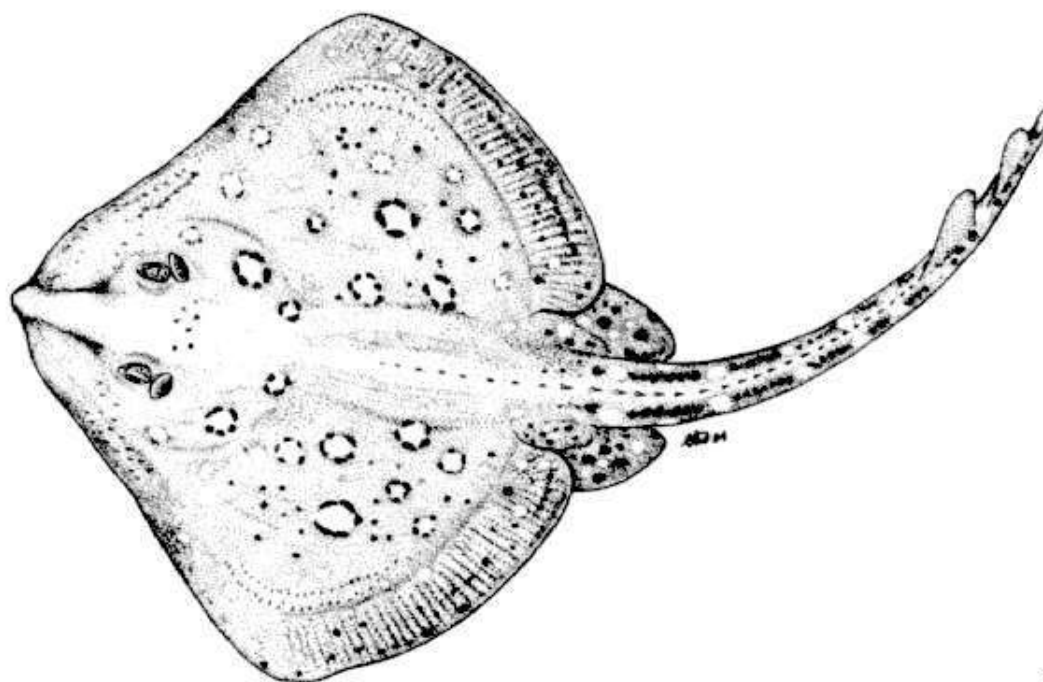# 4. Blonde ray (*Raja brachyura*)

Irish name: Roc fionn

Figure 1: Blonde ray *Raja brachyura* from Bauchot (1987)

Background

Blonde rays are a medium-sized skate species in the Class Chondrichthyes. Blonde rays are a demersal species that is commonly seen inshore and in shelf waters at 14-146 m, though may occur deeper in the southern parts of its range (Ellis et al. 2005). Blonde rays have a preference for 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 fish (Ellis et al. 1996). Blonde rays have a maximum size of approx. 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 approx. 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 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;

King & McFarlane, 2010, Ellis et al. 2011). 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 western Irish Sea

Blonde rays were nominated for inclusion with particular reference to its conservation listing under OSPAR and/or listing as Near Threatened in Ireland, Europe and globally. Total bycatch is not quantified in the Irish Sea, and the population size is currently not known (ICES, 2020). According to Clarke et al. (2016) existing data suggests the juvenile population is increasing over time in the Irish Sea, however, available evidence for adults suggests probable overexploitation. Blonde rays are currently managed under a generic total allowable catch (TAC). However, given population size and discard quantity cannot be quantified, we recommend a precautionary approach is applied and spatial protection of this species is considered.

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 (*R. clavata*), painted (*R. microoecllata*), spotted (*R. montagui*), cuckoo (*Leucoraja naevus*) (Common Fisheries Policy, 2016). 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 (*R. montagui*), which has led to misreported landings in several countries (ICES, 2021).

Based on current knowledge blonde rays are amenable to spatial protection. A high proportion of spawning stock is thought to be in the Irish Sea (Dedman et al. 2017), however, specific egg laying and nursery sites have yet to be identified. It is likely that like other rays that shallow coastal waters are used as nursery grounds (Shark Trust, 2009).

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[3]). Blonde rays are a commercially important species, and are targeted by trawl, gill nets, trammel nets and longlines across much of its range, and also caught as bycatch (ICES, 2009). Literature on blonde ray post-release survival is conflicting (BIM, 2019; Amelot, 2021). 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 owing to their benthic nature, and due to their sessile and slow maturing egg cases which likely require well aerated water for survival.

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[3] Confidence statements (low, medium, high) are derived from the sensitivity scoring evidence base. See appendix 5d for further details.

Following a precautionary principle, blonde rays were identified as sensitive to some shipping related pressures including contaminants (low confidence). The impacts of anthropogenic 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 equivocal response to boat traffic (Rider et al., 2021). Hearing ability in demersal species seems to be most sensitive to low frequencies from nearby sources (Casper, 2006) suggesting blonde ray may not be sensitive to vessel-related noise.

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 moderate sensitivity (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 western Irish Sea, a precautionary approach is recommended. Construction activities may displace some elasmobranch species, although quantitative data is 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 prove beneficial to some species of elasmobranch. Construction activities may displace some species, however, quantitative data is absent.

