RISK ASSESSMENT FOR ANNEX IV SPECIES

Intensive Aquaculture at
Curhownagh, Mannin Bay, Co. Galway
(T09-140)

October 2024

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Introduction

This Annex IV Risk Assessment has been prepared by the Marine Institute to comply with the provisions of Article 12 and 13 of Council Directive 92/43/EC in relation to the protection afforded to Annex IV species from disturbance or harm. Specifically, this Risk Assessment appraises the proposed aquaculture sites at Curhownagh (T09-140), Mannin Bay, Co. Galway.

Legislative Context

The Habitats Directive has identified a number of animal and plant species across Europe, which are rare or are threatened with extinction and which need special measures to be taken to ensure their long-term survival. Under Article 12 and 13 of the Habitats Directive, Member States must establish systems of strict protection for animal and plant species which are listed on Annex IV of the Habitats Directive. Article 12 and 13 of the Habitats Directive are transposed into Irish law by Regulations 51 and 52 of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended[1].

The aim of the strict protection measures (set out in Article 12 (for animals) and 13 (for plants) of the Directive) is that the species in question will reach and remain at favourable conservation status. This means that the population dynamics of the species concerned can maintain itself on a long-term basis as a viable component of its natural habitats. It also means that the natural range of the species is neither being reduced, nor is likely to be reduced for the foreseeable future, and that there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Annex IV species are afforded strict protection throughout their range, both inside and outside of designated protected areas. This protection is afforded to these species at all stages of their life cycle and wherever they occur. This protection includes from deliberate disturbance of these species, particularly during periods of breeding, rearing, hibernation and migration. It is an offence to deliberately capture or kill, keep, transport or sell, injure or disturb a specimen in the wild, or damage or destroy a breeding site or resting place of an Annex IV animal species. For plants it is an offence to deliberately pick, collect, cut, uproot or destroy any specimen of these species in the wild, or keep, transport, or sell any specimen of these species taken in the wild.

S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011 (inc. Amendment SI 293 of 2021[2])
Protection of fauna referred to in the First Schedule **51.** (1) The Minister shall take the requisite measures to establish a system of strict protection for the fauna consisting of the species referred to in Part 1 of the First Schedule. (2) Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a licence granted by the Minister under Regulation 54 or 54A, a person who in respect of the species referred to in Part 1 of the First Schedule— a) deliberately captures or kills any specimen of these species in the wild,

[1] European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 Unofficial Consolidation. Update 28 July 2022.

[2] https://www.npws.ie/legislation

b) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,
c) deliberately takes or destroys eggs of those species from the wild,
d) damages or destroys a breeding site or resting place of such an animal, or
e) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive,

shall be guilty of an offence.

(3) The prohibitions referred to in paragraph (2) shall apply to all stages of life of the biological cycle of fauna to which this Regulation applies.

(4) The Minister shall establish a system to monitor the incidental capture and killing of fauna consisting of the animal species referred to in Part 1 of the First Schedule and, having regard to the information gathered, he or she shall conduct further research or take such conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned.

Protection of flora referred to in the First Schedule

52.

(1) The Minister shall take the requisite measures to establish a system of strict protection for the flora consisting of the plant species referred to in Part 1 of the First Schedule.

(2) Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a licence granted by the Minister under Regulation 54 or 54A, a person who in respect of the plant species referred to in Part 1 of the First Schedule—

a) deliberately picks, collects, cuts, uproots or destroys any specimen of these species in the wild, or
b) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 13(1)(b) of the Habitats Directive

shall be guilty of an offence.

(3) The prohibitions referred to in paragraph (2) shall apply to all stages of the biological cycle of the flora to which this Regulation applies.

The list of Annex IV species which occur in Ireland and its waters[3] is set out in Table 1.

Table 1 Annex IV species which occur in Ireland (NPWS).

Animals	Plants
All bat species	Killarney Fern
Otter	Slender Naiad
Natterjack Toad	Marsh Saxifrage
Kerry Slug	
Dolphins, Whales and Porpoises	
Marine Turtles	

As an Annex IV species may be found throughout the country, the protection of these species is not restricted in geographical terms and is not necessarily associated with areas subject to a specific designation. Any works or projects must ensure compliance with the requirements of the Regulations, which means avoiding impacts to Annex IV species. To do this a project must determine the probability of the protected species being present in the area affected by the works, using existing information.

