2. Blonde ray (*Raja brachyura*)

Irish name: Roc fionn

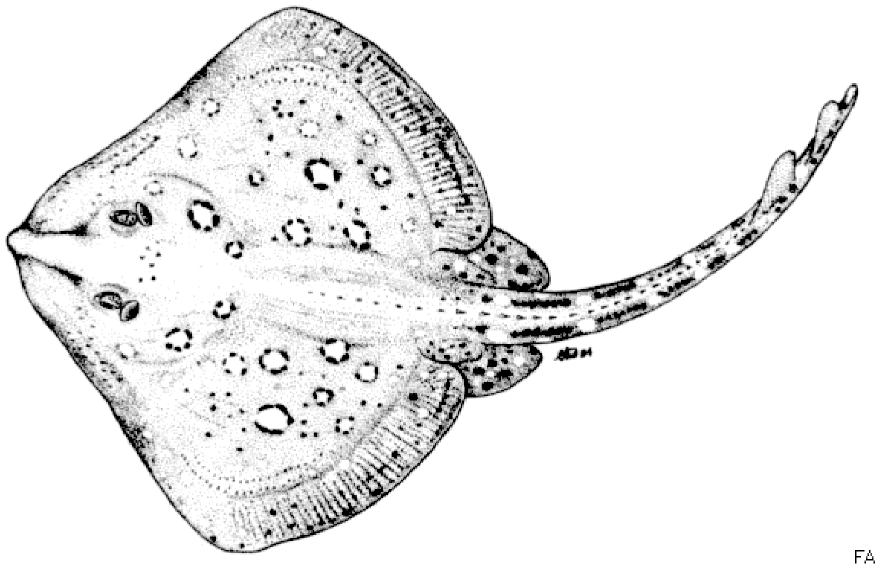

Figure A10.2.1. Blonde ray (*Raja brachyura*) from Bauchot (1987) (CC BY-NC 4.0).

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 Blonde ray is a medium-sized skate species in the Class Chondrichthyes. Blonde rays are demersal, and are commonly seen inshore and in shelf waters at 14-146 m, though they may occur deeper in the southern parts of their range (Ellis et al., 2005). Blonde rays prefer sandbanks and soft sediments (Ellis et al., 2005; Martin et al., 2010). Juveniles are thought to feed on small crustaceans, and larger individuals feed on fishes (Ellis et al., 1996). The Blonde ray has a maximum size of approximately 120 cm total length (Stehmann & Burkel, 1984), making it the largest skate species commercially caught in Irish waters. Blonde rays have a maximum age of 15 years (Gallagher et al., 2005). In the Irish Sea, the length and age at maturity (for 50% of fish) was reported as 82 cm total length and 4.6 years for males, and 84 cm total length and 5.5 years for males (Gallagher et al., 2005). Blonde rays are thought to reproduce between February and August (Ebert & Stehmann, 2013), and produce approximately 30 egg cases per year that take seven months to hatch (Holden et al., 1971; Ebert & Stehmann, 2013). Blonde rays are distributed in the Northeast Atlantic and Mediterranean Sea (Ebert & Stehmann, 2013). ICES considers blonde rays distributed in the Irish Sea, Celtic Seas and the Bristol Channel to be a single stock (ICES, 2020). Species-specific studies on the movement of blonde rays are limited. Studies of skate species in the UK and worldwide suggest high site fidelity and short dispersal distances (Steven, 1936; Templemen, 1984; Walker et al., 1997; Ellis et al., 2010; King & McFarlane, 2010). However, two studies have identified broadscale movements in the range of 2340 km from mark-recapture tagging (King & McFarlane, 2010; Bird et al., 2020), and The Marine Sportfish Tagging Programme has identified blonde ray movements of more than 100 km by individuals tagged in Irish waters (734 individuals, tagged between 1971 and 2009).

Rationale for spatial protection in the southern Celtic Sea

Blonde rays were nominated for inclusion with particular reference to their conservation listing under OSPAR and/or listing as Near Threatened in Ireland, Europe, and globally. Since 2008, European countries are required to record most skate and ray landings by species to help generate a better picture of current population trends. There is potential to misidentify blonde rays with the spotted ray (*Raja montagui*), which has led to misreported landings in several countries (ICES, 2021). ICES reports that the Celtic Sea's total catch and bycatch are not currently quantified, and the population size is unknown (ICES, 2022). According to Clarke et al. (2016), existing data suggest the juvenile population in the Irish Sea is increasing over time; however, available evidence for adults suggests probable overexploitation. Blonde rays are currently managed under a generic total allowable catch (TAC). Given that population size and discard quantity cannot be quantified (ICES, 2022) and it has a Near Threatened conservation status, we recommend that a precautionary approach is applied and that spatial protection of this species is considered.

