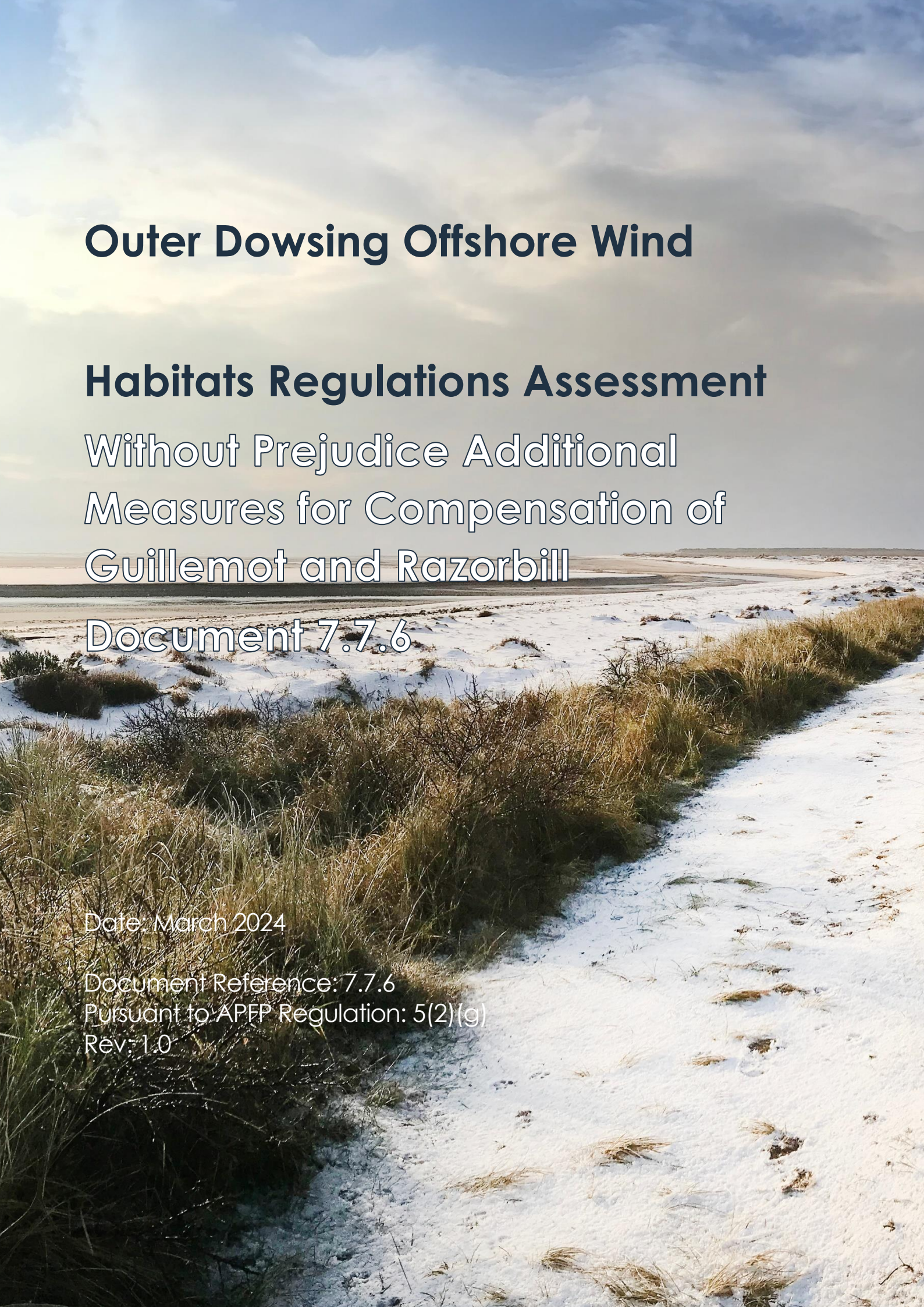

Outer Dowsing Offshore Wind

Habitats Regulations Assessment

Without Prejudice Additional Measures for Compensation of Guillemot and Razorbill

Document 7.7.6

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Acronyms & Definitions

Abbreviations / Acronyms

Abbreviation / Acronym	Description
AEoI	Adverse Effect on Integrity
ANS	Artificial Nesting Structure
COWSC	Collaboration on Offshore Wind Strategic Compensation
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero, formerly Department of Business, Energy and Industrial Strategy (BEIS), which was previously Department of Energy & Climate Change (DECC)
EPP	Evidence Plan Process
ETG	Expert Technical Group
FFC	Flamborough and Filey Coast
GT R4 Ltd	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group portfolio company), Gulf Energy Development and TotalEnergies
GCP	Guillemot Compensation Plan
HPAI	Highly Pathogenic Avian Influenza
HRA	Habitats Regulations Assessment
MPA	Marine Protected Area
MRF	Marine Recovery Fund
OWF	Offshore Wind Farm
OWIC	Offshore Wind Industry Council
RCP	Razorbill Compensation Plan
RIAA	Report to Inform Appropriate Assessment
SAC	Special Areas of Conservation
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
TCE	The Crown Estate

Terminology

Term	Definition
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
Array area	The area offshore within which the generating station (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling will be positioned.

Term	Definition
Baseline	The status of the environment at the time of assessment without the development in place.
Compensatory Measures	Stage 3 of the Habitats Regulations Assessments (see Derogation) involves the development of compensation measures for any features which the report to inform appropriate assessment was unable to conclude no adverse effect on integrity on.
deemed Marine Licence (dML)	A marine licence set out in a Schedule to the Development Consent Order and deemed to have been granted under Part 4 (marine licensing) of the Marine and Coastal Access Act 2009.
Derogation	Stage 3 of the Habitats Regulations Assessments which is triggered once it is determined that you cannot avoid adversely affecting the integrity of a designated site. Involves assessing if alternative solutions are available to achieve the same goals as the project, if there are imperative reasons of overriding public interest, and if compensatory measures will be required.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP) from the Secretary of State (SoS) for Department for Energy Security and Net Zero (DESNZ).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of an impact with the sensitivity of a receptor, in accordance with defined significance criteria.
Evidence Plan	A voluntary process of stakeholder consultation with appropriate Expert Topic Groups (ETGs) that discusses and, where possible, agrees the detailed approach to the Environmental Impact Assessment (EIA) and information to support Habitats Regulations Assessment (HRA) for those relevant topics included in the process, undertaken during the pre-application period.
Habitats Regulations Assessment (HRA)	A process which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European conservation sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of over-riding public interest (IROPI) and compensatory measures.
Mitigation	Mitigation measures, or commitments, are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
Outer Dowsing Offshore Wind (ODOW)	The Project.
Order Limits	The area subject to the application for development consent, the limits shown on the works plans within which the Project may be carried out.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory consultation process during the pre-application phase.

Term	Definition
The Project	Outer Dowsing Offshore Wind including proposed onshore and offshore infrastructure.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Wind turbine generator (WTG)	A structure comprising a tower, rotor with three blades connected at the hub, nacelle and ancillary electrical and other equipment which may include J-tube(s), transition piece, access and rest platforms, access ladders, boat access systems, corrosion protection systems, fenders and maintenance equipment, helicopter landing facilities and other associated equipment, fixed to a foundation

Reference Documentation

Document Number	Title
6.1.3	Project Description
7.1	Report to Inform Appropriate Assessment
7.1.1	Offshore and Intertidal Ornithology Apportioning
7.5	Derogation Case
7.7	Ornithology Compensation Strategy
7.7.2	Guillemot Compensation Plan
7.7.3	Razorbill Compensation Plan
7.7.4	Artificial Nesting Structures Evidence Base and Roadmap
7.7.5.1	Plémont Seabird Reserve Feasibility Study Report
7.7.6	Additional Measures for Guillemot and Razorbill Evidence Base and Roadmap

1 Introduction

1. The Report to Inform Appropriate Assessment (RIAA; Document 7.1) has concluded that there would be no Adverse Effect on Integrity (AEoI) to the common guillemot, *Uria aalge* (hereafter 'guillemot'), and razorbill, *Alca torda* features of the Flamborough and Filey Coast (FFC) Special Protection Area (SPA) due to displacement, both when considering the project alone and in combination with other plans or projects.
2. Following consultation with Natural England and other relevant consultees through the Evidence Plan Process, the project has however provided a 'without prejudice' derogation case for both guillemot and razorbill in relation to the FFC SPA; alongside this, a number of options for Project alone and collaborative compensation measures have been developed as far as possible. In the event that the Secretary of State determines potential for Adverse Effect on Integrity (AEoI) and considers that compensation is required, the Project has provided sufficient confidence that compensation measures are available, securable and deliverable. This document provides the evidence and roadmap for the delivery of additional measures for the compensation of guillemot and razorbill including disturbance reduction, habitat management and potentially additional predator control, at colonies of both species in south-western England.
3. Section 2 provides an overview of the species under consideration and Section 3 details the key threats. Section 4 describes the individual compensation measures that address disturbance reduction and habitat improvement, along with their challenges and feasibility. The longlisting and shortlisting process of selecting suitable sites in the south-west of England are then discussed in Section 5. The feasibility of applying the chosen compensation measures at each of the six sites is explored in Section 6. Finally, plans for implementation and monitoring are provided in Section 7.
4. Six sites are listed as having potential to deliver compensation based upon colony size, current demographics, existing management measures and proximity to, or likelihood to experience human based disturbance. For each site, potential for growth is defined (through comparison with historical populations), and summaries of existing management measures and potential for effective management are provided. Evidence for the efficacy of reduction of disturbance and reduction of habitat loss as a means of compensation are presented.
5. Discussions regarding the development of all compensation measures were framed around an earlier version of the Defra compensation guidance (published in 2021). However, although still under consultation, updated guidance has been published recently (Defra 2024). The new proposals prioritise Ecological Effectiveness when considering compensation, i.e. the ecological outcome and the confidence that the measures will be effective.
6. This report should be read alongside the Project's Guillemot Compensation Plan (document 7.7.2) and the Razorbill Compensation Plan (document 7.7.3).

7. The Applicant's position is that no adverse effect on integrity should be concluded for either auk species. However, should compensation be required then Predator control, through implementation support to of a predator exclusion measure at the Plémont Seabird Reserve (see Predator Control Evidence Base and Roadmap, document 7.6.5), would form is the primary measure for guillemot and/or razorbill, which could deliver all of the compensation required under the Applicant's approach. The compensation requirements for guillemot and razorbill, calculated using the Applicant's approach and Natural England's anticipated approach, are presented in each of the species specific Compensation Plans: the Guillemot Compensation Plan (document reference 7.7.2) and the Razorbill Compensation Plan (document reference 7.7.3) and also within section 7.1 of this document.
8. Should further compensation be deemed necessary then the measures outlined in this document could provide further compensation. Additional compensation could also be provided by Artificial Nesting Structures (ANS) should that be deemed necessary (ANS Evidence Base and Roadmap (document reference 7.7.4)).

