34. NATURE POSITIVE MEASURES

34.1 Introduction

The twin crises of climate change and biodiversity loss are arguably the greatest environmental challenges of our time. In order to tackle climate change and enable a greener future with regards to energy generation, the Government of Ireland published the Climate Action Plan (CAP) 2023 announcing a renewable electricity target of 80% by 2030, a target which was unchanged in the CAP 2024. In addition, a target of at least 5 gigawatts (GW) of offshore wind energy by 2030 were proposed within the CAP 2024 Plan. In order to meet this target and other legally binding commitment to net-zero emissions, transformative measures will be required.

The Sceirde Rocks Offshore Wind Farm (hereafter referred to as 'the Project') is critical to helping Ireland address these challenges as well as addressing the country's over-dependence on imported fossil fuels. Additional justification for the Project and its contribution to achieving Ireland's commitments and targets can be found in Chapter 1: Introduction.

However, offshore renewable developments may have adverse impacts on marine species and habitats, thereby potentially diminishing local biodiversity and hindering possible recovery. This is principally through loss of supporting habitat through pre-installation and installation activities. These impacts are addressed throughout the EIAR, principally within Chapter 9: Benthic Ecology. Similarly, the onshore grid infrastructure required to connect the Offshore Site to existing on shore grid infrastructure can also have an adverse impact on terrestrial species and habitats. These impacts are addressed throughout the EIAR, principally within Chapter 20: Terrestrial Biodiversity and Chapter 21 Terrestrial Ornithology.

This document aims to, at a high level, outline the potential benefits to biodiversity that can arise from the construction of an offshore wind farm. Nature positive effects associated with the Offshore site are considered in Section 34.2. Consideration is given to the evidence relating to nature positive effects in the context of the Project (Offshore site) in Section **Error! Reference source not found.**. Finally, Section 34.4 details the nature positive aspects of the Onshore site and in particular nature positive benefits to habitats.

34.2 Nature Positive Effects of the Project - Offshore site

The presence of a windfarm alone can potentially generate nature positive (ABPMer, 2024) effects through a number of mechanisms. Table 34-1 below provides a list of possible nature positive effects according to which receptor group may benefit. Many of these elements could be directly applicable to Sceirde Rocks Offshore Wind Farm.

It should be noted that there is evidence for these effects without considering additional or supplementary nature-inclusive design measures.

Table 34-1 Evidence for possible nature positive effects associated with offshore windfarms

Receptor	Possible nature positive effect	Justification
Benthos	Provision of habitat	Foundations of infrastructure provide substrate for epifaunal species. Ter Hofstede *et al.* (2022) found that marine life inhabiting scour protection in offshore windfarms was different from the community living in, or on, the surrounding seabed, and that placing rocky scour protection in a sandy system leads to a higher biodiversity. Analogously, the benefit of oil and gas pipelines in the marine environment with regards to support of benthic species is relatively well studied. In addition to colonising species, gadoids, anemones and hermit crabs were also frequently observed around pipelines. The results suggest that removal of pipelines will remove established colonies of epibenthic species, some of which have conservation value (Rouse *et al.*, 2019). It can be assumed that cables and associated rock protection offer the same benefits. In addition, man-made structures can act as 'stepping stones' allowing sedentary organisms to spread to areas that were previously too distant to transit to in a single generation. These structures form a system of interconnected reef environments which facilitate the planktonic dispersal of the pelagic stages of organisms (van der Molen *et al.*, 2018). The Scottish Marine Energy Research (ScotMER) working group considered that new infrastructure, such as turbines, may be associated with increased biodiversity (Scottish Government, 2023). The infrastructure will provide a higher relief substrate with potentially lowered sediment scouring, so there may be a potential net increase in faunal biodiversity and biomass in the vicinity of the installed infrastructure. In addition, enrichment of organic material in the surrounding seabed sediments (caused by aggregations) may also play a part in ecological effects of the increase in marine growth on the structures which may have a localised effect on the infauna communities present. Therefore, establishment of colonising communities results in a continuous cycle of community growth – colonisation leads to aggregations of higher trophic species (discussed below) which in turn facilitate further colonisation.
Fish and shellfish	Fish aggregation hotspots	Fish Aggregation Devices (FADs) are used in the commercial fishing industry to attract, or generate, aggregations of fish which allow for more targeted, and productive, fishing effort. The presence of windfarm infrastructure can have an analogous effect. The introduction of infrastructure attracts growth and development of epifaunal communities, which fish species can then utilise as feeding grounds and for sheltering. A particular study on the association of increased abundance of three species native to the North Sea, cod (*Gadus morhua*), plaice

