NORTH FALLS

Offshore Wind Farm

HABITATS REGULATIONS ASSESSMENT

Appendix 3 Red Throated Diver Compensation Document

Document Reference:	7.2.3
Volume:	7
APFP Regulation:	5(2)(g)
Date:	July 2024
Revision:	0

Project Reference: EN010119

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Project	North Falls Offshore Wind Farm
Document Title	Habitats Regulations Assessment Appendix 3 Red Throated Diver Compensation Document
Document Reference	7.2.3
APFP Regulation	5(2)(g)
Supplier	Royal HaskoningDHV
Supplier Document ID	PB9244-RHD-ZZ-OF-RP-YE-0260

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Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
0	July 2024	Submission	MacArthur Green/ RHDHV	NFOW	NFOW

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Glossary of Acronyms

AEoI	Adverse Effect on Integrity
CIMP	Compensation Implementation and Monitoring Plan
DCO	Development Consent Order
Defra	Department for Environment Food and Rural Affairs
DESNZ	Department of Energy Security and Net Zero
DO	Dissolved oxygen
EA1N	East Anglia ONE North
EA2	East Anglia TWO
EA3	East Anglia THREE
EIA	Environmental Impact Report
EPP	Evidence Plan Process
ES	Environmental Statement
ETG	Expert Topic Group
GGOW	Greater Gabbard Offshore Wind Farm
IMO	International Maritime Organisation
km	Kilometre
LA	London Array
NE	Natural England
NFOW	North Falls Offshore Wind Farm Limited
NSN	National Site Network
OTE	Outer Thames Estuary
OWF	Offshore Wind Farm
RIAA	Report to Inform Appropriate Assessment
RTDCIMP	Red-throated diver compensation implementation plan
RTDCSG	Red-throated diver Compensation Steering Group
RWE	RWE Renewables UK Swindon Limited
SACO	Supplementary Advice on Conservation Objectives
SoS	Secretary of State
SPA	Special Protection Area
SPR	ScottishPower Renewables
SSER	SSE Renewables Offshore Windfarm Holdings Limited
UK	United Kingdom

Glossary of Terminology

European site	Any site which would be included within the definition at regulation 8 of the Conservation of Habitats and Species Regulations 2017 for the purpose of those regulations, including candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation, Special Protection Areas and any relevant marine sites.
The Applicant	North Falls Offshore Wind Farm Limited (NFOW)
The Project Or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.

1 Introduction

1.1 Background

1. The North Falls Offshore Wind Farm (hereafter 'North Falls' or 'the Project') is an extension to the existing Greater Gabbard Offshore Wind Farm (GGOW), located approximately 40km off the East Anglian coast in England. When operational, North Falls would have the potential to generate renewable power for approximately 400,000 UK homes from up to 57 wind turbines.
2. The Applicant, North Falls Offshore Wind Farm Ltd (NFOW), is a consortium between SSE Renewables Offshore Windfarm Holdings Limited (SSER) and RWE Renewables UK Swindon Limited (RWE), both of which are highly experienced developers.
3. As part of the Development Consent Order (DCO) application, the Applicant must provide information to support the Habitats Regulations Assessment (HRA) to be completed by the Competent Authority, the Secretary of State for Department of Energy Security and Net Zero (DESNZ).
4. The Project is located c.4.5km from the boundary of the Outer Thames Estuary (OTE) Special Protection Area (SPA) at the closest point. This SPA was designated to protect a non-breeding population of red-throated divers (*Gavia stellata*). Natural England (NE) has advised the Applicant that red-throated divers may be displaced by up to 12km from North Falls. Consequently, Natural England consider that the Project has the potential to displace red-throated divers within the SPA.
5. Whilst the Report to Inform Appropriate Assessment (RIAA) Part 4 Offshore Ornithology (Document Reference: 7.1.4) concludes no adverse effect on integrity (AEOI) of the red-throated diver feature of the OTE SPA from North Falls alone or in-combination with other plans and projects, in response to pre-application consultation feedback received to date from Natural England and the Royal Society for the Protection of Birds (RSPB), a without prejudice compensation plan is proposed.

1.2 Purpose of this report

6. In the event that the Secretary of State concludes an AEoI in the Appropriate Assessment, the Applicant has developed compensatory measures that could be applied to fully compensate for the predicted effects, which are summarised in Section 3 and detailed in the RIAA Part 4 (Document Reference: 7.1).
7. This document demonstrates how the without prejudice compensatory measures can be delivered to ensure that the overall coherence of the UK National Site Network (NSN) is protected, in accordance with Regulation 68 of the Conservation of Habitats and Species Regulations 2017 and Regulation 36 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 (both sets of regulations together referred to as the "Habitats Regulations") and provides evidence that appropriate measures have been selected which will be ecologically effective.

8. If required, it is proposed that a Red-throated Diver Compensation Implementation and Monitoring Plan (CIMP) will be produced by the Applicant and approved by the Secretary of State (SoS) post-consent, in accordance with the outline version provided with the DCO application (Annex 3A Red-throated Diver Outline Compensation Implementation and Monitoring Plan, Document Reference: 7.2.3.1). The Red-throated Diver CIMP will set out the detailed delivery proposals for the agreed compensatory measures based on those described in this Red-throated Diver Compensation Document.

9. If required, the red-throated Diver compensation can be legally secured through the DCO.

1.3 The Red-throated Diver Feature of the Outer Thames Estuary SPA

10. Red-throated divers breed at high latitudes, migrating further south to winter in the North Sea and Baltic Sea, with birds aggregating in key areas within these seas during the non-breeding season. Many of these areas have been classified as SPAs under the EU Birds Directive.

11. One such area is the OTE SPA, which was classified in 2010 for its important aggregation of wintering red-throated divers.

1.3.1 Conservation Objectives

12. The site's conservation objectives are:

    - to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:
        - the extent and distribution of the habitats of the qualifying features;
        - the structure and function of the habitats of the qualifying features;
        - the supporting processes on which the habitats of the qualifying features rely;
        - the populations of each of the qualifying features; and
        - **the distribution of qualifying features within the site**.

13. The effects on red-throated diver of the OTE SPA screened into the RIAA relate to displacement/ barrier effects and therefore 'the distribution of qualifying features within the site' conservation objective (shown in bold above) is of relevance to the without prejudice compensation.

1.3.2 Supplementary Advice on Conservation Objectives

14. Supplementary Advice on Conservation Objectives (SACO) for designated red-throated divers at OTE SPA were last updated online in May 2023 (NE, 2023). The targets for red-throated diver are as follows and the target of relevance to the without prejudice compensation is shown in bold:

- **Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed;**
- Maintain the size of the non-breeding population at a level which is at or above 18,079 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent;
- Maintain concentrations and deposition of air pollutants at below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk);
- Maintain the structure, function and supporting processes associated with the feature and its supporting habitat through management or other measures (whether within and/or outside the site boundary as appropriate) and ensure these measures are not being undermined or compromised;
- Maintain the extent, distribution and availability of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding) at the following levels: Subtidal sand (220,295.55); Subtidal coarse sediment (73,606.64); Subtidal mixed sediments (62,100.63 ha); Subtidal mud (12,549.14 ha); Circalittoral rock (335.2 ha); and water column;
- Maintain the distribution, abundance and availability of key food and prey items (e.g. fish) at preferred sizes;
- Maintain the depth of inshore waters currently used as feeding or moulting sites;
- Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels;
- Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels;
- Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels; and
- Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.

2 Development of compensatory measures – methodology

2.1 General Approach

15. The approach taken by the Applicant to identify potential compensatory measures and for considering their suitability considers the policy and guidance described in Appendix 1 of the HRA Derogation Provision of Evidence

(Compensatory Measures Overview, Document Reference: 7.2.1) and was as follows:

- Literature review of options for compensatory measures;
- Consultation with relevant stakeholders including:
  - Natural England and RSPB to develop proposals through the ornithology Expert Topic Group (ETG) as part of the Projects' Evidence Plan Process (EPP);
  - Defra (Department for Environment Food and Rural Affairs);
  - Other offshore wind farm (OWF) developers;
- Ongoing review of other OWF applications for which compensatory measures have been accepted for red throated diver (East Anglian ONE (EA1N) and East Anglia TWO (EA2)); and
- The options identified through this process were then considered in relation to various criteria (e.g. feasibility, spatial and temporal scale and monitoring) as described in Section 6.

16. A range of project-led, collaborative and strategic compensatory measures have been considered and are described in Section 4.

2.2 Summary of consultation

17. The Applicant has regularly consulted with relevant stakeholders throughout the pre-application process. Feedback from the stakeholders has informed the development of the compensatory measures and is detailed in Annex 1A Compensation Consultation.

18. Consultation with relevant stakeholders will continue throughout the pre-application and post consent phases of compensation development and delivery. Details of proposed future consultation on the compensatory measure will be set out in the Red-throated Diver CIMP.

3 Quantification of effect

19. Predicted mortality of red-throated divers due to displacement from the North Falls array area is estimated to be between 1 and 11 individuals per annum, assuming a mortality rate of displaced birds of 1% and 10%, respectively. These values are based on the modelled abundance of red-throated divers in the overlap area between the North Falls 12km buffer (being the distance by which Natural England have advised red-throated divers could be displaced by North Falls) and the SPA boundary (RIAA, Part 4, Document Reference: 7.1.4).

20. Additionally, the North Falls array area plus 12km buffer includes 108.7km^2 of the OTE SPA which is 2.8% of the SPA area. Within this area displacement from North Falls could result in reduced densities of red-throated divers and thus an effective degradation of the available habitat for the species within the SPA. Therefore, the impact on the red-throated diver feature of the OTE SPA relates to the conservation objective 'maintain the distribution of qualifying features within the site'. However, all of the area within the 12km overlap of North Falls

and the SPA is already within the 12km buffer of an existing OWF and/or overlaps with International Maritime Organisation (IMO) shipping lanes[1] (RIAA Part 4, Document Reference: 7.1.4). Thus, the area of the SPA within 12km of North Falls is already subject to sources of displacement for red-throated divers, and it is considered by the Applicant that any additional effects from the Project would not materially change the current situation. The Applicant is therefore of the view that North Falls would not cause an adverse effect on the integrity of the OTE SPA, alone, or in combination with other OWFs.