2 Species under Consideration

2.1.1 Guillemot and Razorbill

9. Guillemot, a member of the auk family (*Alcidae*), are a cliff-nesting seabird. They nest in large colonies on rocky cliffs around the UK coastline. The UK breeding population is approximately 1,266,000 individuals (the standard unit for monitoring of breeding guillemot), with the majority of the population found in Scotland and the north of England. The UK population has increased by 23% over the last 40 years (Burnell *et al*., 2023). In line with national increases, populations in the south-west of England have risen. Between the Seabird 2000 census (1998 – 2001) and Seabirds Count (2017 – 2022), the population in Devon has risen by 254%, and the population in Cornwall by 323% (Burnell *et al*., 2023). However, despite these increases, some colonies have been experiencing local decline (Table 5.1).
10. Guillemot have two defined bio-seasons; breeding season from March to July, and non-breeding season from August to February (Furness, 2015). During the breeding season, breeding guillemot forage near their coastal colonies, using pursuit dives to hunt small fish, especially sandeel (*Ammodytes* and *Hyperoplus spp.*), as well as crustaceans (Birdlife International, 2023). Outside of their breeding season guillemot disperse widely at sea throughout UK waters. They have an average lifespan of 23 years, and reach breeding maturity after five years (Robinson, 2005).
11. Razorbill are also cliff-nesting seabirds from the auk family. The breeding population is approximately, 225,000 individuals in the UK (Burnell *et al.,* 2023). While the breeding abundance of razorbill has increased since the late 1980s (by 45%), current trends show an overall population decline since 2017 (JNCC, 2021; Burnell *et al*., 2023). In line with national increases, populations in the south-west of England have risen. Between the Seabird 2000 census (1998 – 2001) and Seabirds Count (2017 – 2022), the population in Devon has risen by 263%, and the population in Cornwall by 332% (Burnell *et al*., 2023). However, despite these increases, some colonies have been experiencing local decline (Table 5.1).
12. This species is long-lived with an average lifespan of 13 years and reaches breeding maturity after 4 years (Robinson, 2005). The razorbill has four defined bio-seasons: breeding season (April - July); post-breeding season (August - October); migration-free winter season (November - December); and return-migration season (January - March) (Furness, 2015). Razorbill are pursuit divers and prey mainly on sandeel and clupids during the breeding season (Birdlife International, 2023).

3 Key Threats

13. The key threats that relate to disturbance reduction and habitat improvement are recreational disturbance (including walking, rock climbing and coasteering, birdwatching, watercraft, and aircraft), avian flu, predation and invasive non-native species, climate change, and litter. Additional compensation measures will focus on addressing one or more of these threats, as these can impact guillemot and razorbill at the population level.

3.1 Recreational Disturbance

14. Recreational activities can disturb guillemot and razorbill both in the marine environment (where the species forage), and on their breeding sites, including walking, rock climbing and coasteering, birdwatching, the use of watercraft, and the use of aircraft can affect these auks.
15. Recreational disturbance has several immediate effects for guillemot and razorbill. First, guillemot and razorbill may demonstrate visible discomfort or distress in the presence of recreational disturbance. Typically, these behaviours are seen as an escalating set of responses and can include looking at the source of disturbance, alarm calling, pacing, freezing, or other species-specific behaviour like bobbing (Buckley, 2004). It is common for guillemot and razorbill to show a range of disturbance behaviours. Guillemot nesting at Bass Rock, Scotland were seen to display disturbance behaviours that included head bobbing and making direct visual contact in the presence of a tourist boat (Cully, 2023).
16. The final escalation of disturbance behaviours for guillemot and razorbill is flushing, where birds leave their nests temporarily or permanently (Carney and Sydeman, 1999; Buckley, 2004; Devney and Congdon, 2009). Both temporary flushing and permanent nest abandonment has been recorded for a range of auks, including tufted puffin (*Fratercula cirrhata*), so it is likely that this behaviour may also translate to guillemot and razorbill who share similar ecological and behavioural characteristics with other members of the auk family (Buckley, 2004). Flushing results in an increased energetic cost for guillemot and razorbill, as birds must expend additional energy leaving their nest more often (Buckley, 2004). Flushing can also result in direct mortality, as the absence of adult birds at nest sites leaves eggs and young exposed to predation (Buckley, 2004). This has been recorded for Atlantic puffin (*Fratercula arctica*) and is common for colony-nesting birds like guillemot and razorbill (Buckley, 2004). Long-term or temporary nest abandonment during flushing can also leave eggs and chicks exposed to the elements with associated implications for hatching success/chick mortality (Carney and Sydeman, 1999).

17. Flushing is a last-resort behaviour for guillemot and razorbill during the nesting season when they prefer to stay to protect their egg (National Trust for Scotland, pers. comm.). Furthermore, some individuals may be unable to flush if they are injured or sick, and birds may be unwilling or less likely to flush if they are protecting their nest (Gill *et al*., 2001; Beale and Monaghan, 2004a). Therefore, a bird may still experience disturbance in the absence of flushing behaviour, as it can experience non-visible stress responses (Buckley, 2004; Devney and Congdon, 2009, Watson *et al*. 2014). These can result in changes to seabirds' temperature, heart rate, levels of corticosterone, and vigilance (Cairns, 1980; Pierce and Simons, 1986; Carney and Sydeman, 1999; Buckley, 2004; Huddart, 2019).
18. Colony-nesting seabirds like guillemot and razorbill are particularly sensitive to the effects of recreational disturbance because direct mortality events like egg crushing are more likely to occur with the mass flushing events that come from large seabird colonies (Buckley, 2004).
19. These disturbance behaviours can ultimately have colony-level consequences for guillemot and razorbill. First, recreational disturbance can alter guillemot and razorbill behaviour and repeated disturbance events may cause seabirds to alter their nest site selection (Huddart, 2019). Secondly, the effects of recreational disturbance can ultimately reduce colony productivity for seabirds, with direct nestling or egg mortality through nest spillage or predation during flushing events, nest abandonment resulting in nestling or egg exposure, and crushed nests from tourists can all result in reproductive failure.
20. Reduced reproductive success due to recreational disturbance and human disturbance has been recorded for auks (Carney and Sydeman, 1999; Buckley, 2004; Huddart, 2019). Pierce and Simons (1986) recorded a higher level of reproductive success in tufted puffin chicks who did not experience disturbance. Chicks in undisturbed areas had a 94% rate of fledgling success as opposed to chicks in a disturbed area who had an 18% fledgling success rate (Pierce and Simons, 1986). Third, physiological effects can reduce the fitness of individual seabirds if they are experienced repeatedly over a long period of time (Buckley, 2004). Scaled across multiple colonies, population level consequences are possible.
21. Finally, it should be noted that recreational disturbance can result in habituation to human presence. This is not a negative effect for guillemot and razorbill in itself, but habituation can make monitoring colony health and response to visitors harder over the long-term. Colonies that have historically received more visitor pressure demonstrate fewer visible disturbance responses (Buckley, 2004). These same individuals may still be experiencing non-visible stress responses, yet these responses are harder to detect (Gill *et al*., 2001; Beale and Monaghan 2004a; Watson *et al*., 2014). Therefore, it may be difficult to monitor the ways in which non-visible stress responses affect long-term individual or colony fitness and degree of disturbance.
22. The following sub-sections provide further detail on specific sources of recreational disturbance, and evidence as to how these ultimately impact guillemot and razorbill.

3.1.1 Walking

23. Guillemot and razorbill colonies that are in close proximity to coastal paths or popular coastal areas receive pressure from visitors on foot. As cliff-nesting seabirds, their colonies may be located further down a cliff and out of eyesight from visitors, yet human smell, noise, and footfall vibrations can all cause disturbance to birds (Watson *et al.,* 2014). Therefore, high human presence in an area can bring disturbance effects to guillemot and razorbill and ultimately impact reproductive success and productivity. Both visitor distance and visitor time spent in close proximity to colonies can negatively impact guillemot and razorbill (Beale and Monaghan, 2005; Beale, 2007; Allbrook and Quinn, 2020). Cairns (1980) found that there was a lower hatching success for guillemot and razorbill in a heavily disturbed area compared to the control plot. Human presence can also result in an increased energetic cost for adult birds, as disturbance from walkers meant that UK golden plover (*Pluvialis apricaria*) had to forage for an extra hour a day (Buckley, 2004). Dogs often accompany walkers in coastal areas and can be particularly disruptive to seabird colonies, especially if they are off-leash. Seabirds are particularly sensitive to acute, high decibel sounds, and cormorants (*Phalacrocorax carbo*) have been shown to flush in the presence of unexpected noise (Buxton *et al*., 2017), such as that from a barking dog.
24. Auks are also affected by the risk of sudden noise that dogs can bring. For example, disturbance from dogs has been recorded on the Isle of Staffa, Scotland when a dog was barking within 10m of a puffin colony and caused a mass flushing event (Cully, 2023).
25. The effect of dogs on birds has been monitored in woodlands, where dogs' presence has been linked to a 35% reduction in bird diversity and 41% reduction in bird abundance (Banks and Bryant, 2007). While these terrestrial studies are able, to an extent, to indicate the potential effects of dogs on seabirds, Lord *et al*. (2001) have demonstrated that the presence of dogs also affects coastal birds. The disturbance behaviour of the New Zealand dotterel (*Charadrius obscurus*) was greatest in the presence of dogs, as opposed to walkers or joggers, for dotterel would flush for greater distances and for a longer time (Lord *et al.,* 2001). This study was able to quantify set back distances that would reduce the effects of humans on coastal birds. They suggested that human presence should be restricted to a distance of more than 50m in a high traffic area and 70m in a low traffic area and dog presence should be restricted to 100m from coastal birds (Lord *et al*., 2001).

3.1.2 Rock Climbing and Coasteering

26. Guillemot and razorbill are key species that are at risk from rock climbing and coasteering due to their presence on sea cliffs (Huddart and Stott, 2019) leading to disturbance from these recreational activities directly at their nesting sites. These types of recreational activities can result in direct incursions into nesting areas. UK climbing associations have provided seabird ID information and tips on avoiding seabird disturbance to their members (UKC, 2019), indicating that UK climbers often encounter seabirds at their nesting sites. The frequency of interactions between climbers and birds has resulted in seasonal closures at cliffs during breeding season (Huddart and Stott, 2019).

27. Rock climbing has been shown to alter bird behaviour and even affect reproductive success. In a study of the effects of climbing on the common raven (*Corvus corax*), raven were seen to restrict their movement and vocalisations in the presence of climbers (Covy *et al*., 2020). Furthermore, climbing has decreased peregrine falcon (*Falco peregrinus*) reproductive success, with records of climbers causing peregrine falcon to flush from their nests, leaving eggs exposed to chilling and dehydration (Huddart and Stott, 2019).

3.1.3 Birdwatching

28. Birdwatching can be a particularly disruptive form of recreation because birdwatchers may focus on certain individuals and colonies and observe them over extended periods of time (Inman *et al.,* 2016). Guillemot and razorbill are especially at risk of birdwatching exposure, as they were found to be among the top ten species that Scottish seabird tourists wanted to see on their birdwatching excursions (Cully, 2023).
29. Beale and Monaghan (2004b) found that if visitor numbers remain constant, disturbance is directly correlated to visitor distance from guillemot colonies. Birdwatching creates a high risk for human proximity, as visitors will approach seabird colonies as far as they are allowed. Furthermore, visitors will often enter colonies in the absence of any restriction measures. A study of recreational disturbance from Isle of Staffa, Scotland found that 84.75% of visitors over the course of a week approached the seabird colony as close as the set-back rope would allow (between 0 and 2.5m from the colony; Cully, 2023). A further 4.31% of visitors even entered the colony despite the presence of a set-back rope (Cully, 2023). Birdwatching can alter bird behaviour, as it has been shown to disrupt migration for Mexican species whose range changed due to increased tourism at the US-Mexico border (Connell, 2009). Direct mortality due to birdwatchers has also been recorded. In the UK, Manx shearwater (*Puffinus puffinus*) burrows were crushed by tourists who entered the colony on Skomer, Wales, and shag (*Phalacrocorax aristotelis*) eggs were crushed as tourists threw stones at a nesting bird at the Isle of May, Scotland (Harris and Wanless, 1995; Connell, 2009). Watson *et al.* (2014) have translated these disturbance effects to the colony level and found that the presence of birdwatchers can reduce colony productivity of seabirds by approximately 1.6%.
30. Photographers also bring a particular risk to seabirds. The literature suggests that photographers are most likely to ignore any management measures, including signs and fences (Allbrook and Quinn, 2020). A study from the Isle of Staffa revealed that 37.14% of the incidents where the colony was entered involved photographers (Cully, 2023). Allbrook (2021) has recorded and photographed instances of photographers who have entered UK seabird nesting colonies and crushed eggs. Several studies have revealed that photographers exacerbate disturbance for seabirds more than different types of human presence. The slow-moving photographers, whose behaviour may mimic predators, caused seabirds to flush for longer and demonstrate an increased frequency of disturbance behaviours (Ellenberg *et al*., 2013; Slater *et al*., 2019).

