Annex B4– Red Throated Diver Compensation Case

In formulating these comments, the following documents have been considered:

- [REP3-064] 9.37 Habitats Regulations Assessment Without Prejudice Derogation Case – Red-Throated Diver at Liverpool Bay / Bar Lerpwl SPA

1. Introduction

As the derogations material differs in content/structure to a standard Environmental Statement chapter, our comments are provided in a different format to the other Appendices. Within this Appendix we provide our current position on our confidence in each proposed compensation measure, followed by key consenting concerns and detailed comments on the compensation plans and supporting documents. For clarity, we have also provided a summary RAG table for each measure alongside our position to highlight areas of agreement and outstanding concern. We have used the following criteria to assess each category in the summaries:

	NE has broad confidence in this aspect of the measure, though there may be some uncertainties that need addressing.
	There are significant concerns/uncertainties regarding this aspect of the measure, but they have the potential to be resolvable.
	Major uncertainties remain with this aspect of the measure, which if not resolved would make compensation undeliverable. NE cannot be confident at this stage that the measure is deliverable.

Natural England compensatory measures 'check list'

To assist developers and regulators, Natural England has developed a checklist of aspects that need to be described in detail in compensation submissions, to give confidence that the measures can be secured (see Annex A). This checklist forms the basis of the summary table criteria.

2. Natural England's Advice and Recommendations

Liverpool Bay Special Protection Area (SPA): red-throated diver nesting rafts/habitat management

Table 1: Summary position of compensation measure

Compensation measure: Nesting rafts and habitat management for Liverpool Bay SPA Red-throated diver (RTD)		
Overall confidence in the measure		Natural England is satisfied that the measure is technically capable of delivering appropriate compensation, however our overall confidence in the measure is reduced by the lack of information on the location(s) at which it will be delivered and the challenges around measuring its success with respect to securing the coherence of the National Site Network, given it targets breeding rather than non-breeding RTD.
		NE Comment
Theoretical merit to deliver compensation		**Nesting rafts.** We consider that the provision of nesting rafts to improve the breeding success of RTD could be a reasonably effective measure to compensate for the Project's impacts on the non-breeding red-throated diver feature of Liverpool Bay SPA. We recognise that, given the location of this measure in Scotland, the targeting of breeding rather than non-breeding RTD and the fact that the breeding origins of the divers that overwinter in Liverpool Bay are uncertain, there would not necessarily be

		any direct benefit to the impacted population. In any event, the measure would not address the disturbance and displacement (effectively felt as habitat loss) impacts of the project on non-breeding RTD. Nevertheless, there would be connectivity with the National Site Network (NSN) through potential recruitment into Scottish SPAs designated for breeding RTD, and possibly also to the Scottish and English SPAs designated for non-breeding red-throated divers. **Habitat management.** Variables influencing nesting success have been shown to include fluctuating water levels (flooding, drought), a lack of anthropogenic disturbance and predation, and nest vegetation height (which might mediate predation risk), amongst others. Thus, we consider that appropriate habitat management could prove to be effective, particularly if combined with nesting rafts.
Technical feasibility		**Nesting rafts.** This measure has been shown to increase productivity at suitable sites and has a long history of successful implementation, proving it is technically feasible. **Habitat management.** We consider this measure to be feasible should baseline monitoring identify there is a need at suitable sites. We highlight that regulation of water levels (on peat) may prove much more challenging than reducing predation/anthropogenic disturbance or managing the height of vegetation. Peat restoration has the potential to increase the water retention capacity of an area and improve its resilience to drying out during the summer, an impact which is likely to worsen as a result of climate change. RTD productivity is likely to be low on a waterbody that dries out during the breeding season so measures that prevent this from occurring would represent an improvement in productivity.
Agreed compensation level		**Nesting rafts/habitat management.** Natural England agree with the Applicant that there is no measurable direct link between the potential effect (habitat loss/degradation) and the proposed scale of compensation (increased productivity), and there is therefore no robust way to scale the level of compensation to be delivered. The Applicant suggests that the suggested provision of 20 rafts would enable between five and seven additional birds to be fledged each year. We highlight that the success of a compensation measure is generally considered in terms of the number of breeding adults the measure may introduce into the population, rather than fledged juveniles. Survival rates of red-throated diver are not well evidenced but are thought to be relatively low. Horswill & Robinson (2015) report (with low confidence) survival rates of 0.6 for juveniles (age 0-1) and 0.62 for immatures (age 1-2). This suggests that the measure might be expected to deliver approximately two additional adult red-throated divers per year into the population. Nonetheless, we consider that the scale of compensation proposed is broadly appropriate in this case, subject to suitable locations being identified and secured.
Scale/extent of measure		**Nesting rafts/habitat management.** See comments above relating to scale and extent. We also highlight that should site suitability criteria dictate that sites already used by red-throated diver are selected, productivity should be assessed not on the productivity of pairs using the rafts as a stand-alone consideration, but how productivity has been improved in comparison with baseline productivity prior to the provision of the rafts (see also ‘Location of measure’ below).