21. In acknowledgement that Natural England does not agree with this position and considers there would be an adverse effect on site integrity for the Project, a derogation case, including compensation measures described in this document, are provided without prejudice.

4 Selection of compensatory measure(s)

22. An initial long list of potential compensatory measures for the red-throated diver feature of the OTE SPA was presented to Natural England and the RSPB through the EPP (see Annex 1A) and was subsequently submitted with the Preliminary Environmental Information (NFOW, 2023).

23. The measures considered are shown in Table 4.1, with the two options selected in consultation with Natural England and RSPB, shown in bold.

24. Under ideal conditions compensation measures would directly address predicted impacts within the relevant European site. However, this is not always possible or feasible and therefore compensation guidance (Defra 2021, 2024a) includes a hierarchy of approaches for delivering compensation for situations where direct measures are not available. Defra (2024a) states that:

"The following factors should be considered in order of priority when selecting measures:

i. Ecological effectiveness – ecological effectiveness of measures takes account of the ecological outcomes to be achieved and the confidence that the measures will be effective. This should be the priority consideration when working through the hierarchy.

ii. Local circumstances – as far as possible, measures should take account of local circumstances where the risk is predicted to occur (see local circumstances header for further information).

iii. Proximity – measures should be delivered as close as possible to the area affected by the plan or project.

25. This, and other guidance discussed in the Compensatory Measures Overview (Document Reference: 7.2.1), was considered during the review and selection of compensatory measures.

[1] As well as OWFs, red-throated divers are also displaced from vessels

Table 4.1 Screening of compensation measures for red-throated diver (selected options in bold)

Measure	Conclusions
Reducing disturbance from vessel activity	A number of studies have demonstrated the effect of ship traffic in displacing red-throated divers during the non-breeding season. Management to reduce vessel activity in areas used by concentrations of non-breeding birds could reduce disturbance and displacement and potentially improve over-winter survival and body condition. This measure was secured as part of the EA1N and EA2 compensatory measures for red-throated diver, specifically with regards to managing the vessel activity of EA1N and EA3 which were owned by the same developer. The Applicant considered the potential to manage vessels from other offshore wind farms, however the ecological benefit of rerouting vessels would be limited and the ability to secure agreements was highly uncertain. In addition, Natural England was unsupportive of this option. Management of vessels beyond other offshore wind farms would require government intervention and relates to the creation of a sanctuary area discussed further below, or would face the same challenges as discussed above regarding offshore wind farm vessels.
Reduction of fisheries bycatch	The compensation for EA1N and TWO also includes a secondary measure, involving a programme of work to investigate seabird bycatch off the East Anglian coast, and to trial measures to reduce bycatch, however it is noted that confidence in this measure is low (MacArthur Green / Royal HaskoningDHV, 2022) and therefore the Applicant is not currently progressing this option.
Closure of sandeel and sprat fisheries	It is recognised that a permanent closure of sandeel fisheries in English North Sea waters is being introduced from April 2024 (Defra, 2024) and that the Energy Act provides the powers to allow this measure to be allocated as compensation for offshore wind projects. The process whereby sandeel closures can be used as compensation is still in development and at this stage, it is not considered further as a potential compensatory measure for North Falls. However, the Applicant recognises that sandeel closures could be a compensatory measure that the Secretary of State could rely on in the future to provide compensation either for North Falls alone or as part of a strategic approach to compensation. This option is not considered further by the Applicant. However, should this become available as a strategic option, the Applicant may give this further consideration.
Enhance breeding habitat (e.g. with nesting rafts and/or habitat management)	**There is good evidence that provision of nesting rafts and habitat management can increase the breeding success of red-throated divers. This would result in increased numbers of juveniles recruiting into the population and in due course (the age of first breeding is three years) increased numbers of breeding adults. This could offset any adverse effects on over-winter survival as a result of displacement from OWFs during the non-breeding season.** **This is the primary without prejudice measure being considered by the Applicant as compensation for red-throated diver (if required).**
Creation of 'sanctuary' or 'reserve' areas within the OTE SPA	**Creation of marine reserves within the OTE SPA was reviewed as a possible compensatory measure for red-throated divers, in MacArthur Green (2022). These reserves would offer a sanctuary from disturbance from vessel activity, fishing, recreation and other sources of human disturbance and could provide a compensatory measure directly related to disturbance effects in the OTE SPA.** **This would require government intervention and would therefore be a potential strategic option. This is discussed further in Section 8.1**
Collection of data to support the development of a sanctuary/reserve area	**Natural England has advised that data collection in collaboration with the consented** EA1N **and EA2 offshore wind farms could be an alternative compensatory measure.** **This collaborative compensation option is discussed in Section 8.2.**
Designation of additional SPAs	Natural England advised that any areas that meet the requirement to be designated as SPAs should have been or should be designated. This measure is

Measure	Conclusions
	therefore not considered further, however, should this become available as a strategic option, the Applicant may give this further consideration.
Contribution to a strategic fund	**In accordance with the SEP&DEP DCO, which enables compensation to be delivered through contribution to a Strategic Compensation Fund, this option is included for North Falls. However, it is recognised that compensation for red-throated diver is not yet listed on the Defra (2024b) library of measures.**

26. Enhancement of breeding habitat is the preferred compensatory measure that could be delivered by the Project alone. Further consideration has been given to where this compensatory measure could be delivered, noting that current evidence indicates the population of red-throated diver which overwinter in the OTE SPA breed in Fennoscandia, while the UK breeding population in Scotland has limited connectivity with the OTE SPA (discussed further in Section 6.2.2).

27. Natural England advised the Applicant that: “implementing this measure in Scotland currently represents the only realistic option for project-delivered measures and that it could deliver legitimate conservation benefits to the species and to some extent the National Site Network (NSN), albeit to sites classified for breeding rather than non-breeding divers. In comparison it seems unlikely that Fennoscandia offers meaningful conservation opportunities, given the sites are outwith the NSN and any breeding season benefits to the population might be neutralised by the predicted impacts of North Falls” (Letter dated 15 December 2023, see Annex 1A)

28. Since this advice was received, there have been further discussions with Natural England. While the Applicant is mindful of the advice of Natural England, the option for nesting rafts in Finland has been progressed given that there is evidence of connectivity between red-throated divers breeding in Finland and the OTE SPA. The option for nesting rafts in Scotland has also been progressed, and consideration extended to other measures in combination with, or instead of, rafts, to increase breeding productivity. Hence this report (Sections 5 to 7) provides the information on provision of management measures (e.g. nesting rafts) in breeding areas of Scotland and Finland.

29. The strategic options, including creation of marine reserves/sanctuary areas or contribution to a strategic fund, or the collaborative option of data collection in the OTE SPA are discussed further in Section 8.

5 Ecological evidence

5.1 Evidence that RTD productivity is constrained

5.1.1 Average red-throated diver productivity

30. Red-throated divers start breeding at around 3 years old. They typically lay 1-2 eggs in a shallow scrape immediately adjacent to an inland waterbody (e.g. lake,

pond, loch, or lochan[2]; hereafter 'waterbody'). Incubation lasts for approximately 26 days. On hatching, the chicks usually spend the first 24 hours in the nest but after that rarely return to land, staying on the water on the breeding waterbody. They are fed on fish brought back to the breeding waterbody by both parents, either from the sea or freshwater lakes and rivers. Chicks usually fledge around age 5-6 weeks, at which point they move to the sea.

31. Red-throated divers are a long-lived species with relatively low and highly variable productivity (Rizollo et al. 2014; Erikkson & Johansson, 1997; Ollason et al 2021; Hulka, 2010). Comparisons of productivity are not straightforward as methods of data collection are not always identical.

32. Nest failure is highest during incubation (Hulka, 2010; Gomersall, 1986) so surveying needs to commence very early in the breeding season in order to identify early nest failure (Dahlen & Erikkson, 2002; Rizzolo et al, 2014) and avoid biasing productivity estimates.

33. Additionally, surveys that do not visit nesting waterbodies late in the season can assume that chicks successfully fledged, rather than failing, thereby over-estimating productivity. But this needs to be balanced against the risk of disturbance caused by each visit to assess breeding status. Human disturbance is known to reduce breeding success in red-throated divers and consequently, some methods of monitoring productivity can increase the risk of nest failure (Bundy, 1978; Rizollo et al. 2014). Therefore, productivity measures based on multiple nest site visits, whilst capturing the full breeding season, may cause a lower productivity (Rizzolo et al. 2014; Hulka, 2010).

34. Another source of variation among estimates of productivity is the point at which a nesting attempt is classed as 'successful'. Generally, a nesting attempt that results in at least one 'large' juvenile, e.g. two-thirds the size of an adult (Ollason et al. 2021) is considered to be successful. However, Lokki & Eklof (1984) classed a nesting attempt as successful if a chick hatched and their very high estimates of productivity are probably partially due to this.

35. In Scotland, estimated red-throated diver productivity was surprisingly consistent across years and sites (Table 5.1). Gomersall (1986) found annual productivity of at least 0.51 chicks fledged per breeding pair across 191 nesting attempts, and a review of all field studies for Shetland gave a mean annual productivity value of 0.45/pair, based on 1,104 nesting attempts. Since no trends in the Shetland population were detected, Gomersall (1986) concluded that this productivity was sufficient to maintain a stable population in Shetland. Annual productivity in south-west mainland Scotland (Kintyre, Argyll) was found to be slightly lower at 0.34 large chicks per pair (Merrie et al. 1996; Dewar & Lawrence, 2023).

36. The exception to this stability across most of Scotland, was the estimate of productivity for mainland Shetland of 0.77 (Fraser et al. 2009). This estimate was derived from monitoring as part of the Viking Wind Farm EIA[3]. In two years

[2] Lochans are small holes in peat that contain water

[3] Environmental Impact Assessment 2009 | Viking Energy Wind Farm

(2003, 2005), productivity was at least 1.00 fledged young per breeding pair, but in another four years (2004, 2006-2008) productivity was lower, ranging from 0.54-0.75. Productivity in this part of Shetland was found to be higher than elsewhere on Shetland (Fraser, et al. 2009).

