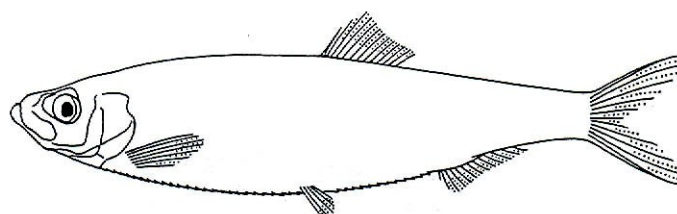


**Sprat*****Sprattus sprattus***
Family ClupeidaeMax size: 16 cm
Max age: 5 years

Introduction

Taxonomy: European sprat *Sprattus sprattus* (Linnaeus, 1758) (Order: Clupeiformes, Family: Clupeidae) is one of five clupeids occurring in the North Sea. Three sub-species have been defined [1], namely *S. sprattus sprattus* in the North-East Atlantic and North Sea, *S. sprattus balticus* in the Baltic Sea and *S. sprattus phalericus* in the Mediterranean and Black Seas.

common names			
<i>Danish</i>	Brisling	<i>Icelandic</i>	Brislingur
<i>Dutch</i>	Sprot	<i>Latvian</i>	Btētiņa
<i>English</i>	Sprat	<i>Norwegian</i>	Brisling
<i>Estonian</i>	Kilu	<i>Polish</i>	Szprot
<i>Faroese</i>	Brislingur	<i>Portuguese</i>	Espadilha / Lavadilha
<i>Finnish</i>	Kilohaili	<i>Russian</i>	Илупор
<i>French</i>	Sprat	<i>Spanish</i>	Espadín
<i>German</i>	Sprott	<i>Swedish</i>	Skarpsill

General: Sprat is a small-bodied pelagic schooling species that is most abundant in relatively shallow waters, including areas of low salinity such as the Baltic. It is an important food resource for many top predators. Sprat is mainly landed for industrial processing (often mixed with juvenile herring), but a small market exists for human consumption (smoked sprat and whitebait). Sprat may be confused with juvenile herring, but the relative positions of dorsal and pelvic fins, the grey rather than blue coloration on the dorsal side and the sharply toothed keel on the belly are clear distinguishing features.

Minimum Landing Size: None.

Distribution

Biogeographical distribution: Sprat is widely distributed in the shelf waters of Europe and North Africa, ranging from Morocco to Norway, including the Mediterranean, Black Sea and Baltic Sea [1,2], but stays largely within the 50 m depth contour and is also common in inshore waters.

Spatial distribution in North Sea: Sprat is most abundant south of the Dogger Bank and in the Kattegat (Fig. 1), but the distribution extends along the British coast and secondary concentrations are found in the Firth of Forth and the Moray Firth [3].



Sprat

Sprattus sprattus
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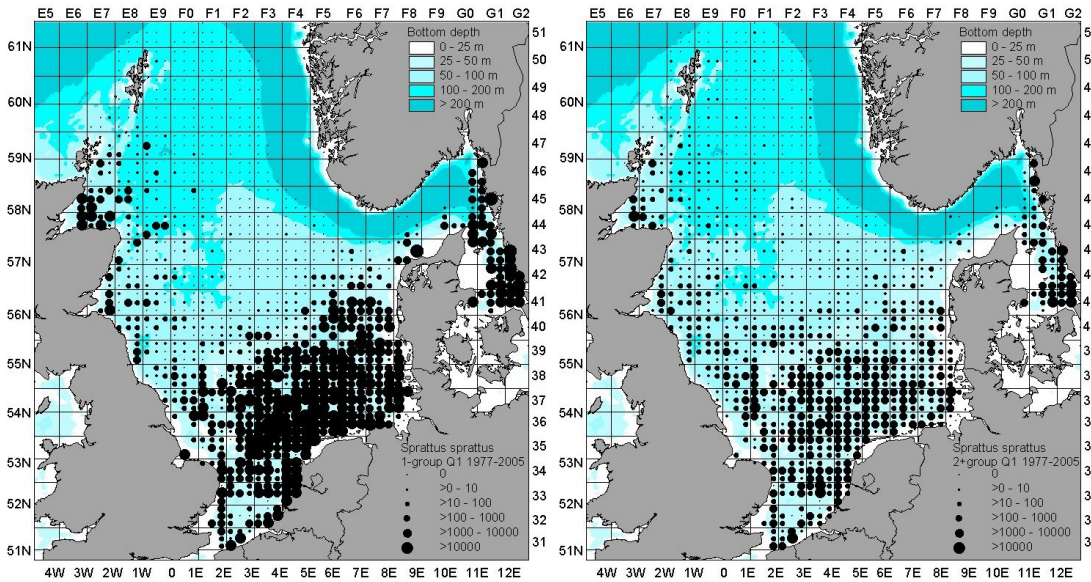


Figure 1. Average annual catch rate (number per hour fishing) for 1-group and 2+ group sprat in the quarter 1 IBTS, 1977–2005.