Based on current knowledge, blonde rays are amenable to spatial protection. Blonde rays are thought to have high site fidelity and residency, but may perform some long-ranging movements. Blonde ray egg-laying and nursery sites have yet to be identified in the southern Celtic Sea. Egg case records suggest that the south coast from Tralee Bay to Waterford constitutes nurseries (Clarke et al., 2016). It is likely that, similar to other rays, shallow coastal waters are used as nursery grounds (Shark Trust, 2009).

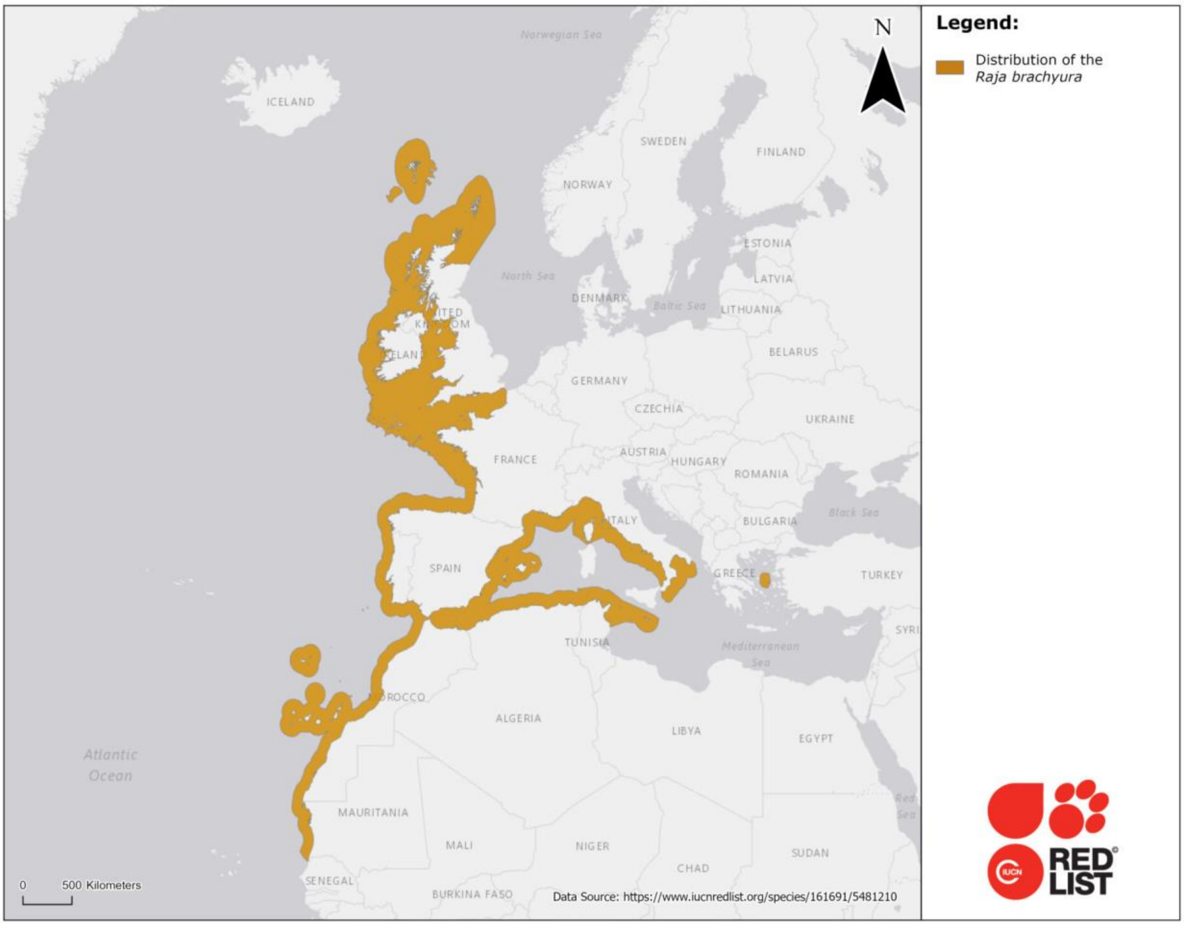

Figure A10.2.2. Geographic distribution of blonde ray (*Raja brachyura*) in the northeast Atlantic. Figure from Ellis et al. (2009). https://www.iucnredlist.org/species/161691/5481210

