NORTH FALLS

Offshore Wind Farm

# HABITATS REGULATIONS ASSESSMENT

## Appendix 3 Red Throated Diver Compensation Document (Clean)

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|---|---|
| Document Reference: | 7.2.3 |
| Volume: | 7 |
| Date: | June 2025 |
| Revision: | 2 |

**Project Reference: EN010119**

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



| Revision | Date | Status/Reason for Issue | Originator | Checked | Approved |
|---|---|---|---|---|---|
| 0 | July 2024 | Submission | MacArthur Green/ RHDHV | NFOW | NFOW |
| 1 | Feb 2025 | Deadline 1 | MacArthur Green/ RHDHV | NFOW | NFOW |
| 2 | June 2025 | Deadline 6 | MacArthur Green/ RHDHV | NFOW | NFOW |
| | | | | | |

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# Glossary of Acronyms

| | |
|---|---|
| AEoI | Adverse Effect on Integrity |
| CIMP | Compensation Implementation and Monitoring Plan |
| CSG | Compensation Steering Group |
| DCO | Development Consent Order |
| Defra | Department for Environment Food and Rural Affairs |
| DESNZ | Department for 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 |
| ETG | Expert Topic Group |
| GGOW | Greater Gabbard Offshore Wind Farm |
| HRA | Habitats Regulations Assessment |
| IMO | International Maritime Organisation |
| km | Kilometre |
| 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 |
| RSPB | Royal Society for the Protection of Birds |
| RTD | Red-throated diver |
| RTDCIMP | Red-throated diver Compensation Implementation and Monitoring plan |
| RTDCSG | Red-throated diver Compensation Steering Group |
| RWE | RWE Renewables UK Swindon Limited |
| SACO | Supplementary Advice on Conservation Objectives |
| SEP&DEP | Sheringham Shoal and Dudgeon Extension Projects |
| 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<br>Or<br>'North Falls' | North Falls Offshore Wind Farm, including all onshore and offshore infrastructure. |

# 1 Revision 2 Updates at Deadline 6

1. This document has been updated at Deadline 6 to provide further information on the scale of compensation in line with information provided in the Applicant's Response to Natural England's Deadline 3 submissions **[REP4-028**] and information regarding 2025 surveys..

# 2 Introduction

## 2.1 Background

2. 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 40 kilometre (km) off the East Anglian coast in England. When operational, North Falls would have the potential to generate renewable power for approximately 400,000 United Kingdom (UK) homes from up to 57 wind turbines.

3. The Applicant, NFOW, is a consortium between SSE Renewables Offshore Windfarm Holdings Limited (SSER) and RWE, both of which are highly experienced developers.

4. 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 for Energy Security and Net Zero (DESNZ).

5. 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 RTD (*Gavia stellata*). Natural England has advised the Applicant that RTD may be displaced by up to 12km from North Falls. Consequently, Natural England consider that the Project has the potential to displace RTD within the SPA.

6. Whilst the Report to Inform Appropriate Assessment (RIAA) Part 4 Offshore Ornithology **(Document Reference: 7.1.4 [APP-178])** concludes no adverse effect on integrity (AEOI) of the RTD 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.

## 2.2 Purpose of this report

7. 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 4 and detailed in the RIAA Part 4 **(Document Reference: 7.1.4, [APP-178]).**

8. 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.

9. If required, it is proposed that a RTD CIMP will be produced by the Applicant and approved by the Secretary of State (SoS) post-consent, in accordance with the Outline CIMP (**Document Reference: [7.2.3.1, Rev 2]).**

10. If required, the red-throated diver compensation can be legally secured through the DCO in accordance with the Without prejudice HRA DCO Schedules [9.73, Rev 1].

## 2.3 The RTD Feature of the Outer Thames Estuary SPA

11. RTD 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.[1]

12. One such area is the OTE SPA[2], which was classified in 2010 for its important aggregation of wintering RTDs.

### 2.3.1 Conservation Objectives

13. 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.

14. The effects on RTD of the OTE SPA screened into the RIAA relate to displacement/ barrier effects and therefore 'the distribution of qualifying features

[1] SPAs were classified under the Habitats Regulations which transposed the requirements of European Council Directive 92/43/EEC ('the Habitats Directive') into English law - Habitats Directive and the Wild Birds Directive (Council Directive 2009/147/EC, which codified 79/409/EEC)). Changes were made to the Habitats Regulations (as amended) by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, meaning SPAs are now part of the UK National Site Network rather than the Natura 2000 network of sites.

[2] Designated Sites View

within the site' conservation objective (shown in bold above) is of relevance to the without prejudice compensation.

### 2.3.2 Supplementary Advice on Conservation Objectives

15. Supplementary Advice on Conservation Objectives (SACO) for designated RTD at OTE SPA were last updated online in May 2023 (NE, 2023). The targets for RTD 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.

# 3 Development of compensatory measures – methodology

## 3.1 General Approach

16. The approach taken by the Applicant to identify potential compensatory measures and for determining 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, Rev 2]).**

17. North Falls has appointed experts in RTD breeding ecology and their requirements in Scotland[3] (Sue O'Brien and Rafe Dewar, MacArthur Green; Digger Jackson, Atlantic Ecology). Their knowledge and experience are being used to shape the Project-led compensatory measures, to ensure these measures can be secured and delivered.

18. The approach taken 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; and
        - NatureScot.
    - Ongoing review of other OWF applications for which compensatory measures have been accepted for RTD (East Anglia ONE North (EA1N) and East Anglia TWO (EA2));
    - 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 Sections 8; and
    - Identification of potential locations (Section 8.4).

19. A range of project-led, collaborative and strategic compensatory measures have been considered and are described in Section 6.

[3] North Falls also appointed Petteri Lehikoinen to provide advice on RTD in Finland, however this option is no longer being taken forward

## 3.2 Summary of consultation

20. 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 **Document Reference [7.2.1.1, APP-185].**

21. Consultation with relevant stakeholders will continue throughout the Examination and post consent phases of compensation development and delivery. Details of proposed future consultation on the compensatory measure will be set out in the RTD CIMP.

22. As well as consultation with Natural England and RSPB throughout the Project's pre-application phase, consultation with NatureScot also started in 2024. This is because of plans to deliver compensation for RTDs, if required, in Scotland.

# 4 Quantification of effect

23. Predicted mortality of RTD 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 RTD in the overlap area between the North Falls 12km buffer (being the distance by which Natural England have advised RTD could be displaced by North Falls) and the SPA boundary (RIAA, Part 4, **Document Reference: 7.1.4, [APP-178**]).

24. 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 RTD and thus an effective degradation of the available habitat for the species within the SPA. Therefore, the impact on the RTD 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[4] (RIAA Part 4, **Document Reference: 7.1.4,** [**APP-178**]). 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.

25. 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

[4] As well as OWFs, RTD are also displaced from vessels

and the Outline CIMP **Document Reference** [**7.2.3.1, Rev 2**], are provided without prejudice.

## 5 Scale of compensation

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

27. Natural England has advised that, in the case of the possible displacement impacts to RTDs in the Outer Thames Estuary SPA, the compensatory measure should focus on compensating for the area of effective habitat loss within the SPA (discussed further in Section 4), rather than displacement mortality.

28. 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 the compensation quantum, i.e. the magnitude by which RTD breeding success would need to be increased. Furthermore, even if a common currency was available, with low ecological connectivity between populations of breeding divers in Scotland and the populations of RTDs using the OTE SPA, the benefits of compensation in Scotland are unlikely to be seen in the OTE SPA diver population.