3.1.4 Watercraft

31. Recreational disturbance from the water can also affect guillemot and razorbill, both while they are nesting and foraging at sea. Watercraft like boats, jet skis, and kayaks are commonly used in coastal recreation. Similarly to terrestrial recreational disturbance sources, watercraft can cause disturbance for these species both based on their proximity and time spent near a colony; watercraft can cause disturbance in guillemots if they are within 200m of the colony (Blanchard, 1994; Chardine *et al*., 1998; Lavers *et al*., 2020; Ainley *et al*., 2021).
32. Watercraft can alter bird behaviour, as tourist boats were shown to interrupt shag foraging, and watercraft also result in the concentration of seabirds in areas of little boat traffic (Buckley, 2004; Velando and Munilla, 2011). Watercraft can cause birds to flush, and pigeon guillemot (*Cepphus columba*) have been shown to have a 6% probability of displaying disturbance behaviour from watercraft at 40m away and a 2% chance of displaying disturbance behaviour from 50 away (Chatwin *et al*., 2013). Pigeon guillemot were even more likely to be disturbed out of other seabirds and waterbirds in the study, including double-crested cormorant (*Phalacrocorax auritus*), black oystercatchers (*Haematopus bachmani*), and glaucous-winged gull (*Laurus glaucescens*; Chatwin *et al*., 2013). This suggests the particular sensitivity of auks to watercraft. Disturbance from watercraft has been recorded to have colony-level consequences for guillemot, as the collapse of a Norwegian colony of guillemots was at least in part attributed to an increased presence of tourist boats around a colony over the long-term (Barrett and Vader, 1984).

3.1.5 Aircraft

33. Finally, aircraft can also cause disturbance for guillemot and razorbill if they are flying within 1,000m of the colony (Blanchard, 1994; Chardine *et al*., 1998; Lavers *et al*., 2020; Ainley *et al*., 2021). Common sources of aircraft used in recreation are drones and planes.
34. Seabirds have been shown to flush in response to aircraft proximity (Blanchard, 1994; Chardine *et al*., 1998; Lavers *et al*., 2020; Ainley *et al*., 2021). This behaviour has decreased nesting success for some seabirds, as both brown pelicans (*Pelecanus occidentalis*) and white pelicans (*Pelecanus erythrorhynchos*) have been recorded crushing nests in a flushing event that was caused by aircraft (Buckley, 2004).

3.1.6 Avian Flu

35. Avian flu, or Highly Pathogenic Avian Influenza, can spread between birds through bodily fluids, including saliva and faeces (RSPB, n.d.; NatureScot, 2023). Avian flu can also spread through organic materials, like soil and nesting materials (NatureScot, 2023). Migratory species have spread this disease globally (RSPB, n.d.). Avian flu can result in a variety of lethal and sublethal symptoms for birds, including haemorrhage, respiratory disease, unresponsiveness, swelling, musculoskeletal twisting, and loss of limb control (RSPB, n.d.).

36. The current outbreak, which started in 2021, began in English black-headed gull (*Chroicocephalus ridibundus*) colonies (RSPB, n.d.; BTO, 2023). Due to their close-proximity colonial nesting structure, auks are particularly vulnerable to this disease. The National Trust, who monitor the Farne Islands, England, have reported that guillemot were among the most affected species in 2023 (National Trust, 2023). The BTO has also reported 1,443 guillemot deaths in 2023.

37. Whilst avian flu generally spreads outside of human presence, humans can also be a vector for avian flu (NatureScot, 2022). Therefore, the spread of avian flu is an additional risk posed by human presence around seabird colonies in addition to recreational disturbance. A particular risk is the potential for cross-contamination from other seabird colonies by human vectors (NatureScot, 2023). Any management looking to reduce the impacts of human disturbance could thus also consider the potential for measures to reduce disease spread.

3.2 Predation and Invasive Non-native Species

38. Predation is a key threat for many breeding bird species. Guillemot and razorbill colonies are at risk from both avian and mammalian predators. Bird species such as great black-backed gulls (*Larus marinus*), corvids (*Corvus spp.*), and great skuas (*Stercorarius skua*), and mammals such as brown rats (*Rattus norvegicus*) and otters (*Lutra lutra*), are known to predate seabird eggs and chicks (O'hanlon and Lambert, 2017; Johnston *et al*., 2019; Lopez *et al*., 2023). Furthermore, humans can also bring predatory mammals to seabird colonies via boats (Biosecurity for life, n.d.). On Lundy, UK, rats were confirmed as the cause of seabird decline, using comparison with seabird populations on the adjacent rat-free islands, Skomer and Skokholm (RSPB England, 2021). Camera traps have been used to record otter and hooded crow predating on auk eggs (Johnston *et al*., 2019). Furthermore, razorbill nest failure was recorded in areas of brown rat activity (O'Hanlon and Lambert, 2017). Predation threat can cause significant colony-level effects for seabirds. Great black-back gull predation was calculated to affect puffin population sizes by 1.6-8.7 % annually (Lopez *et al*., 2023).

39. Furthermore, after avian predators increased at a guillemot colony due to declined tourist presence during the COVID-19 pandemic, the increased predation reduced guillemot colony productivity by 26% (Hentati-Sundberg *et al*., 2021). Fewer tourists increased the presence of white-tailed eagles (*Haliaeetus albicilla*) around seabird colonies, as this species typically avoids human presence (Hentati-Sundberg *et al*., 2021). Although white-tailed eagles do not prey on guillemot, their presence caused the colony to flush, leaving the guillemot nests without an adult guardian and exposed to avian predation from species like herring gull (*Larus argentatus*) and hooded crow (Hentati-Sundberg *et al*., 2021). Flushing commonly leaves eggs and young exposed to predation (Buckley, 2004). This has been recorded for Atlantic puffin (*Fratercula arctica*) and is common for colony-nesting birds like guillemot and razorbill (Buckley, 2004). The presence of humans can increase the risk of flushing around colonies, which allows for more opportunities for avian predation

40. Finally, invasive non-native species can include plants as well as predators that can cause habitat destruction or direct predation for seabirds. While the risks of predation have been described above, it is important to acknowledge the risk posed by invasive non-native plants. For example, species like tree mallow (*Lavatera maritima*) have invaded important seabird islands in the Firth of Forth, Scotland and prevented seabirds from accessing what would be available nesting space (RSPB, 2023).

3.3 Litter

41. Litter is a widespread threat to seabirds. Massetti *et al*. (2021) have reported that over one million seabirds die from plastic pollution annually. Litter has multiple sources of origin, including fisheries and port activity (Massetti *et al.,* 2021). Litter pollution can also be exacerbated by increased human presence along coastal areas (Galgani *et al*., 2019). A study of litter presence on German beaches along the Baltic coast revealed that 61% of the litter originated from tourism (Schernewski *et al*., 2018). In a study of litter on UK beaches, the coasts of the Western English Channel and the Celtic Seas had the highest litter levels (Nelms *et al*., 2017). Most of this litter originated from terrestrial sources like public littering (Nelms *et al.,* 2017).
42. Entanglement is a key risk of seabirds' frequent interactions with litter (Massetti *et al*., 2021). Seabirds come into contact with litter in the marine environment, as microplastics have been recorded in sub-surface waters and on the seabed (O'hanlon *et al*., 2017). 28.1% of *Charadriiformes*, which include the auk family, have documented records of entanglements with litter (Kuhn *et al*., 2015). Guillemot mortalities have been attributed to litter entanglement in East Lothian, Scotland, as entangled birds washed up on the beaches (Allan, 2021).
43. Ingestion of litter is another key risk for seabirds, as 30.6% of *Charadriiformes* have documented records of ingestion (Kuhn *et al*., 2015). Ingestion is a particular risk for diving species who may have difficulty distinguishing prey from inorganic material under water (Franco *et al*., 2019). It has been reported that 7% of guillemot in the western Atlantic have ingested plastic (Bond *et al*., 2013; Wilcox *et al.*, 2015). Ireland has the highest prevalence of litter ingestion for guillemot out of sites in the northeastern Atlantic (12%; Acampora *et al*., 2016). Ingestion of litter can cause digestive problems, including blockage and accumulation in the stomachs of seabirds (Kuhn *et al*., 2015; Massetti *et al*., 2021). This can cause mortality for seabirds through starvation, as stomachs full of litter may imitate satiation, and litter in the digestive tract can cover the intestinal wall and prevent digestion (Kuhn *et al*., 2015).

4 Possible Management Measures

4.1 Direct Reduction of Disturbance from Recreational Activities

44. Reduction of recreational disturbance with the aim to increase small-scale guillemot and razorbill colonies could be achieved by implementing several different measures which include:

- Signage;
    - Signage can be used to alert visitors to the presence of breeding colonies and outline appropriate set back distances and behaviour around seabirds. Signage can be placed in the water using buoys or on land.
- Visitor access statements;
    - Some site management plans and organisations have created visitor coastal access codes, especially in areas where the public has direct access to coastal habitats like beaches or cliffside walks. These visitor access statements can be posted on signs or relevant organisational websites to alert visitors to the presence of any wildlife and outline appropriate codes of conduct when visiting coastal habitats.
- Restriction of dogs;
    - As described above in Section 3, dogs that accompany visitors can have a large disturbance impact. Restricting dog access spatially or temporally may help reduce the impact of dogs on sensitive nesting species.
- Restriction of visitor time;
    - Management of visitor time around sensitive nesting colonies could be achieved through the presence of wardens. The specific methods of restricting visitor time will be described in more detail below.
- Restriction of visitor approach distance;
    - Visitor approach distance to sensitive nesting colonies could be managed with rope or fences. The specific methods of restricting visitor approach distance will be described in more detail below.
- Restriction of boat time;
    - Management of boat time around sensitive nesting colonies could be achieved through the presence of wardens. The specific methods of restricting boat presence are described in more detail below.
- Restriction of boat approach distance;
    - Management of boat approach distance to sensitive nesting colonies could be achieved with buoys. The specific methods of restricting boat presence are described in more detail below.
- Seasonal closures;

- As described above in Section 3, some recreational activities, like rock climbing, or the use of beaches, takes place around seabird nesting colonies. Closing these sensitive areas during the breeding season when key species are present, could help prevent incursions into colonies.

- Birdwatching codes;
  - Statutory or voluntary codes of practice could be created on how to best approach and view breeding seabird colonies could be created by conservation organisations or statutory bodies.
- Wardens;
  - Wardens, guides, rangers, or volunteers could be used to monitor and influence visitor behaviour.
- Coordination with equipment hire businesses;
  - Equipment hire businesses and recreational businesses could help raise awareness about recreational disturbance. Marine activities like boating, kayaking, stand-up paddleboarding, rock climbing, and swimming could bring visitors into close proximity with seabird colonies. Many of these activities require equipment, and while many individuals own their own equipment, many other visitors will rent equipment from businesses. Equipment hire businesses could be part of the solution to help mitigate visitor disturbance. Management organisations could coordinate with these businesses to help create an education programme about the local area and wildlife for their customers who hire equipment.
- Coordination with recreational organisations.
  - Recreational organizations could help raise awareness about recreational disturbance. Marine activities like boating, kayaking, stand-up paddleboarding, rock climbing, and swimming could bring visitors into close proximity with seabird colonies. Many of these activities require equipment, and while many individuals own their own equipment, many other visitors will rent equipment from businesses. As mentioned above, management organisations could coordinate with these businesses to help mitigate visitor disturbance, but this would miss the other portion of visitors who do not need to rent equipment. Many dedicated individuals who participate in recreational activities in the marine environment are part of membership organisations associated with their preferred activities. These organisations could be part of the solution to help mitigate visitor disturbance. Management organisations could coordinate with these organisations to help create an education programme about the local area and wildlife for their members.