Habitat characteristics: Being a pelagic species, its distribution is strongly affected by hydrographic conditions and large variations in distribution and abundance have been observed between individual years. The larvae are known to be most abundant in the vicinity of tidal mixing fronts [4]. Sprat is characterised by a tolerance to a wide range of salinities and is also abundant in estuarine habitats [5].

Life history

Age, growth rates, longevity, length-weight relationship: Growth rates in sprat are notoriously variable within and between age groups, areas and years. For example, the modal length of 1-group sprat in the North Sea may be 7 cm in the spring of one year, and 4 cm another year [6]. Sprat is short-lived and rarely attains an age of more than five years [7] or a length of >16 cm [1]. The mean length and proportion mature at age, as observed in IBTS surveys, are illustrated in Figure 2. The relationship between weight (W) and total length (L) is [8]: $W = 0.002112 * L^{3.4746}$

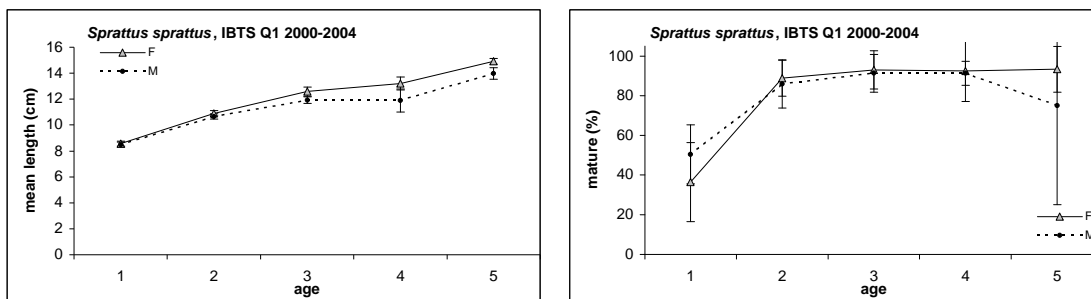


Figure 2. Mean length (left panel) and proportion mature (right panel) at age with standard errors for sprat in the North Sea and Skagerrak/Kattegat, based on IBTS data 2000–2004



Sprat

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Reproduction: Sprat are multiple batch spawners, with females spawning repeatedly throughout the spawning season (up to 10 times in some areas) [9]. They produce 100–400 eggs per gram body weight [15], which is equivalent to 1,500–6,000 eggs per batch for a 2-year old female weighing 15 grams [7]. Spawning occurs in both coastal and offshore waters [2], during spring and late summer, with peak spawning between May and June, depending on water temperature [10,11]. Spawning generally takes place at night [12]. The eggs (0.8–1.3 mm in diameter) and larvae of sprat are pelagic [13, 14]. The larvae hatch at 3.0–3.6 mm in length [13]. Sprat generally first spawn at 2 years of age, though a small proportion of the population spawn at 1 year of age [7]. In the North Sea the eggs are distributed in waters with a salinity range of 30–33‰, while larvae are likely to occur over a similar range, or slightly higher [14]. Important spawning areas are situated in the inner German Bight, off Jutland, along the English coast, and in areas west and north of Scotland [16].

Migrations: On the west coast of Scotland, young sprat tend to migrate into sea lochs in July/August [17]. The traditional winter fisheries in coastal waters indicate migrations towards inshore waters for overwintering, though older fish are likely to remain offshore [7]. Sprat shoals also undertake vertical migrations on a diurnal basis, with schools moving to surface waters at dusk [18].

Food habits: Larvae feed on diatoms, copepods and crustacean larvae [13,19]. After metamorphosis, at 32–41 mm [13], larger planktonic organisms are also eaten, including cladocerans, *Oikopleura*, bivalve larvae, mysids, and euphausiids [20].

Predation: Sprat represents an important prey for many commercially important predatory fish such as the larger gadoids [21], as well as diving seabirds.

Population structure

Age and length composition: Landings are dominated by 0-, 1- and 2-group fish. IBTS data indicate that most sprat caught are between 5 and 13 cm in length, with sprat of up to 18 cm caught frequently (Fig. 3). In the Skagerrak and Kattegat, sprat are substantially larger than in the North Sea.

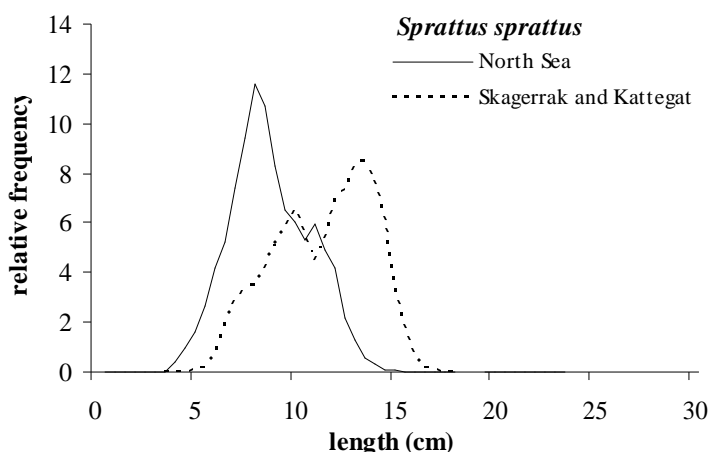


Figure 3: Length-frequency of sprat in the North Sea and in Skagerrak/Kattegat caught in quarter 1 IBTS, 1985–2005.