Sensitivity assessment

The highest associated sensitivity scoring for blonde ray was in relation to its targeted and non-targeted removal (bycatch) by fishing (high confidence). Blonde rays are commercially important and are targeted by trawl, gill nets, trammel nets, and longlines across much of their range. They are also caught as bycatch (ICES, 2009; ICES, 2022; Thys et al., 2023). BIM (2019) found blonde rays caught in an Irish otter trawl fishery had the lowest injury scores and performed best in reflex assessments post-trawl (compared to other elasmobranch species) tentatively suggesting high survivability in bycatch. In contrast, McCully Phillips et al. (2015) identified blonde ray as the most vulnerable member of the 'skate and ray' group based on existing fishery type, management, monitoring or assessment of stock and value of the fishery. Blonde rays are currently managed under a generic total allowable catch (TAC) with other named ray species. The group TAC applies to rays including thornback (*Raja clavata*), painted (*Raja microocellata*), spotted (*Raja montagui*), cuckoo (*Leucoraja naevus*) (S.I. No. 125/2016). In the Celtic Seas ecoregion, blonde ray was identified as the most vulnerable of the generic TAC rays to gillnet and otter trawl fisheries owing to its life history and ecology (McCully Phillips et al., 2015). Following a precautionary approach, blonde rays were deemed sensitive to transition elements and organo-metal contamination (low confidence), hydrocarbon and PAH contamination (low confidence). Blonde rays were deemed moderately sensitive to heavy smothering and siltation changes linked to fisheries activities (low confidence). This perceived sensitivity is due to their benthic nature and the laying of slow-maturing, sessile egg cases, which likely require well-aerated water for survival.

Following a precautionary principle, blonde rays were identified as sensitive to some shipping-related pressures, including contaminants (low confidence). While evidence for this species was limited, it is thought that elasmobranchs are vulnerable to environmental pollutants such as transition elements given they are long-lived and consume a range of lower trophic level prey (Dulvy et al., 2017). Elasmobranchs are thought to tolerate high metal levels in their tissues, however, a precautionary approach is applied and blonde rays were deemed sensitive to this pressure. Elasmobranchs lack a swim bladder and specialised hearing structures, and therefore are considered to only detect particle motion, and not the pressure component of sound (Banner, 1967; Mickle et al., 2020; Popper & Hawkins, 2021). The impacts of vessel noise on elasmobranch species are poorly understood. Lab-based studies suggest noise can increase swimming activity (de Vincenzi et al., 2021), whereas research in the wild indicates an unclear response to boat traffic (Rider et al., 2021). Hearing ability in demersal and benthopelagic elasmobranch species is thought to be most sensitive to low frequencies (Casper et al., 2006; Nieder et al., 2023). However, hearing range varies depending on the species (Popper & Fay, 1999). A low frequency range is within the operational range of both wind turbines and shipping activities (Tougaard et al., 2020). Whether sensitivity translates to turbine and boat avoidance is yet to be determined, but owing to the mobile nature of this species, operational noise is unlikely to result in mortality. Ship strike is deemed not to be a significant pressure owing to the benthic nature of this species.

Offshore energy impacts on elasmobranchs are poorly understood, however, blonde rays were deemed moderately sensitive or sensitive to several offshore energy impacts. Pressures, including physical loss of marine habitat and physical change to another seabed type, were deemed moderately sensitive (low confidence) owing to limited mobility of early life stages. Blonde rays were deemed moderately sensitive to heavy smothering and siltation changes (low confidence) due to their sessile and slow-maturing egg cases, which likely require well-aerated water for survival. Given the nursery areas for egg-laying have not been delineated in the southern Celtic Sea, a precautionary approach is recommended. Construction activities may displace some elasmobranch species, although quantitative data are absent. Electromagnetic fields from high-voltage cables 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. Post-construction wind farms may provide refugia and artificial reef communities which could benefit some elasmobranch species.