Timing: Deliverable before impact		**Nesting rafts.** Adoption of new nesting rafts appears to be high, with Merrie (1996) noting rafts were usually accepted in the first year in Argyll, Scotland. Hancock (2000) similarly observed that most rafts placed in lochs in Scotland for black-throated diver were used in the first or second years, and similar to Nummi and others' (2013) findings for red-throated diver in Finland, DeSorbo and others (2007) found that 90% of rafts for great northern diver were used within 3 years. Subject to suitable sites being available and secured, it is likely that sites would be used in the first year, or shortly thereafter. Thus, benefits could be felt at the NSN after a single breeding season. We consider the measure could be delivered before the point of impact. **Habitat management.** As above.
Location of measure		**Nesting rafts/habitat management.** Gomersall (1986) amongst others (e.g. Solovyeva and others, 2017; Dahlén and others, 2024), found that red-throated diver breeding success was higher on smaller lochs which Okill and Wanless (1990) speculated might be due to disturbance issues at larger lochs (as well as being more prone to dramatic fluctuations in water level, nest flooding from wave action/foaming during high winds, and intraspecific competition). Merrie (1996) observed that red-throated diver seemed to be attracted to traditional nesting lochs (where nesting attempts had previously been noted) and the presence of nesting rafts in other areas did not seem to lure them away. Furthermore, successful rafts were always in sheltered positions. Gomersall (1986) noted significantly greater re-use of lochs which had previously supported successful breeding, whilst Lehtonen (2016) found that distance to foraging area was negatively correlated with breeding success. These studies suggest that site location is an extremely important factor in the success of the measure. We note that the Applicant is seeking to avoid overlap with the measures proposed by North Falls by seeking suitable sites in the Hebrides and the West of Scotland rather than in Shetland. There is generally less data available on the extent and breeding success of red-throated divers in these areas, which increases the level of uncertainty regarding the effectiveness of the measures. The ability to monitor the measures and demonstrate improvements in productivity compared to control sites will therefore be crucial. Site selection is a critical factor to the success of this measure. We welcome that the Applicant has progressed a shortlisting process and has secured initial letters of support from some landowners – although it is not clear from the report whether the waterbodies for which support has been secured are the most appropriate for the proposed measures. Whilst we acknowledge that this is an ongoing process, we consider that further information on the selected locations and the rationale for these is much needed. This should include, among other elements, any risk of unintended consequences (e.g. drawing divers out of SPAs into areas where they are not protected), predation risk, particularly regarding American mink in mainland locations, and potential negative consequences of inappropriate habitat management.