29. Consequently, Natural England has advised that there is no means by which to directly link one type of impact (redistribution within an overwintering SPA) to the available compensation option (boosting productivity in breeding areas in Scotland). Instead, it is intended that compensatory measures will be deployed at 20 lochs used by breeding RTDs in Scotland. Compensatory measures are installation of artificial nesting rafts and/or habitat management measures to boost breeding success.

30. Where required, control lochs will be considered to facilitate monitoring. The success of raft provision will be evaluated by comparing breeding success between lochs with rafts and control lochs, i.e. with no rafts or natural islands. Breeding success at control lochs, as well as other information on breeding success on mainland Scotland, will be used as a baseline, against which success of the compensatory measure (rafts) will be assessed. As far as possible, control lochs will be matched with lochs at which compensation rafts (where applicable) have been implemented, e.g. close by, of a similar size and surrounding habitat, likely to be subject to similar egg/chick predation risks, etc.

31. The success of the measure to restore breeding lochans for RTDs through peatland management is unlikely to require control lochs. This is because peatland restoration is likely to be carried out on lochs which are currently unsuitable for breeding RTDs (i.e. baseline breeding success is zero).

32. Compensation sites are being identified in Shetland, as well as Caithness and Sutherland (Section 9). In Shetland, the compensation management would involve peatland habitat management to restore lochs where RTDs are unable to breed successfully as water is draining away due to erosion. In Caithness

and Sutherland, compensation measures would involve the installation of rafts on lochs to enhance the breeding success of RTDs. Both of these are proven techniques for increasing RTD breeding success ([REP1-021] and [REP1-022] (clean/tracked)).

33. It is noted that in their Deadline 5 response to ExQ2 [REP5-110], Natural England has advised that "*The success of the measure, as proposed by the Applicant, relates to the increased productivity of breeding RTD on rafts, or in habitat subject to other management actions. Thus, a benefit is (potentially) accruing as soon as a pair is breeding on a raft or at improved habitat. There is no mortality debt concern due to the nature of the impact*."

34. The Applicant has calculated the total number of additional fledglings per year that the compensation could produce and the number of these that are predicted to survive to produce adult red-throated divers which recruit into the breeding population. These are based on three scenarios, one in which all compensation is delivered in Shetland; one in which three-quarters of compensation is delivered in Shetland and the rest in Caithness and Southerland; and one in which all compensation is delivered in Caithness and Sutherland.

35. The calculations behind these three scenarios are presented in Table 5.1 below.

- If the Applicant delivers compensation (peatland habitat management) at 20 lochs, only in Shetland, the measure would produce an estimated additional **13.9 fledglings per annum**.
- Alternatively, under more precautionary demographic assumptions and assuming that the Applicant delivers compensation at 15 lochs in Shetland (peatland habitat management) and 5 lochs in Caithness and Sutherland (nesting rafts), the measures would produce **an estimated additional 9.4 fledglings per annum**.
- If the Applicant delivers compensation at 20 lochs in Caithness and Sutherland (nesting rafts), the measure would produce an estimated additional **six fledglings per annum.**

36. The difference in the scenarios is due to the expectation that peatland habitat management measure would increase breeding success to a greater extent than the nesting raft measure. Habitat management would aim to restore lochs that divers could not otherwise have bred successfully on due to water draining away. Thus, on Shetland, breeding success per managed loch would be increased from zero to an estimated value of 0.77 chicks per loch occupied by a pair of RTDs.

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**Table 5.1 Number of additional RTDs that North Falls compensation could produce per year**

| DEMOGRAPHIC PARAMETER | SCENARIO 1 | | SCENARIO 2 | | SCENARIO 3 | |
|---|---|---|---|---|---|---|
| | SHETLAND | CAITHNESS & SUTHERLAND | SHETLAND | CAITHNESS & SUTHERLAND | SHETLAND | CAITHNESS & SUTHERLAND |
| No. lochs at which compensation is implemented | 20 | 0 | 15 | 5 | 0 | 20 |
| Breeding success in the absence of compensation | 0 | 0.35 | 0 | 0.35 | 0 | 0.35 |
| Breeding success following implementation of compensation | 0.77 | 0.75 | 0.7 | 0.75 | 0.7 | 0.75 |
| Difference in breeding success due to compensation | 0.77 | 0.40 | 0.7 | 0.40 | 0.7 | 0.40 |
| Occupancy rate following implementation of compensation | 0.90 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| **Number of additional fledglings per annum from compensation lochs** | **13.86** | **0** | **7.86** | **1.50** | **0** | **6** |
| Survival to adulthood (age 3) | 0.312 | 0.312 | 0.312 | 0.312 | 0.312 | 0.312 |
| No. of fledglings reaching adulthood | 4.33 | 0 | 2.46 | 0.47 | 0 | 2.23 |
| **Compensation benefit: number of additional adults from compensation** | **4.33** | | **2.93** | | **1.87** | |

# 6 Selection of compensatory measure(s)

37. An initial long list of potential compensatory measures for the RTD feature of the OTE SPA was presented to Natural England and the RSPB through the EPP (see Annex 1A **[APP-185])** and was subsequently submitted with the Preliminary Environmental Information (NFOW, 2023).

38. The measures considered are shown in Table 6.1, with the options selected in consultation with Natural England and RSPB, shown in bold.

39. 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.*

40. This, and other guidance discussed in the Compensatory Measures Overview (**Document Reference: [7.2.1, Rev 2**]), was considered during the review and selection of compensatory measures.

**Table 6.1 Screening of compensation measures for RTD (selected options in bold)**

| Measure | Conclusions |
|---|---|
| Reducing disturbance from vessel activity | A number of studies have demonstrated the effect of ship traffic in displacing RTD 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 East Anglia THREE (EA3) which were owned by the same developer.<br>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.<br>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 EA2 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 |

| Measure | Conclusions |
| --- | --- |
| | 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 was introduced from April 2024 (Defra, 2024) and that the Energy Act has the potential to provide 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.<br>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.**<br>**This is the primary without prejudice measure being considered by the Applicant as compensation for RTD (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.**<br>**This would require government intervention and would therefore be a potential strategic option. This is discussed further in Section 12.1** |
| **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.**<br>**This collaborative compensation option is discussed in Section 12.2.** |
| 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 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 Sheringham Shoal and Dudgeon Extension Projects (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 RTD is not yet listed on the Defra (2024b) library of measures.** |

41. 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 RTD which overwinters in the OTE SPA breeds in Fennoscandia, while the UK breeding population in Scotland has limited connectivity with the OTE SPA (discussed further in Section 9).

42. 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 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).

43. Since this advice was received, there were further discussions with Natural England. Whilst the Applicant was mindful of the advice of Natural England, the option for nesting rafts in Finland was still progressed given that there is evidence of connectivity between RTD breeding in Finland and the OTE SPA. The option for nesting rafts in Scotland was also progressed, and consideration extended to other measures in combination with, or instead of, rafts, to increase breeding productivity.

