

8. Starry smooth-hound (*Mustelus asterias*)

Irish name: Scoirneach ballach



Figure A10.8.1. Starry smooth-hound shark (*Mustelus asterias*). Image © Hans Hillewaert, CC BY-SA 4.0.

This case report has been updated from the western Irish Sea case report published in 2023. A new Web of Science literature review was conducted to assess whether any new research on the species had been conducted since the western Irish Sea report was published, and used to inform both the report and the sensitivity analysis.

Background

The starry smooth-hound shark is a relatively small cartilaginous fish species in the Class Chondrichthyes. The starry smooth-hound has a maximum estimated age of 13 for males, and 18.3 years old for females (Clarke et al., 2016). Starry smooth-hounds have a reported total length of 140 cm (Compagno, 1984). In the Northeast Atlantic, starry smooth-hound reach maturity at around 78 cm total length and 4-5 years for males, and 87 cm total length and 6 years for females (Farrell et al., 2010 a,b). This viviparous species gives birth to live young, but with geographic variation in its reproductive traits (Clarke et al., 2016). Gestation lasts for approximately 12 months with 6-18 embryos produced, followed by a 12-month resting period (Farrell et al., 2010b). There is no published literature on the location of parturition and nursery areas for this species in the Celtic Sea, however, neonates and juveniles are periodically abundant in shallow areas of the English Channel,

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southern North Sea (including the Thames Estuary), and Bristol Channel (Ellis et al., 2005). In the eastern Irish Sea (Holyhead, Wales) large pregnant females are seasonally abundant in May (Farrell, 2010c). Starry smooth-hounds are demersal with a depth range of 0-350 m (Brito, 1991). In Irish waters they are most commonly encountered in shallow sandy areas, including off the coast of Wicklow and Wexford with a northern expansion in their reported range in recent years (Clarke et al., 2016). Starry smooth-hound sharks have a narrow dietary niche, and are specialised on crustaceans as evidenced by their crushing dentition and species-specific diet studies (Berrow, 1994; Ellis et al., 1996; Phillips et al., 2019; Biton-Porsmoguer, 2022). Starry smooth-hound occur in inshore temperate waters of the Northeast Atlantic (Celtic Sea, Irish Sea, North Sea, English Channel, Bristol Channel and Bay of Biscay) and Mediterranean (Compagno, 1984). The ICES Working Group on Elasmobranch Fisheries (ICES, 2019) considers there to be a single biological stock on the continental shelf of the northeast Atlantic (ICES areas IV, VI-VIII). However, recent tracking work suggests this stock may comprise at least two sub-populations (Griffiths et al., 2020). One population is thought to spend April to September in coastal waters of the southern North Sea and English Channel, migrating in October to March to deeper waters in the western English Channel, Celtic Sea and northern Bay of Biscay. The other sub-population appears to reside in the Irish Sea, Celtic Sea and Bristol Channel. These findings suggest a degree of philopatry and circannual migration.