4.1.1 Examples of Implementation

4.1.1.1 Signage and Wardens

45. Signage has been shown to successfully reduce disturbance at seabird sites. For example, signage implemented at tern breeding colonies has been shown to increase little tern (*Sternula albifrons*) nesting success by 34 times (Medeiros *et al.,* 2006). Signage at a UK gannet (*Morus bassanus*) colony was successful in restricting visitor approach distance, as visitor proximity to the colony was reduced when signs were implemented and fewer birds were flushed from their nests (Allbrook and Quinn, 2023).

46. Wardens increase the success of any management measures, as they provide a mechanism of enforcement to any statutory or voluntary management measures. Wardens have been shown to be an effective management measure for national parks, as there was a 20% increase in the number of dogs kept on a leash when there was a ranger present in the Danube Floodplain National Park in Austria where it is compulsory to keep dogs on leashes (Batey, 2013).

4.1.1.2 Visitor Access Statements

47. Visitor access statements have already been implemented at seabird islands that receive visitor pressure. Management at the Saltee Islands has created visitor access statements that they posted on their website and on signage (The Saltee Islands, 2001). These visitor access statements include instructions to remain more than six meters away from nesting birds and include information on the restriction of drones (The Saltee Islands, 2001).

4.1.1.3 Restriction of Dogs

48. NatureScot has worked with local tour operators to ban dog access on the Isle of May and the Saltee Islands' management have banned dogs from the islands (The Saltee Islands, 2001; NatureScot, 2020). This measure could help reduce the physiological and direct mortality effects that dogs bring to seabirds. Dogs in the presence of bird colonies have previously been associated with mass flushing events, egg crushing, and a reduction in abundance and diversity (Banks and Bryant, 2007; Showler *et al*., 2010; Cully, 2023).

4.1.1.4 Restriction of Visitor Time

49. The Isle of May, Scotland has successfully reduced disturbance by restricting visiting hours to three hours a day during the breeding season, and the Saltee Islands have restricted visiting hours to five hours per day (Cully, 2023; The Saltee Islands, 2001). As evidenced in Section 3, the length of time spent in close proximity to guillemot and razorbill colonies can result in stress responses (Beale and Monaghan, 2005; Beale, 2007; Allbrook and Quinn, 2020).

4.1.1.5 Restriction of Visitor Approach Distance

50. Studies on the establishment of setback distances have highlighted their importance. A study of gannet in the UK demonstrated that gannet flushed more frequently the closer visitors approached, and nesting success was higher away from the edges of colonies that received visitor pressure (Allbrook and Quinn, 2020). The success of using a fence to restrict visitor approach distance was studied in Michaelmas Cay, Australia. The fence was established in 1990, and after long-term implementation of this fence, there was no difference in egg loss for sooty tern (*Onychoprion fuscatus*) and common noddy (*Anous stolidus*) that nested both against the fence and further from the fence (Devney and Congdon, 2009). Therefore, the fence successfully mitigates the effects for the birds that nest nearer visitors over the long term because they demonstrate a similar breeding success rate as the undisturbed birds (Devney and Congdon, 2009). Similarly, a study of wetland birds in California revealed that individuals who nested behind a fence demonstrated similar flushing distances to individuals at an undisturbed site (Ikuta and Blumstein, 2002). Both groups demonstrated significantly shorter flushing distances than birds that nested at a site with high visitor pressure (Ikuta and Blumstein, 2002). Finally, Manx shearwater burrows at Skomer, Wales, were subject to crushing from visitors until visitor approach distance was successfully managed (Connell, 2009).

4.1.1.6 Restriction of Boat Time

51. There are currently no examples of the use of restrictions on boat time around sensitive seabird colonies from which to analyse implementation.

4.1.1.7 Restriction of Boat Approach Distance

52. The distance of watercraft form seabird colonies makes a difference to bird disturbance behaviour. Watercraft can cause birds to flush, and pigeon guillemot have been shown to have a 6% probability of displaying disturbance behaviour from watercraft at 40m away and a 2% chance of displaying disturbance behaviour from 50m away (Chatwin *et al*., 2013). Appropriate set-back distances have been studied for boats. Burger *et al*. (2010) found that 95% of nesting black skimmers (*Rynchops niger*) flushed when a boat approached the colony to 118m, and that threshold provided an appropriate set back distance.
53. Voluntary restrictions in the form of a ‘Seabird Protection Zone’ (SPZ) can limit disturbance from encroaching vessels. In Jersey, a voluntary SPZ around seabird breeding cliffs in the Plémont area is well respected, with incursions tending to be occasional and from those unfamiliar with the area (BOTE, pers comms). As such, the SPZ is largely an effective control against seaward disturbance.

4.1.1.8 Seasonal Closures

54. Statutory measures, like seasonal closures, have also been implemented, as certain cliffs have been closed to rock climbers during the breeding season (Harrison, 2008). Lundy, a key seabird site, is subject to seasonal closures (The Landmark Trust, 2024a). Climbing organisations maintain databases of seasonal restrictions (BMC, 2023). These measures have been successful in reducing bird disturbance from climbing throughout the UK. For example, peregrine falcons have been well protected at their cliff nesting sites, and through management measures like seasonal closures that are enforced by wardens, it is estimated that disturbance is restricted to 1% of the UK population (Huddart and Stott, 2019). Seasonal closures can also be applied to beaches and coastal areas. Weston *et al*. (2012) studied the effects of temporary beach closures and reported a 93.7% compliance rate among visitors. The temporary beach closure reduced footfall and egg crushing during the breeding season (Weston *et al*., 2012).

4.1.1.9 Birdwatching Codes

55. The voluntary WiSe accreditation scheme has had success at promoting proper behaviour during marine wildlife watching in the UK. This programme delivers training to operators and individuals who undertake recreation in the marine space to promote an understanding of disturbance for marine wildlife and the species-specific ways to reduce disturbance when viewing wildlife (Wise Scheme, 2018). The WiSe scheme has created codes of conduct for sustainably viewing seabirds, among other marine species, and conducting marine recreation around seabirds (Wise Scheme, 2018). The extent of participation among the public and operators in this programme, however, is unclear. Therefore, further promotion of this programme or the creation of a seabird-specific programme would help continue to bolster mitigation of recreational disturbance. There are no data on the success of this programme in reducing disturbance, as participation is voluntary. There are no current examples of statutory bird watching codes that are implemented throughout the UK. It is suggested that voluntary accreditation schemes, like WiSe, could be strengthened when paired with statutory measures.

4.1.1.10 Coordination with Equipment Hire Businesses and Recreational Organisations

56. To our knowledge, there has not yet been a coordinated effort between breeding site managers and equipment hire business or recreational organisations to reduce recreational disturbance, however recreational organisations or businesses have voluntarily taken steps to reduce disturbance or encourage their clients and members to reduce disturbance. For instance, an Irish rock climbing organisation promoted educational information about cliff nesting seabirds and encouraged its members to avoid popular routes, like Ireland's Eye (an island off the coast of County Dublin), during the breeding season (UKC, 2023).

4.1.2 Feasibility

57. Reducing recreational disturbance through compensation measures has the potential to benefit entire guillemot and razorbill colonies (Section 3). These measures will have a higher impact at sites that receive higher visitor pressure. Most of these measures are low cost (with the exception of monitoring enforcement, and widespread educational efforts), easily implemented, and do not require specialist equipment, so they can easily be applied across multiple sites.
58. Reduction of disturbance can potentially contribute at a scale of increasing guillemot numbers across the six colonies (described in Section 6) by 2,081 birds and increasing razorbill numbers across the six colonies by 269 birds. This contribution is calculated based upon the difference between the most recent population estimate and the recent historical peak (between 2022 and 1990) at each of the six sites considered. Monitoring efforts would need to include productivity monitoring to better observe the effects of these measures at the population level. This is often conducted by measuring breeding success using a viewpoint study, with nest failure being checked daily (Beale and Monaghan, 2005). It is important to observe study plots both close to and away from areas of high visitor pressure to monitor whether there are differences in breeding success between the two areas both before and after the implementation of mitigation measures (Watson *et al*., 2021).
59. The Applicant will continue to work with the relevant organisations to further the development of these measures and ensure coordination with any existing management plans so as not to repeat mitigation efforts and ensure the additionality of any implemented measures. Consultation with Natural England regarding the development of this measure is outlined in the Guillemot Compensation Plan (document reference 7.7.2) and Razorbill Compensation Plan (document reference 7.7.3).

4.2 Additional Measures to Reduce Disturbance from Recreational Activities

4.2.1 Disease Mitigation

60. As described in Section 3, the reduction of human presence around seabird colonies may naturally reduce the spread of disease at seabird colonies since fewer tourists reduces the opportunities for tourists to become a vector for avian flu. However, there is scope to further reduce the effects of recreational disturbance as a vector for avian flu.
61. The compensation goal of reducing the effects of disease, especially avian flu, can be met by implementing several different measures which include:
    - Seasonal closures;
    - Set-back distances;
    - Sanitising mats;
    - Educational campaigns; and
    - Reporting systems.

4.2.1.1 Examples of Implementation

62. There are examples of disease mitigation measures being implemented throughout the UK. For example, sanitising mats were implanted at the Isle of May, Scotland and Staffa, two key seabird tourism destinations, during the 2023 breeding season (Cully, 2023). Furthermore, both the Isle of May, Scotland and the Farne Islands, England have implemented seasonal tourism closures to protect seabirds from this potential vector. Set back distances were implemented on Staffa, Scotland during the 2023 breeding season to prevent tourists from bringing infected organic materials into puffin nesting sites (Cully, 2023). Defra has implemented a UK national reporting system for avian flu where members of the public can report sightings of dead birds (Defra, 2023). Finally, management organisations in the southwest of England, including the Cornwall Council and North Devon Council, have undertaken public education initiatives that instruct the public to use the reporting system and provides tips to avoid spreading the disease (North Devon Council, n.d.a; Cornwall Birds, 2023).

4.2.1.2 Feasibility

63. Preventing the spread of avian flu owing to tourism has the potential to have a positive impact on bird numbers. These measures will be more impactful at sites that receive higher visitor pressure. Most of these measures are low cost (with the exception of monitoring and enforcement efforts), easily implemented, and do not require specialist equipment, so they can easily be applied across multiple sites.
64. The creation of a UK-wide group that can conduct mortality monitoring and carcass testing is necessary to address this issue at a wide scale and coordinate the efforts of individual site managers (Pearce-Higgins *et al*., 2023).

4.2.2 Litter

65. As described in Section 3, the reduction of human presence around seabird colonies may naturally reduce the spread of litter at seabird colonies since fewer tourists reduces the opportunities for tourists produce waste. However, there is scope to further reduce the effects of recreational disturbance as a vector for litter.
66. The compensation goal of reducing the effects of littering can be met by implementing several different measures which include:
    - Statutory litter control measures;
    - Voluntary local litter picks;
    - Educational campaigns; and
    - Reporting systems.