[3] European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 - Unofficial Consolidation

If it is highly unlikely that an Annex IV species could be present or affected by the works, then the works will be compliant with Regulations 51 and 52[4].

If information shows that the Annex IV species is present, or may be present, then an investigation to establish presence is required. The Precautionary Principle must be applied in relation to this matter at this stage. If the investigation finds the species to not be present, then the project may proceed. If an Annex IV species is found to be present, or there is a breeding or resting place to which the animals are likely to return, then the likely impacts of the project needs to be examined to see if those impacts can be avoided through the design of the works[5].

Outline of the Proposed Aquaculture Activities

The Curhownagh site is operated by Mannin Salmon Ltd and has been operational for more than 40 years. The production will follow MOWI's Standard operating procedures (SOPS). The licence review requests a licence:

- To amend the current licence operating conditions (annual harvest of 200 t of salmon) to harvest 380 t of salmon every 24 months
- A maximum allowable biomass of 380 t
- To amend the site area from 3 ha to 4.1 ha

A total of 6 pens are being applied for in a 2x3 formation. Pens will have a 90 m circumference and net depth to the cone of 10 m (net mesh size 15-22 mm^2). Total cubic capacity would be approximately 6,400 m^3 per pen. The maximum stocking density within the pen will be 10kg/m^3.

The Curhownagh site will be used in conjunction with the Ardbear and Hawk's Nest intensive aquaculture sites, operated by Ardbear Salmon Ltd and Mannin Salmon Ltd. The overall proposed production operates on a 2-year cycle over the 3 sites.

In October Y1 (month 1), 200,000 smolts (11-month-old MOWI stock from Douglas Valley Hatchery or Lough Altan) will be input to the Hawk's Nest site. In month 14, a proportion of the stock (approximately 100t) will be transferred from the Hawk's Nest site to the Ardbear site. In months 15 and 16 approximately 200 tonnes of fish will be harvested. In month 17 (February Y2), the remaining fish at the Hawk's Nest site (approximately 280 t) will be transferred to the Curhownagh site (T09-140). Fish will be grown until harvest in months 20 and 21 (approximately 190 t and 200 t respectively). The site will be fallow for 21 months from June to the following March (of the next production cycle Y2) when it will be stocked again from the Hawk's Nest site.

The fish will be fed a dry pellet, produced to organic standards, by feed-barge. The pellet utilises a limited selection of raw materials, mainly comprising trimmings-derived fish meals and marine oils, organic wheat and other organic plant raw materials, natural pigments, natural antioxidants, and only organic-approved vitamins and minerals. The barge is filled by boats from the shore facility. The site will be accessed by boat from the private Mannin Bay Salmon Company Ltd. pier in Drinagh.

[4] Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. 2021. National Parks and Wildlife Service Guidance Series 1. DHLGH Link

[5] Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. 2021. National Parks and Wildlife Service Guidance Series 1. DHLGH Link

Harvesting will take place after fish have been tested for quality parameters and have been starved for at least 60 days prior to harvest. The harvest boat will be moored in a secure manner and fish will be transferred to the de-watering table by fish pump and passed into a percussion holding chamber where they are directed towards percussion hammers for stunning. Once stunned, fish are passed through the bleeding unit. Fish are then pumped from the hold for transfer to the bulk tanker. The blood water in the bleeding unit shall be disinfected by adding 50mL of Virkon to the water prior to discharge. It is then pumped into a tanker which is taken to the processing plant for disposal in accordance with the licenced conditions.

Relevant Annex IV Species

The Habitats Directive has identified a number of plant and animal species across Europe, which are rare or are threatened with extinction and which need special measures to be taken to ensure their long-term survival. All species listed under Annex IV with the potential to be impacted by the proposed site investigation works should be included, even if they have been separately assessed in the AA process.

