

# New northerly limit for the sharptail mola in the northeast Atlantic: first sighting of *Masturus lanceolatus* in the northeast Irish Sea

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## Abstract

The ocean sunfishes are currently represented by five species within three genera: *Mola mola* (Linnaeus, 1758), *Mola alexandrini* (Ranzani, 1839), *Mola tecta* (Nyegaard, Sawai, Gemmell, Gillum, Loneragan, Yamanoue & Stewart, 2017) (Sawai et al., 2018), *Masturus lanceolatus* (Lienard, 1840), and *Ranzania laevis* (Pennant, 1776). Growing conservation concerns have led to an ongoing re-examination of their classification status on the International Union for the Conservation of Nature Red Lists, a process requiring the latest data to best support their conservation management on a global scale. Here we report the first sighting of *Masturus lanceolatus* in the northeast Irish Sea, representing a new northerly range limit for this species in the northeast Atlantic. The species is more commonly reported in tropical seas, and in the Western Atlantic they occur from North Carolina in the United States to southeast Brazil. This sighting increases the most northerly range limit by 2610 km, providing additional insight into the ecology and potentially changing distribution of this generally considered tropical megafaunal species.

## KEYWORDS

Molidae, range expansion, stranding, sunfish

The ocean sunfishes (family Molidae) contain some of the world's largest bony fish species, including *Mola alexandrini*, which reaches 3.3 m in length and 2.7 tonnes in weight (Gomez-Pereira et al., 2022). Despite their large size, establishing the global ranges of Molidae species has proved challenging. The conservation status of all ocean sunfishes is currently undergoing a 10-year review by the International Union for the Conservation of Nature (IUCN). The current IUCN Red List status (accessed January 2024) of each molid species is summarized in Table 1. Up-to-date information on the range and distribution of each species is essential for informing the latest global assessments.

Recording new latitudinal records for elusive species serves multiple important purposes. First, many conservation and management decisions are based on the IUCN Red List assessments, which depend on accurate, up-to-date information about each species, including their distributional patterns.

Second, an expanded distribution of megafaunal species may provide new predatory interactions and opportunities with existing incumbent megafaunal assemblages. This may have a knock-on effect for other species. For example, Visser and Fletcher (2023) reported that, in the Eastern Pacific, *Masturus lanceolatus* is a newly recorded prey item for the circumglobal megafaunal predator the killer whale (*Orca orcinus*), which also occurs in the northeast Atlantic. Third, new northerly or southerly sightings can also help pinpoint if opportunistic sightings may be in response to climatic change. For example, Lyashevskaya et al. (2022) recently reported that the increasing presence of ocean sunfish (*Mola* spp.) in the northeast Atlantic was correlated with a 200-km northward shift in the 13°C isotherm calculated from monthly sea surface temperature (SST) data between 48.5°N to 52.5°N and 12.5°W to 4.5°W.

In this paper we provide a confirmed sighting of a freshly stranded sharptail mola (*Masturus lanceolatus*) from Powillimount

**TABLE 1** IUCN conservation status of Molidae.

| Molidae species             | Date of last assessment | Current IUCN listing | Population trend | Needing update? |
|-----------------------------|-------------------------|----------------------|------------------|-----------------|
| <i>Mola mola</i>            | 2011                    | Vulnerable           | Decreasing       | Yes             |
| <i>Masturus lanceolatus</i> | 2011                    | Least Concern        | Unknown          | Yes             |
| <i>Ranzania laevis</i>      | 2011                    | Least Concern        | Unknown          | Yes             |
| <i>Mola alexandrini</i>     | NA                      | Not Assessed         | NA               | NA              |
| <i>Mola tecta</i>           | NA                      | Not Assessed         | NA               | NA              |

Abbreviation: IUCN, International Union for the Conservation of Nature.



**FIGURE 1** Distribution of *Masturus lanceolatus* modified with permission from Thys et al. (2021). Numbered circles correspond to the number of genetically confirmed samples. The red question mark designates the current record location and the yet-be-determined status of being a formal range extension pending additional sightings. Inset photograph of specimen indicating the location of stranding (photo credit Niamh Gilmore).

beach (54.8895°N, 3.5698°W) near Kirkbean, Solway Firth, Dumfries and Galloway, southwest Scotland in the northeast Irish Sea. The specimen was identified to species level by several highly diagnostic features, including an elongated projection from the midpoint of its clavus and lack of visible clavus ossicles, lack of head or chin bumps, and a slight ridge in the dorsal region. The stranded *Masturus*, measuring c.50 cm total length (TL), was recorded on November 5, 2021 and represents the most northerly record for this species in the northeast Atlantic.

Records of other Molidae species in Irish and other northwest European waters are dominated by the common ocean sunfish, *M. mola* (Breen et al., 2017; Carl & Nyegaard, 2019; Dell'Amico, 2020; Houghton et al., 2006; Lyashevskaya et al., 2022; Moritz et al., 2017; Pálsson & Astthorsson, 2016; Quigley, 2013; Sims, Queiroz, Doyle, et al., 2009; Sims, Queiroz, Humphries, et al., 2009; Sousa et al., 2016). This species has the largest circumglobal range of any molid, stretching from the South Island of New Zealand (Caldera et al.