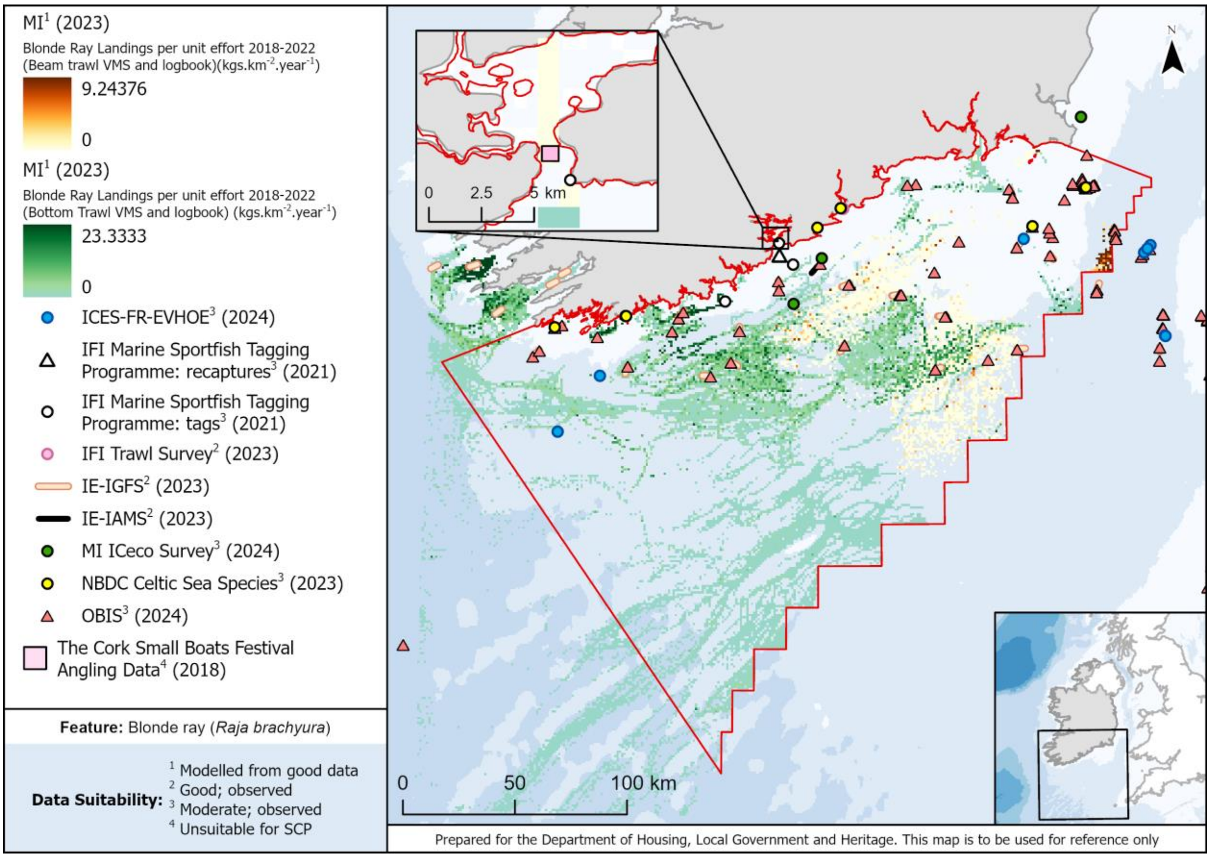

Figure A10.2.3. Data available for blonde ray (*Raja brachyura*) in the Celtic Sea

Data sources available

Data for blonde rays were available from a variety of sources (Figure A10.2.3), including landings data, fisheries surveys, the Marine Sportfish Tagging programme. Data on a notable former angling hotspot for blonde ray on the Turbot Bank (Cork Harbour) were supplied by a stakeholder. For explanation of data suitability, refer to Table 3.2.1 Main Report. For information on how data were prepared for use in prioritization analyses, and for visualisation of layer used, see Appendix 5e, section 5e.4.

Further research needs

Further work is required to identify population size, trends, migrations and movements, essential habitats, spawning and nursery areas. Equally, total discard quantity and post-release survival rates require further investigation. In addition, evidence to identify the potential effect of multiple pressures was insufficient to form an assessment and relied heavily on expert judgement. These pressures included the effects of changes in suspended solids (water clarity), smothering and siltation changes (light and medium), electromagnetic energy, death or injury by collision, transition elements and organo-metal contamination, hydrocarbon and PAH contamination, synthetic compound contamination, introduction of other substances and the introduction or spread of invasive non-indigenous species.

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