37. Red-throated diver productivity was generally higher in Fennoscandia and North America than Scotland, although was also highly variable (Table 5.1). Productivity on the Swedish Holmoarna archipelago, in the Pomeranian Sea, was more similar to Scottish productivity, at 0.35-0.41 chicks per pair per year (Lehtonen, 2016; Ollason et al. 2021). However, caution should be used when comparing productivity estimates from these different studies due to different methodological approaches influencing productivity estimates, as explained above.

Table 5.1 Estimates of red-throated diver productivity (mean numbers of chicks* fledged per pair per annum)

Productivity	Location	Year(s)	Source
0.36 - 0.51	Shetland, Scotland	1981, 1982	Gomersall (1986)
0.45	Shetland, Scotland	1918-1982	Gomersall (1986)
0.41	Unst, Shetland, Scotland	1973 + 1974	Bundy (1978)
0.77	Mainland Shetland, Scotland	2003-2008	Fraser et al (2009)
0.34 (0-0.8)	Kintyre, Scotland	2016-2020	Dewar & Lawrence (2023)
0.34	Argyll, Scotland	1973-1993	Merrie et al. (1996)
0.76	Central Sweden	1991-2000	Dahlen & Erikkson (2002)
1.15	Southern Finland	1979-1982	Lokki & Eklof (1984)
0.65-1.04	Southern Finland	1993-2011	Nummi et al (2013)
0.35	Holmoana Islands off east coast Sweden	2012-2015	Lehtonen (2016);
0.07-0.41	Holmoana Islands off east coast Sweden	2010-2015	Ollason et al. (2021)
0.17-1.0	Yukon-Kuskokwim Delta, Alaska	1998-2004	Rizollo et al (2014)

* Note, the definition of a successful nesting attempt varied among studies and consequently productivity rates are not directly comparable

5.1.2 Factors limiting productivity

38. Red-throated diver productivity has been shown to be related to a range of factors including human disturbance, predation by mammalian and avian predators, food availability, distance to foraging areas from breeding waterbodies, fluctuating water levels in breeding waterbodies, the presence of natural islets or artificial rafts, and the size of breeding waterbodies. However, in many cases, the cause of individual nest failures is not known (Dahlen & Erikkson, 2002).

39. In a review, Hulka (2010) found the following improved breeding success: vegetation around nest site >30cm height, smaller breeding waterbodies with inflow/outflow streams rather than static pools and nests being <9km from foraging areas.

5.1.2.1 Food availability

40. Availability of prey will affect productivity, through both adult body condition and chick provisioning rate. If there is insufficient prey available for adults in the pre-breeding season, they may fail to attempt to breed. Reduced prey early in the breeding season could mean the adults may not be able to maintain their body condition during incubation and so abandon the eggs. As a long-lived species with low productivity, red-throated diver will tend to prioritise maintaining their own condition over their current breeding attempt, postponing breeding to another year with better conditions.

41. Chicks are fed on fish prey either from the sea or freshwater lakes and rivers. Scottish red-throated divers are dependent on lipid rich prey, such as sandeels (*Ammodytes marinus*). When prey is scarce, foraging trip duration will increase so the adults will be away from the nest for longer periods which increases the likelihood of a predator taking the eggs or chicks. Rizollo et al. (2014) found a combination of high fox occurrence and low lipid-rich fish prey resulted in low productivity.

5.1.2.2 Nesting waterbody size

42. Generally, red-throated divers tend to nest on the banks of small inland waterbodies. For example, in Scotland, a negative relationship has been reported between breeding success and loch size (Bundy, 1978; Gibbons et al, 1994; Gomersall, 1986; Okill & Wanless, 2011) although Hulka (2010) did not find higher breeding success on smaller lochs. In Sweden, Lehtonen (2016) reported lake area to be negatively related to breeding success. Dahlen & Erikkson (2002) found the majority of red-throated divers bred on small lakes but found no evidence of higher breeding success on larger lakes. In Scotland, lochs/lochans smaller than 1 hectare have been reported in some studies to have higher breeding success (Gomersall, 1986; Bundy, 1978), while other studies have reported higher success at even smaller lochs of 0.3 ha (Okill & Wanless, 2011). In Finland, Nummi et al. (2013) monitored red-throated diver breeding success at waterbodies, some of which had rafts installed and others with no rafts. Waterbodies used by red-throated divers ranged in size, from very small to relatively large (0.1 - 94.5 ha). Nummi et al. (2013) did not report any relationship between waterbody size and breeding success.

5.1.2.3 Sudden changes to water level on breeding waterbody

43. Red-throated divers nest at the water's edge of static waterbodies, i.e. not on the banks of rivers. This is an anti-predatory mechanism, as incubating adults can slip into the water undetected when a predator approaches, which protects the eggs by reducing nest detection.

44. Water levels can change through natural processes, e.g. excessive rainfall, drought, or through water being removed, e.g. in reservoirs (Okill & Wanless, 2011). In Orkney, dry periods can result in small lochs drying out both through evaporation and through peat erosion causing lochs to drain, causing nesting failure (*pers. obs.* S. O'Brien). The underlying geology and habitat affect the underlying hydrology which in turn influences the rate at which lochs drain in dry

periods (Bundy, 1978; Viking Energy Partnership, 2010; Hulka, 2010; *pers. comm.* D. Jackson).

45. Changes in water level during incubation can either flood or strand nests, both of which may cause nest failure. However, other factors appear to affect this relationship; Hulka (2010) found nests in Shetland that were closer to the water edge had higher breeding success than those further from the water. However, Dahlen & Erikkson (2002) found no evidence of the distance from nest to water influencing breeding success in Swedish divers.

5.1.2.4 Distance from foraging areas

46. Red-throated divers breeding near the coast forage at sea, both for themselves and their chicks, whereas divers breeding further inland forage in freshwater lakes/lochs. Above a certain point, the distance to foraging areas has been shown to be negatively correlated with breeding success (Lehtonen, 2016; Erikkson & Johansson 1997).

47. In Shetland, Hulka (2010) found no relationship between breeding success and distance to the sea but all nesting lochs/lochans were relatively close to the coast.

48. In North America, Eberl & Picman (1993) found no relationship between hatching success and distance between breeding lake and foraging waters, up to a threshold value of approximately 9km. When foraging and breeding areas were more distant, the feeding frequency of chicks decreased.

5.1.2.5 Predation

49. Predation is generally the most common ultimate cause of nest failure (Bundy 1976; Gomersall 1986; Eberl & Pieman 1993; Dahlén & Eriksson 2002; Hulka, 2010; Dewar & Lawrence, 2023; Ollason et al 2021). However, determining the cause of nest failure is difficult and identifying the predator of eggs or chicks is even more challenging (Okill & Wanless, 2011; Dewar & Lawrence, 2023).

50. In Shetland, egg and chick predators include great skua (*Catharacta skua*) (Furness, 1981; pers. comm. D. Okill) with predation frequency potentially being increased in the presence of human disturbance (Bundy, 1978; Furness, 1981). Other potential predators in Shetland include hooded crow *Corvus corone cornix,* raven (*Corvus corax*), arctic skua (*Stercorarius parasiticus*), great black-backed gull (*Larus marinus*), lesser black-backed gull (*Larus fuscus*), herring gull (*Larus argentatus*), common gull (*Larus canus*) and otter (*Lutra lutra*) (Gomersall, 1986; Hulka, 2010).

51. Elsewhere in Scotland, other presumed predators of red-throated diver nests were common gull, herring gull*,* great black-backed gull*,* and possibly otter and American mink (*Neovison vison;* Dewar & Lawrence, 2023; Bundy, 1978).

52. In Sweden, Ollason et al. (2021) reported red fox (*Vulpes vulpes*), common cranes (*Grus grus*) and white-tailed eagles (*Haliaeetus albicilla*) affecting red-throated diver breeding success. In North America an index of fox presence was negatively associated with red-throated diver breeding success (Rizollo et al. 2014).

5.1.2.6 Human disturbance

53. Red-throated divers are highly sensitive to the presence of humans and will flush from their nests readily. Human disturbance can be from fishing, bird

watching, recreational watersports and walkers, particularly with dogs (Bundy, 1978; Dahlen & Erikkson 2002; Nummi et al. 2013). Repeated visits to red-throated diver nests by fieldworkers has also been demonstrated to reduce breeding success (Rizollo et al. 2014).

5.2 Evidence that natural islands and artificial nesting rafts can increase productivity

5.2.1 Natural islands

54. Breeding success was slightly higher at Swedish lakes with islands, than lakes with no islands (Dahlen & Erikkson, 2002) and divers will preferentially use islands over the shore (Eberly & Picman, 1993; *pers obs.* S. O'Brien) but the presence of islands was not found to increase breeding success in Shetland (Gomersall, 1986). Dahlen & Erikkson (2002) suggest this might be due to the prevalence of aerial predators in Shetland.

5.2.2 Provision of artificial nesting rafts

55. There is good evidence for artificial nesting rafts increasing productivity in three species of diver, including red-throated diver.

56. Productivity in common loons (great northern divers, *Gavia immer*) in North America increased following provision of rafts on lakes with fluctuating water levels and a higher human development index (de Sorbo et al. 2010). Hatching success increased by 69% and fledging success by 32% following provision of artificial nesting rafts for common loons, due to reduced mammalian egg predation (Piper et al. 2002).

57. Scottish black-throated diver productivity also increased after provision of artificial rafts, from around 0.24 to 0.35 large chicks per occupied territory (Hancock et al. 2000).

58. Red-throated diver productivity in Argyll increased from an average of 0.35 young per year to 0.75 young per year following provision of rafts (Merrie, 1986; Rheinallt et al. 2007). The increase in productivity was thought to be due to eliminating nest flooding from fluctuating water levels and reducing impacts of human disturbance and predation by foxes and mink.