2020) to north of the Arctic Circle in Norway at 70°44'N during December 1881 (Frafjord et al., 2017).

*Masturus alexandrini* has also been reported from northwest Europe, with a record from Norway in 2017 (Frafjord et al., 2020). Previously it was believed to be confined to the northeast Atlantic as far north as northwest Africa. However, it is now considered a globally distributed generalist. Further sightings and new northerly range records are expected (Sawai et al., 2018; Wirtz & Biscoito, 2019).

*Mola tecta*, recently described in 2017, was initially believed to be a temperate southern hemisphere species (IUCN expert panel, 2023). However, subsequent records from commercial fisheries, public sightings (Graff, 2023), and strandings from New Zealand, Australia, Chile, Peru, California, and Alaska have expanded its previously known distribution (Nyegaard & Sawai, 2018). As marine temperatures increase, the value of anecdotal sighting data for rare megafaunal species in high latitudinal increases as well. There is an unconfirmed but creditable late 19th century (December 1889) report of a large mature

female specimen measuring 223 cm TL stranded on the Dutch coast (Ameland Island) (Nyegaard et al., 2017; Van Lidth de Jeude, 1890).

*Ranzania laevis* is less well known in northwest European waters and is generally considered to be a tropical and subtropical species (IUCN expert panel, 2023). Although there are only six records from Irish waters and 15 from UK waters, the species has been reported from as far north as Scandinavia (Quigley, 2013). Several specimens have also been recorded between the Bay of Biscay and the Celtic Sea (Quero et al., 2008), which suggests that this species may occur more regularly in Irish waters than previously thought.

*Masturus lanceolatus* is more commonly reported from tropical seas and only occasionally from temperate waters (IUCN expert panel, 2023). Records from the Western Atlantic range from North Carolina (United States) to southeast Brazil, with some isolated records occurring around the tropical northeast Atlantic (e.g., Azores, Canary Islands, and Senegal) (Thys et al., 2021). The current record from the northeast Irish Sea represents a 2610 km northward expansion in its latitudinal range within the northeast Atlantic (Figure 1) and provides new insights into the ecology and distribution of this rarely observed species.

As conservation concerns grow for ocean sunfishes (following locally reported population declines, unregulated target fisheries, and widespread bycatch), understanding of the ecology of these large-bodied, widely distributed mega faunal species remains vital for their continued health and wellbeing (Thys et al., 2021). This brief communication highlights the important contribution of citizen science mega faunal sightings supported by proper identification of ocean sunfish species to further ongoing insights into the potential effects of changing oceanic conditions on fish distributions.

## AUTHOR CONTRIBUTIONS

All authors contributed fully to all elements of this manuscript.