44. More recently, Natural England, in their Relevant Representation [**RR-243**] again made clear their preference is for RTD compensation to be delivered in Scotland instead of Finland. This was primarily due to compensation in Scotland contributing to the UK National Site Network, despite compensation in Finland potentially contributing to the same population of RTD that use the OTE SPA. Natural England's concerns regarding implementation of compensation in Finland were:

- Natural England retains concerns about the provision and management of this measure in Finland given the interventions will be beyond the UK and therefore the NSN (Applicant's Reference NE-301 in Document Reference [**9.1**]);
- Nesting rafts (Finland). If the measure were to be adopted in Fennoscandia (i.e. Finland) additional birds could be delivered into the non-breeding RTD population in the southern North Sea, including at the OTE SPA. It is not clear that this is advantageous given the increasing levels of disturbance and displacement causing activities within the OTE SPA. Natural England retains concerns that rafts in Finland may not present meaningful conservation opportunities, with birds being highly likely to recruit into local populations outside the UK NSN (Applicant's Reference NE-309 in **Document Reference** [**9.1**]);
- Nesting rafts (Finland). Natural England retains concerns about the provision of this measure and highlight our preference for delivery in Scotland (Applicant's Reference NE-317 in **Document Reference** [**9.1**]); and
- Natural England is not convinced that the Applicant will be able to demonstrate sufficient control over rafts deployed in Finland in the long term and would consequently recommend that should this measure at this location be progressed, it is done so on a trial basis alongside more extensive deployment in Scotland (Applicant's Reference NE-319 in **Document Reference** [**9.1**]).

45. As a consequence of Natural England's clear and consistent preference for RTD compensation to be delivered in Scotland, the Applicant has not progressed site selection in Finland any further. Details of selection of sites in Scotland, which would be suitable for RTD compensation, are provided in Section 9.

46. 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 12.

# 7 Project-led compensatory measure

47. As discussed in Section 2, information on compensatory measures for RTD is provided without prejudice to the Applicant's position presented in the RIAA Part 4 Offshore Ornithology [**APP-178**], that there will be no AEoI from North Falls alone or in-combination. The following sections, describing the compensation proposals, are therefore provided without prejudice to the Applicant's position, to demonstrate that compensation can be secured and delivered should the Secretary of State conclude AEoI in the Appropriate Assessment.

48. Further information is provided in the Outline RTD CIMP **Document Reference**: [**7.2.3.1, Rev 2**] and in Section 10. If required, it is proposed that the RTD CIMP will be produced by the Applicant and approved by the SoS post-consent and prior to construction, in accordance with the outline version provided. Amendments to or variations of the RTD CIMP would be in accordance with the principles and evidence base set out in this RTD Compensation Document or informed by new evidence which may emerge. This would be discussed with the RTD Compensation Steering Group (CSG) and agreed with the SoS.

49. As discussed in Section 6, the Applicant's preferred compensatory measure (if required) is to increase RTD breeding success by provision of artificial nesting rafts (Section 7.2); and/or breeding habitat management/restoration in Scotland (Section 7.3); or provision of artificial nesting rafts in Finland. However, as discussed in Section 6, Natural England have advised that they have a strong preference for compensation to be delivered in the UK, thereby contributing to the NSN, rather than in Finland, which would contribute to the wider Nature 2000 and biogeographic population. Natural England acknowledges that the RTDs using the OTE SPA are more likely to be birds that breed in Fenno-Scandia than Scotland and so compensation implemented in Scotland may not directly benefit the OTE SPA RTD population. Despite this, their preference remains for RTD compensation to be delivered in the UK. Consequently, the Applicant is undertaking detailed site selection only in Scotland and not in Finland.

## 7.1 Aims and objectives of the compensation

50. The aim of the North Falls project-led RTD compensation is to increase the number of juveniles fledged in areas where compensation is implemented. This can be achieved by increasing productivity at lochs where RTDs are already breeding and/or increasing the number of breeding pairs within an area. This will contribute additional RTDs to the NSN for this species.

51. This will be achieved by:

- Reducing risk of flooding of nests by using rafts;
- Reducing risk of nests becoming stranded by stabilising water levels in lochs used by breeding RTDs;
- Reducing predation of eggs/chicks by using rafts; and/or
- Reducing human disturbance of nesting divers (which can increase predation risk) by using rafts.

52. These objectives can be achieved via installation of breeding rafts and/or management of moorland habitat to reduce peat erosion and consequent draining of breeding lochs. These compensation measures can be delivered either at lochs where RTDs are already breeding or at lochs where RTDs are currently breeding close by, to increase the number of breeding pairs and/or increase breeding success, relative to the numbers in the surrounding area.

53. Alternative, strategic or collaborative compensatory measures are discussed in Section 12.

## 7.2 Provision of artificial nesting rafts

54. Raft construction will follow successful methods used previously in Scotland, Finland and North America. Advice will be sought on how best to construct durable rafts, both from published literature and from contacting those with experience of constructing and deploying nesting rafts.

55. Nummi et al. (2016) 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.

56. 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 any human disturbance, looking for areas with least disturbance.

57. Roofs would be made of chicken wire or some other material that would allow wind to pass through but would prevent corvids or great skuas from taking eggs from the nest. In North America, rafts with roofs have increased great northern diver productivity (de Sorbo et al. 2008; Furness 2013).

58. Rafts will be checked during the non-breeding season to ensure they are in a good state. Any repairs to maintain the rafts will be made each non-breeding season to ensure that they are in good condition for the following breeding season. This will be done for the duration of the Project operation, i.e. for the period over which compensation is required.

### 7.3 Habitat management to reduce peat erosion and draining of breeding lochs

59. In Scotland, RTD 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 RTDs use for breeding, this can result in nests being stranded and failing. Peat habitat management has been identified as a more effective compensation measure in Shetland, rather than installation of nesting rafts, due to the absence of foxes and low levels of human disturbance along with high levels of peat erosion (*pers. comm.* Digger Jackson).

60. 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 high productivity lochs in Shetland, to ensure that high productivity is maintained.

61. 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 by reducing the size of outflow channels and allowing rainwater to accumulate; and/or
- Enlarging small lochans that are considered to be at, or just below the minimum size required for breeding.

# 8 Ecological evidence

## 8.1 Evidence that RTD productivity is constrained

### 8.1.1 Average RTD productivity

62. RTD 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[5]; 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.

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

64. 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.

65. 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 RTD 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).

66. 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 (Ollson 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.

67. In Scotland, estimated RTD productivity was surprisingly consistent across years and sites (Table 8.1). 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

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

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).

68. 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 Environmental Impact Report (EIA)[6]. In two years (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).

69. RTD productivity was generally higher in Fennoscandia and North America than Scotland, although was also highly variable (Table 8.1). 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; Ollson 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 8.1 Estimates of RTD 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 (2016) |
| 0.35 | Holmoana Islands off east coast Sweden | 2012-2015 | Lehtonen (2016); |

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

| Productivity | Location | Year(s) | Source |
|---|---|---|---|
| 0.07-0.41 | Holmoana Islands off east coast Sweden | 2010-2015 | Ollson 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

### 8.1.2 Factors limiting productivity

70. RTD productivity has been shown to be related to a range of factors including human disturbance, disturbance and interspecific competition from geese, 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; Dewar and Lawrence, 2023).

71. 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.

#### *8.1.2.1 Food availability*

72. 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, RTD will tend to prioritise maintaining their own condition over their current breeding attempt, postponing breeding to another year with better conditions.

73. Chicks are fed on fish prey either from the sea or freshwater lakes and rivers. Scottish RTD 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 low lipid-rich fish prey with high fox occurrence resulted in low productivity.

#### *8.1.2.2 Nesting waterbody size*

74. Generally, RTD 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, 1997; 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 RTD 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). Dewar and Lawrence (2023) found RTDs in Kintyre, Scotland, had successful breeding attempts on lochs smaller than 5 ha, with a mean loch size of 1.4 ha. In Finland, Nummi et al. (2016) monitored RTD breeding success at waterbodies, some of which had rafts installed and others with no rafts. Waterbodies used by RTD ranged in size, from very small to relatively large (0.1 - 94.5 ha). Nummi et al. (2016) did not report any relationship between waterbody size and breeding success.