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Changes in abundance: Sprat is a very common and abundant species in the southern North Sea and Skagerrak/Kattegat. Estimates of relative abundance from acoustic surveys indicate that the biomass is in the region of 360 000 t, and IBTS surveys indicate that sprat have increased in abundance since the mid 1980s [22]. A significant proportion of the total biomass may be comprised of 0-group fish (5-6 cm length) and given the variability in recruitment, biomass can fluctuate widely.

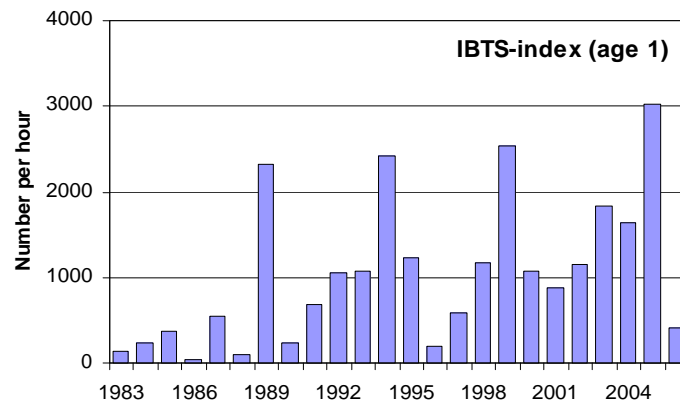


Figure 4. Index for 1-year-old sprat in the North Sea. Catch in number per hour during the quarter 1 IBTS survey in the central North Sea (area IVb).

Stock structure: Sprats in the North Sea (sub-area IV) are assessed as a unit stock, while stocks in the Skagerrak (IIIa) and eastern English Channel (VIIId) are treated as separate units. However, little is known regarding stock structure, movements and mixing of sprat between these management areas.

Exploitation in the North Sea

Main métiers targeting the stock: Sprats are usually caught by small-meshed trawling gear. The larger part of the catch is used in the reduction industry for fish meal, but locally targeted fisheries for human consumption exist. Sprat are often preserved by smoking or cooking in oil [10], while juveniles may be landed and marketed as whitebait.

Landings: When North Sea herring catches decreased in the early 1970s, an offshore industrial fishery developed around 1972, particularly during autumn and winter. Catches rose substantially to reach a peak of 700 000 t in the mid-1970s. Not only an increasing fishing effort but also some very successful recruiting year classes are likely to have contributed to the temporary boom in the sprat fisheries [6]. Subsequently, catches dropped to less than 100 000 t. More recently, landings have increased again to around 200 000 t with a temporary peak in excess of 300 000 t in 1994/95 (Fig. 5). Catches in the Skagerrak/Kattegat have been much lower, but the overall pattern is similar.



Sprat

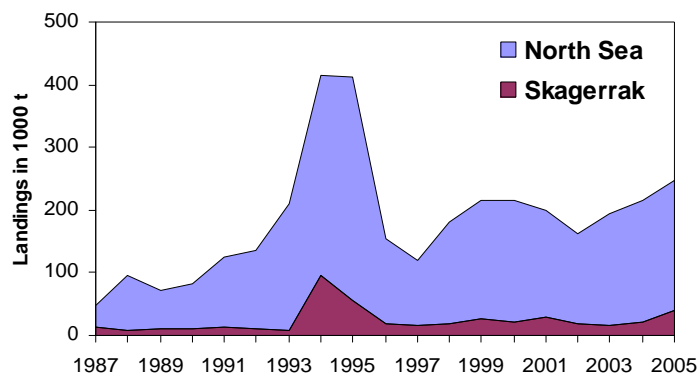
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Figure 5. Landings (1000 t) of sprat in the North Sea (IV) and Skagerrak (IIIa) [23].

Stock status: The status of the North Sea sprat stock is uncertain, but there are indications for an increase over most of the time-series. The most recent increase is due to the strong 2004 year class [23].

Protection and management: Explicit or implicit management objectives do not exist because of insufficient data. However, fishing for sprat is prohibited in certain areas and at certain times because of the high by-catch of juvenile herring. So-called sprat boxes exist along the north-west Danish coast, Northumberland coast, Firth of Forth, and Moray Firth. Timing of the closures varies depending on location [24]. Many sprat fisheries have by-catch limits for juvenile herring, which may constrain the fisheries [23]. TACs are set for the Skagerrak (Division IIIa), and for the Norwegian Sea (Division IIa) and North Sea (sub-area IV) combined (in 2006 52 000 and 283 000 t respectively) [23].

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