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## REFERENCES

- Breen, P., Canadas, A., O'Cadhla, O., Macke, M., Scheidat, M., Geelhoed, S. C. V., Rogan, E., & Jessopp, M. (2017). New insights into ocean sunfish (*Mola mola*) abundance and seasonal distribution in the northeast Atlantic. *Scientific Reports*, 7, 2025.
- Caldera, E., Whitney, J. L., Nyegaard, M., Ostalé-Valrib-eras, E., Kubicek, L., & Thys, T. M. (2020). Chapter 3 genetic insights into the taxonomy, evolution and development of the ocean sunfishes. In T. M. Thys, G. C. Hays & J. D. R. Houghton (Eds.), *The Ocean Sunfishes Evolution, Biology and Conservation* (pp. 37–54). CRC Press.
- Carl, H., & Nyegaard, M. (2019). Klumpfisk 1, Atlas over danske saltvandsfisk. In H. Carl & P. R. Moller (Eds.), *Statens Naturhistoriske Museum*. Kobenhavens Universitet. [https://fiskeatlas.ku.dk/artstekster/Klumpfisk\\_Fiskeatlas.pdf](https://fiskeatlas.ku.dk/artstekster/Klumpfisk_Fiskeatlas.pdf)
- Dell'Amico, F. (2020). Signalements de tortues marines et de poisons-lunes en 2019 sur la façade Manche-Atlantique (Dermochelyidae, Cheloniidae & Molidae). *Annales de la Societe des Sciences Naturelles de la Charente-Maritime*, 11(2), 141–153.
- Frafjord, K., Bakken, T., Caldera, E., Kubicek, L., Syvertsen, P. O., & Thys, T. M. (2020). Om manefisker langs kysten av Norge og første funn av kjempemanefisk. *Fauna*, 73(1–2), 24–33.
- Frafjord, K., Bakken, T., Kubicek, L., Ronning, A.-H., & Syvertsen, P. O. (2017). Records of ocean sunfish *Mola* along the Norwegian coast spanning two centuries, 1801–2015. *Journal of Fish Biology*, 91(5), 1365–1377.
- Gomez-Pereira, J., Pham, C., Catarino, D., Miodonsky, J., Santos, M. A. R., Dionisio, G., Nyegaard, M., Sawai, E., & Afonso, P. (2022). The heaviest bony fish in the world: A 2744 kg giant sunfish *Mola alexandrini* (Ranzani, 1839) from the North Atlantic. *Journal of Fish Biology*, 101, 1–4.
- Graff, A. (2023). Extremely Rare Sunfish Washes Up on California Beach. <https://www.sfgate.com/california-news/article/rare-sunfish-washes-up-california-beach-18430944.php> Accessed 8 December 2023.
- Houghton, J. D. R., Doyle, T. K., Davenport, J., & Hays, G. C. (2006). The ocean sunfish *Mola mola*: Insights into distribution, abundance and behaviour in the Irish and Celtic seas. *Journal of the Marine Biological Association of the United Kingdom*, 86(5), 1237–1243.
- IUCN Molidae expert panel. (2023). Distribution patterns of Molidae family, panel discussions.
- Lyashevskaya, O., Brophy, D., Wing, S., Johns, D. G., Haberlin, D., & Doyle, T. K. (2022). Evidence of a range expansion in sunfish from 47 years of coastal sightings. *Marine Biology*, 169(20), 1–10. <https://doi.org/10.1007/s00227-021-04005-8>
- Moritz, T., Augustin, C. B., Winkler, H. M., & Pagel, H.-J. (2017). Records of the Ocean Sunfish (*Mola mola*, Tetraodontiformes) in the German Baltic Sea. *Bulletin of Fish Biology*, 17(1–2), 45–51.
- Nyegaard, M., & Sawai, E. (2018). Species identification of sunfish specimens (Genera *Mola* and *Masturus*, family Molidae) from Australian and New Zealand natural history museum collections and other local sources. *Data in Brief*, 19, 2404–2415.
- Nyegaard, M., Sawai, E., Gemmell, N., Gillum, J., Lonergan, N. R., Yamanoue, Y., & Stewart, A. L. (2017). Hiding in broad daylight: Molecular and morphological data reveal a new ocean sunfish species (Tetraodontiformes: Molidae) that has eluded recognition. *Zoological Journal of the Linnean Society*, 182(3), 631–658.
- Palsson, J., & Astthorsson, O. S. (2016). New and historical records of the ocean sunfish *Mola mola* in Icelandic waters. *Journal of Fish Biology*, 90(3), 1126–1132.
- Quero, J.-C., Spitz, J., & Vayne, J.-J. (2008). Faune Française de l'Atlantique. Poisson Tetraodontiformes. *Annales de la Societe des Sciences Naturelles de la Charente-Maritime*, 9(8), 815–832.
- Quigley, D. T. G. (2013). Sunfishes (family: Molidae) in Irish & NE Atlantic waters. *Sherkin Comment*, 56, 8.
- Sawai, E., Yamanoue, Y., Nyegaard, M., & Sakai, Y. (2018). Redescription of the bump-head sunfish *Mola alexandrini* (Ranzani 1839), senior synonym of *Mola ramsayi* (Giglioli 1833), with designation of a neotype for *Mola mola* (Linnaeus 1758) (Tetraodontiformes: Molidae). *Ichthyological Research*, 65, 142–160.
- Sims, D. W., Queiroz, N., Doyle, T. K., Houghton, J. D. R., & Hays, G. C. (2009). Satellite tracking of the world's largest bony fish, the ocean sunfish (*Mola mola* L.) in the north East Atlantic. *Journal of Experimental Marine Biology and Ecology*, 370(1–2), 127–133.
- Sims, D. W., Queiroz, N., Humphries, N. E., Lima, F. P., & Hays, G. C. (2009). Long-term GPS tracking of ocean sunfish *Mola mola* offers a new direction in fish monitoring. *PLoS One*, 4(e7351), 1–6. <https://doi.org/10.1371/journal.pone.0007351>
- Sousa, L. L., Queiroz, N., Mucientes, G., Humphries, N. E., & Sims, D. W. (2016). Environmental influence on the seasonal movements of

- satellite-tracked ocean sunfish *Mola mola* in the north east Atlantic. *Animal Biotelemetry*, 4(1), 1–19.
- Thys, T. M., Hays, G. C., & Houghton, J. D. R. (Eds.). (2021). *The ocean sunfishes – Evolution, biology and conservation*. CRC Press, Taylor & Francis Group.
- Van Lidth de Jeude, T. W. (1890). On a large specimen of *Orthgoriscus* on the Dutch coast. *Notes from the Leyden Museum*, 12, 189–195.
- Visser, I. N., & Fletcher, L. A. (2023). First records of orca, *Orcinus orca* (Linnaeus, 1758) (Mammalia Cetacea), predation on sharptail ocean sunfish, *Masturus lanceolatus* (E. Lienard, 1840) (Pisces Molidae), with novel components of foraging behaviour discovered through social media. *Biodiversity Journal*, 14(1), 19–60.
- Wirtz, P., & Biscoito, M. (2019). The distribution of *Mola alexandrini* in the subtropical eastern Atlantic, with a note on *Mola mola*. *Bocagiana*, 245, 1–6.

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