4.2.2.1 Examples of Implementation

67. Voluntary and statutory litter control measures have been implemented throughout the UK and in the southwest of England. For example, Cornwall Council has implemented statutory fines for littering and an online reporting system for beaches that need cleaning (Cornwall Council, 2023). North Devon Council has also implemented statutory fines for littering, an online system to report those who litter, educational campaigns, monitoring systems, and public beach cleans (North Devon Council, n.d.b). Beyond traditional waste removal schemes, community litter picks are a common voluntary method of reducing litter (Love Portreath, n.d.; National Trust, n.d.a; St Agnes Parish Council, 2020).

4.2.2.2 Feasibility

68. Addressing the spread of litter from tourism has the potential to reduce the presence of litter around colonies. These measures will be more impactful at sites that receive higher visitor pressure. Most of these measures are low cost (with the exception of monitoring and enforcement efforts), easily implemented, do not require specialist equipment, and draw upon existing efforts, so they can easily be applied across multiple sites.
69. Frequent monitoring is important for analysing the success of litter reduction measures (Schernewski *et al*., 2018). Monthly monitoring of litter rates was shown to be three times more effective than monitoring litter rates every three months (Schernewski *et al*., 2018). Furthermore, 32-75% more litter was found when litter was recorded through collection as opposed to visual observation (Schernewski *et al*., 2018).

4.3 Habitat Improvement

4.3.1 Predator Control

70. As described in Section 3, Key Threats, the reduction of human presence around seabird colonies may naturally reduce the rate of mammalian predation since fewer tourists reduces the opportunities for tourists to become a vector for mammalian predators at seabird colonies. Furthermore, the reduction of human presence around seabird colonies may naturally reduce the rate of avian predation if seabirds demonstrate fewer disturbance effects. However, there is scope to further reduce the effects of predation and supplement the reduction of recreational disturbance that naturally accelerates the mitigation of predation on seabirds.
71. The compensation goal of reducing the threat of mammalian predators can be met by implementing both eradication-focused control measures and exclusion-focused control measures. Eradication measures focus on removing a current predator population from a seabird site to help maintain or recover an existing seabird population. Exclusion measures focus on keeping mammalian predators out of key seabird colonies to help maintain a seabird population. Eradication-focused measures are more effective on islands, where there are smaller chances of reinvasions by invasive species, and exclusion measures are better suited to mainland areas.
72. Avian predator control can be carried out by controlling avian predator populations through culling or breeding control.

4.3.1.1 Examples of Implementation

73. A successful predator eradication programme was implemented on Lundy from 2002 to 2006 that resulted in a tripling of the number seabirds on the island, including a greatly increased guillemot population (The Landmark Trust, 2024b). Over the course of the eradication programme, the guillemot population rose from 2,348 to 6,198 individuals, and it continued to rise, standing at 9,880 in 2021 (RSPB England, 2021). This eradication programme, that was implemented as a partnership between NE, The Landmark Trust, and the Royal Society for the Protection of Birds (RSPB), was followed up by the implementation of exclusionary measures (The Landmark Trust, 2024b). Other studies on the effects of predator eradication on auks saw a reduction of Xantus's murrelet (*Synthliboramphus hypleucus*) egg predation from 36.7% to 20.5% when deer mice (*Peromyscus*) were removed from the study site as opposed to a control site (Millus *et al*., 2007).

74. The technique of oiling eggs to prevent them from hatching has been used for common raven (*Corvus corax*) that were impacting the breeding success of black-crowned night heron (*Nycticorax nycticorax*; Brussee and Coates, 2018). These control measures increased black-crowned night heron, as the rate of predation decreased after this measure was implemented (Brussee and Coates, 2018). The reduction of crow predation of seabirds, including from kittiwake (*Rissa tridactyla*) and black guillemot (*Cepphus grylle*), has been implemented as a compensation measure for Ailes Marines since 2012 (Ailes Marines, 2024). This programme has increased the kittiwake breeding population by 87 pairs from 2012-2019 (Ailes Marines, 2024).

4.3.1.2 Feasibility

75. Each method of mammalian predator control (eradication-focused and exclusion-focused) has different challenges and it is easier to implement exclusionary measures for mammalian predators. Predator eradication programmes are much more costly due to the prolific breeding rates of mammalian predators. Once predator populations become entrenched near seabird colonies, it becomes difficult to curb their breeding rate. Therefore, it is much easier to control predators if they are prevented from entering seabird colonies in the first place. Though exclusion-focused predator control programmes come with their own costs, they are less costly than implementing extensive eradication programmes.

76. Though implementing predator control measures necessitates a costly and often lengthy process, reducing predation has the potential to benefit guillemot and razorbill populations. Therefore, this compensation measure would provide a significant impact for guillemot and razorbill, as it could help protect entire colonies.

77. The Plémont area of Jersey has been identified as suitable for a predator control programme (document 7.7.5). Implementing exclusion programmes for these additional colonies can help protect guillemot and razorbill populations from predators before the threat arises, if there is evidence that non-native predators are limiting breeding numbers therein.

78. Colonies that are receiving exclusion-focused predator control measures can implement monitoring programmes that help detect the presence of mammalian predators. Wax bait boxes can be used to detect predator presence, as the wax bait will record the presence of rodents through the presence of teeth marks. Wax bait boxes should also be placed on ferries and any ships travelling to key seabird colonies, as mammalian predators can be transported to seabird islands and colonies by ships. Conservation dogs and their handlers can also be deployed near key seabird sites to help detect the presence of mammalian predators. Frequent monitoring will mean that any predator presence can be detected early and before the predator population breeds out of control.
79. For avian predator control, many of the measures, like egg oiling and culling, do not require highly specialised equipment. However, practices like egg oiling would necessitate the hiring of experienced individuals to carry out the work. Furthermore, permits are required to carry out control of avian predator populations.
80. Monitoring efforts would need to include productivity monitoring to better observe the effects of these measures at the population level. This is often conducted by measuring breeding success using a viewpoint study, with nest failure being checked daily (Beale and Monaghan, 2005). It is important to observe study plots both before and after the implementation of mitigation measures (Watson *et al*., 2021).
81. More research is needed to determine the scale of benefit that reducing avian predators can provide for guillemot and razorbill colonies. However, the benefits of reducing non-native predators such as rats are well established from eradication programs on, for example Lundy, or the Isles of Scilly. As such, it seems sensible to assume that reduction of predation where predation is a relevant pressure, alongside other measures such as disturbance reduction, will have considerable benefits. The Applicant will work with landowners and managers to determine whether predator control measures are appropriate at the relevant sites and if so, would look to establish the scale and nature of habitat improvement that will deliver the most effective compensation on a site-by-site basis.

4.3.2 Invasive Species Management

82. As described in Section 3, invasive non-native species like tree mallow have invaded important seabird islands in the Firth of Forth, Scotland and prevent seabirds from accessing available nesting space (RSPB, 2023). The reduction of invasive species around seabird colonies can take place through volunteer-led removal programmes.

4.3.2.1 Examples of Implementation

83. Tree mallow eradication programmes have had success on the seabird islands of Crigleith, Fidra, and Lamb in the Firth of Forth, Scotland (Scottish Seabird Centre, 2024b). This programme has been in place for 14 years and relies on volunteers to help manage the invasive plant on these islands (Scottish Seabird Centre, 2024b). This project has benefitted a range of nesting birds on the island, including auks, eider (*Somateria mollissima*), and fulmar (*Fulmarus glacialis*; Scottish Seabird Centre, 2024b).

4.3.2.2 Feasibility

84. Removal of invasive species like tree mallow can be costly and labour intensive (Scottish Seabird Centre, 2024a). However, the Project could employ removal experts as part of an implementation strategy. Removal programmes must take place annually, or tree mallow could easily overwhelm an island if left unchecked due to the seed bank that lies in the soil (Scottish Seabird Centre, 2024a&b). This removal schedule could be built into an annual implementation strategy by the Project.

5 Locations for Implementation of Compensation Measures

5.1 Site Selection Process

85. Sites with the potential to be selected for the delivery of the measures described (Table 5.1) were limited to the southwest of England due to the presence of larger guillemot and razorbill colonies, and the desire to provide compensation for English guillemot and razorbill colonies (given the location of the Project). Whilst there is also a large population of guillemot and razorbill at FFC SPA, this site is already highly managed, so there are limited options to provide additional management measures for guillemot and razorbill at that site. The long list of potential sites (Table 5.1) was therefore selected from seabird sites that fell within the boundaries of the South West Inshore and South West Offshore Marine Plan 2021 (HM Government, 2021). The Applicant plans to improve productivity and increase breeding populations through the deployment of compensation measures at these sites, in order to increase numbers of birds recruiting to sites within the national site network.
86. The six short-listed sites in Table 5.2 were selected from the long list based on the following criteria:
    - have a declining population of guillemot and/or razorbill;
    - are close to built-up areas and/or existing tourist attractions; or
    - are likely to experience higher human presence than other sites.
87. After the longlist of sites was compiled, the shortlisting process involved determining each colony's population and health (Table 5.2). Colony health was identified based on changes between the most recent count and the peak historical count. Where only one count was available for sites, both the peak historical site and colony health are populated with 'N/A'.
88. These characteristics were considered in the shortlisting process to help target colonies that had the potential to increase to peak historical counts. Guillemot and razorbill colonies with a higher peak historical count indicate that there is unused habitat that was previously occupied by a larger population. Therefore, the colony has room to expand and benefit from any new compensation measures. Colonies that currently have a population at peak levels may not be able to benefit from the outlined compensation measures, if restricted habitat availability is the limiting factor for population growth.
89. Colonies that have been stable historically but are in recent decline were considered appropriate targets for compensatory measures as they present an opportunity to return to these historically higher counts. Based on the colony counts outlined in Table 5.2, there is potential additionality of 2,081 guillemots and 269 razorbill at these sites.

90. Sites were shortlisted based on their proximity to built-up areas or popular tourism areas. This process drew from desk-based research and the local knowledge of project delivery teams and stakeholders. Popular tourist destinations and settlements were identified in the southwest of England that could provide locations for tourist destinations or origin sites of holiday makers. Sites with settlements within twenty miles were identified. This distance can account for a reasonable distance that holiday makers may travel for a day trip. Furthermore, research was undertaken into the tourism industry around each site, with the assumption that the presence of recreational businesses indicates the presence of higher tourism. High levels of tourism will attract the presence of recreational-focused industry. The search criteria used to identify the presence of the recreational industry included searching for watersport equipment hire businesses (kayak, paddleboard, sailboat), boat tour companies, and adventure companies (offering coasteering, kayak, rock climbing tours). Furthermore, hotspots for coastal recreation were identified using Strava, a social subscriber platform that tracks exercise-based activity. A desk-based review of rock climbing or kayak blogs or chat forums was used to identify various individuals' presence around the selected colonies. Consultation was undertaken with land managers and conservation organisations (e.g., RSPB and the National Trust) to identify key pressures at each site (see Technical Consultation, document 6.1.6). This criterion ensured that compensation measures could be targeted towards those sites that have to contend with high human pressure and its associated risks.