#### *8.1.2.3 Sudden changes to water level on breeding waterbody*

75. RTD 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.

76. 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).

77. 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.

#### *8.1.2.4 Distance from foraging areas*

78. RTD 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).

79. 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.

80. 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.

#### *8.1.2.5 Predation*

81. Predation is generally the most common ultimate cause of nest failure (Bundy 1978; Gomersall 1986; Eberl & Pieman 1993; Dahlén & Eriksson 2002; Hulka, 2010; Dewar & Lawrence, 2023; Ollson 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).

82. 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).

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

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

##### *8.1.2.6 Disturbance*

85. RTD 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. 2016). Repeated visits to RTD nests by fieldworkers has also been demonstrated to reduce breeding success (Rizollo et al. 2014).

86. Geese may also disturb nesting RTDs. Whilst Dewar & Lawrence (2023) found no direct evidence of RTD breeding attempts failing due to the presence of geese, they thought it likely that geese had displaced RTDs from favoured nesting areas, including on man-made rafts.

## 8.2 Evidence that natural islands and artificial nesting rafts can increase productivity

### 8.2.1 Natural islands

87. Breeding success was found to be slightly higher at Swedish lakes with islands, than lakes with no islands (Dahlen & Erikkson, 2002) and divers will preferentially use islands over the shore (Eberl & 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.

### 8.2.2 Provision of artificial nesting rafts

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

89. 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).

90. 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).

91. RTD productivity in Argyll increased from an average of 0.35 young per year to 0.75 young per year following provision of rafts (Merrie, 1996; ap 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.

92. RTD productivity has also been shown to increase following provision of artificial nesting rafts in Finland (Lokki & Eklof, 1984; Nummi et al, 2016). Annual productivity increased from 0.98 to 1.29 chicks per pair (Lokki & Eklof, 1984). Nummi et al. (2016) compared RTD 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. 2016).

93. Furness (2013) estimated that RTD 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. 2016).

## 8.3 Evidence of the benefits of habitat management

94. As discussed in Section 8.1.2.3, drying out of Scottish lochs, e.g. due to peat erosion, can present a constraint on breeding success. Additionally, drying out of lochs and/or eutrophication can lead to increased growth of vegetation in the water, e.g. bottle sedge. In these circumstances, nesting rafts may be unsuitable or may require additional habitat management.

95. Noting the small size of waterbodies preferred by RTD 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).

96. 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).

97. 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).

## 8.4 Ecological constraint factors

98. The sites to deliver the RTD compensation (if required) will be subject to a detailed site selection exercise (Section 9), taking into account the ecological considerations discussed below.

### 8.4.1 Breeding density

99. RTD 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).

100. The aim of installing rafts or providing habitat management/restoration is to increase the productivity of existing pairs of breeding RTD rather than to increase the number of pairs (e.g. by making more waterbodies suitable for breeding). However, the provision of higher quality nesting habitat could attract additional pairs to the area, thereby also increasing the size of the breeding population, as well as the productivity of each pair. Compensation will be delivered at a sufficient distance from SPAs with breeding RTD features, so that established pairs within the SPA would not be attracted away to breed outside of the SPA. RTD have high inter-annual site fidelity, tending to breed in the same area once established, although they can move a short distance (<1 km, *pers. obs.* S. O'Brien) to another lochan if their breeding attempt fails. The additional offspring produced by increased breeding success, would augment the NSN breeding populations, depending on the location of the compensation measures (see below). Consequently, raft provision and habitat management will be most effective if undertaken in areas with a relatively high density of breeding RTD in order to maximise use of the lochans with compensation and thereby increase productivity.

### 8.4.2 Proximity to SPAs

101. 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 were 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 RTD 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).](birdlife.fi)

102. Consequently, while compensatory measures should ideally be implemented as close to SPA boundaries as possible, in practice there would be benefits to the NSN expected from compensation at waterbodies within 68 km of terrestrial SPAs. Also, compensation at lochs further from SPA boundaries would have the potential to benefit marine SPAs with non-breeding season RTD features (see below). Note, compensation should be implemented as close as possible to terrestrial SPA boundaries but at a sufficient distance to ensure no disturbance to RTDs breeding in the SPA, nor risk attracting established RTD pairs within the SPA to breed outside the SPA.

103. NatureScot advised against trying to implement compensation within terrestrial SPAs with breeding RTD features, as this would not be considered additional to conservation management of the site (NatureScot 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).

104. Scotland has terrestrial SPAs with breeding RTD features, marine SPAs with breeding RTD features and marine SPAs with non-breeding RTD features. There is therefore the potential to benefit the NSN in several ways.

105. Firstly, implementing compensation at waterbodies near to terrestrial SPAs has the potential to benefit these SPAs by the additional fledglings produced by the compensatory measures recruiting into the terrestrial SPAs, once mature. RTDs are known to have high natal fidelity, breeding on lochans close to their natal site (Okill, 1992). However, this would only benefit the NSN once these additional fledglings are mature, after 3-4 years.

106. Secondly, marine SPAs with breeding RTD features are close to terrestrial SPAs with breeding RTD features, as these functionally-linked marine SPAs protect important marine foraging habitat used by RTDs in the breeding season. Implementing compensation at lochans near to terrestrial SPAs and their functionally-linked marine SPAs, means RTDs benefiting from the compensatory measures are likely to forage in the nearby marine SPAs, during the breeding season.

107. Thirdly, RTDs that breed in Scotland tend to winter around Scotland and Northern Ireland (Duckworth *et al*., 2022). This means that the additional fledglings could potentially be using non-breeding season marine SPAs as soon as they fledge. There is evidence that juvenile RTDs tend to winter further south, off the coast of France, in their first non-breeding season and then increasingly winter further north, near to their breeding grounds, in subsequent years (Okill, 1994). Therefore, the marine SPAs with non-breeding season RTD features may be used to some extent by juveniles but will be used more extensively by immatures (2 or 3 year old birds). This means that the compensation would start to benefit the non-breeding season marine SPA component of the NSN before the additional fledglings reach maturity.

108. The Applicant has shortlisted lochs for compensation that are outside but close to terrestrial SPAs with breeding RTD features. However, if a sufficient number of lochs on the shortlist cannot be secured, it will be necessary to select lochs that are further from SPAs. Nevertheless, there is still potential for RTDs

fledging from these lochs to use marine SPAs with non-breeding season RTD features.

### 8.4.3 RTD Waterbody size

109. Most studies reported higher breeding success on small waterbodies in Scotland (see section 8.1.2.2). It is not clear why breeding success is lower on larger lochs. It seems that RTDs preferentially use small lochs over large lochs, although it may be that breeding attempts on larger lochs fail due to water fluctuations, e.g. drawdown of reservoirs. Rafts installed in small waterbodies may be more likely to be used, given that RTD appear to preferentially breed on small waterbodies. Lochs of between 50m and 600m length have been preferentially selected. Some sites up to 1km longest dimension were also included in the long list if the site had complex convoluted shorelines.

### 8.4.4 Past breeding success

110. Rafts will be most beneficial at waterbodies where RTD 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 have been 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 affect a nest on an island.

111. Section 8.1.2 lists the primary constraints on RTD 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. RTD 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[7]. Nests on natural islands will be flooded or stranded, the same as on the shore.

112. Habitat management to rectify peat erosion and stop lochans from draining will address the last point above, i.e. will stop sudden fluctuations in water level which leave nests stranded.