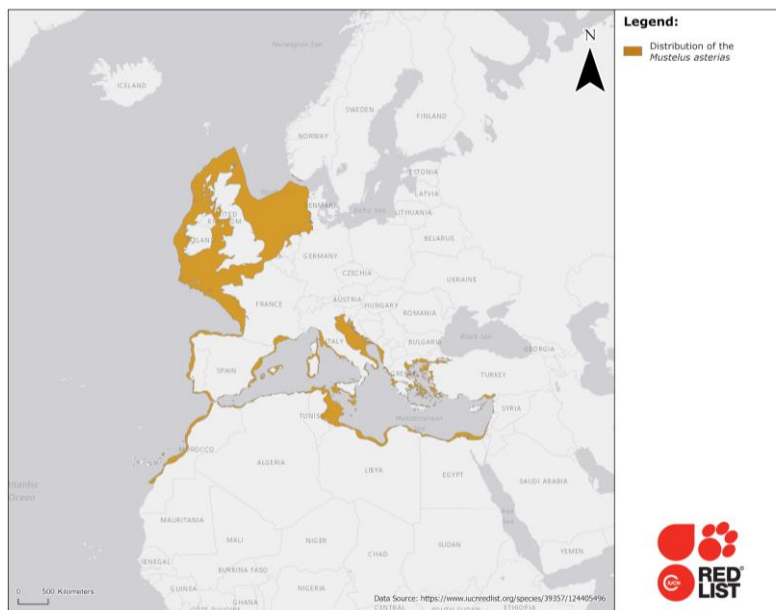


Figure A10.8.2. Geographic distribution of starry smooth-hound (*Mustelus asterias*) from Jabado et al. (2021). Source: <https://www.iucnredlist.org/species/39357/124405496>

Rationale for spatial protection in the Celtic Sea

Starry smooth-hound were nominated for inclusion with particular reference to their IUCN conservation listing as Near Threatened both in Europe and globally. In Irish waters, the population is thought to be stable or increasing over time (abundance trends from International Bottom Trawl Survey data), which led to its classification of Least Concern in the Irish Red List (Clarke et al., 2016). Advice from ICES (2023) for *Mustelus* spp. (non-species specific advice) described stock capacity for a 20% increase in landings for 2024-2025 compared to 2022-2023 (using a stock assessment approach). ICES species-specific landings are unreliable, with starry smooth-hounds often reported under generic dogfish and shark landing codes (ICES, 2023). Additionally, discarding and discard survival has yet to be quantified. There is also longstanding misidentification of this species with the common smooth-hound (*Mustelus mustelus*) and juvenile tope (*Galeorhinus galeus*) (Farrell et al., 2009). A genetic study of 431 fish from 2006-2008 thought to be *M. asterias*, *M. mustelus* and *G. galeus* caught in the NE Atlantic, Irish Sea, Celtic Sea, Bristol Channel and Celtic Sea were all identified as *M. asterias* (Farrell et al., 2009). This suggests misidentification is common, and *M. asterias* may be the only *Mustelus* species in the focal study area. While deemed a species of Least Concern in Ireland (2016), a lack of species-specific landing data, discard quantity, and misidentification with other hounds, suggests a precautionary approach to spatial protection is advisable.

The Celtic Sea is likely an important part of this species' range. Connectivity is not well understood for this species, however, movement data suggest movements of individuals across the Bristol Channel, Irish Sea and Celtic Sea. Shallow sandy beaches and estuarine habitats in the Celtic Sea (Farrell, 2010b; Biton-Porsmoguer & Lloret, 2023), may therefore provide important areas for essential life stages including nursery grounds and breeding, however, further investigation is required.

Based on current knowledge, starry smooth-hound are amenable to spatial protection. Movement data suggest a degree of philopatry and circannual migration (Brevé et al., 2016, Griffiths et al., 2020). However, knowledge on how this species uses the Celtic Sea is limited (e.g., for breeding or nursery areas).

Sensitivity assessment

Several fisheries-related activities were related to pressures with medium and high associated sensitivity scoring. Starry smooth-hounds were classed as highly sensitive to direct removal (high confidence). Starry smooth-hound are typically caught using otter trawl and nets, with fewer records for beam trawl and *Nephrops* trawl (Silva & Ellis, 2019). A high degree of smaller individuals are discarded (Silva & Ellis, 2019). Almost all recreational anglers practise catch-and-release for this species (Clarke et al., 2016). Starry smooth-hounds likely play an important role in regulating the inshore food web, therefore unmanaged and poorly quantified commercial landings may affect ecosystem health. Starry smooth-hound sharks were deemed moderately sensitive to non-targeted removal (high confidence), as well as to physical loss of habitat (low confidence), physical change of seabed type (moderate confidence), physical change of substrate to another seabed type (moderate confidence) and habitat structures (change or removal of substratum via extraction) (moderate confidence). These habitat-related scorings are related to its specialised diet, whereby functionality of sandy and soft bottom habitats is key to their survival (Biton-Porsomoguer, 2022).