Of the animal and plant species on Annex IV known to occur in Ireland, the following species were identified as relevant to the proposed development:

Dolphins, Whales and Porpoises

This is the list of marine mammals (dolphins, whales and porpoises) that intersect, in some way, with Mannin Bay area (data from the National Biodiversity Data Centre Ireland[6]).

- Bottle-nosed Dolphin (*Tursiops truncatus*)
- Common Dolphin (*Delphinus delphis*)
- Long-finned Pilot Whale (*Globicephala melas*)
- Sowerby's Beaked Whale (*Mesoplodon bidens*)

It is likely that there will be Annex IV species from dolphins, whales and porpoises present in the area of the project.

Otter

Ireland remains a European stronghold for the otter and the species is widespread here in our rivers and streams and along our coastline and lakeshores. Otters have two basic habitat requirements: adequate prey; and safe refuges where they can rest and breed. Otters maintain territories along riverbanks, lake shores and coasts. Coastal territories require a freshwater source for the otter to wash, so will always include a stream or spring. In productive areas, such as coastlines, territories are in the range of 5-6 km. On the coast, otters forage within 80-100m of the coastline, typically in depth of <3m, but up to 10-12m. For foraging, they prefer shallow, rocky environments with seaweed cover. Otters maintain numerous resting places, known as couches (above-ground, hidden in foliage) and holts (underground, among roots, rocks, or tunnels) within its territory. They breed all year, nesting in a well-hidden natal holt. There is potential for otter to be present in the area of the project.

[6] https://maps.biodiversityireland.ie/

All bat species

This is a marine site, distant from bat habitats. The project does not involve trees, hedges, buildings, bridges, caves, souterrains or changes in lighting, so bats are not likely to be present or affected by the works. As bats are not likely to present, the lack of spatial overlap or likely interactions between the Annex IV species and the aquaculture activities means there is no significant risk to the number of individuals to breed successfully, nor to the survival of the population, and the species natural range is secure and will not be reduced.

Natterjack Toad

The natural ranges for the Natterjack Toad are freshwater and terrestrial. Populations are restricted to sites in County Kerry. Natterjacks are nocturnal and during the day they hide under logs and stones. Over winter, natterjacks hibernate in burrows that they dig themselves in sandy soils, or in piles of rocks or dry-stone walls. The toad breeds in shallow ponds and forages in the areas around those ponds at these locations. The aquaculture site is not a suitable habitat for Natterjack toads. There is not likely any overlap between this marine site and this species, so there is no risk to the number of individuals to breed successfully, nor to the survival of the population, and the species natural range is secure and will not be reduced.

The Kerry Slug

The Kerry Slug are terrestrial and nocturnal (generally), with their natural ranges restricted to sites in County Kerry and west Cork (and more recently found in Galway, Limerick and Tipperary). Its habitats are woodland, and lichen covered rock outcrops and boulders. The aquaculture site is not a suitable habitat for the Kerry slug. There is not likely any overlap between this marine site and this species, so there is no risk to the number of individuals to breed successfully, nor to the survival of the population, and the species natural range is secure and will not be reduced.

Plants

The natural ranges for the Annex IV plants species (Killarney Fern, Slender Naiad, and Marsh Saxifrage) are terrestrial and not likely to be impacted by the project, so there is no risk to these Annex IV species.

Marine Turtles

Leatherback turtles (*Dermochelys coriacea*) are occasional visitors to Irish waters. During the ObSERVE surveys[7], three leatherback turtles and 2 unidentified turtles were recorded during the summer months, 4 in the southern extent of the Celtic Sea survey area and 1 to the north of the Porcupine bank. The last record of the Leatherback turtle near this site was in 1984 (more than 8 km from the site. The last record of Loggerhead turtle (*caretta* caretta) (alive but stranded) was in 2002 in Claddaghduff, more than 8 km from the aquaculture site[8]. Considering the rarity in Irish waters of these widely-roaming marine species, that may utilise entire oceans, and the design of the infrastructure with weighted and taut nets and moorings, it is not likely that there will be any

[7] Rogan, E., Breen, P., Mackey, M., Cañadas, A., Scheidat, M., Geelhoed, S. & Jessopp, M.(2018). Aerial surveys of cetaceans and seabirds in Irish waters: Occurrence, distribution and abundance in 2015-2017. Department of Communications, Climate Action & Environment and National Parks and Wildlife Service (NPWS), Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland. 297pp

[8] https://maps.biodiversityireland.ie/Map

significant interactions with these Annex IV species, and there is no risk to the number of individuals to breed successfully, nor to the survival of the population, and the species natural range is secure and will not be reduced.