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

113. Thus, rafts and habitat management are most likely to be beneficial in areas with foxes, human disturbance and higher frequencies of changing water levels during incubation. Areas of Scotland where these factors are known to be affecting RTD breeding success have been shortlisted.

# 9 Site selection for compensation

114. Ideally, compensation would be delivered at the impacted site (the OTE SPA) but this is not feasible as a project led measure (see Sections 6 and 12). The options are therefore to deliver benefits to the same population of RTD that use the OTE SPA or to contribute to the maintenance of the UK NSN for this species. As discussed previously, the preference of Natural England is to focus on the UK NSN.

## 9.1 Connectivity with OTE SPA

115. The OTE SPA is used in the non-breeding season by RTD drawn from a wide breeding area, including Greenland, Scandinavia and Russia (Kleinschmidt et al. 2022; see DIVERLOG | GSM GPS tracking of RTD (divertracking.com) for more information on movements of GPS tagged divers).

116. Evidence from RTD 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).

117. There have been very few ringed RTD recovered along the coastal boundary of the OTE SPA. All records of ringed RTD 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 RTD 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 9.1 shows that the 12 individuals recovered between 1959 and 2016 were from Greenland, Finland, Sweden, Norway and Scotland[8].

**Table 9.1 Recoveries of ringed RTD 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 |

[8] 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.

| Ringing location | Ringing date | Recovery location | Recovery date |
|---|---|---|---|
| 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 |

118. Recoveries of RTD 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).

119. 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.

120. 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).

## 9.2 Country selection

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

122. 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.

123. Finland has many Natura 2000 sites with RTD 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 would contribute to the NSN by benefiting a population which is a component of the wintering population within the NSN being impacted by North Falls.

124. Compensation in Scotland will directly benefit the NSN as RTDs have high natal fidelity. Birds that fledge from lochs in Scotland are very likely to breed in Scotland. If compensation is implemented in lochs close to terrestrial SPAs, birds fledging from these lochs may return to breed within SPAs. Additionally, compensation implemented at any lochs in Scotland will produce RTDs that could use SPAs with non-breeding season RTD features.

125. As previously discussed, Natural England advised (15 December 2023, see Annex 1A [**APP-185**]) that their preference is to deliver compensation within the UK NSN, and further emphasised their strong preference for this compensation to be delivered in Scotland, in their Relevant Representation (see section 6 for more details).

126. Consequently, the Applicant is no longer refining site selection for compensation in Finland and is instead, focusing on site selection in Scotland.

## 9.3 Identification of potentially suitable regions

127. Within Scotland, regions have been identified that are considered to be the best areas for implementing compensation, according to the following criteria:

- High RTD breeding density;
- Evidence that productivity is suppressed in the region;
- Productivity is likely to be suppressed by fluctuating water levels, human disturbance and/or mammalian predation; and
- Logistical and practical feasibility of implementing compensation.

### 9.3.1 RTD breeding density

128. Areas of high RTD 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. Secondly, RTD have high site fidelity. Therefore, lochs at which rafts have been installed and/or habitat management undertaken are more likely to be used by new pairs of RTDs in areas with many pairs of breeding RTDs in the vicinity, compared with low RTD breeding density. Competition for high quality nesting sites is likely to be higher where there are many RTDs attempting to breed than where there are few pairs, meaning RTDs are more likely to use lochs at which compensation has been implemented where breeding density is higher.

129. 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). RTD breed at lower densities on mainland Scotland and have lower breeding success (Gibbons et al. 1997).

### 9.3.2 SPAs with RTD features

130. 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 with NatureScot, 13 February 2024). Consequently, the optimal region(s) in which to deliver compensation

would be an area of high diver breeding density outside of SPAs. Dillon *et al*. (2009) estimated the number of breeding pairs of RTD 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 RTD outside of SPAs. Table 9.2 lists all terrestrial SPAs in Scotland that have a breeding RTD feature and the location of these SPAs is shown in Figure 1.

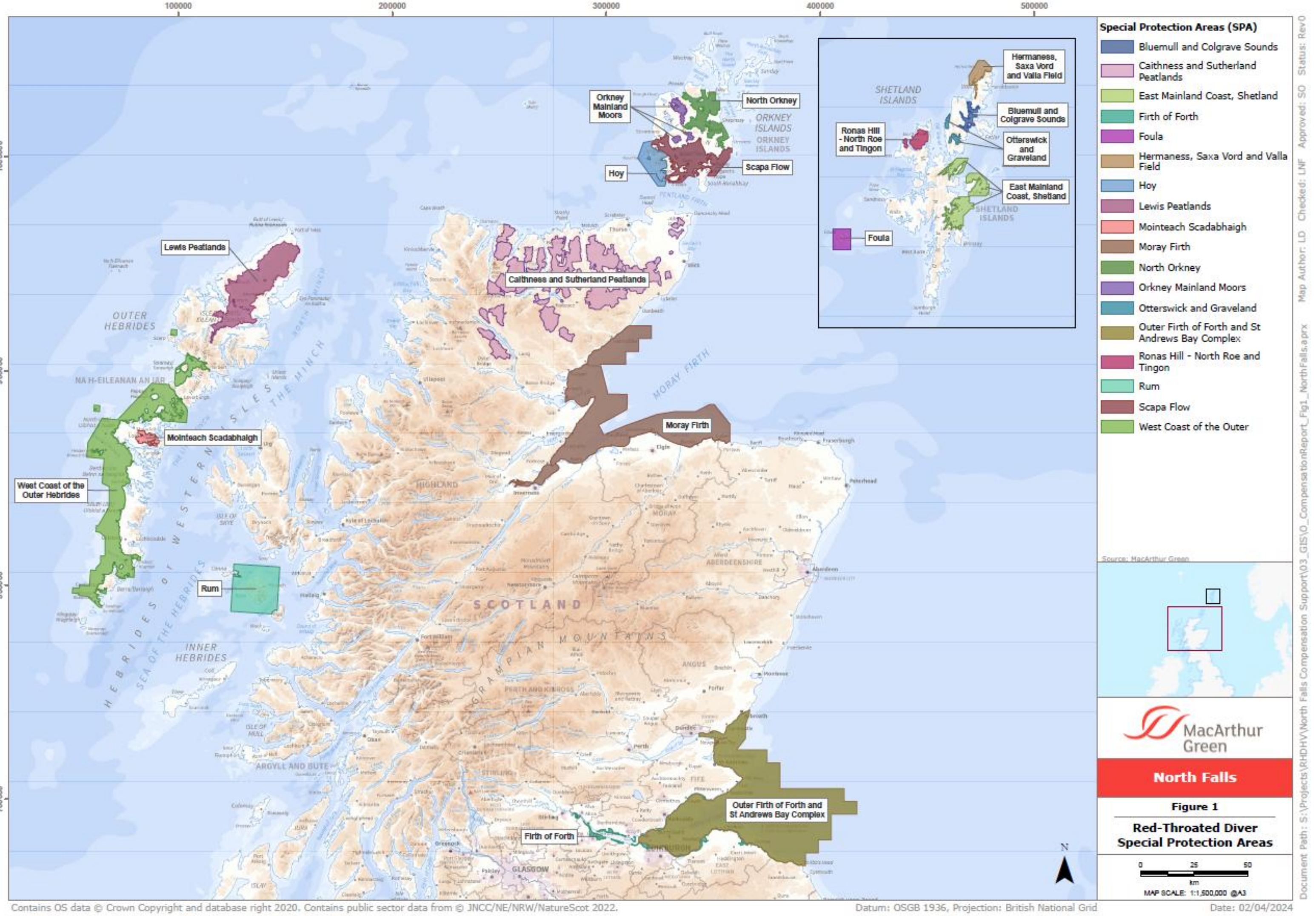


**Figure 1. Location of SPAs in Scotland with a RTD feature, including breeding and non-breeding features as well as terrestrial and marine sites.**

**Table 9.2 Estimated numbers of breeding pairs of RTD 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%)** |

131. In 2006, an estimated 329 pairs of RTDs were breeding within SPAs in Scotland, with 74% of the RTD population breeding outside of SPAs. Shetland has the largest population of breeding RTDs outside of SPAs, followed by the Western Isles and Inner Hebrides (Table 9.2).