59. Red-throated diver productivity has also been shown to increase following provision of artificial nesting rafts in Finland (Lokki & Eklof, 1984; Nummi et al, 2013). Annual productivity increased from 0.98 to 1.29 chicks per pair (Lokki & Eklof, 1984). Nummi et al. (2013) compared red-throated diver productivity in two areas in southern Finland, one in which 10 rafts had been installed and another with no rafts. Both areas had human disturbance from dog walkers, fishing and water sports. The area with rafts showed a strong increase in productivity, averaging 1.04 juveniles per pair per year (where a juvenile was described as a chick of about 3 weeks of age). The area with no rafts maintained a lower productivity of a mean of 0.65 juveniles per pair per year. The study population that was provided with rafts also showed a strong increase in number of breeding pairs over the 15 years of the study, while the control population without rafts remained at very low numbers (Nummi et al. 2013).

60. Furness (2013) estimated that red-throated diver productivity in Scotland could be increased from an average of 0.3 to 0.7 chicks per pair by providing artificial nesting rafts. This increase of 0.4 chicks per pair is similar to that found in Finland following nest provision (Nummi et al. 2013).

5.3 Evidence of the benefits of habitat management

61. As discussed in Section 5.1.2.3, drying out of Scottish lochs, e.g. due to peat erosion, can present a constraint on breeding success. In these circumstances, nesting rafts may be unsuitable or may require additional habitat management.

62. Noting the small size of waterbodies preferred by red-throated diver for breeding, these are particularly vulnerable to drying out in Scotland due to drainage resulting from peat erosion (S.Hulka, D.B Jackson pers.obs., cited in Hulka, 2010; S. O'Brien pers. obs.). As a result of peat erosion, many lochans that were once suitable for nesting divers are now less suitable or totally unsuitable (Viking Energy Partnership, 2010).

63. Management and/or restoration of peatland (e.g. by reprofiling, damming and bunding) has been used to successfully raise groundwater and create small waterbodies (e.g. NatureScot, 2023).

64. Restoration and management of peatland lochans is being undertaken by the Viking Wind Farm, in Shetland to benefit red-throated diver, as part of the Habitat Management Plan (Viking Energy Partnership, 2010; Plantecol Ltd, 2019).

5.4 Site selection for compensation

65. Ideally, compensation would be delivered at the impacted site (the OTE SPA) but this is not feasible as a project led measure (see Sections 4 and 8). The options are therefore to deliver benefits to the same population of red-throated divers that use the OTE SPA or to contribute to the maintenance of the UK NSN for this species.

66. A three-stage approach to site selection is underway:

- Identify suitable countries in which compensation could be implemented, taking into account connectivity with the OTE SPA and feasibility of working within the country (Section 5.4.2);
- Identify suitable regions within the countries for implementing compensation, taking into account density of divers breeding in the area and evidence of productivity being suppressed (Section 5.4.3); and
- Identify suitable waterbodies within either Scotland or Finland for implementing compensation, taking into account a range of factors to identify optimal waterbodies (Section 6.3).

5.4.1 Connectivity with OTE SPA

67. The OTE SPA is used in the non-breeding season by red-throated divers drawn from a wide breeding area, including Greenland, Scandinavia and Russia (Kleinschmidt et al. 2022; see DIVERLOG | GSM GPS tracking of Red-throated

divers (divertracking.com) for more information on movements of GPS tagged divers).

68. Evidence from red-throated divers fitted with geolocator tags on their breeding grounds in Finland, Scotland (Orkney and Shetland) and Iceland suggests divers from Finland move into the southern North Sea in mid-winter whereas divers from Scotland remain around Scottish and Irish coasts in the non-breeding season (Duckworth et al. 2021).

69. There have been very few ringed red-throated divers recovered along the coastal boundary of the OTE SPA. All records of ringed red-throated divers recovered from an area defined by a latitude of between 0º and 1.8ºE longitude of between 50.0º and 55.0º N were examined to determine the origin of red-throated divers using the OTE SPA. (Note, the defined area is larger than the OTE SPA but allows for movement of birds along the coast to the north and south of the SPA boundary.) Table 5.2 shows that the 12 individuals recovered between 1959 and 2016 were from Greenland, Finland, Sweden, Norway and Scotland[4].

Table 5.2 Recoveries of ringed red-throated divers found in south-east England.

Ringing location	Ringing date	Recovery location	Recovery date
Greenland	1950	Essex	1959
Greenland	1955	Kent	1964
Finland	1967	Kent	1970
Scotland (Shetland)	1979	East Sussex	1981
Scotland (Shetland)	1979	Essex	1983
Scotland (Shetland)	1982	Kent	1990
Finland	1984	Kent	1986
Finland	1987	Suffolk	1990
Sweden	1988	Essex	1990
Scotland (Shetland)	1992	Suffolk	2002
Sweden	1998	Kent	2001
Norway	2015	Kent	2016

70. Recoveries of red-throated divers ringed in Shetland showed that, in their first winter, birds tend to move further south to France and Spain, compared with their second winter. In summer, some individuals return to the breeding grounds when aged 1, more individuals return when aged 2 and by age 3, most individuals return to the breeding grounds, even if they do not actually breed (Okill, 1994).

[4] Ringing records were provided by the British Trust for Ornithology. The BTO Ringing Scheme is funded by a partnership of the British Trust for Ornithology, the Joint Nature Conservation Committee (on behalf of: Natural England, Natural Resources Wales, NatureScot and the Department of Agriculture, Environment & Rural Affairs, (Northern Ireland)), The National Parks and Wildlife Service (Ireland) and the ringers themselves.

71. The BTO ringing data showed that, of the 196 Shetland-ringed birds that were recovered, 46% were recovered within 50km of where they were ringed.

72. During the non-breeding season there is substantial turnover of individuals at any given site with individuals moving around the network of protected sites (European Natura sites and the UK NSN).

5.4.2 Country selection

73. The tagging and ringing information shows strong evidence of connectivity between the OTE SPA and red-throated divers which breed in Siberia, Svalbard, Greenland and Finland. There is also some evidence of connectivity between the OTE SPA and Sweden, Norway and Scotland.

74. Implementing compensation measures in Siberia, Svalbard or Greenland is not logistically feasible due to the physical and political challenges of working in these areas. Therefore, Finland offers the most feasible location for sites with connectivity with the OTE SPA for delivering compensation.

75. Finland has many Natura 2000 sites with red-throated divers as a feature. However, the UK's protected sites are no longer part of the EU Natura 2000 network, with SPAs now part of the UK NSN. The UK NSN includes breeding and non-breeding sites (e.g. OTE SPA). Compensation implemented in Finland will contribute to the NSN by benefiting a population which is a component of the wintering population within the NSN being impacted by North Falls. Compensation in Scotland will directly benefit the NSN. Natural England have advised (15 December 2023, see Annex 1A) that their preference is to deliver compensation within the UK NSN.

76. Nonetheless, at this stage North Falls is continuing to explore options to deliver compensation in both Scotland and Finland.

5.4.3 Region selection

77. There is good evidence that rafts increase red-throated diver productivity in either Scotland and Finland (see Section 5.2.2 Provision of artificial nesting rafts).

78. Within each country, regions have been identified which are optimal for delivering this compensatory measure. Key aspects that are being considered are:

- Areas of high red-throated diver breeding density;
- Evidence that productivity is suppressed in the region;
- Logistical and practical feasibility of implementing compensation in a region.

79. Areas of high red-throated diver breeding density are preferable for implementing compensation for two reasons. Firstly, for practical and logistical reasons, working in an area of high density of divers will be more efficient than areas with breeding waterbodies widely separated. Proposed compensation measures (Section 6.4.1 below) include control waterbodies at which no compensation is implemented, to provide a representative comparison of

productivity increases seen at waterbodies with rafts; these would ideally be close to waterbodies with compensation measures.

80. Secondly, red-throated divers have high site fidelity. Therefore, new breeding pairs are unlikely to move into areas in which there are currently few divers, i.e. rafts are more likely to be used by existing breeding pairs, and hence the compensation will have a higher likelihood of success if implemented in areas of high diver density.

5.4.3.1 Scotland

81. In 2006, during the last census of the British breeding population of red-throated divers, there were an estimated 1,255 pairs (95% confidence intervals: 1,014-1,551), with breeding occurring only in Scotland (Dillon et al. 2009). The largest breeding population and highest densities are found in Shetland, where numbers have been relatively stable since 1994 (Gibbons et al. 1997; Dillon et al. 2009). Red-throated divers breed at lower densities on mainland Scotland and have lower breeding success (Gibbons et al. 1997; Gibbons et al 1994).

82. NatureScot has advised the Applicant to avoid looking to implement compensation within SPAs in Scotland, as this would not be considered additional to conservation management that is already being delivered or planned for the SPAs (consultation meeting 13 February 2024). Consequently, the optimal region in which to deliver compensation would be an area of high diver breeding density outside of SPAs. Table 5.3 lists all terrestrial SPAs in Scotland that have a breeding red-throated diver feature. Dillon et al. (2009) estimated the number of breeding pairs of red-throated divers across five regions of Scotland: Shetland, Orkney, Western Isles, Inner Hebrides and Mainland Scotland. Within each region, the number of pairs within SPAs was also estimated, and the estimated number of pairs of breeding red-throated divers outside of SPAs. The location of these SPAs is shown in Figure 5.1.

