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The Finest Salmon from
SCOTLAND



Predator Control Plan

Morrison's Rock, Isle of Benbecula

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Glossary of Abbreviations / Terms

Abbreviation / Term	Definition
A&W	Animals and Wildlife
BFS	Bakkafrost Scotland Ltd.
EPS	European Protected Species
HDPE	High Density Polyethylene
HOS	Haul Out Site
LPA	Local Planning Authority
MD-LOT	Marine Directorate Licensing Operations Team
NMPi	National Marine Plan interactive
NS	NatureScot
The Proposed Development	The Proposed Morrison's Rock Fish Farm

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1. Introduction

Bakkafrost Scotland Ltd. (BFS) recognises that predation on farmed stock is not only of welfare and financial concern to the company, but can have significant impacts on stock containment and, as such, will take all reasonable steps to ensure that interaction with predators is minimised with minimal impact to other local wildlife. As a general policy BFS will not locate any fish farm in the vicinity of grey seal (*Halichoerus grypus*) pupping sites.

The anti-predation techniques and devices described in this document will be reviewed regularly by the Site and Area Manager to assess their effectiveness. If found to be unnecessary or ineffective, the appropriate actions will be taken to modify and improve the management of this aspect. In the unlikely event that a predator succeeds in damaging nets, resulting in an escape incident, BFS has a site-specific Escapes Contingency Plan in place for the Morrison's Rock fish farm (the Proposed Development).

The Animals and Wildlife (A&W) (Scotland) Act 2020¹ has repealed several sections and passages of the Marine (Scotland) Act 2010², meaning that the Scottish Ministers may no longer authorise a person to enter land in order to kill or take seals for the purpose of preventing them from causing serious damage to a fish farm. BFS adheres to all requirements regarding seal licensing.

2. Wildlife Assessment

The Proposed Development is a new fish farm; therefore, the wildlife assessment has been based on a desktop analysis and the wildlife logs of the closest BFS farms in this region (Maragay Mor, Maaey and Greanamul, all within 5 km of the Proposed Development). All sightings from wildlife logs are incidental, with no measurement of observational effort.

The closest recognised seal haul-out site (HOS) is Gairbh-Eilean Ronaigh, located 3.37 km to the north-northwest of the Proposed Development. This HOS is primarily used by common seals (*Phoca vitulina*), which typically forage up to 50 km from their HOS, so the Proposed Development is within their foraging range. The National Marine Plan (Interactive) (NMPI) indicates that both common and grey seals have been observed along the east coast of the Isle of Benbecula, with common seal being more abundant in the immediate area. This trend is supported by aerial survey data that provides a 2017 August count of 644 common seal individuals for Sub-Unit 11 (SE N'Uist, E Benbecula, NE S'Uist) (the sub-unit within which the Proposed Development is located), in comparison to an August (2017) count of 61 grey seal individuals³. The wildlife logs for the neighbouring farms also support this trend with sightings of both seal species recorded, with common seal sightings making up a higher proportion of seal sightings across the farms.

Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV⁴ surveys suggest that common dolphin (*Delphinus delphis*) and harbour porpoise (*Phocoena phocoena*) are the most abundant cetaceans in the region. The wildlife logs of the neighbouring farms have recorded harbour porpoise, at negligible abundance, and no common dolphin over the previous production cycles, indicating that the waters immediate to the existing fish farms are of limited importance to either species. No incidence of predation by any cetacean has ever been recorded at any BFS marine fish farm.

It is thought that both common and grey seal are likely to be the most significant potential predator of the Proposed Development. For this reason, the Proposed Development will be equipped with multiple

¹ Scottish Parliament. (2020). Animals and Wildlife (Penalties, Protections and Powers) (Scotland) Act 2020. [Online] Available at: <https://www.legislation.gov.uk/asp/2020/14/chapter/1/crossheading/conservation-of-seals/enacted> (Accessed 27/08/2020)

² Scottish Parliament. (2010). Marine (Scotland) Act 2010. [Online] Available at: https://www.legislation.gov.uk/asp/2010/5/pdfs/asp_20100005_en.pdf (Accessed 27/08/2020)

³ Morris, C.D., Duck, C.D., and Thompson, D. 2021. Aerial surveys of seals in Scotland during the harbour seal moult, 2016-2019. NatureScot Research Report 1256. [Online] Available at: <https://www.nature.scot/doc/naturescot-research-report-1256-aerial-surveys-seals-scotland-during-harbour-seal-moult-2016-2019>