Conclusion

The relevant Annex IV species which are likely to be present in the area or potentially affected by the project, and considered for further investigation, are:

- Dolphins, Whales and Porpoises.
- Otters.

Risk Assessment

Assessment

Dolphins, Whales and Porpoises

This is the list of marine mammals (dolphins, whales and porpoises) that intersect, in some way, with Mannin Bay area (data from the National Biodiversity Data Centre Ireland, and the applicants NIS)[9].

- Bottle-nosed Dolphin (*Tursiops truncatus*)
- Common Dolphin (*Delphinus delphis*)
- Long-finned Pilot Whale (*Globicephala melas*)
- Sowerby's Beaked Whale (*Mesoplodon bidens*)

It is likely that there will be Annex IV species from dolphins, whales and porpoises present in the area of the project.

Summary of Potential Impacts and Risk Assessment

The main impacts associated with the proposed project on dolphins, w*hales and porpoises are related* to:

- Noise disturbance - the increase in marine vessels resulting from the proposed project was considered minimal and would not be a significant increase, when compared to the existing movements in the area from fishing boats and recreational vessels. Noise associated with marine vessels is considered low. Noise from the pens during operation is considered to be not significant as the sound pressure would be low and with rapid attenuation. According to the EIAR, Acoustic Deterrent Devices to protect the stock form seals (which have a potential to disturb dolphins, whales and porpoises), have never been used at the licenced site, and are not planned to be used - predator control will be through sufficiently weighted and taut netting to prevent attacks.
- Collisions or entanglement - the small number of vessels that will be required will not significantly increase vessel traffic in the area. These vessels will be travelling at slow speeds, in a predefined trajectory, allowing for animals to predict movement of the vessels and avoid collisions. There has not been a significant number of studies undertaken on the interactions

[9] National Biodiversity Data Centre Link

between dolphins, whales and porpoises and salmon farms. However, in Ireland reports of dolphins, whales and porpoises becoming entangled or trapped in salmon pens are extremely rare, and this is not expected to occur with moorings and netting which are appropriately tensioned and weighted, which is the case in this project.

- Obstruction and displacement – the potential for the infrastructure to cause obstruction to dolphins, whales and porpoises is considered low. These mobile species can avoid and go around any obstructions without any significant disturbance. The size of the project is relatively limited and not significant when considered against the overall area and is not likely to cause loss of habitat to these wide-ranging species.
- Attraction – some dolphins, whales or porpoises may be attracted to the farm sites as the infrastructure can act as artificial reefs and encourage fish aggregation. This would be limited to the direct vicinity of the site and would be considered small-scale. Feed management and stock management will reduce the effect, minimising the potential attraction.
- Water quality – there is the potential deterioration in water quality due to build-up of waste feed or faeces, but the site is well flushed and exposed to waves and currents, so significant build-up is unlikely. Organic status ensures lower stocking density which helps avoids this. The use of veterinary products and chemicals are possible. Concentration of these in the water or food chain are considered likely to be very low and well diluted.
- Commissioning and decommissioning - Most of the infrastructure will be assembled and disassembled on land and floated to and from the site. Activities will be short-term and with low impact.

The potential for impact from the listed hazards is generally unlikely or of low intensity. While there may be some changes present in the environment, they are not likely to be significant, and impact on dolphins, whales and porpoises can be ruled out.

Otter

The main impacts associated with the proposed project on otters are related to:

- Distribution – The most recent recording of otter was approximately 2 km from the closest boundary of the T09-140 site in 2013[10]. Due to the distance from last recorded otter presence and the depth of the seabed where the proposed net pens will be located (~13m), the potential impact of the aquaculture structures on otter distribution is considered low.
- Extent of habitats – The terrestrial and freshwater habitats used by otters will not be impacted by the marine aquaculture structures. The extent of the marine habitat is based on the research that otters tend to forage within 80 m of the shoreline (from the highwater mark) [11]. As such the potential impact by the facilities (no additional construction of piers or foreshore sites) or the aquaculture site itself on the otters' habitat is considered low.
- Couching sites and holts – Otter couching sites and holts are located on terrestrial habitats. As such the potential impact by the facilities (no additional construction of piers or foreshore sites) or the aquaculture site itself on otter couching sites and holts is considered low.