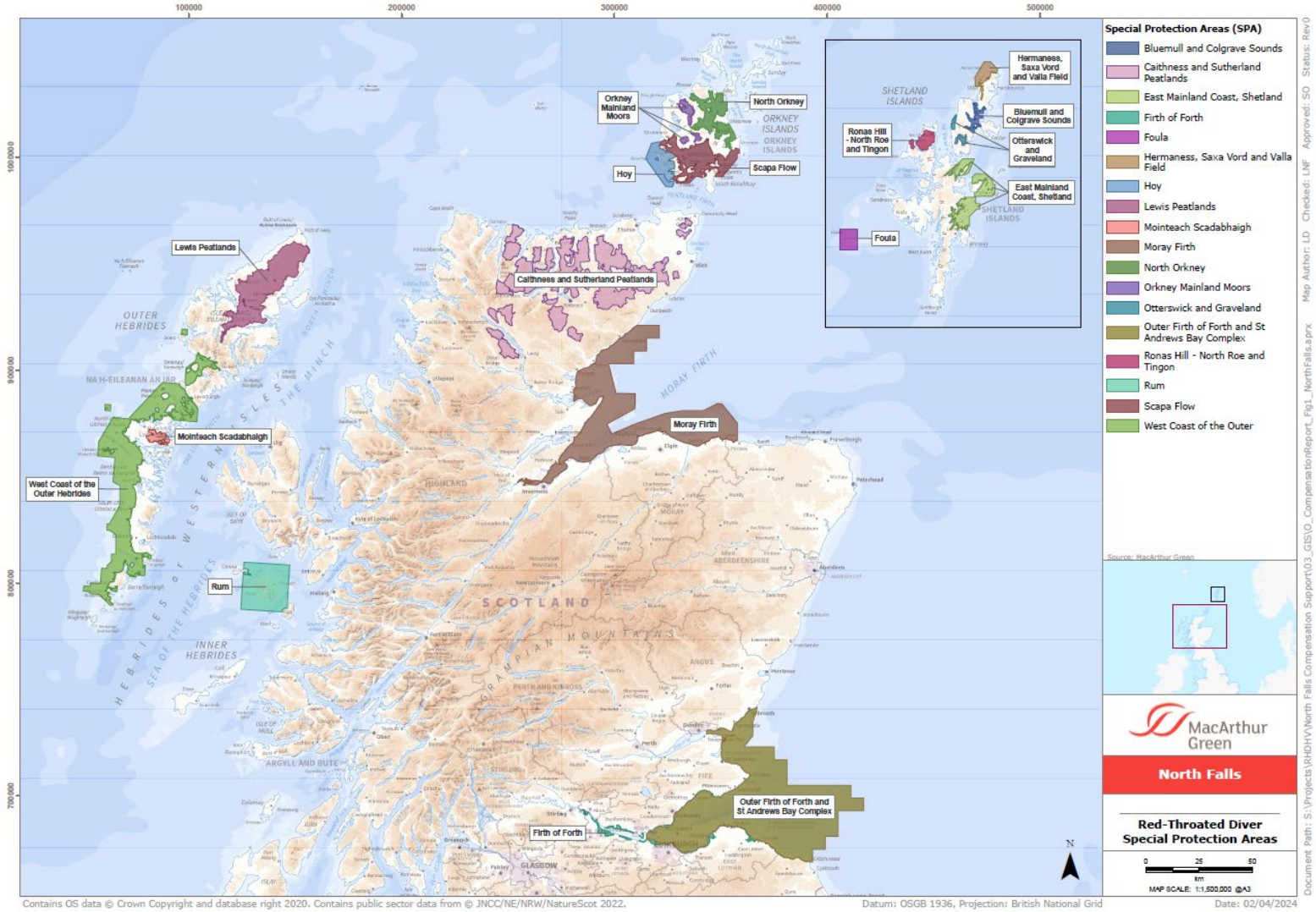

Figure 5.1 Location of SPAs in Scotland with a red-throated diver feature, including breeding and non-breeding features as well as terrestrial and marine sites.

Table 5.3 Estimated numbers of breeding pairs of red-throated divers in Scotland in 2006, from Dillon et al. (2009). The estimated number of pairs in each SPA is given, along with the total estimated number of pairs in each region. The number of pairs outside of SPAs is the difference.

Region	SPA	No. of breeding pairs (in 2006)		
		In SPAs	In region	Outside of SPAs (% population)
Shetland	Foula	8	407	**304 (75%)**
	Hermaness, Saxa Vord and Valla Field	22		
	Otterswick and Graveland	23		
	Ronas Hill - North Roe and Tingon	50		
	TOTAL	103		
Orkney	Hoy	46	97	**27 (28%)**
	Orkney Mainland Moors	24		
	TOTAL	70		
Western Isles	Lewis Peatlands	80	317	**220 (69%)**
	Mointeach Scadabhaigh	17		
	TOTAL	97		
Inner Hebrides	Rum	13	221	**208 (94%)**
	TOTAL	13		
Mainland	Caithness and Sutherland Peatlands	46	227	**181 (80%)**
	TOTAL	46		
All Scotland	**TOTAL in all SPAs**	**329**	**1,255 pairs (1,014-1,551 95% CI)**	**926 pairs (74%)**

83. An estimated 329 pairs of divers were breeding within SPAs in Scotland, with 74% of the diver population breeding outside of SPAs. Shetland has the largest population of breeding divers outside of SPAs, followed by the Western Isles and Inner Hebrides (Table 5.3). Consequently, North Falls is currently considering implementing red-throated diver compensation in Shetland, and will consider other regions of Scotland if required.

5.4.3.2 Finland

84. Red-throated diver breeding density is generally higher in southern Finland (Figure 5.2). Implementing compensation in southern Finland is likely to be effective, as both human disturbance and mammalian predation pressure are higher in southern Finland. Also, working in southern Finland is logistically more feasible, with more roads and infrastructure. Therefore, southern Finland is a focus area for site selection for red-throated diver compensation.

85. Many lakes already have rafts supporting breeding divers and therefore a key consideration in the Finnish site selection, in addition to identifying areas of high density breeding red-throated diver, includes identifying sites which have no

previous nesting raft, unless the previous raft has decomposed or is unsuitable for breeding.

86. The existence of several suitable lakes close to each other is also preferred to aid logistics and monitoring of breeding success. This resulted in three primary areas of search (Figure 5.3), which are:

- Suomusjärvi area in western Uusimaa and eastern Varsinais-Suomi,
- Kuhmoinen area in eastern Pirkanmaa and northern Päijät-Häme (east of lake Päijänne), and
- Mäntyharju region (east of lake Päijänne) in eastern Päijät-Häme, southern Etelä-Savo and northern Kymenlaakso.

87. Should additional locations be required, consideration would be given to areas further north/northwest towards Jyväskylä and areas north of Tampere, and/or east/northeast towards Savonlinna.

[redacted]

[redacted]

0 25 50 100 nm

0 50 100 200 km

Data Source: © UNEP-WCMC and IUCN (2024). © HaskoningDHV UK Ltd. 2024.
Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other contributors. © OpenStreetMap (and) contributors, CC-BY-SA.

Drawing Title

Red-Throated Diver Breeding Locations

Rev	Date	Remarks	Drwn	Chkd
01	28/06/2024	First issue	FC	GK

Drawing Number	Figure Number
PB9244-RHD-ZZ-OF-DR-GS-0603	5.2

Scale	Plot Size	Datum	Projection
1:5,000,000	A3	WGS84	UTM35N

Royal HaskoningDHV
Enhancing Society Together

NORTH FALLS
Offshore Wind Farm

300000

400000

500000

6800000

6700000

0 5 10 20 nm

0 10 20 40 km

Data Source: © UNEP-WCMC and IUCN (2024). © HaskoningDHV UK Ltd. 2024.
Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other contributors. © OpenStreetMap (and) contributors, CC-BY-SA.

Drawing Title

Preferred Areas for Red-Throated Diver Compensation in Finland

Rev	Date	Remarks	Drwn	Chkd
01	28/06/2024	First issue	FC	GK

Drawing Number	Figure Number
PB9244-RHD-ZZ-OF-DR-GS-0604	5.3

Scale	Plot Size	Datum	Projection
1:950,000	A3	WGS84	UTM35N

Royal HaskoningDHV
Enhancing Society Together

NORTH FALLS
Offshore Wind Farm

File ref: C:\Users\305050\OneDrive - Royal HaskoningDHV\Team - Project-PB9244-North-Falls-Team-Space\WIP\E02 GIS\02_Shared\02_Figures\06_HRA\HRA_Derogation\PB9244_RHD_ZZ_OF_DR_GS_0604_RTD_PreferredCompensationAreas.mxd

5.4.4 Ecological constraint factors

88. The sites to deliver the red-throated diver compensation (if required) will be subject to a detailed site selection exercise (Section 6.3), taking into account the ecological considerations discussed below.

5.4.4.1 Breeding density

89. Red-throated divers have high breeding site fidelity, either breeding on the same or a nearby waterbody once they start breeding (Dahlen & Erikkson, 2022; Okill, 1992; Eberl & Picman, 1993; Gomersall, 1986). Additionally, individuals tend to recruit into the same breeding areas from which they fledged (Okill, 1992).

90. The aim of installing rafts or providing habitat management/restoration is to increase the productivity of existing pairs of breeding red-throated divers rather than to increase the number of pairs (e.g. by making more waterbodies suitable for breeding). The additional offspring would augment the NSN breeding populations, depending on the location of the compensation measures (see below). Consequently, raft provision will be most effective if undertaken in areas with a relatively high density of breeding red-throated divers in order to maximise raft use and thereby increase productivity.

5.4.4.2 Proximity to SPAs

91. NatureScot advised against trying to implement compensation within SPAs with breeding red-throated diver features, as this would not be considered additional to conservation management of the site (NS meeting 13 February 2024). Natural England has advised implementing compensation as close as possible to SPAs to maximise the chances of the compensation measure benefiting the SPA populations and therefore the NSN (ETG, 11th April 2024). The Applicant proposes to select sites that are outside but close to European sites.

92. Evidence from recoveries of divers ringed as chicks in Shetland show that females tend to recruit into areas further from their natal area than males. Although sample sizes are small, males were found breeding only 0.5 - 4.4km (mean 2km) from their natal site, whereas females moved 6 - 68km (mean = 38km; Okill, 1992). A similar pattern was seen in red-throated divers ringed as chicks in Finland, with adult males found breeding an average 14km from their natal site, whereas females bred an average 136km from their natal site (unpublished data, Petteri Koskimies Dia 1 (birdlife.fi).

93. Consequently, while compensatory measures should ideally be implemented as close to SPA boundaries as possible, in practice there would be some benefits to the NSN expected from rafts placed at waterbodies within 68km of SPAs.

5.4.4.3 Waterbody size

94. Most studies reported higher breeding success on small waterbodies in Scotland (see section 5.1.2.2). It is not clear why breeding success is lower on larger lochs. However, rafts installed in small waterbodies are more likely to be used, given that red-throated divers preferentially breed on small waterbodies. Waterbodies of up to 5ha will be preferentially selected.