132. The following regions were selected for further consideration in creation of a long list of potential lochs at which compensation could be implemented:

- Shetland (greatest number of breeding pairs outside of SPAs; peat erosion causing fluctuating water levels on many waterbodies)
- Inner Hebrides (good numbers of breeding pairs outside of SPAs; potential for fox predation reducing breeding success and/or peat erosion causing water levels to fluctuate on waterbodies)
- Mainland (good numbers of breeding pairs outside of SPAs plus productivity potentially reduced by fluctuating water levels, human disturbance and/or fox predation)

133. The regions of Orkney and the Western Isles were not selected for creating a long list of sites due to Orkney having few pairs of RTDs breeding outside of SPAs and a lack of evidence that RTDs in the Western Isles have reduced

breeding success due to water level fluctuations, human disturbance or fox predation.

134. Additionally, mainland regions with good numbers of breeding RTDs but with no terrestrial SPAs with RTD features, were also selected for creating the long list, in case an insufficient number of suitable lochs were found close to SPAs.

## 9.4 Long list of lochs

### 9.4.1 Habitat management/ peat restoration long list

135. Aerial images of Shetland were examined using expert judgement to identify small existing or former lochs in peatland habitats where there appeared to be issues with peat erosion and/or potential to undertake relatively small scale peat reprofiling works that could lead to enhance the value of sites to breeding red-throated divers.

136. Consideration was also given to:

- Where there are cluster of lochs that could be more logistically practical;
- Distance to sea (km);
- Severity of existing erosion within 100 metres proximity;
- Loch maximum dimension (m). If the site was dry or partly dry, the maximum dimension measured was the length including the dry parts of the lochan basin;
- Position in landscape (summit, sub-summit, spur-top, valley);
- Altitude (m asl);
- Ruggedness of topography (gentle/medium/rugged/mixed);
- Distance from nearest road or track.

137. A total of 51 loch clusters (search areas) were identified as meeting the criteria for potential habitat management/peat restoration. These are presented in Figure 2.

### 9.4.2 Rafts long list

138. A long list of lochs in the regions identified in Section 9.3, at which RTD compensation could potentially be implemented, has been drawn up. For a loch to be included on the long list for potential raft deployment, the loch needs to be:

- In Inner Hebrides or mainland Scotland but outside of an SPA with a breeding RTD feature;
- A sufficient distance from the boundary of a terrestrial SPA to avoid disturbance of breeding RTDs within the SPA and to reduce risk of SPA birds being attracted out of the SPA;

- Within c. 12km of the coast, as RTDs in Scotland forage at sea during the breeding season;
- Areas where conditions at existing lochs could be currently limiting breeding success, i.e. presence of foxes or other mammalian predators which tend not to swim, human disturbance, rapidly fluctuating water levels;
- Suitability of waterbody for RTDs to use for breeding:
  - Size of loch (see Section 8.4.3).
  - Water depth estimated to be >1 metre based on aerial imagery (RTDs need sufficiently deep water to be able to submerge and avoid detection when disturbed);
  - Suitable local terrain and habitat (i.e. providing clear flight paths to/from the loch and sufficient opportunity for RTDs to spot any approaching predators). Lochs more distant from conifer plantations will be preferentially selected as these areas could harbour more predators, e.g. foxes, corvids;
- Vehicular access to within c.1km to allow transportation of rafts/equipment;
- Accessible areas (i.e. avoiding steep inaccessible mountainous areas) to facilitate access to sites for monitoring and installation of compensation measures.

139. A total of 305 lochs were identified as meeting the criteria for long listing for potential raft deployment. These are presented in Figure 3.