[10] https://maps.biodiversityireland.ie/Map

[11] Kruuk, Hans, *Otters: Ecology, behaviour and conservation* (Oxford, 2006; online edn, Oxford Academic, 1 Apr. 2010), https://doi.org/10.1093/acprof:oso/9780198565871.001.0001

- Fish biomass available – Otter diet varies seasonally and are considered omnivorous generalists[12]. The otters' freshwater diet consists mainly of salmonids, eels and sticklebacks[13] and wrasse and rockling in coastal waters[14]. As uneaten salmon feed can pass through the net and attract wild fish, otters have been observed feeding on walkways between cages (in the UK) where they would otherwise take their wild prey to shore[15]. The boundary of the proposed aquaculture site does overlap with the 80 m boundary of the potential otter marine habitat. Therefore, the potential impact of the aquaculture activities to impact fish biomass availability is considered low.
- Barriers to connectivity — Otters will commute across stretches of open water up to 500m[16]. The aquaculture activities will not prevent access for otters to traverse across the bay as they do not span across a significant portion of the waterbody. The proposed site will occupy 4.1 ha and the area of Mannin Bay is approximately 1070 ha. There is also no overlap with terrestrial habitat. Therefore, the potential impact of the aquaculture structures to be a barrier to connectivity is considered low.

Due to these factors and that there are no recorded sightings of the presence of otter in the vicinity of the aquaculture site, the depth of the site, and the distance from the coastline, along with the absence of freshwater, means this is not a suitable environment of otters. The lack of likely interactions between this Annex IV species and the aquaculture activities means there is no risk to the number of individuals to breed or forage successfully, nor to the survival of the population, and the species natural range is secure and will not be reduced.

Mitigation Measures

Dolphins, Whales and Porpoises

Cetaceans rarely interact with marine farm sites. Based on the information above, no mitigation measures for cetacean encounters were listed in the application documents, and none are considered necessary for this project.

Otters

Otters have the potential for interaction with marine fish farm sites (e.g. feeding on walkways between pens). The closest proposed Curhownagh site boundary is approximately 450 m from the coastline. Due to the large extent of the potential terrestrial otter habitat, and the information above, no mitigation measures for otter encounters were listed in the application documents and none are considered necessary for this project.

[12] Saunders, G. (2017). Aquaculture Licences Appeals Board Appeal Ref No. AP2/2015 Technical Advisor's Report: Supplementary Briefing Note Otter (Lutra lutra) impact assessment. 24th November 2017. Report prepared by Graham Saunders Marine Ecology.

[13] Bailey, M and Rochford, J. (2006) Otter Survey of Ireland 2004/2005. *Irish Wildlife Manuals*, No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

[14] Kingston, S, O'Connell, M, Fairley, JS (1999) Diet of Otters *Lutra lutra* on Inishmore, Aran islands, west coast of Ireland. Biology and Environment: Proc R Ir Acad B 99B:173-182

[15] Conroy, J. and Green, R. (1998) Otters (*Lutra lutra*) and fish farming in Scotland. BOKU-Reports on Wildlife Research & Game Management. (14). Proceedings: International Workshop Lischau, 8-9 February 1996 (Austria).

[16] De Jongh, A. and O'Neill, L., (2010). Otter tracking study of Roaringwater Bay. Report to National Parks & Wildlife Service, Department of Arts, Heritage and Gaeltacht.

Conclusions

Following a risk assessment of the proposed aquaculture licence site for Curhownagh (T09-140), Mannin Bay, Co. Galway, the activities pose no risk to the number of individuals to breed successfully, nor to the survival of the population, and the species natural range is secure and will not be reduced, for the Annex IV species which occur in Ireland and its waters.