		(*Pleuronectes platessa*) and thornback ray (*Raja clavata*) found that all three species showed seasonal increases in abundance in areas with high densities of artificial structures (Wright *et al.*, 2018). Recent evidence produced by the Predator & Prey Around Renewable Energy Developments (PrePARED; see Section 34.3) working group indicates that flatfish and haddock were observed in increased numbers around the turbines within the Beatrice and Moray East Wind Farm. In addition, fish were also slightly larger closer to the turbines. However, even a small size difference can markedly change the total energy content of the fish (of benefit to predator species; PrePARED, 2024). Evidence from windfarms on the east coast of the United States of America showed that flounder and gadoid fish did definitively forage on turbine structures colonised by epifauna (Wilber *et al.*, 2022). Research also indicates that piscivorous fish responded positively to the aggregation of biomass on piles and turbine scour protection (Raoux *et al.*, 2017), suggesting that infrastructure and rock protection measures are both beneficial to fish species to an extent.
	Provision of habitat	Evidence suggests that hard structures may act as artificial reefs through provision of food and refuge, and therefore may increase the productivity of an area (Langhamer and Wilhelmsson, 2009; Wilhelmsson *et al.* 2006; Linley *et al.* 2007). Species such as brown crab and lobster prefer harder substrates. Therefore, introduction of artificial hard substrate should not affect them adversely. Within windfarms in Belgian waters, Degraer *et al.* (2020) found evidence of increased numbers of species associated with hard substrates, including crustaceans. This suggests that an introduction of hard substrate can be beneficial to some species, in turn potentially increasing habitat complexity and biodiversity of the area. Kenchington *et al.*, (2018) reviewed studies investigating the influence of no-take marine reserves on the marine environment, and also fisheries stakeholders. The review concludes that no-take marine reserves show a trend of an overall positive effect on parameters such as in increased stock, spill-over of adults and larvae and increased egg production. While no-take marine reserves are not directly analogous with the displacement experienced by the commercial fishing industry, evidence indicates that temporary closures (due to windfarm construction) can have beneficial impacts on lobster. Roach *et al.*, (2018) studied the impact of a short-term closure of lobster fishing grounds within the Westermost Rough Offshore Wind Farm (English North Sea), associated with construction activities. The temporary closure to fisheries lead to increased abundance and size of lobsters, with a short-term increase in catch rates following the re-opening of the fishery.
Birds	Provision of foraging habitat	While potential for bird collision with windfarm infrastructure is a point of concern, windfarms may provide nursery or refuge areas for fish, or provide a greater diversity of substratum and associated

		fish assemblage, which can increase prey availability for some birds (Wilson *et al.*, 2009).
Marine mammals (pinnipeds)	Provision of foraging habitat	Russell *et al.* (2016) found that there was a close-to-significant increase in harbour seal (*Phoca vitulina*) usage within an operational windfarm, compared to usage of the area prior to windfarm development. However, the windfarm was at the edge of a large area of increased usage, so the presence of the wind farm was unlikely to be the sole cause. While there is no strong evidence in support of increased presence of seals within an operational windfarm, it is sensible to assume that increased presence of fish aggregations (attributed to the presence of man-made infrastructure) is likely to also be of benefit to predator species, like seals. Another study tagged both harbour and grey seals (*Halichoerus grypus*) and monitored their movement around two windfarms – one in German waters, another in English waters. There was evidence of the seals using the structures to forage. At the time of the study, the windfarms considered were new, and the study hypothesises that the prevalence of such behaviour may increase with time in line with continued establishment of the artificial reefs (Russel *et al.*, 2014).
Marine mammals (cetaceans)	Provision of foraging habitat	Scheidat *et al.* (2011) found that, despite significantly higher acoustic activity inside a Dutch windfarm, there was an increase within the windfarm of harbour porpoise (*Phocena phocena*) occurrence. The study hypothesised this apparent preference could be due to increased food availability inside the windfarm (reef effect, as discussed previously). Conversely, evidence within a UK windfarm found that there was no significant difference in harbour porpoise abundance between the pre-construction and operational phases (Vallejo *et al.*, 2017). While the evidence base is inconsistent on the benefits that such infrastructure can provide, the long-term presence of a windfarm does not appear to negatively affect harbour porpoise.
	Refuge / shelter from vessels	Harbour porpoise have been recorded to exhibit increased acoustic activity (and therefore, presence) within offshore wind farm sites, that may be attributed to the shelter effect. The shelter effect occurs due to the absence of vessels in otherwise heavily trafficked areas (Scheidat *et al.*, 2011).

34.3 Latest evidence from the PrePARED project

The PrePARED (Predators and Prey Around Renewable Energy Developments) project is a collaborative research initiative funded by the UK Offshore Wind Evidence & Change (OWEC) Programme and Crown Estate Scotland. It focuses on studying the interactions between offshore wind farms and marine ecosystems, particularly the distribution and behaviour of predators (seabirds and marine mammals) and their prey (fish). The project utilises the real-world laboratory of offshore wind developments off the east coast of Scotland (including the Beatrice, Moray East, Moray West, Seagreen and Neart na Gaoithe offshore wind farms) to examine the role that offshore wind developments play in affecting the ecosystem at low trophic levels (prey) and the influence this can then have on marine predators such as marine mammals, seabirds and predatory fish.