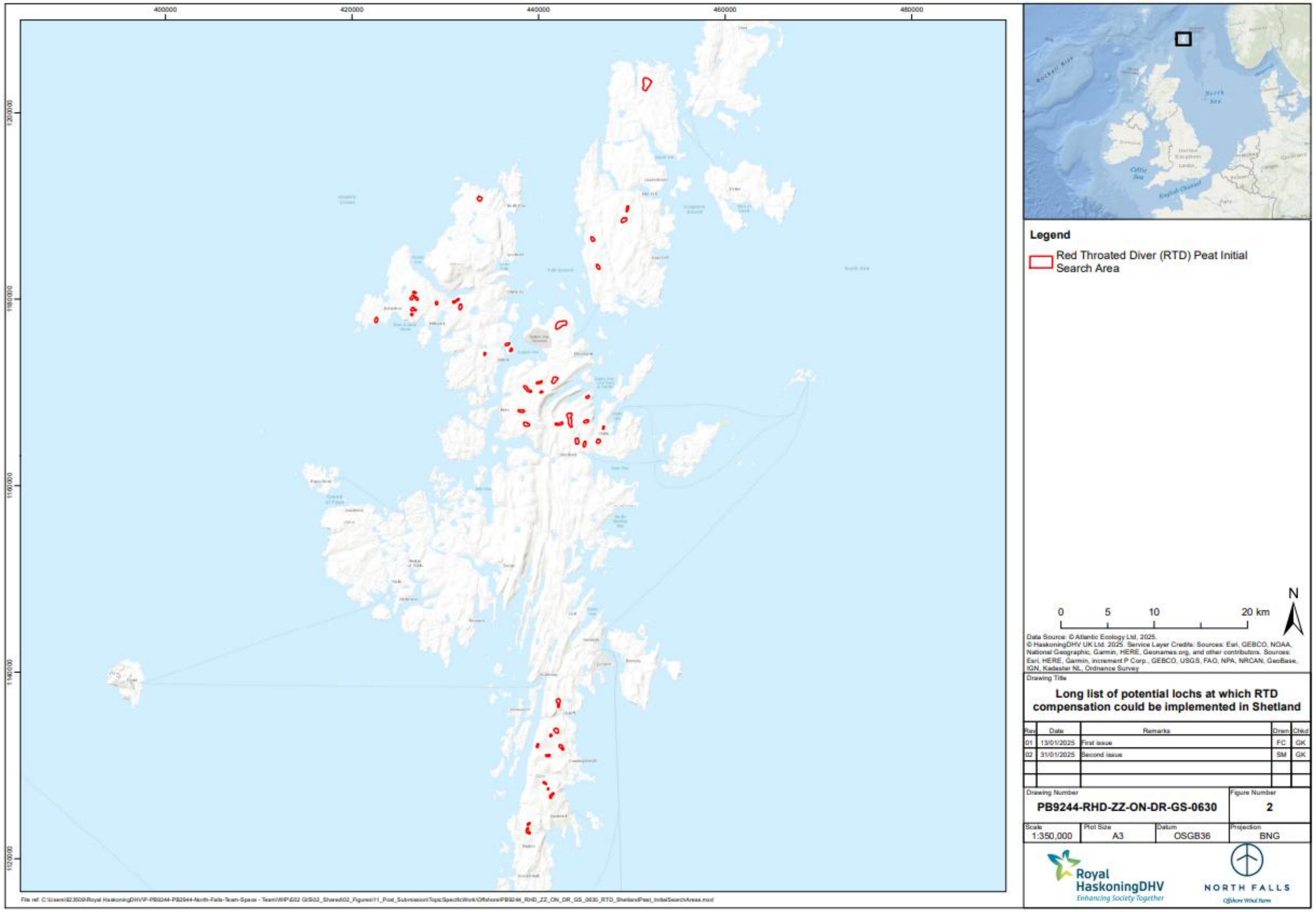


**Figure 2. Long list of potential lochs at which RTD compensation could be implemented in Shetland.**

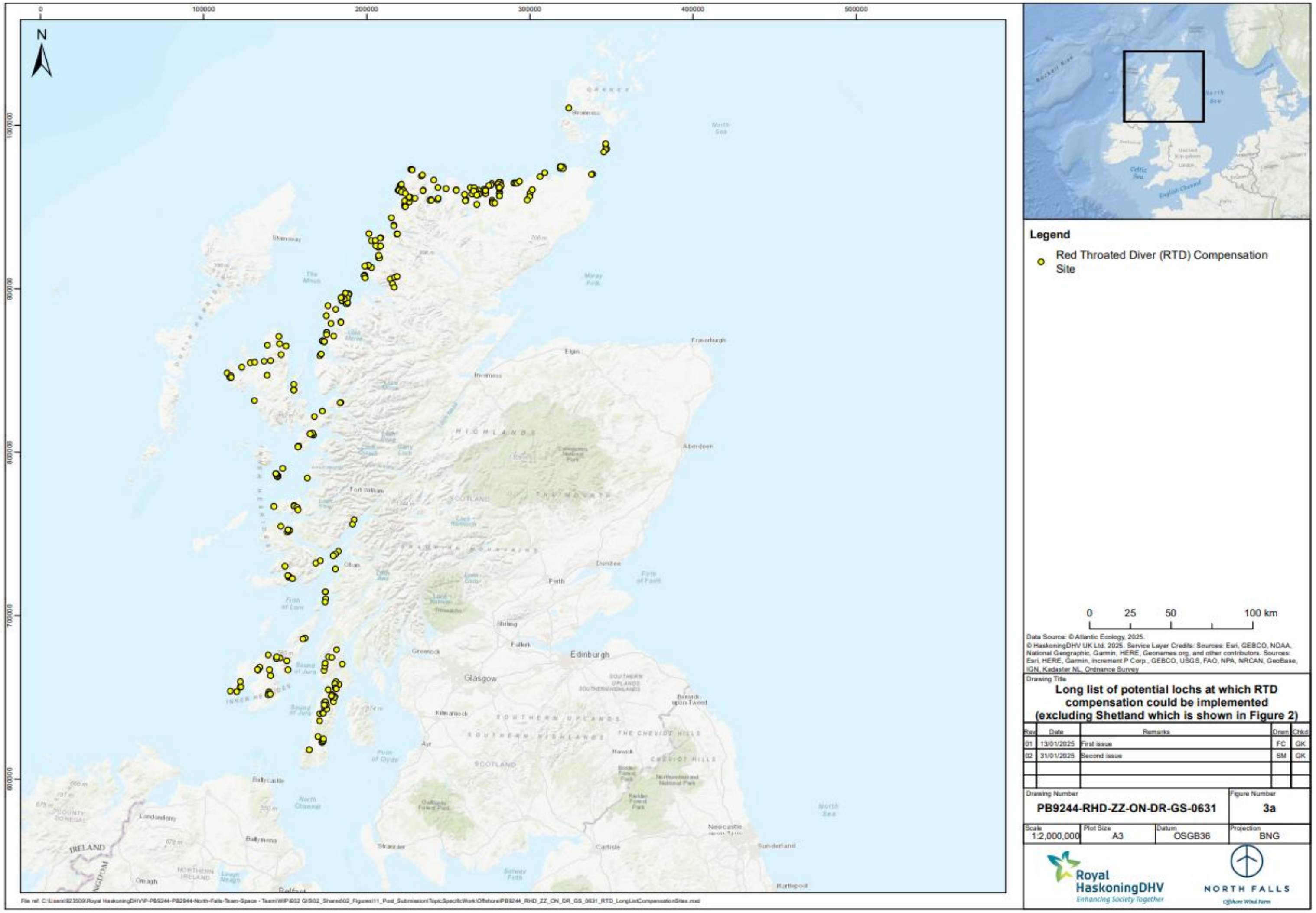


**Figure 3. Long list of potential lochs at which RTD compensation could be implemented (excluding Shetland which is shown in Figure 2).**

## 9.5 Short listing sites

140. From this long list, a short list of suitable lochs for compensation is being developed based on the following considerations:

- Preferred regions;
- Stakeholder feedback;
- Landowner feedback; and
- Site visits to confirm ecological suitability.

### 9.5.1 Preferred regions

141. Ideally, evidence of an established breeding population of RTDs in the area would be used to short-list lochs. Where this information is available, this will be used to fine tune the short list of sites. However, details of lochs at which RTDs breed are scant, outside of Orkney and Shetland.

142. Compensation should be implemented as close as possible to terrestrial SPAs, since males tend to recruit to breeding lochs within 2 km of their natal site and females within 38 km (Okill, 1992). However, given that RTDs are highly sensitive to disturbance, it will be important to implement compensation (if required) at a sufficient distance from SPA boundaries to ensure no disturbance of breeding birds in SPAs and to avoid SPA birds being attracted out of SPAs. Whilst rafts will be installed and/or peat management undertaken outside of the breeding season, thereby avoiding any disturbance of breeding RTDs, monitoring of breeding RTDs at lochs with compensation, if too close to the boundary of SPAs, could disturb birds within the SPA.

143. The initial short list of suitable lochs are in Shetland and along the north mainland coast of Scotland (Caithness and Sutherland).

### 9.5.2 Stakeholder feedback

144. Consultation during site selection is also being undertaken with relevant stakeholders in Scotland, e.g. NatureScot and the RSPB. Additionally, local knowledge from ornithologists and information on historic RTD breeding in the area will be sought.

145. Consultation will be undertaken with the Local Planning Authority once the final region(s) are confirmed.

### 9.5.3 Landowners

146. Landowner consultation is underway, including consideration of waterbody access for installing rafts or peatland management/restoration measures and for surveys to inform site selection and subsequent monitoring.

### 9.5.4 Site visits

147. Once land access has been confirmed for each loch, the sites will be visited to confirm the suitability of the loch for breeding RTDs. This can only be done in the breeding season (April to September) as it is not possible to confirm whether a loch is used by RTDs outside of the breeding season.

#### *9.5.4.1 Interim surveys*

148. Initial access has been agreed for a selection of the short-listed sites and site visits have been undertaken on Caithness and Sutherland during 20th-22nd May 2025 and on Shetland during 10th-12th June 2025 to commence ground-truthing of the desk-based review of suitable sites for compensation implementation and to inform the ongoing site selection process.

149. Visits involved an initial search for breeding RTDs at some distance from the loch. If RTDs were seen, the surveyors left the area to avoid disturbance. If no RTDs were seen, the area immediately adjacent to the loch was walked.

150. On Shetland, the area was assessed for the extent of peatland habitat erosion and scope for improving the area using established methods. Also, the scope for creating new lochans suitable for breeding RTDs was considered. These can be created by restoring the water table of the blanket bog habitat and creating natural peatland lochans as part of this restoration.