Long term implementation		**Nesting rafts/habitat management.** We welcome the Applicant's undertaking that permissions for these measures in Scotland would be secured via lease for the operational life of the Project, with land purchase also given consideration. **Monitoring.** We acknowledge the inherent risks that multiple monitoring visits might represent and recognise that anthropogenic disturbance has been reported as a factor in reduced breeding success, though Nummi and others (2013) found that red-throated diver bred successfully on nesting rafts despite anthropogenic disturbance. Nevertheless, we would advocate investigation into the feasibility of using established or emerging technologies for this purpose, such as thermal drones, trail cameras/temperature data loggers (Hulka, 2010) or remote camera systems to ensure that the potential improvements to red-throated diver productivity by adopting nesting rafts are adequately quantified in comparison with natural sites and/or a baseline. We note that where site visits are required, these would be conducted by appropriately licensed individuals. We note discussion of the need for retrofitting roofs to nesting rafts should avian predation be identified as a limiting factor in breeding success. We understand that the deployment of camouflage nets over wire mesh has met with some success elsewhere for great northern diver (DeSorbo and others, 2008) but consider that references to 'roofs' are somewhat misleading. Rafts will need to be placed in sheltered locations to avoid a retrofitted structure acting as a sail in high winds. We would encourage raft design to allow for the development of natural vegetation (e.g. *carex* spp. At <30cm).
Success criteria/Ability to prove additionality		**Nesting rafts/habitat management.** Success of these measures relies heavily on the Applicant's ability to quantify existing productivity (see monitoring above) as this measure relies on improvements to existing productivity. Identification of sites with an established (or implementable) monitoring baseline outside of the existing SPA network designated for RTD, and with no current nesting raft provision or habitat management programme, would therefore seem critical. We expect that final site selection could prove challenging and recommend that the Applicant continues to progress their work in this area.
Suitable as sole measure for target species		**Nesting rafts.** The provision of this measure is suitable as a primary measure to compensate for impacts to red-throated diver in Liverpool Bay SPA but we consider it best delivered alongside habitat management (where appropriate). **Habitat management.** We consider that this measure should be delivered alongside the provision of nesting rafts to establish optimum conditions for breeding red-throated diver, thereby potentially reducing the impacts of mammalian predation and anthropogenic disturbance and potentially increasing resilience to drought.
Key uncertainties		

Site selection		Site selection is likely to be a critical aspect defining the success of the measure. While we acknowledge the progress that has been made, it is unclear from this report how suitable the sites that have been shortlisted are for the successful implementation of this measure and consider that further information is required, particularly with respect to those issues identified in the ‘Location of Measures’ section above.

References

DAHLÉN, B., BRADTER, U., OTTOSSON, E. AND ERIKSSON, M. O., (2024). Influence of pool habitat characteristics on Red-throated Loon Gavia stellata occupancy and reproduction in a Boreal forest landscape. Ornis Svecica, **34**; 64-106.

DeSORBO, C. R., TAYLOR, K. M., KRAMAR, D. E., FAIR, J., COOLEY JR, J. H., EVERS, D. C., HANSON, W., VOGEL, H. S. AND ATWOOD, J. L., (2007). Reproductive advantages for Common Loons using rafts. The Journal of wildlife management, **71**(4); 1206-1213.

DeSORBO, C. R., FAIR, J., TAYLOR, K., HANSON, W., EVERS, D.C., VOGEL, H. S. AND COOLEY, J. H., (2008). Guidelines for constructing and deploying common loon nesting rafts. Northeastern Naturalist, 15(1); 75-86.

GOMERSALL, C. H., (1986). Breeding performance of the red-throated diver Gavia stellata in Shetland. Ecography, 9(4); 277-284.

HANCOCK, S., (2000). Artificial floating islands for nesting Black-throated Divers Gavia arctica in Scotland: construction, use and effect on breeding success. Bird Study, 47(2); 165-175.

HORSWILL, C. and ROBINSON, R.A., 2015. Review of Seabird Demographic Rates and Density Dependence. JNCC Report no. 552.

HULKA, S., (2010). Red-throated Diver breeding ecology and nest survival on Shetland. University of Glasgow (United Kingdom). PhD Thesis.

LEHTONEN, E., (2016). Breeding site selection and breeding success in Red-throated Divers (Gavia stellata): Implications for wind power development. Uppsala University (Sweden). MSc Thesis.

MERRIE, T. D. H., (1996). Breeding success of raft-nesting divers in Scotland. British Birds, **89**(7); 306-309.

NUMMI, P., VÄÄNÄNEN, V. M., PAKARINEN, R. AND PIENMUNNE, E., (2013). The Red-throated Diver (Gavia stellata) in human-disturbed habitats–building up a local population with the aid of artificial rafts. Ornis Fennica, **90**(1); 16-22.

OKILL, J. D. AND WANLESS, S., (1990). Breeding success and chick growth of Red-throated Divers Gavia stellata in Shetland 1979–88. Ringing & Migration, **11**(2); 65-72.

SOLOVYEVA, D. V., PARUK, J. D., TASH, J., VARTANAYN, S. L., DANILOV, G. K., POSPEKHOV, V. V. AND EVERS, D. C., (2017). Post-breeding densities, population sizes and lake size partitioning of loon species in wstern Chukotka, Russia. Contemporary Problems of Ecology, **10**; 621-63.