⁴ Gilles, A., Authier, M., Ramirez-Martinez, NC, Araújo, H., Blanchard, A., Carlström, J., Eira, C., Dorémus, G., Fernández Maldonado, C., Geelhoed, SCV, Kyhn, L., Laran, S., Nachtsheim, D., Panigada, S., Pigeault, R., Sequeira, M., Sveegaard, S., Taylor, NL, Owen, K, Saavedra, C., Vázquez-Bonales, JA, Unger, B., Hammond, PS (2023). Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys. Final report published 29 September 2023. 64 pp. [Online] Available at: https://www.tiho-hannover.de/fileadmin/57_79_terr_aqua_Wildtierforschung/79_Buesum/downloads/Berichte/20230928_SCANS-IV_Report_FINAL.pdf

methods of seal deterrent, and the measures will be monitored regularly by farm staff to assess their effectiveness. The predator management measures detailed below will be employed at the Proposed Development.

2.1 Wildlife Logbook

The farm staff will keep a log of wildlife observed around the Proposed Development to record the incidence of wildlife sightings and any interactions with the Proposed Development. This will help to determine the need and effectiveness of the anti-predator measures and will help to inform the Site and Area Managers during the annual predator control reviews, by building an understanding of seasonal and longer term, local wildlife trends.

Any entanglement or entrapment of birds will be recorded in accordance with NatureScot (NS) requirements. From the date of stocking, BFS will:

1. Maintain daily records of wildlife entanglements or entrapment at the development using the NS standardised proforma and shall submit six-monthly returns to the Local Planning Authority (LPA) and to NS; and
2. Provide written immediate notification to both the LPA and NS in the event of any significant entrapment or entanglement in any pen or other nets of any single bird species (northern gannet and / or any other SPA qualifying features). Significant should be interpreted as:
 - (a) three or more birds become entangled or entrapped on a single day; and/or
 - (b) ten or more birds become entangled or entrapped in any seven-day period; and/or
 - (c) one or more birds become entangled or entrapped on four or more consecutive days.

A number of SPA qualifying features have been identified as relevant to Morrison's Rock based upon review of mean foraging range data^{5,6}. A summary of these qualifying features and their respective SPAs is provided in Table 2.1.

Table 2.1: Summary of the SPA qualifying features that are relevant to Morrison's Rock based upon mean foraging range data.

Qualifying Features of SPAs within Mean Foraging Range	Scientific Name	Relevant SPAs	Mean Foraging Range (+1 Standard Deviation (SD)) (km)
Storm petrel	<i>Hydrobates pelagicus</i>	Auskerry, North Rona and Sula Sgeir, Priest Island (Summer Isles), Seas off St. Kilda, St. Kilda, Sule Skerry and Sule Stack, and Treshnish Isles	336*
Black-legged kittiwake	<i>Rissa tridactyla</i>	Canna and Sanday, Flannan Isles, Mingulay and Berneray, Rum, Shiant Isles, and St. Kilda	54.70 (50.4)
Atlantic puffin	<i>Fratercula arctica</i>	Canna and Sanday, Mingulay and Berneray, Seas off St. Kilda, and Shiant Isles	48.10 (28.30)
Northern fulmar	<i>Fulmarus glacialis</i>	Cape Wrath, Flannan Isles, Handa, Mingulay and Berneray, North Rona and Sula Sgeir, Seas off St. Kilda,	134.60 (90.10)

⁵ Woodward, I., Thaxter, C.B., Owen, E and Cook, A.S.C.P. (2019). Desk-based revision of seabird foraging ranges used for HRA screening. Report of work carried out by the British Trust for Ornithology on behalf of NIRAS and The Crown Estate. BTO Research Report No. 724. [Online] Available at: <https://www.marinedataexchange.co.uk/>

⁶ NatureScot. Assessing Connectivity with Special Protection Areas (SPAs). Guidance, Version 3 – June 2016. [Online] Available at: <https://www.nature.scot/doc/assessing-connectivity-special-protection-areas>

Qualifying Features of SPAs within Mean Foraging Range	Scientific Name	Relevant SPAs	Mean Foraging Range (+1 Standard Deviation (SD)) (km)
		Shiant Isles, and St. Kilda	
Leach's petrel	<i>Hydrobates leucorhous</i>	Flannan Isles, Foula, North Rona and Sula Sgeir, Ramna Stacks and Gruney, St. Kilda, and Sule Skerry and Sule Stack	657
Red-throated diver	<i>Gavia stellata</i>	Mointeach Scadabhaigh and West Coast of the Outer Hebrides	13.5
Greenland barnacle goose	<i>Branta leucopsis</i>	North Uist Machair and Islands	15
Manx shearwater	<i>Puffinus puffinus</i>	Rum and St. Kilda	136.10 (88.70)
Northern gannet	<i>Morus bassanus</i>	Seas off St. Kilda and St. Kilda	120.40 (50.00)
Great skua	<i>Stercorarius skua</i>	St. Kilda	67.00 (31.50)

*No mean foraging range data for storm petrel is available therefore the mean maximum foraging range has been used to assess connectivity.