151. On the Scottish mainland, the suitability of the loch to support breeding RTD was assessed, along with consideration of pressures on RTD such as disturbance which would limit nesting on the banks of the lochs and therefore rafts would provide a likely benefit to breeding success.

152. Observations were also made regarding the presence of RTD in the wider area, providing increased potential to enhance breeding success with improved breeding habitat.

153. The field visits were successful in:

- Identifying initial sites which could be suitable for installation of rafts or peatland restoration (examples of the latter shown in Plate 1);
- Validating the desk-based review process; and
- Providing further information which could be considered if further desk based review is required[9]. For example, it was found in Shetland that valley bottoms may have more potential for peatland restoration than on top of hills.

154. The site visit also observed peatland restoration which has been successfully undertaken in Shetland. As sites suitable for restoration have been identified and this measure has proven to be successful elsewhere in Shetland, the Applicant is confident it will be able to provide compensation at 20 waterbodies, either on Shetland or mainland Scotland.

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[9] In the event that 20 sites from the initial shortlist cannot be confirmed which are ecologically suitable and have access agreed, further site selection will be undertaken, including further desk based review to ensure 20 lochs can be secured.

Damaged peatland which could be restored, thereby raising the water level. This would turn the water body into a larger deeper lochan, suitable for RTD breeding

Another water body that is currently too small and shallow to be used by breeding RTDs but which would be suitable if the water level was raised through peatland restoration techniques

Reforming the banks of this lochan and restoring the surrounding peatland would retain water and form a pool suitable for RTDs to use for breeding

**Plate 1 Examples of areas suitable for peatland restoration and creation of new lochans suitable for breeding RTDs**

### 9.6 Final site selection

155. If either access to a loch is denied or a site is not ecologically feasible for breeding RTDs, it will be removed from the short list. If an insufficient number of lochs remain on the short list, other regions not near to SPAs will be considered, e.g. Argyll where evidence suggests breeding success may be suppressed by mammalian predation, human disturbance and/or fluctuations in water levels in lochs or the initial criteria used in identifying the long list may be revisited as appropriate.

## 10 Implementation and Delivery Roadmap

### 10.1 Overview

156. The steps that would be followed by the Applicant to implement and deliver the RTD raft or habitat management/restoration compensation measure are as follows:

- Final site selection to identify waterbodies in Scotland will be undertaken as described in Section 9.5.
- 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. NatureScot, RSPB and the Local Planning Authority;
  - Post consent, a red-throated diver Compensation Steering Group (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 10.3;
- The detailed delivery proposals for the compensatory measure will be set out in the RTD CIMP. This will be produced post-consent and be in accordance with the Outline RTD CIMP (**Document Reference: [7.2.3.1, Rev 2**]). It is expected that should RTD 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 RTD CIMP would be in accordance with the principles set out in this RTD 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 and the results reported to stakeholders (see Outline RTD CIMP [**7.2.3.1, Rev 2**]);
- The compensatory measure(s) will remain in place/be maintained for the operational lifetime of the Project if the waterbodies are colonised by breeding RTD.
- Adaptive management measures and monitoring (see Outline RTD CIMP [**7.2.3.1, Rev 2**]) 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.

157. Further information on delivery and implementation is provided in the Outline RTD CIMP **Document Reference:** [**7.2.3.1, Rev 2**].

## 10.2 Timing of compensation delivery

158. 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 (2016) also found rafts in Finland were used within three years of installation.

159. Juveniles fledging from sites at which compensation has been deployed would not recruit into the adult breeding population until aged 3 years old (Horswill &

Robinson, 2015). However, juveniles in their first non-breeding season could be expected to use marine SPAs designated for non-breeding RTDs. Consequently, a contribution to the National Site Network could be deemed to have been made in the first non-breeding season after compensation lochs have been successfully used by RTDs. Movements of these birds further south into English non-breeding SPAs (including OTE SPA) or the European SPA network would also contribute to those sites. Additionally, immature RTDs are likely to return to the breeding grounds in the breeding season, potentially using marine SPAs designated for breeding RTDs. Thus, RTD compensation, if required, will make a contribution to the NSN by augmenting RTD populations at both marine SPAs as well as terrestrial SPAs. In their Deadline 5 response to ExQ2 [REP5-110], Natural England has advised that "*The success of the measure, as proposed by the Applicant, relates to the increased productivity of breeding RTD on rafts, or in habitat subject to other management actions. Thus, a benefit is (potentially) accruing as soon as a pair is breeding on a raft or at improved habitat. There is no mortality debt concern due to the nature of the impact. Therefore, and in the absence of any evidence regarding how quickly rafts or improved habitat will be occupied and/or result in improved productivity, Natural England consider implementation of the measure one breeding season in advance of construction commencing to be adequate. Natural England highlight that the success of the measure should be judged at agreed intervals by an expert panel with the benefit of monitoring data*."

160. If the Secretary of State deems RTD compensation to be a requirement for North Falls, rafts and/or habitat management will be implemented pre-OWF array construction, during the non-breeding season. RTDs would be expected to start using rafts the following summer, and fledglings from these sites will contribute to the NSN (marine SPAs with non-breeding season features) in their first winter (i.e. within 12 months of raft installation).

## 10.3 Permits and licenses

### 10.3.1 Landowner permission

161. 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.

### 10.3.2 Statutory Permits

162. 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).

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

164. 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).

## 11 Impact of Proposed Compensatory Measure

165. 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 11.1 together with details, where relevant, of how these would be avoided, reduced or mitigated.

**Table 11.1 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. |
| | Monitoring will need to take place during the breeding season to establish the effectiveness of compensatory measures. This has the potential to disturb other breeding RTDs and other sensitive species, e.g. great skua. | Lochs will be selected to ensure no disturbance to birds breeding within SPAs. Monitoring will be conducted in a manner that minimises disturbance to all breeding birds, irrespective of species or location. Any monitoring of RTD breeding will be undertaken under a Schedule 1 licence. | 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.<br><br>Visual impacts associated with habitat management could cause temporary adverse visual impacts within open landscape during construction. However, such impacts | 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 |

| Potential impacts | Details | Measures required to avoid, reduce or mitigate | Effect significance |
|---|---|---|---|
| | are considered to be outweighed by the landscape and visual benefits of the related restoration and enhancement measures once the works are complete. | | |
| 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. |

# 12 Strategic and Collaborative Compensation

166. 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 4; or partly in substitution, in the unlikely event the proposed compensatory measures were not able to deliver the full compensation requirement.

## 12.1 Strategic

167. 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 RTD at this stage. The Applicant has therefore proposed project specific compensation which can be relied upon.

168. 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.

## 12.2 Collaborative

169. 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.

170. As shown in Schedule 18, Part 3 of the EA1N and EA2 DCOs (PINS, 2022a) (PINS, 2022b)[10], as part of their suite of compensatory measures, SPR is required to monitor RTD 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.

171. NFOW has, and continues to, engage with SPR to explore potential collaboration, however opportunities for North Falls to provide additional benefit to the data collection required for the EA1N/2 projects have not currently been identified. NFOW expects to be invited to join a working group being established by SPR and intends to contribute to this group.

## 13 Summary

172. A range of compensatory measures for RTD 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 sites 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 would be considered if this becomes available.

173. The information provided in this document and the Outline RTD CIMP [**7.2.3.1, Rev 2**] demonstrates the ecological evidence for the measure, how the measure can be secured and that the mechanism for delivery can be implemented.

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

175. The RTD CIMP will set out the detailed delivery proposals for the agreed compensatory measures based on those set out in this RTD Compensation Document and in accordance with the Outline RTD CIMP [**7.2.3.1, Rev 2**].

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

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