are no additional species-specific conservation measures in place for flounder. It is a non-quota species; therefore, catches are not limited and the Landings Obligation does not apply.

Table 1. Minimum Landing Size (MLS)/ Minimum Conservation Reference Size (MCRS) for flounder (*Platichthys flesus*) enforced by Inshore Fisheries and Conservation Authorities (IFCA) in England and authorities in other regions. All measurements in cm for total length (L). \*Only applies within a certain area of the district (Between the Welsh border in the Dee Estuary to Haverigg Point)

| <b>IFCA</b>      | <b>Minimum Landing Size (MLS)/ Minimum Conservation Reference Size (MCRS)</b> |
|------------------|---|
| Northumberland   | -   |
| North Eastern    | -   |
| Eastern          | -   |
| Kent & Essex     | -   |
| Sussex           | -   |
| Southern         | 27  |
| Devon & Severn   | -   |
| Cornwall         | 25  |
| Isles of Scilly  | 0   |
| North Western    | 25*   |
| <b>Other</b>     |   |
| EU               | -   |
| North Wales      | 25  |
| States of Jersey | 25  |
| Government       |   |

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