3. Net Tensioning and Seal Blinds

BFS will install enhanced, rigid netting at the Proposed Development. These nets are structurally designed using high density polyethylene (HDPE) to provide cut resistance and rigidity, protecting stock from predator damage and reducing the risk of escape events occurring. This type of netting has been deployed across all existing BFS marine fish farms and has greatly reduced net damage and ingress of seals into the pens.

Sinker tubes will be used at the Proposed Development to ensure that nets remain highly tensioned. Net tensioning systems hold the pen net uniformly taut, so that it presents a 'wall' to any underwater predator with no slack areas for entanglement or purchase on the net, through which a seal can grab or bite fish. The use of a net tensioning system minimises the need for secondary predator nets and therefore reduces the risk of entanglement for predators.

The use of net tensioning is recognised as best practice in terms of predator control. Seal Blinds may also be used at the Proposed Development, which are sections of material hanging down from underwater net panels, acting as a curtain to prevent seals from reaching the fish from below the pen. This system is also recognised as best practice.

3.1 Predatory Bird Protection

Various species of bird cohabit the environment in which BFS farm. Piscivorous birds can on occasion be attracted to salmon pens as a potential food source. Surface feeding birds including grey heron (*Ardea cinerea*), northern gannet (*Morus bassanus*), and gull spp. may take fish, usually smolts, from or near the water surface, some by shallow plunging from the air. Diving birds, including great cormorant (*Phalacrocorax carbo*), European shag (*Gulosus aristotelis*), auks and divers obtain their food during dives between periods of swimming on the surface of the water.

The Proposed Development will be fitted with tensioned top nets (100 mm ceiling and 75 mm sidewall) in conjunction with bird net supports, in accordance with NS recommendations to reduce risk of any entanglement to birds. Top nets are inspected and re-tensioned on a daily basis and maintenance conducted as required which further reduces the potential risk of entanglement or entrapment to birds. BFS utilises state of the art feed management systems to ensure control of feed delivery within pens, ensuring there is no surplus food available to birds. Control measures include pellet detection systems, designated feed technicians, and downward facing feed spreaders.

4. Effective Husbandry

The presence of mortalities is known to attract seals and an effective mortality removal procedure can reduce predator attacks. Mortalities are removed by a Lift-Up system although manual removal of dead and moribund fish is also undertaken as required. This practice will reduce predator attacks, particularly from seals to a minimum. Careful farm and waste management procedures will be implemented that prevent net and rope debris entering the marine environment during farm servicing, thereby removing any entanglement risks. The Proposed Development will be kept in a neat and tidy state in order to significantly reduce the potential of debris entering the marine environment. Any debris, regardless of origin, found on the adjacent shoreline will be collected, and appropriately disposed of, by local farm staff.

The measures outlined in relation to wildlife monitoring, pen design, and husbandry and site management, will be done as a minimum at all farms. The following predator deterrents have been identified as potentially necessary in circumstances of exceptional welfare concern for stocked fish.

5. Acoustic Deterrent Devices

BFS has committed to not using ADDs as standard practice at the Proposed Development. In circumstances of exceptional welfare concern for stocked fish, BFS will consult with NS, the LPA, and the Marine directorate Licensing Operations Team (MD-LOT) to discuss how best to proceed and to obtain approval for any ADD use. It is likely that a European Protected Species (EPS) licence will be required for all currently available ADDs unless it can be demonstrated that the device proposed for use will not cause disturbance to cetaceans. An EPS licence can be applied for via the MD-LOT who will consult with NS on any applications.

6. Secondary Anti-predator Nets

BFS will not use secondary anti-predator nets as a standard measure at the Proposed Development. In circumstances of exceptional welfare concern for stocked fish, BFS will consult with NS and the LPA on the feasibility and potential for use of anti-predator nets at the Proposed Development.

Flow Chart of Anti Predator Device Assessment