5.4.4.4 Past breeding success

95. Rafts will be most beneficial at waterbodies where red-throated diver productivity is currently constrained. To boost productivity, nests on rafts at a given site need to result in higher breeding success than would otherwise occur

at existing nests (e.g. on the shores of lochs). Consequently, individual waterbodies will be selected where there are records of factors such as a history of water level fluctuation, disturbance from local human activity and predation by mammalian predators that are unlikely to predate a nest on an island.

96. Section 5.1.2 lists the primary constraints on red-throated diver productivity. Of these, the following are likely to be fully or partially addressed by rafts (Furness 2013):

- Mammalian predation, specifically fox predation. Whilst foxes can swim, they generally tend not to predate nests on islands/rafts. Other mammalian predators such as otters and mink are aquatic and are as likely to predate a nest on an island/raft as on the shore.
- Human disturbance. Red-throated divers are highly sensitive to the presence of humans and readily flush from their nests, even when people are far from their nests. When on islands/rafts, divers are less likely to flush from their nests. Eggs left unattended due to disturbance may chill in poor weather, but the bigger risk is of predation.
- Changes in water level in the nesting waterbody. Nests on floating rafts will not be flooded or stranded if water levels rise or drop[5]. Nests on natural islands will be flooded or stranded, the same as on the shore.

97. Thus, rafts are most likely to be beneficial in areas with foxes, human disturbance and higher frequencies of changing water levels during incubation.

6 Details of the compensatory measures

6.1 Aims and objectives of the compensation

98. The aim of the North Falls project-led red-throated diver compensation is to increase productivity, i.e. number of juveniles fledged per pair, and thereby the population's resilience.

99. This will be achieved by:

- Reducing risk of flooding of nests or nests becoming stranded,
- Reducing predation of eggs/chicks,
- Reducing human disturbance of nesting divers (which can increase predation risk).

100. These objectives can be delivered via installation of breeding rafts and/or management of moorland habitat to reduce peat erosion and consequent draining of breeding lochs.

101. Alternative, strategic or collaborative compensatory measures are discussed in Section 8.

[5] Assuming the waterbody does not dry out altogether, if this occurs then nest will fail irrespective.

102. As discussed in Section 1, information on compensatory measures for red-throated diver is provided without prejudice of the Applicants position presented in the RIAA Part 4 Offshore Ornithology, that there will be no AEoI from North Falls alone or in-combination. The following sections, describing the details of the compensation proposals are therefore provided without prejudice of the Applicant's position to demonstrate that compensation can be secured and delivered should the Secretary of State conclude AEoI in the Appropriate Assessment.

6.2 Delivery mechanism

103. The preferred compensatory measure (if required) is to increase productivity of breeding red-throated divers by provision of artificial nesting rafts and/or breeding habitat management/restoration in Scotland or provision of artificial nesting rafts in Finland.

6.2.1 Provision of artificial nesting rafts

104. Artificial nesting rafts will be installed in waterbodies already used by red-throated divers for successful breeding, i.e. the aim is to increase productivity of established pairs rather than to increase the size of the breeding population.

105. Raft construction will follow successful methods used previously in Scotland, Finland and North America. In Finland, a network of experts have experience of successfully installing rafts that last for many years. Their advice will be sought on how best to construct durable rafts.

106. Nummi et al. (2013) used the following method for raft construction in southern Finland:

- A piece of peat with vegetation was taken from the edge of the breeding loch and placed on a raft that was approximately 1m x 1m. Below the raft were two 20 litre plastic canisters to provide buoyancy;
- The raft was anchored to the bottom of the waterbody by a rope attached to a heavy rock;
- The raft needed to be at least 15cm above the water level but not so high that divers could not easily enter and exit the nest;
- The vegetation on the raft continued to grow, providing cover for nesting divers.

107. Care will also be given to where rafts are sited within breeding waterbodies, taking into account prevailing wind conditions with the aim of placing rafts in sheltered areas. Also, consideration will be given to human disturbance, looking for areas with least disturbance.

108. Rafts used successfully to date in Scotland and Finland are uncovered. Given that aerial predation is likely to be suppressing productivity in Scotland, it may be helpful for rafts to be roofed. However, this will only be considered if productivity is not sufficiently increased by provision of standard rafts (i.e. adding roofs will be part of the adaptive management plan). An additional adaptive option which may be taken forward alongside or in place of raft provision would be to undertake habitat management to maintain water levels

in diver breeding lochs. These are discussed in more detail in the adaptive management section (6.7.3).

6.2.2 Habitat management to reduce peat erosion and draining of breeding lochs

109. As discussed in Section 5.3, in Scotland, red-throated divers frequently nest at the edges of small lochans that form in peat moorlands. These lochans fill with rain water and the water is retained within the pools, i.e. they generally have no inflow or outflow. However, in areas with poor peat management, erosion can cause damage to the integrity of the peat, resulting in water seeping away. For lochans which divers use for breeding, this can result in nests being stranded and failing. Thus, if Shetland were to be selected as the compensation area for North Falls, it could be that peat habitat management would be identified as the compensation measure, rather than or in addition to, installation of nesting rafts.

110. The Viking Wind Farm Habitat Management Plan (Viking Energy Partnership, 2010) includes methods to identify diver lochs with currently high productivity that are at risk of deterioration due to peat erosion. Measures to stop peat erosion and better manage local hydrology will be implemented around these high productivity lochs, to ensure that high productivity is maintained.

111. Whilst North Falls will not be working within the Viking Wind Farm Habitat Management Plan area, a similar approach can be implemented in nearby areas of mainland Shetland (pers. comm. D. Jackson). Habitat management could include (Plantecol Ltd, 2019):

- Blanket bog restoration in proximity to lochans by:
    - Blocking eroding gullies;
    - Reprofiling gullies and peat haggs (single vertical cliffs of peat);
    - Re-vegetating the blanket bog habitat surrounding the lochan/loch to improve stability;
- Raising the water level at former or potential breeding lochans; and/or
- Enlarging small lochans that are considered to be at, or just below the minimum size required for breeding.

6.3 Location

112. If compensation for red-throated diver is required and the Project-led measure of breeding enhancement is selected, site selection would be undertaken within the Scottish or Finnish regions (discussed in Section 5.3) to identify suitable waterbodies. The principles for site selection will be agreed in the CIMP post consent, in consultation with the Red-throated diver Compensation Steering Group (RTDCSG). Site selection will consider the ecological constraint factors discussed in Section 1.1.1, as well as logistical constraints and ownership of the waterbodies and land for access to the waterbody.

113. Landowners will be consulted and consideration given to waterbody access, both for installing rafts or management/restoration measures and for subsequent monitoring. There may be some lochs/lakes that are not accessible due to landowner issues so an initial long list will be identified for deploying rafts. Landowners will be approached as early as possible.

6.4 Scale of compensation

6.4.1 Number of artificial breeding rafts to be installed

114. Typically, the scale of compensation is calculated to compensate for the predicted damage to the site, with a multiplier applied to increase the scale of compensation to address uncertainty around the likely success of the measure.

115. Natural England has advised that the compensatory measure should focus on compensating for the area of displacement (discussed further in Section 3), rather than displacement mortality.

116. There is no straightforward means to convert such a redistribution effect within the OTE SPA into a demographic effect that could be used to calculate how many rafts are required. Furthermore, even if a common currency was available, with low connectivity between breeding divers in Scotland and the OTE SPA, the benefits of compensation in Scotland are unlikely to be seen in the OTE SPA diver population.

117. Consequently, North Falls does not consider there to be any robust means by which to link one type of impact (redistribution within an overwintering SPA) to the available compensation option (boosting productivity in breeding areas). Instead, it is intended that up to 20 artificial nesting rafts and/or habitat management measures to boost breeding productivity will be installed in Scotland or Finland, paired with up to 20 control sites with no rafts/management measures installed, with monitoring to determine success. The number of waterbodies would be subject to the size of the selected waterbodies, as well as site investigations and land agreements. The water bodies would be in the same region where practicable.

118. Rafts have been shown to increase red-throated diver productivity by 0.4 chicks per pair per year (see Section 5.2.2 Provision of artificial nesting rafts). Reported raft occupancy rates have varied between 63% and 90%: in Finland, the average yearly occupation rate of rafts was 63% (Nummi et al. 2013). Thus, if 20 rafts are installed, 12 rafts would be expected to be occupied and an extra 5 juveniles per year would result; in Argyll, Merrie (1996) reported an occupancy rate of 75%, equating to 15 rafts and 6 additional juveniles; in North America great northern divers in North America were found to occupy up to 90% of rafts provided (de Sorbo et al. 2010). If red-throated divers had a similar occupancy rate in Scotland this would result in an estimated 18 rafts used per annum, and an additional 7 juveniles fledging each year.

119. The presence of juveniles hatched at Scottish compensation sites following fledging in Scottish marine SPAs would constitute an immediate contribution to the NSN. Movements of these birds further south into English nonbreeding SPAs (including OTE SPA) or the European SPA network would also contribute to those sites.

120. Juveniles from Finnish compensation sites would most directly contribute to the European SPA network, but some proportion would also be expected to use UK SPAs such as OTE SPA over the winter.

121. Furthermore, a high proportion of juveniles produced on rafts at Scottish lochs/lochans located close to terrestrial breeding SPAs would be expected recruit to those SPAs as breeding adults, further contributing to the UK NSN.

6.5 Timing of compensation delivery

122. Divers tend to start using artificial nesting rafts for breeding soon after they are installed. Half of rafts installed for great northern divers in North America were used in the first year and by the third year, 90% of rafts were in use (DeSorbo et al. 2010). Nummi et al (2013) also found rafts in Finland were used within three years of installation.

123. If the Secretary of State deems red-throated diver compensation to be a requirement for North Falls, rafts will be installed pre-construction. Red-throated divers would be expected to start using rafts the following summer, and fledglings from these sites will contribute to the NSN in their first winter (i.e. within 12 months of raft installation).