Further research needs

Further work is required to identify population size, population trends, migrations and movements, essential habitats, spawning and nursery areas. Equally, discard quantity and survival requires further investigation. In addition, evidence to identify the potential effect of multiple pressures was insufficient to form an assessment, or relieved 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.

Figure 2. Global geographic distribution of blonde ray (*Raja brachyura*) from Ellis et al. (2009)
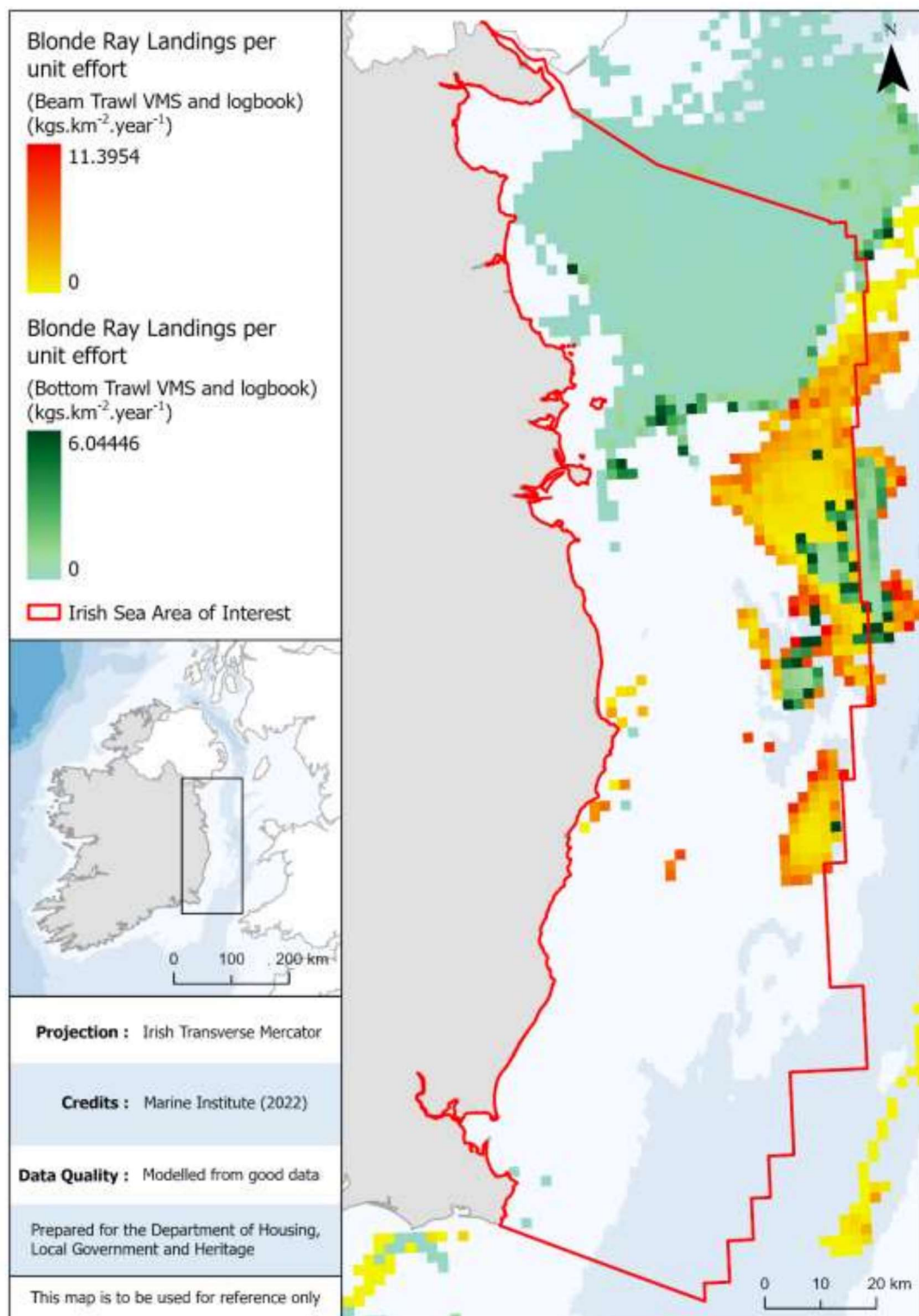
Figure 3. Distribution of blonde ray (*Raja brachyura*) in the western Irish Sea as identified by ICES international fishing effort and swept area ratios and VMS.

Data sources and quality

Dataset Name	Data Owning Organisation	Dataset Quality	Metadata URL	Comments
Dedman et al. (2015) Species Distribution Model (SDM)	Dedman et al (2015)	Modelled from moderate data		
ICES international fishing effort and swept area ratios; VMS	International Council for the Exploration of the Seas	Modelled from good data		
International Bottom Trawl Survey (IBTS) Fisheries Database of Trawl Surveys (DATRAS)	International Council for the Exploration of the Seas	Good; observed	IE-IGFS and NIGFS	Data is sparse for this species
Marine Institute VMS and logbook	Supplied to Marine Institute by Irish Naval Service and Sea Fisheries Protection Authority	Modelled from good data		

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