Table 5.1: Long list of sites selected for compensation

Site	Master Site	Guillemot Peak Historical Count (IND)	Guillemot Most Recent Count (IND)	Guillemot Colony Health	Razorbill Peak Historical Count (IND)	Razorbill Most Recent Count	Razorbill Colony Health
Armed Knight	West Penwith	402 (2023)	402 (2023)	Increase	23 (2023)	23 (2023)	Increase
Barras Nose	Tintagel Cliffs SSSI	2 (1999)	0 (2015)	Decrease	N/A	N/A	N/A
Berry Head	Berry Head to Sharkham Point SSSI: Berry Head 1	1464 (2011)	943 (2023)	Historical growth, but mostly stable with minor fluctuations. Slight recent declines, as current population is below historical peak	N/A	N/A	N/A
Bounds Cliff	Bounds Cliff – North Cornwall	20 (2017)	20 (2017)	N/A	48 (2017)	48 (2017)	Increase
Carvannet – Portreath 1	Godrevy Head to St Agnes SSSI	3 (2007)	0 (2017)	Decrease	N/A	N/A	N/A
Carvannet – Portreath 2	Hayle – Chapel Porth	240 (2016)	240 (2016)	Increase	21 (2007)	6 (2016)	Decrease

Site	Master Site	Guillemot Peak Historical Count (IND)	Guillemot Most Recent Count (IND)	Guillemot Colony Health	Razorbill Peak Historical Count (IND)	Razorbill Most Recent Count	Razorbill Colony Health
Carvannet – Portreath 5	Hayle – Chapel Porth	78 (2014)	76 (2016)	Stable	N/A	N/A	N/A
Cow and Calf	West Exmoor Coast and Woods SSSI	1308 (2016)	760 (2023)	Historical increase, now slight decrease	181 (2016)	103 (2023)	Historical increase, now slight decrease
Elwill bay	West Exmoor Coast and Woods SSSI	N/A	160 (2023)	N/A	33 (2016)	25 (2023)	Stable
Godrevy	Godrevy Head to St Agnes SSSI	40 (2016)	40 (2016)	Increase	12 (2000)	9 (2016)	Decrease
Gorregan	Isles of Scilly SPA	343 (2023)	343 (2023)	Increas	80 (2006; 2023)	80 (2023)	Increase
Gull Rock – North Cornwall	Gull Rock – North Cornwall	N/A	2 (2015)	N/A	48 (2009)	40 (2015)	Increase
Gull Rock	Plymouth – Falmouth	300 (2017)	298 (2023)	Increase then stable	79 (1985)	17 (2023)	Decrease
Gulland Rock	Gulland Rock – North Cornwall	1176 (2016)	580 (2017)	Historical increase, now decrease	82 (2015)	52 (2016)	Decrease
Hell's Mouth	Hayle – Chapel Porth	50 (1986)	48 (1987)	Stable	16 (1986; AOS Count)	16 (1986; AOS Count)	N/A
Long and Short Island	Tintagel Cliffs SSSI	895 (2015)	895 (2015)	Increase	264 (2015)	264 (2015)	Increase

Site	Master Site	Guillemot Peak Historical Count (IND)	Guillemot Most Recent Count (IND)	Guillemot Colony Health	Razorbill Peak Historical Count (IND)	Razorbill Most Recent Count	Razorbill Colony Health
Long Island Coast	Tintagel Cliffs SSSI	7 (1999)	0 (2015)	Decrease	27 (2009)	10 (2015)	Decrease
Lundy	Lundy	9912 (2023)	9912 (2023)	Increase	3785 (2023)	3785 (2023)	Increase
Meachard	Grower Rock to Boscastle, North Cornwall	N/A	8 (2015)	N/A	N/A	97 (2015)	N/A
Melledgan	Isles of Scilly SPA	N/A	2 (2015)	N/A	36 (2015)	24 (2023)	Historical increase, then stable
Men-a-vaur	Isles of Scilly SPA	177 (1999)	60 (2023)	Decrease	101 (1999)	100 (2023)	Stable
Mew Stone & Cod Rock	Berry Head to Sharkham Point SSSI	8 (1987; AOS Count)	0 (2017)	Decrease	6 (1987)	0 (2017)	Decrease
Mincarlo	Isles of Scilly SPA	80 (2023)	80 (2023)	Increase	120 (2015)	58 (2023)	Historical increase, now decrease
Morvah 1	West Penwith	N/A	3 (2017; SEA Count)	N/A	N/A	1 (2017)	N/A
Morvah 3	West Penwith	N/A	10 (2017)	N/A	7 (2017)	7 (2017)	Stable
Mullion to Predannack Cliff NNR	Mullion Cliff to Predannack Cliff SSSI	14 (1985)	10 (2016)	Historical decrease, now stable	10 (1985)	3 (2015)	Decrease

Site	Master Site	Guillemot Peak Historical Count (IND)	Guillemot Most Recent Count (IND)	Guillemot Colony Health	Razorbill Peak Historical Count (IND)	Razorbill Most Recent Count	Razorbill Colony Health
Needles Rocks & Main Bench Cliffs	Isle of Wight	337 (2001)	300 (2017)	Historical increase, then stable	4 (1985)	0 (2017)	Decrease
Newland Island	Newland Island, North Cornwall	1 (1986)	0 (2017)	Decrease	10 (1987)	0 (2017)	Decrease
North Cliffs 1	Godrevy Head to St Agnes SSSI	154 (2014)	120 (2020)	Stable	46 (2000)	1 (2020)	Decrease
North Cliffs 3	Godrevy Head to St Agnes SSSI	N/A	172 (2016)	N/A	11 (2016)	11 (2016)	Increase
North Cliffs 5	Godrevy Head to St Agnes SSSI	N/A	3 (2016)	N/A	N/A	4 (2016)	N/A
North Cornwall 3	North Cornwall Coast	112 (2022)	102 (2023)	Historical increase, now stable	86 (2021; 2022)	58 (2023)	Decrease
Ore Stone	Northern End of Torbay	339 (2017)	90 (2022)	Historical increase, now decrease	25 (2017)	25 (2017)	Increase
Penally	Penally to Cornakey	75 (2000)	0 (2018)	Decrease	16 (2000)	10 (2018)	Decrease
Pentargon	Penally to Cornakey	N/A	9 (2018)	N/A	31 (2018)	31 (2018)	Increase

Site	Master Site	Guillemot Peak Historical Count (IND)	Guillemot Most Recent Count (IND)	Guillemot Colony Health	Razorbill Peak Historical Count (IND)	Razorbill Most Recent Count	Razorbill Colony Health
Pentargon Cove	Penally to Cornakey	67 (2018)	67 (2018)	N/A	11 (2018)	11 (2018)	N/A
Port Isaac	Port Isaac, North Cornwall	35 (1999)	0 (2017)	Decrease	2 (1999)	0 (2017)	Decrease
Portland 5	Portland	586 (2018)	586 (2018)	Increase	74 (2007; AOS Count)	55 (2018)	Historical Increase, now stable
Portreath – Porthtowan 2	Godrevy Head to St Agnes SSSI	95 (2000)	49 (2016)	Decrease	65 (2016)	65 (2016)	Stable
Portreath – Porthtowan 3	Godrevy Head to St Agnes SSSI	9 (2007)	0 (2016)	Decrease	41 (2000)	0 (2016)	Decrease
Portreath – Porthtowan 4	Godrevy Head to St Agnes SSSI	27 (2000)	0 (2016)	Decrease	8 (2016)	8 (2016)	Increase
Scilly Rock	Isles of Scilly SPA	60 (2015)	7 (2023)	Historical increase with recent decrease	81 (2023)	81 (2023)	Increase
Seal Hole to Trevaunance Cove	Chapel Porth to Perranporth	122 (2015; 2017)	24 (2023)	Mostly stable with recent decrease	70 (2017)	7 (2023)	Decrease

Site	Master Site	Guillemot Peak Historical Count (IND)	Guillemot Most Recent Count (IND)	Guillemot Colony Health	Razorbill Peak Historical Count (IND)	Razorbill Most Recent Count	Razorbill Colony Health
St Aldhelm's Head – Durlston Head	South Dorset Coast SSSI	1652 (2022)	1071 (2023)	Historical increase, then stable	194 (2022)	155 (2023)	Historical increase, now stable
The Brisons	West Penwith	350 (2016)	348 (2023)	Increase	500 (2016)	68 (2023)	Historical increase, now decrease
The Mouls	The Mouls, North Cornwall	732 (2015)	678 (2016)	Increase	68 (2015)	16 (16)	Historical increase, now decrease
The Sisters	The Sisters, North Cornwall	870 (2015)	870 (2015)	Increase	58 (2016)	58 (2015)	Increase
Willapark	Tintagel Cliffs SSSI	N/A	87 (2015)	N/A	N/A	50 (2015)	N/A
Woody Bay 1 and 2	West Exmoor Coast and Woods SSSI	204 (2001)	90 (2023)	Decrease	142 (2001)	66 (2023)	Decrease
Wringapeak	West Exmoor Coast and Woods SSSI	912 (2018)	530 (2023)	Historical increase, recent decrease	216 (2016)	61 (2023)	Decrease
Wringcliff Bay 2 and 3	West Exmoor Coast and Woods SSSI	N/A	2 (2023)	N/A	28 (2023)	28 (2023)	Increase

Table 5.2: Sites for compensatory measures

Site	Designation	Leasehold	Freehold	Management	Are guillemot or razorbill a designated feature?	SMD Data Guillemot Population (IND)	SMD Data Razorbill Population (IND)	Colony Health
Cow and Calf	West Exmoor Coast and Woods SSSI	Landward side held by National Trust[j] Seaward side held by North Devon District Council[k]	Seaward side held by The Crown Estate[l]	Natural England[a] South West Inshore and South West Offshore Marine Plan 2021[b] Exmoor National Park[c] National Trust (property adjacent to site)[d] North Devon Coast AONB[e]	Yes, both	224 (2001); 540 (2008); 1308 (2016); 1165 (2018); 760 (2023)	18 (2001); 168 (2008); 181 (2016); 110 (2018); 103 (2023)	Historical increases for both razorbill and guillemot followed by recent declines
Woody Bay 1 and 2	West Exmoor Coast and Woods SSSI	Seaward side held by North Devon District Council[k] Further investigation required to	Seaward side held by The Crown Estate[l] Further investigation required to determine	Natural England[a] South West Inshore and South West Offshore	Yes, both	204 (2001); 126 (2008); 130 (2016); 90 (2023)	142 (2001); 124 (2008); 57 (2016); 66 (2023)	Despite past declines, the razorbill population has increased in the last four years. The guillemot

Site	Designation	Leasehold	Freehold	Management	Are guillemot or razorbill a designated feature?	SMD Data Guillemot Population (IND)	SMD Data Razorbill Population (IND)	Colony Health
		determine landowner on landward side	landowner on landward side	Marine Plan 2021[b] Exmoor National Park[c] National Trust (property adjacent to site)[d] North Devon Coast AONB[e]				population is in decline
Gulland Rock	N/A	N/A	N/A	Cornwall AONB[f] South West Inshore and South West Offshore Marine Plan 2021[b]	N/A	156 (1987); 150 (1992); 46 (1999); 45 (2007); 1019 (2015); 1176 (2016); 580 (2017)	52 (1987); 7 (1999); 15 (2007); 82 (2015); 52 (2016)	Historical increases for both razorbill and guillemot followed by recent declines
North Cliffs 1	Godrevy Head to St Agnes SSSI	National Trust[j]	N/A	Natural England[a] Cornwall AONB[f] South West Inshore and South West	No, both	151 (2000); 139 (2013); 154 (2014); 150 (2016); 102 (2020)	46 (2000); 0 (2016); 1 (2020)	Both colonies are in decline

Site	Designation	Leasehold	Freehold	Management	Are guillemot or razorbill a designated feature?	SMD Data Guillemot Population (IND)	SMD Data Razorbill Population (IND)	Colony Health
				Offshore Marine Plan 2021[b] National Trust (property adjacent to site)[g]				
Ore Stone	N/A	The Council Borough of Torbay[m]	The Crown Estate[l]	South West Inshore and South West Offshore Marine Plan 2021[b] Torbay Council – Harbour Authority and Beaches[h]	N/A	18 (1987); 5 (2001); 168 (2007); 339 (2017); 300 (2021); 90 (2022)	9 (1987); 0 (2001); 2 (2007); 25 (2017)	Increasing razorbill population; Historical increases for guillemot followed by recent declines
Berry Head	Berry Head National Nature Reserve; South Hams SAC and Berry Head to	N/A	N/A	Natural England[a] South West Inshore and South West Offshore Marine Plan 2021[b]	Yes, guillemot	673 (1986); 701 (1991); 762 (1992); 679 (1993); 1003 (1994); 806 (1995); 830 (1996); 878 (1997);	N/A	Stable (guillemot), N/A (razorbill)

Site	Designation	Leasehold	Freehold	Management	Are guillemot or razorbill a designated feature?	SMD Data Guillemot Population (IND)	SMD Data Razorbill Population (IND)	Colony Health
	Sharkham Point SSSI; The Berry Head and Berry Head (Southern Redoubt) Area of Special Protection.			Torbay Council – Harbour Authority and Beaches[h] South Devon Area of Outstanding Natural Beauty[b] Torbay Coast and Countryside Trust[i]		676 (1998); 661 (1999); 1029 (2000); 953 (2001); 858 (2002); 649 (2003); 986 (2004); 1053 (2005); 884 (2007); 1196 (2008); 1229 (2009); 1378 (2010); 1464 (2011); 927 (2012); 704 (2013); 1029 (2014); 823 (2015); 930 (2016); 1145 (2017); 877 (2018); 1053 (2019); 712 (2020); 891 (2021); 739 (2022); 943 (2023).		