6.6 Implementation and Delivery Roadmap

124. North Falls has appointed experts in red-throated diver breeding ecology and their requirements in Scotland (Sue O'Brien, MacArthur Green; Digger Jackson, Atlantic Ecology) and in Finland (Petteri Lehikoinen, University of Helsinki). Their advice will shape the compensation, particularly site selection, to ensure this measure can be secured and delivered.

125. The steps that would be followed by the Applicant to implement and deliver the red-throated diver raft or habitat management/restoration compensation measure are as follows:

- Site selection to identify waterbodies in Scotland or Finland will be undertaken with consideration to:
    - The ecological constraint factors described in Section 1.1.1;
    - Logistical constraints e.g. access constraints; and
    - Ability to secure rights to the waterbody, in consultation with landowners for installation and monitoring.
- Other stakeholders with interests in the region and sites identified for compensation and for monitoring will be engaged early in the process.
    - Consultation during site selection will be undertaken with relevant stakeholders e.g. in Scotland, NatureScot, RSPB and the Local Planning Authority; or in Finland, the local Centre for Economic Development, Transport and the Environment ('ELY Centre'), municipal environmental protection authorities and BirdLife Finland;
    - Once the country and region has been selected, a RTDCSG would be established with the relevant stakeholders to inform the ongoing refinement of the compensation proposals;
- The requirement for legal permissions will also be established, and the relevant application(s) submitted, discussed further in Section 6.6.1;

- The detailed delivery proposals for the compensatory measure will be set out in the Red-throated Diver CIMP. This will be produced post-consent and be based on the outline version provided with the DCO application (Annex 3A Red-throated Outline Compensation, Implementation and Monitoring Plan (CIMP) (Document Reference: 7.2.3.1). It is expected that should red-throated diver compensation be required, the CIMP would be secured through the DCO and that it would require to be submitted to the Secretary of State for approval prior to construction;
- Amendments to or variations of the approved Red-throated Diver CIMP would be in accordance with the principles set out in this Red-throated Diver Compensation Document. They may only be approved where it has been agreed with the Secretary of State that they are unlikely to give rise to any materially new or materially different environmental effects and that the required level of compensation will continue to be delivered;
- The compensatory measures will be monitored (Section 6.7) and the results reported to stakeholders;
- The compensatory measure will remain in place/be maintained for the operational lifetime of the Project if the waterbodies are colonised by breeding red-throated diver.
- Adaptive management measures and monitoring (Section 6.7) would be adopted should the rafts/habitat management be unsuccessful. Consultation will be undertaken with the RTDCSG to help determine the most appropriate course of action.

6.6.1 Permits and licenses

6.6.1.1 Landowner permission

6.6.1.1.1 Finland - Permission of the water area owner

126. Placing a stationary raft in a water area requires the permission of the waterbody owner, such permission can be established contractually with or without leasing the area in question.

127. Consideration would be given to registration of the special right to ensure the right to maintain the compensation is secured for the life of the Project (i.e. even if the property owner sells the property).

128. It is recognised by the Applicant that a significant proportion of water areas in Finland are jointly owned by properties surrounding the waterbody. Appropriate agreements would be secured, subject to the ownership arrangements of the waterbody.

6.6.1.1.2 Scotland

129. Placing a raft in a Scottish loch or undertaking habitat management/restoration, would require permission from the landowner. This is expected to be secured via lease for the operational life of the Project, alternatively land purchase could be considered.

6.6.2 Statutory Permits

130. In most cases small-scale nesting rafts or habitat management/restoration outside European Sites will not necessitate permits, other than the right to use, and access the waterbody from the landowner (discussed above).

6.6.2.1 Potential Finnish Statutory Permits

131. In general, projects targeting water areas may require a water permit in accordance with the Finnish Water Act (587/2011) if they have the following types of impacts:

    i. detrimental changes in the natural environment and the way it functions or deterioration in the ecological status of a water body or groundwater body;
    ii. significant reduction of the beauty of nature, deterioration in the amenities of the environment or in cultural values or the suitability of the water body for recreational use;
    iii. damage or harm to fishing or fish stocks;
    iv. damage or harm to waterborne traffic or timber floating;
    v. violation of public interest in another manner similar to the above.

132. The site selection process will seek to avoid or mitigate impacts on red-throated diver or other receptors (discussed in Section 7) to ensure there is no likely significant effects associated with the compensatory measure and as such, a water permit is not expected to be required.

6.6.2.2 Potential Scottish Statutory Permits

133. No permits are anticipated to be required for breeding enhancement in Scotland.

134. Site selection and development of the measure would avoid triggering the following permit requirements (Plantecol Ltd, 2019):

- Water-level would not be raised by more than 0.5 metres above present levels and therefore no CAR licence under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) would be required; and
- The works would not increase the amount of stored water above the existing level by equal to or greater than 10,000m^3 and therefore the loch could not be considered a controlled reservoir Reservoirs (Scotland) Act (2011).

6.7 Monitoring and adaptive management

6.7.1 Licenced surveyors

135. All species of diver (*Gavia* spp.), including red-throated diver are listed as 'Birds which are Protected by Special Penalties', under Schedule 1 of the Wildlife and Countryside Act 1981. This means that it is an offence to intentionally disturb these birds whilst they are building a nest, or in, on or near a nest containing eggs or young; or to disturb dependent young even if not in the nest and licences are required to:

- Disturb a Schedule 1 species during the breeding season to monitor breeding performance and ring adults or young; and/or
- Visit the nest of a Schedule 1 species during the breeding season (to record the contents only).

136. North Falls will therefore ensure all surveys/monitoring is undertaken by a specialist(s), licenced to undertake this work.

6.7.2 Monitoring

137. To demonstrate that the compensatory measure of raft installation/habitat mangement is successful, the Project needs to demonstrate higher productivity at waterbodies in which rafts have been installed or habitat management measures implemented, compared with control waterbodies with no rafts or habitat management, i.e. the compensation will be considered to be 'successful' if mean productivity on managed waterbodies is demonstrably higher than waterbodies with no management. Existing evidence suggests increases in productivity following raft installation of 0.3-0.4 large chicks per pair per year (Merrie et al. 1986; Nummi et al. 2013).

138. As discussed in Section 6.4, up to 20 rafts or habitat management measures will be implemented with a further 20 control sites . Managed and control sites will be within suitable habitat for breeding red-throated divers, and monitoring of productivity at each of the raft/habitat management sites and control sites will be the same, to ensure data are comparable. Waterbodies with a raft installed will also be checked carefully for breeding attempts on the edge of the waterbodies as well as on the rafts. The primary aims of monitoring will be to record occupancy of sites, breeding attempts, breeding success and ultimately the number of chicks fledged.

6.7.2.1 Monitoring productivity

139. Red-throated diver productivity tends to be reduced in nesting attempts that occur later in the season (Gomersall, 1986; O'Brien et al. 2020; Hulka, 2010; Dahlen & Erikkson, 2002; Rizollo et al. 1994; Bundy, 1978). Divers that fail on their first breeding attempt, e.g. due to egg predation, will re-lay but the success of that second attempt is likely to be reduced. Therefore, it is important to start monitoring sufficiently early in the breeding season to be sure of recording the early nesting attempts as otherwise productivity may be underestimated.

140. Nest failure can be increased by human disturbance, including nest site visits to assess breeding status (i.e. due to elevated predation of eggs or chicks). For example, flushing adults from their nests can increase the probability of egg predation. Consequently, it is preferable to use remote monitoring techniques where possible. For example, Hulka (2010) used temperature probes in nests to determine when a nest failed. Cameras could also be used to monitor nests which would be helpful for determining the cause of nest failure.

141. Ideally, productivity monitoring should be undertaken using as few nest site visits as possible. Hulka (2010) used just two visits in a breeding season to determine productivity. Ideally, sites for monitoring productivity should be visible from a distance, to be able to look for chicks on a waterbody without needing to approach close to the site and disturbing birds.

142. Red-throated divers sometimes move their flightless chicks over land from the waterbody on which they fledged to a nearby, often larger, waterbody (Dahlen & Erikkson, 2022; Hulka, 2010; S. O'Brien, *pers. obs.*) so neighbouring waterbodies (within 100m) should also be checked when monitoring for diver chicks, subject to landowner access agreement.

143. Red-throated diver productivity will be monitored during early May and late August or possibly September for any late nesting broods. Following methods used in Fraser et al (2009), Hulka (2010) and O'Brien et al (2020) at least two visits per potential nest site will be made.

144. The number of site visits will be limited to the minimum necessary in order to establish breeding status. Where possible, sites will be checked at a distance with a telescope. When no evidence of an adult sat on a nest is seen from a distance, the perimeter of the waterbody will be walked to search for any nest scrapes. Any nests found will have the contents of the nest recorded, e.g. no eggs, number of eggs, any remains of egg shell including whether the shell suggests a chick hatched or the egg was predated.

145. For raft nests it will be necessary to use a boat to visit the nest (a small inflatable that can be carried to site will be used). No more than two visits will be made, to install remote sensors and retrieve them at the end of the season. All other monitoring will be from a distance using telescopes and binoculars.

146. Any eggs found in nests will be floated in water to determine the stage of embryo development (O'Brien et al., 2018; van Paassen et al. 1984). This information will help predict when eggs can be expected to hatch and when to return to check on breeding success, while avoiding disturbing adults with newly hatched young.

147. A temperature probe will be placed in nests with eggs in to monitor when eggs hatch or whether the nest fails prior to hatching. The probe will record when nest temperature drops to ambient temperature, indicating that an adult is no longer sitting on the nest regularly. A follow up visit to the site will be made within one week of expected hatch date to look for chicks on the waterbody. The temperature probe will also be collected at this point.

148. At a subset of nests, cameras will be installed to monitor the outcome of the nesting attempt. Sites which cannot be viewed from a distance with a telescope will be preferentially selected for monitoring by cameras. This is because these sites would require flushing the adults off nests to establish breeding status, rather than monitoring breeding status from a distance.