Following a precautionary principle, starry smooth-hounds were deemed sensitive to two shipping-related pressures. Elasmobranchs are thought to tolerate high metal levels in their tissues, however, a precautionary approach is applied and starry smooth-hounds were deemed sensitive to chemical pollutants including transition elements and organo-metal contamination, and hydrocarbon and PAH contamination.

Offshore energy impacts on elasmobranchs are poorly understood, however, based on existing knowledge starry smooth-hounds were deemed sensitive to some of the associated sectoral pressures. As detailed above, a precautionary approach was followed for chemical pollutants therefore this species was deemed sensitive to these associated pressures. *Mustelus asterias* are mobile and demersal (situated in the lower water column), therefore they were not deemed sensitive to underwater noise. Construction activities may displace some elasmobranch species, although quantitative data are absent. There are no species-specific quantitative data on the effects of electromagnetic fields (EMF) from high voltage cables for starry smooth-hounds. Existing studies suggest EMF are likely to affect the behaviour of some species (Gill et al., 2009; Hutchison et al., 2020), however, long-term impacts are unknown at present (no evidence for this species). Post construction, wind farms may provide refugia and artificial reef communities which could prove beneficial to some species of elasmobranch

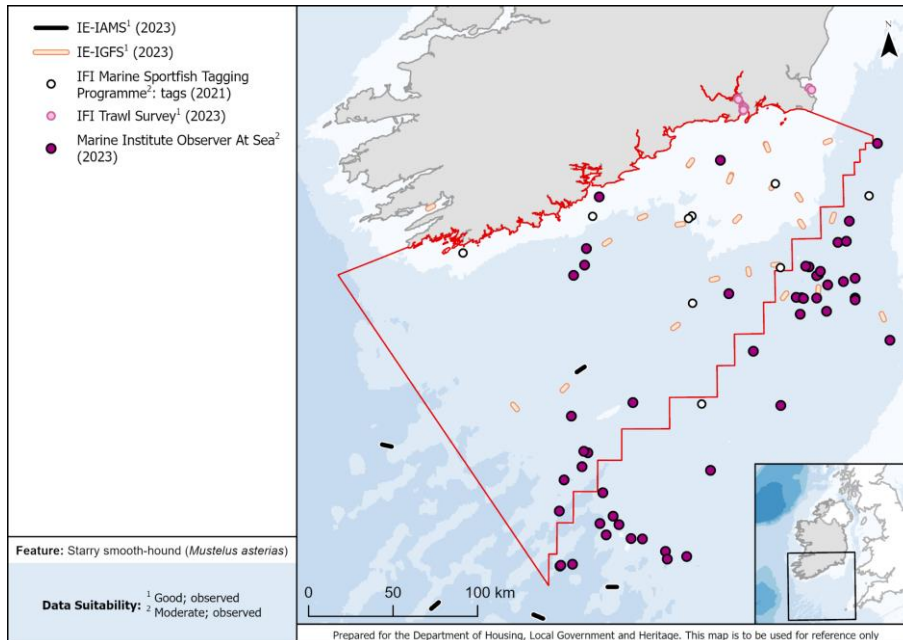


Figure A10.8.3. Distribution of starry smooth-hound (*Mustelus asterias*) in the Celtic Sea.

Data sources available

Data sources for starry smooth-hound in the Celtic Sea AOI that were available to the MPA Advisory Group, and the quality / suitability of those data for conservation prioritization analyses (See Table 3.2.1 Main Report), are shown in Figure A10.8.3. Data were not considered suitable for inclusion in prioritization analyses due to sparsity of records and lack of spatial coverage.

Further research needs

Species-specific landings and discard data are necessary for this species. Equally, determining how starry smooth-hound might use the Celtic Sea as nursery and partition areas is a priority. Evidence on the effects of several pressures on this species is limited and requires further research, including; abrasion/disturbance of substratum surface or seabed, penetration or disturbance of substratum subsurface, changes in suspended solids (water clarity), light smothering and siltation changes, electromagnetic energy, water flow changes, transition elements and organo-metal contamination, hydrocarbon and PAH contamination, synthetic compound contamination, and the introduction of other substances.

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