[a]Telephone: 0300 060 3900

[b]Area of Outstanding Natural Beauty; Email: planning@marinemanagement.org.uk

[c]Conservation Email : conservation@exmoor-nationalpark.gov.uk ; Ranger Email : access@exmoor-nationalpark.gov.uk

[d]Email : northdevon@nationaltrust.org.uk

[e]Email : aonb@devon.gov.uk

[f]Email : info@cornwall-aonb.gov.uk

[g]Email : godrevy@nationaltrust.org.uk

[h]Email : harbour.authority@torbay.gov.uk

[i]Email : info@countryside-trust.org.uk

[j]National Trust, Heelis, Kemble Drive, Swindon, Wiltshire, SN2 2NA

[k]North Devon District Council, Lynton House, Commercial Road, Barnstaple, EX31 1DG

[l]The Crown Estate, 1 St James's Market, London, SW1Y 4AH

[m]The Council Borough of Torbay, Town Hall, Castle Circus, Torquay, TQ1 3DR

6 Colony Analysis

6.1 Cow and Calf

6.1.1 Site Pressures

91. Although this site is located along the South West Coast path, the guillemot colonies are located on the sheer cliffs below the path, about 40 – 45m from the cliff tops (National Trust, personal communication). This distance means that the colony is out of sight from visitors and receives little disturbance from non-visible indicators of human presence, such as noise.
92. Due to the sheer cliffs, this site can be used for rope climbing. This activity is infrequent at this site (National Trust, personal communication) but potentially highly disruptive when it does occur.
93. This site also experiences visitor pressure from the water. Although there are multiple kayak hire facilities within 5 miles of this site, most kayakers generally stay within the sheltered bays and do not reach as far as this site very frequently (National Trust, personal communication). However, there are also multiple companies in the area who run boat tours to this site to specifically view the seabirds. These boats have been observed to come within 10m of guillemot colonies, and they have resulted in flushing events (National Trust, personal communication, see Technical Consultation, document 6.1.6). Threats from other pressures such as avian or mammalian predators due to suboptimal nesting habitat could potentially be impacting populations at this site. The Applicant will continue working to determine whether this is the case.

6.1.2 Existing Management Measures

94. There are no specific conservation measures in place for guillemot and razorbill in the management plans of relevant management organisations beyond a general desire to conserve the environment, as expressed in the South West Inshore and South West Offshore Marine Plan 2021 and the North Devon Coast AONB (North Devon Coast AONB, 2019; Defra, 2021). There is a goal to conserve breeding seabird populations in the Exmoor National Park management plan, but this does not include specific actions (Exmoor National Park Authority, 2018).
95. There are strategic measures in place to keep litter away from wildlife at this site, including statutory fines for littering, an online system to report those who litter, educational campaigns, monitoring systems, and public beach cleans (North Devon Council, n.d.b).
96. There is a current reporting system in place for avian flu, where members of the public can report sightings of dead birds (Defra, 2023). Local councils in Devon have also advertised this helpline and passed on instructions to stop its spread in the local area (North Devon Council, n.d.a).

6.1.3 Feasible Compensation Measures for This Site

97. There are currently no measures in place at this site to mitigate the effects of recreational disturbance. However, due to the inaccessibility of the colonies by foot, there is little opportunity for such measures, for example, signage, visitor time restrictions, to make an impact at this site. Furthermore, due to the cliffside location of this site, physical interventions like predator control or fencing would not be effective at this site. However, the difficulties associated with this location can be mitigated by carrying out any monitoring by boat.

98. However, due to the threats posed by climbers and tour boats at this site, wardens would be a useful mitigation measure to help direct visitors' behaviour. Furthermore, the employment of an engagement officer would be another useful tool. An engagement officer could work with local boat operators to better carry out boat tours in a way that reduces disturbance.

99. More research will be undertaken to understand the degree to which a given site is threatened by predators and non-native species. If disturbance is identified as a relevant pressure specific to this site, through further stakeholder consultation and site visits, the Applicant will seek to secure appropriate disturbance reduction measures for the site in order to deliver compensation at the required level.

6.2 Woody Bay 1 and 2

6.2.1 Site Pressures

100. Though this site is located along the SW Coast path, the guillemot colonies are located on the sheer cliffs below the path, about 40 – 45 m from the cliff tops (National Trust, personal communication). This distance means that the colony is out of sight from visitors, and it receives little disturbance from non-visible indicators of human presence, such as noise.

101. The coastal path allows visitor access to a small beach area near this site, therefore human presence further down the cliffs is possible.

102. This site also experiences visitor pressure from the water. There are multiple kayak hire facilities within 5 miles of this site. There are also multiple companies in the area who run boat tours to this site to specifically view the seabirds. These boats have been observed to come within 10m of guillemot colonies, and they have resulted in flushing events (National Trust, personal communication). Threats from other pressures such as avian or mammalian predators due to suboptimal nesting habitat cannot be ruled out as impacting populations at this site.

6.2.2 Existing Management Measures

103. There are no specific conservation measures in place for guillemot and razorbill in the management plans of relevant management organisations beyond a general desire to conserve the environment that is expressed in the South West Inshore and South West Offshore Marine Plan 2021 and the North Devon Coast AONB (North Devon Coast AONB, 2019; Defra, 2021). There is a goal to conserve breeding seabird populations in the Exmoor National Park management plan, but this does not include specific actions (Exmoor National Park Authority, 2018).

104. There are strategic measures in place to keep litter away from wildlife at this site, including statutory fines for littering, an online system to report those who litter, educational campaigns, monitoring systems, and public beach cleans (North Devon Council, n.d.b).

105. There is a current reporting system in place for avian flu, where members of the public can report sightings of dead birds (Defra, 2023). Local councils in Devon have also advertised this helpline and passed on instructions to stop its spread in the local area (North Devon Council, n.d.a).

6.2.3 Feasible Compensation Measures for This Site

106. There are currently no measures in place at this site to mitigate the effects of recreational disturbance. However, due to the inaccessibility of the colonies by foot, there is little opportunity for disturbance measures to make an impact at this site. Furthermore, due to the cliffside location of this site, physical interventions like predator control or fencing would not be effective at this site. However, the difficulties associated with this location can be mitigated by carrying out any monitoring by boat.

107. Due to the threats posed by climbers and tour boats at this site, wardens would be a useful mitigation measure to help direct visitors' behaviour. Furthermore, the employment of an engagement officer would be another useful tool. An engagement officer could work with local boat operators to conduct boat tours in a way that reduces disturbance.

108. More research is needed into the degree to which a given site is threatened by predators and non-native species. If identified as relevant pressures through further stakeholder consultation and site visits, then improved habitat to protect against predators and invasive species could provide a feasible measure of compensation.

6.3 Gulland Rock

6.3.1 Site Pressures

109. This site is located on an offshore island and so there is no risk of visitor pressure by foot. Local tour companies offer daily boat trips for birdwatchers to visit this colony from the nearest town of Padstow. There is further visitor pressure by water, as this site is located near Padstow and Polzeath, two popular tourist areas. There are multiple equipment hire companies that allow tourists to hire their own sailboats, kayaks, speedboats, and jet skis. Access to this equipment allows tourists to visit the seabird colony and potentially cause disturbance. As with other sites, threats from other pressures such as avian or mammalian predators due to suboptimal nesting habitat cannot be ruled out as impacting populations at this site. The Applicant will continue to explore whether there is evidence to demonstrate that other such pressures could be linked to colony decline at this site.

6.3.2 Existing Management Measures

110. There are no specific conservation measures in place for guillemot and razorbill in the management plans of relevant management organisations beyond a general desire to conserve the environment that is expressed in the South West Inshore and South West Offshore Marine Plan 2021 (Defra, 2021). There is a goal to improve bird habitat in the Cornwall AONB management plan, but this does not specify seabirds or include specific actions or strategic goals (Cornwall AONB, 2022).

111. There are strategic measures in place to keep litter away from wildlife at this site, including statutory fines for littering, and an online reporting system for beaches that need cleaning (Cornwall Council, 2023).

112. There is a current reporting system in place for avian flu, where members of the public can report sightings of dead birds (Defra, 2023). Bird watching clubs in Cornwall have also advertised this helpline, and the Cornwall Council has undertaken public education initiatives that instruct the public to use the reporting system and provides tips to avoid spreading this disease (Cornwall Birds, 2023).

6.3.3 Feasible Compensation Measures for This Site

113. There are currently no measures in place at this site to mitigate the effects of recreational disturbance. As this is an offshore island, there is a reduced risk of visitor pressure by foot and so measures like signage, visitor access statements, and dog restriction may be less effective at this site. However, there is an opportunity to use floating signage and buoys to help keep individual visitors on watercraft back from the colonies present on this island.

114. Such measures could be strengthened through the creation of enforcement measures, such as the use of wardens to help monitor and enforce appropriate visitor behaviour around seabirds. Due to the location of this site, patrols from the water would be required. Enforcement measures could help mitigate disturbance from visitors who choose to ignore any set back distances.

115. This site would also benefit from coordination with local gear hire companies and recreational organisations, especially any watercraft outfitters and organisations, in promoting appropriate visitor behaviour to the areas surrounding this colony.

116. Finally, national statutory or voluntary bird watching codes could help protect birds from recreational disturbance. Compensation measures could assist with the establishment of this measure by facilitating any funding or stakeholder consultation that is needed to create birdwatching codes and promote their buy-in.

117. Habitat management and predator eradication will be considered for this site, should evidence that these pressures are impacting seabird breeding numbers or performance become available.

118. More research is needed into the degree to which a given site is threatened by predators and non-native species. If identified as relevant pressures through further stakeholder consultation and site visits, then improved habitat to protect against predators and invasive species could provide a feasible measure of compensation.

6.4 North Cliffs 1

6.4.1 Site Pressures

119. This site receives high levels of pressure from visitors on foot. The site is adjacent to the popular South West Coast Path. This section of the coastal path is near popular tourist destinations and surfing beaches, so potential for visitor pressure is high. While these colonies are located lower down on the steep cliffs below the coastal path, there is still potential for non-visible indicators of human presence, such as noise, to cause disturbance to these colonies. The coastal path allows visitors access to lower beaches near this site and so visitor presence further down the cliffs is possible.

120. Due to the cliffs and lower beach access, this site is a popular location for coasteering, therefore colonies face visitor pressure directly on the cliffside (National Trust, personal communication). There are several companies that offer coasteering tours in the area.

121. This site also experiences visitor pressure from the water. There are multiple companies in the area who run boat tours to this site to specifically view the seabirds. Threats from other pressures such as avian or mammalian predators due to suboptimal nesting habitat cannot be excluded as playing a role in impacting on colony decline at North Cliffs 1. The Applicant will continue working to determine whether this may be the case.