149. For each nesting attempt, the following potential outcomes will be recorded:

    a) Eggs disappeared, presumed predated;
    b) Egg shell present showing evidence of predation;
    c) Egg shell present showing evidence of hatching;
    d) Whole eggs present but cold, presumed abandonment of the nesting attempt by parents;
    e) No chicks seen on any visit;
    f) Small chicks seen but not present at a later visit; and

g) Large chicks (3/4 the size of adult) present.

150. Only under outcome (g) will a nesting attempt be recorded as 'successful'. Red-throated divers typically lay two eggs and can produce two large chicks, but more commonly only successfully raise one chick to fledging. The number of large chicks will be recorded.

151. Productivity will be measured as the total number of large chicks recorded divided by the total number of nests with eggs.

152. Red-throated divers will re-lay if a nesting attempt fails early in the breeding season. Following nest failures, the waterbody and nearby waterbodies will be visited again to look for any re-lay nests. The same methods for monitoring productivity will be used on any re-lay nesting attempts, as for first attempts.

153. Additional information of relevance to productivity will also be collected each year. This will include weather information (e.g. rainfall, temperature) and evidence of the presence of predators (including scats, visual observations and other information, e.g. from local ringers and fieldworkers). Great skua are known to predate red-throated diver eggs and chicks in Scotland. This species was badly affected by Highly Pathogenic Avian Influenza, with very large declines in the populations recorded. Consequently, predation on diver eggs and chicks may have decreased recently. However, assuming the great skua population recovers, this source of predation may become more frequent again. In other words, during the course of the compensation monitoring, diver productivity may decline as predation may become more frequent due to recovery of the great skua population. If this does occur, productivity at the control nests would be expected to decrease, i.e. monitoring of control nests will be important.

6.7.3 Adaptive management

6.7.3.1 Circumstances under which adaptive management may be needed

154. Red-throated divers can have years of poor breeding success, e.g. due to poor weather or a lack of prey. Consequently, productivity monitoring needs to be carried out for at least three consecutive years before concluding that the measure is not successful and moving to adaptive management.

155. Each year, following the breeding season, the RTDCSG (see Section 6.7.4 below) will be provided with a summary report describing RTD productivity at all the monitored sites. Divers can take up to three years to start using rafts therefore it is anticipated it may take up to three years before seeing an increase in productivity at waterbodies with rafts.

156. After three consecutive years of monitoring productivity, the RTDCSG will be presented with a detailed report describing productivity at waterbodies with rafts and control sites, including information on causes of nest failure, where known. The report will include any other information available on potential causes of nest failure (e.g. weather conditions, changes to populations of potential predators, etc.).

157. If productivity is demonstrated to be higher at waterbodies with rafts installed (i.e. the compensation aim has been achieved), no adaptive management will be required. Instead, the RTDCSG, in discussion with the Project, will agree a

programme of ongoing monitoring which balances collection of necessary data whilst minimising unnecessary disturbance (e.g. annual monitoring may no longer be required, or only conducted at a subset of sites).

158. If productivity at waterbodies with rafts installed is the same as waterbodies without rafts, i.e. the compensation aim has not been met, the RTDCSG, in discussion with the Project, will consider options for alternative compensation measures and whether to continue with monitoring productivity at waterbodies with and without rafts. Consideration should be given to whether a particular set of circumstances may have driven a short-term reduction in productivity and whether further monitoring of rafts is warranted.

6.7.3.2 Adaptive management measures

159. Adaptive management is necessarily responsive to circumstances and therefore cannot be specified at this stage. However, two adaptive management measures have been identified as likely suitable candidates for consideration should rafts be the selected compensation measure:

- Adapt rafts to include a roof to reduce avian predation risk,
- Habitat management to reduce peat erosion and improve hydrology in the area, to prevent breeding waterbodies from draining.

160. Should habitat management be selected as the primary measure, adaptive management could include the addition of nesting rafts, if required.

6.7.3.2.1 Adaptation of rafts

161. In North America, rafts with roofs have increased great northern diver productivity (de Sorbo et al. 2008; Furness 2013).

162. In Scotland, aerial predators such as skuas, corvids and gulls are known to take diver eggs and chicks. Consequently, nesting on rafts rather than the shoreline may only provide limited increased nest survival. If rafts do not produce a discernable increase in productivity, compared with control waterbodies with no rafts, a new design of rafts with a roof could be deployed. However, this would only be proposed if there was sufficient evidence that predation by birds was reducing productivity at diver nests on rafts.

6.7.4 Governance for post-consent phase

163. Following project consent and the identification that red-throated diver compensation as detailed here is required, a RTDCSG will be convened, with relevant stakeholders and experts invited to be members. This group will oversee the finalisation of the red-throated diver compensation implementation plan (RTDCIMP) which will build on the information in this report and set out the steps to be taken to put the measures in place. The RTDCIMP will then be submitted to the SoS for sign-off.

164. It is envisaged that in the run up to submitting the RTDCIMP to the SoS the steering group will meet at regular intervals (e.g. 3-4 per year). An independent chair will be appointed to oversee these meetings.

165. Following ratification of the RTDCIMP the project will begin the steps as outlined and provide updates and reporting to the RTDCSG as agreed. As a minimum, this is likely to comprise an annual meeting at the end of the breeding season

at which the results of the monitoring will be presented and discussed and the next steps agreed (e.g. adaptive options). The monitoring report and agreed next steps will also be submitted to the SoS for sign-off each year.

7 Impact of Proposed Compensatory Measure

166. Consideration has been given to any potential impacts that might arise as a result of the implementation of rafts or habitat management. The potential impacts identified are described in Table 7.1 together with details, where relevant, of how these would be avoided, reduced or mitigated.

Table 7.1 Potential impact of proposed compensation measure

Potential impacts	Details	Measures required to avoid, reduce or mitigate	Effect significance
Impacts on other protected areas and features	Works are expected to be undertaken outside any designated sites, however connectivity/ functionally linked land will be considered during site selection.	Installation works to take place outside of sensitive season;	With the implementation of mitigation measures, there would be no likely significant effect on protected areas or features.
Visual impact	Visual impacts related to the provision of artificials rafts are considered to be permanent and long-term. However, the size and profile of artificial nesting rafts are small. Therefore, any change to landscape character and impacts to visual amenity are considered to be highly localised to views from the edge of the selected waterbody. Visual impacts associated with habitat management could cause temporary adverse visual impacts within open landscape during construction. However, such impacts are considered to be outweighed by the landscape and visual benefits of the related restoration and enhancement measures once the works are complete.	Design of rafts to be similar in appearance to the existing margin of the selected waterbody.	There would be no likely significant effect on landscape and visual receptors
Impact on cultural heritage assets	The proposed compensation could have an impact on cultural heritage assets depending on its location.	The site selection would include principles setting out the avoidance of statutory heritage designations.	There would be no likely significant effect on cultural heritage receptors.
Increase to flood risk	The compensatory measure will not result in a change to surface water flows or introduce hardstanding.	N/A	There would be no likely significant effect in relation to flood risk. A Flood Risk Assessment will be undertaken for the area chosen for the compensatory measure.

8 Strategic and Collaborative Compensation

167. Strategic or collaborative compensation would be implemented wholly in substitution of the project led compensatory measure, at a level proportionate to the effects described in Section 3; or partly in substitution, in the unlikely event

the proposed compensatory measures were not able to deliver the full compensation requirement.

8.1 Strategic

168. It is recognised that Defra is considering strategic compensation options for red-throated diver, however the timescales are uncertain. Natural England advised (15 December 2023) that their preferred strategic option, sanctuary areas within the OTE SPA, cannot be delivered by a single offshore wind farm and is likely to require government intervention. Further, Natural England acknowledged that strategic compensation cannot be relied upon by North Falls for red-throated diver at this stage. The Applicant has therefore proposed project specific compensation which can be relied upon.

169. Should this or another strategic measure become available e.g. through a contribution to a Strategic Compensation Fund this will be considered by the Applicant.

8.2 Collaborative

170. Advice was given by Natural England for North Falls (see HRA Derogation Provision of Evidence, Annex 1A Compensation Consultation, Document Reference: 7.2.1.1) to supplement data to be collected in the OTE SPA by ScottishPower Renewables (SPR) in relation to the compensation for the EA1N and EA2 offshore wind farms in order to support the development of a potential 'sanctuary' area within the OTE SPA.

171. As shown in Schedule 18, Part 3 of the EA1N and EA2 DCOs (PINS, 2022a) (PINS, 2022b)[6], as part of their suite of compensatory measures, SPR is required to monitor red-throated diver abundance and distribution using digital aerial surveys (DAS) in the OTE SPA and a 10km buffer over two winters. Three surveys should take place each winter (between 1 November and 31 March) with one batch to take place before the installation of the turbines forming part of the authorised development and the other batch to take place after.

172. NFOW is in the early stages of discussion with SPR to identify viable methods of to support data collection. This may include:

- Collaboration with SPR to expand on their planned surveys. This could include providing extra surveys or providing extra data collection/analysis (e.g. vessel data and/or environmental data)
- Collaboration with SPR, their DAS surveyors and/or shipping specialists to explore methods for improving the understanding of vessel activity during the DAS.
- Collaboration with SPR and relevant specialists to explore options to analyse environmental data (e.g. tide state and measurements of

[6] described further within Appendix 6 of the Offshore Ornithology Without Prejudice Compensation Measures documents (Scottish Renewables, 2022a) (Scottish Renewables, 2022b)

chlorophyll), matched with the date and time that DAS data are acquired to investigate the influence of environmental factors on RTD distribution.

9 Summary

173. A range of compensatory measures for red-throated diver have been considered by the Applicant and developed through a process of pre-application consultation with stakeholders. The delivery of rafts or habitat management at breeding colonies has been identified by the Applicant as a measure that could be taken forward as part of a project alone delivery model. Alternatively, contribution to a strategic or collaborative compensatory measure could be undertaken.

174. The information provided demonstrates the ecological evidence for the measure, how the measure can be secured and that the mechanism for delivery can be implemented.

175. There are no likely significant effects associated with the compensatory measure.

176. The Red-throated diver CIMP will set out the detailed delivery proposals for the agreed compensatory measures based on those set out in this Red-throated diver Compensation Document and in accordance with the Outline Red-throated diver CIMP.

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