While research activity is still ongoing and project outputs are limited, some early findings of this project include:

- At the Beatrice offshore wind farm, baited remote underwater video (BRUV) surveys indicated that there were ~2.5 times more flatfish observed near turbines (i.e., < 30 m from the turbine) than at reference sites distant from turbines;
- There was ~3 times more haddock near turbines at Beatrice offshore wind farm, and ~2 times more haddock near turbines at Moray East, compared to reference sites;
- Fish were slightly bigger close to turbines than at reference sites for both haddock and flatfish; and
- The total mean energy content (kJ) of the prey (fish) found close to turbines (i.e., <30 m from the turbine) within the Beatrice and Moray East wind farms was estimated to between 2 and 3 times larger than at reference sites, and such estimates represent significant energy sources for top predators (i.e., 2-3 times daily energy requirements).

The results of PrePARED will further the understanding of the nature-positive effects of offshore wind developments, by helping to describe changes in carrying capacity (e.g., energy available to predators) and changes in individual species abundance and distributions due to Offshore Wind Farms (OWFs).

34.3.1 Applicability to Offshore Site

Although the direct applicability of results from one site to another is uncertain, it is likely that a number of factors which will occur at Offshore Site as they do at other sites, could have similar effects on the fish community and the biodiversity of the area. These include a reduction of fishing pressure from the immediate vicinity of the turbines, the artificial reef/FAD effect of the turbine structures, and the increased available substrate for encrusting organisms around the gravity based structure fixed-bottomturbine foundations.

34.4 Nature Positive Effects of the Project - Onshore Site

The Onshore Site as described in Chapter 5 has limited above ground features and relatively small footprint. The most significant element of the Onshore Site is the Onshore Compensation Compound (OCC). Section 20.51 of Chapter 20 Terrestrial Biodiversity describes the habitats within and adjacent to the Onshore Compensation Compound as well as the habitat along the proposed Onshore Grid Connection (OGC) route. The majority of the OGC route, which forms part of the Onshore Site, is located within habitats assessed as Local Importance (lower value), and include Buildings and artificial surfaces (BL3), Improved agricultural grassland (GA1), Wet grassland (GS4), and Spoil and bare ground (ED2). However, to facilitate the OGC there will be some direct loss of habitats assessed as Local Importance (higher value), including Hedgerows (WL1), Mature scrub and scrub woodland (WS1), and Mixed broadleaved woodland (WD1). The details of the biodiversity improvements to address any impacts on local importance (higher value) habitats are outlined in Table 34-2 below and form an element of the onshore landscape plan (Appendix 27-1 Landscape Management Plan) for the OCC. The biodiversity improvements exceed the loss of habitats arising from the construction and operation of the OGC. Arising out of these improvements there will be a nature positive effect.

Table 34-2 - Nature positive effects associated with the Onshore Site

Receptor	Possible nature positive effect	Justification
Terrestrial Ecology	Provision of additional Hedgerow habitat	To compensate for the loss of approximately 456m of hedgerow habitat to facilitate the Onshore Site, a landscape mitigation plan has been produced by Macroworks (Appendix 27-1 of Chapter 27) which provides for the bolstering and planting of hedgerow habitat around the OCC site. Existing or marginal hedgerows around the OCC, totalling 870m, will be bolstered and maintained using native stock. Gaps in hedgerow alignment will be filled with native vegetation similar to existing species on site. Additionally, there will be approximately 406m of new hedgerow planted within the OCC site. Details of species, form, and size to be planted for the above are detailed in the Landscape Plan included in Appendix 27-1. Whilst there will be a loss in overall hedgerow habitat (50 meters), given the compensation measures given above, which includes the bolstering and maintenance of 870 m of hedgerow, this habitat will improve in the local area, as a result of the Onshore Site. The planting of additional linear habitats as outlined will result in a net gain of linear habitats within the Onshore site.
	Provision of additional scrub/scrub	In order to compensate for the loss of approximately 0.244 ha of scrub/scrub woodland and approximately 0.327 ha of mixed broadleaved woodland habitat to facilitate the Onshore

	woodland and Mixed broadleaved woodland	Site, a landscape mitigation plan has been produced by Macroworks (Appendix 27-1) which provides for planting of approximately 0.92 ha of native woodland within the OCC site. Given the compensation measures given above, there will be total net gain of 0.35 ha of woodland habitat in the local area, as a result of the Onshore Site. The planting of additional native woodland as outlined above will result in a net gain of such habitats within the Onshore Site.

34.5 Conclusion

This chapter has evidenced, at a high-level, the potential nature positive effects associated with the Project (both Offshore Site and Onshore Site). The construction and operation of an offshore wind farm can create substrate, provide refuge, and increase foraging opportunities for marine species. The latest scientific evidence from research in the northeast Atlantic has demonstrated some of these effects, with evidence that the effect is greater at longer-established offshore wind farms, suggesting that these developments can have long-term ecological benefits. The proposed additional habitat creation associated with the Onshore site works will result in a net gain of such habitats.