6.4.2 Existing Management Measures

122. There are no specific conservation measures in place for guillemot and razorbill in the management plans of relevant management organisations beyond a general desire to conserve the environment that is expressed in the South West Inshore and South West Offshore Marine Plan 2021 (Defra, 2021). There is a goal to improve bird habitat in the Cornwall AONB management plan, but this does not specify seabirds or include specific actions or strategic goals (Cornwall AONB, 2022).

123. There are strategic measures in place to keep litter away from wildlife at this site, including statutory fines for littering, and an online reporting system for beaches that need cleaning (Cornwall Council, 2023).

124. There is a current reporting system in place for avian flu, where members of the public can report sightings of dead birds (Defra, 2023). Bird watching clubs in Cornwall have also advertised this helpline, and the Cornwall Council has undertaken public education initiatives that instruct the public to use the reporting system and provides tips to avoid spreading this disease (Cornwall Birds, 2023).

6.4.3 Feasible Compensation Measures for This Site

125. There are currently no measures in place at this site to mitigate the effects of recreational disturbance. Therefore, there is an opportunity to use these measures to mitigate the effects of recreational disturbance at this site, including effects from walkers, those involved in coasteering, and tourists using watercraft.

126. Furthermore, management measures for watercraft, including floating signage and set back distances marked by buoys, could be utilised to address recreational disturbance that comes from the sea.

127. These measures could be strengthened through the creation of enforcement measures, including the use of wardens to help monitor and enforce appropriate visitor behaviour around seabirds. This could help mitigate disturbance from visitors who choose to ignore any signs or access statements. These enforcement measures could also be undertaken by boat.

128. This site could also benefit from coordination with local gear hire companies and recreational organisations, especially any watercraft and coasteering outfitters and organisations, in promoting appropriate visitor behaviour to the areas surrounding this colony.

129. Finally, national statutory or voluntary bird watching codes could further help protect birds from recreational disturbance. The development of these codes to target both individuals and tour companies would be beneficial, as both groups operate at and around this site. Compensation measures could assist with the establishment of this measure by facilitating any funding or stakeholder consultation that is needed to create birdwatching codes and promote their buy-in.

130. Seasonal closures, set-back distances, and sanitising mats could also be employed to supplement the efforts to reduce the spread of avian flu at this site.

131. More research is needed into the degree to which a given site is threatened by predators and non-native species. If identified as relevant pressures through further stakeholder consultation and site visits, then improved habitat to protect against predators and invasive species could provide a feasible measure of compensation.

6.5 Ore Stone

6.5.1 Site Pressures

132. This site is located on an offshore island and so there is a reduced risk of visitor pressure by foot. Local tour companies offer daily boat trips for birdwatchers to visit this colony from the nearest town of Torquay. As this site is located near a popular tourist area, visitor frequency is high as multiple companies offer kayak tours, jet ski tours, and boat tours, all of which have the potential to cause seabird disturbance. There are also multiple equipment hire companies that allow tourists to hire their own sailboats, kayaks, paddleboards, speedboats, and jet skis. Access to this equipment allows tourists to visit the seabird colony and cause disturbance. Threats from other pressures such as avian or mammalian predators due to suboptimal nesting habitat cannot be excluded as playing a role in impacting on colony decline at this location. The Applicant will continue working to establish whether such pressures may play a role in observed colony decline.

6.5.2 Existing Management Measures

133. There are no specific conservation measures in place for guillemot and razorbill in the management plans of relevant management organisations beyond a general desire to conserve the environment that is expressed in the South West Inshore and South West Offshore Marine Plan 2021 (Defra, 2021). Torbay Harbour Authority has included instructions on its website on the statutory requirements for boats to stay out of adjacent Special Protection Areas the breeding season (around Berry Head), but this does not apply to Ore Stone (Torbay Harbour, n.d.).

134. There are strategic measures in place to keep litter away from wildlife at this site, including statutory fines for littering, an online system to report those who litter, educational campaigns, monitoring systems, and public beach cleans (Devon County Council, n.d.; Clean Devon, 2024).

135. There is a current reporting system in place for avian flu, where members of the public can report sightings of dead birds (Defra, 2023). Local councils in Devon have also advertised this helpline and passed on instructions to stop its spread in the local area (Devon County Council, 2022).

6.5.3 Feasible Compensation Measures for This Site

136. There are currently no measures in place at this site to mitigate the effects of recreational disturbance. As this is an offshore island, there is a reduced risk of visitor pressure by foot and so measures like signage, visitor access statements, and dog restriction may be less effective at this site. However, there is an opportunity to use floating signage and buoys to help keep individual visitors on watercraft back from the colonies present on this island.

137. This measure could be strengthened through the creation of enforcement measures, like the use of wardens, to help monitor and enforce appropriate visitor behaviour around seabirds. Due to the location of this site, patrols from the water would be required. These enforcement measures could help mitigate disturbance from visitors who choose to ignore any set back distances.

138. This site could also benefit from coordination with local gear hire companies and recreational organisations, especially any watercraft outfitters and organisations, in promoting appropriate visitor behaviour to the areas surrounding this colony.

139. Finally, national statutory or voluntary bird watching codes could further help protect birds from recreational disturbance. Compensation measures could assist with the establishment of this measure by facilitating any funding or stakeholder consultation that is needed to create birdwatching codes and promote their buy-in.

140. More research is needed into the degree to which a given site is threatened by predators and non-native species. If identified as relevant pressures through further stakeholder consultation and site visits, then improved habitat to protect against predators and invasive species could provide a feasible measure of compensation.

6.6 Berry Head

6.6.1 Site Pressures

141. This site is subject to high numbers of visitors, both to the top of the cliffs by foot and to the surrounding waters by vessels, especially anglers and tourist boats. As this site is located near a popular tourist area, visitor frequency is high with vessels present year-round and in the vicinity of the guillemot colony (outside the exclusion zone) during the breeding season. The area is also popular with walkers on top of the cliffs, and climbers, both of which have the potential to cause disturbance to birds. The South West Coast Path runs along the cliff top, bringing walkers near the guillemot colony which can cause noise disturbance even if visitors are out of eyesight. Additionally, climbing within the area is not fully restricted within the breeding season (according to the British Mountaineering Council (BMC))[1]; certain routes in the protection zone have been closed to protect breeding birds, although others remain open and there is the potential for people to go off-route and/or people to be present in the water below which remains a displacement risk to guillemots. It is not yet clear whether threats from other pressures such as avian or mammalian predators due to suboptimal nesting habitat could also play a role in colony decline at Berry Head.

[1] https://www.thebmc.co.uk/modules/rad/view.aspx?id=352

6.6.2 Existing Management Measures

142. The guillemot colony at Berry Head is the largest on the South Coast and is protected as an Area of Special Protection (under an Order issued by the Department of the Environment in 1988). Accordingly, boats are prohibited from entering the cove where the colony is located during the breeding season (2nd March to the 31st July). Birds and their eggs are also protected from damage and disturbance under the Wildlife and Countryside Act 1981, though specific measures beyond vessel (including kayak/paddleboard) restrictions are not stated.

143. There are strategic measures in place to keep litter away from wildlife at this site, including statutory fines for littering, an online system to report those who litter, educational campaigns, monitoring systems, and public beach cleans (Devon County Council, n.d.; Clean Devon, 2024).

144. There is a current reporting system in place for avian flu, where members of the public can report sightings of dead birds (Defra, 2023). Local councils in Devon have also advertised this helpline and passed on instructions to stop its spread in the local area (Devon County Council, 2022).

6.6.3 Feasible Compensation Measures for This Site

145. Seasonal closures, set-back distances, and sanitising mats could also be employed to supplement the efforts to reduce the spread of avian flu at this site.

146. The Area of Special Protection at Berry Head provides this site with a level of protection that can help mitigate against the disturbance caused by boats . However, there is an opportunity to provide measures that can help mitigate the effects of kayaking and paddleboarding. Measures like floating signage and buoys to keep visitors on watercraft back from the colonies would be effective at this site.

147. This measure could be strengthened through the creation of enforcement measures, like the use of wardens, to help monitor and enforce appropriate visitor behaviour around seabirds. Due to the location of this site, patrols from the water would be required. These enforcement measures could help mitigate disturbance from visitors who choose to ignore any set back distances.

148. This site could also benefit from coordination with local gear hire companies and recreational organisations, especially any watercraft outfitters and organisations, in promoting appropriate visitor behaviour to the areas surrounding this colony.

149. Finally, national statutory or voluntary bird watching codes could further help protect birds from recreational disturbance. Compensation measures could assist with the establishment of this measure by facilitating any funding or stakeholder consultation that is needed to create birdwatching codes and promote their buy-in.

150. The Applicant will undertake more research to establish the degree to which a given site is threatened by predators and non-native species. If identified as relevant pressures through further stakeholder consultation and site visits, then improved habitat to protect against predators and invasive species could provide a feasible measure of compensation.

7 Roadmap

7.1 Scale and location of compensation

151. The nature and scale of the measures to be implemented will be defined in collaboration with stakeholders, landowners and land managers at each of the six proposed sites, based upon the requirements at each site. The Applicant will assess the existence of, and the impacts from the pressures discussed here (disturbance and other human traffic induced pressures such as litter and HPAI), habitat loss, and the potential for predator eradication) at each site, assess what existing management measures are place at each site, and will define a bespoke package for each site based upon the above.

152. The scale of compensation will be defined by the current population of guillemot and razorbill in the context of historical peaks, i.e. the potential population each site could support. For example, restoring guillemot populations at Cow and Calf would increase numbers from the current (2023) level of 760 individuals to a recent maximum of 1,308. This site would also deliver an increase in razorbill from 103 to 181 birds. Restoring the Gulland Rock colony to previous maxima for guillemot and razorbill would see increases from 580 to 1,176 guillemot and from 52 to 82 razorbill. Therefore, the overall scale of compensation that can be delivered by this suite of additional measures will be defined by which sites are taken forward.

153. Across the six sites, restoring populations to previous maxima through the implementation of a measure or suites of measures described here, would increase guillemot numbers by 2,081 birds and razorbill by 269. Applying standard conversion rates (Walsh *et al* 1995) of multiplying numbers of individuals on cliffs by 0.67 gives an increased breeding population of 1,394 pairs of guillemot and 180 razorbill. Should measures or suites of measures produce 50% of the birds required to return to previous maxima, the quanta delivered would be 1,040 individual guillemots and 134 razorbill, which would equate to 520 breeding pairs of guillemot and 77 breeding pairs of razorbill.

154. The required compensation for guillemots and razorbills based on predicted impacts using the Applicant's approach is shown in Table 7.1.

Table 7.1: Capacity of the additional measures measure to deliver the required compensation (Applicant's approach)

Species	Requirement (breeding pairs)	Capacity (breeding pairs)	% of requirement delivered by measure
Guillemot	110.6	520	470.2
Razorbill	103.4	77	77.5

155. The Applicant's position is that no adverse effect on integrity should be concluded for either auk species. However, should compensation be required then Predator control, through implementation support to a predator exclusion measure at the Plémont Seabird Reserve (see Predator Control Evidence Base and Roadmap, document 7.6.5), would form the primary measure for guillemot and/or razorbill, which could deliver all of the compensation required under the Applicant's approach as presented in Table 7.1.

156. Should it be deemed necessary that additional compensation is required beyond that provided by the Plémont Seabird Reserve, then that measure could be augmented by the measures outlined in this document. Additional supporting compensation could also be provided by ANS should that be deemed necessary. Therefore, in the event that an AEoI is identified for either (or both) auk species, a combination of these measures could be used to deliver compensation, dependent on the final quantum deemed necessary by the Secretary of State.

7.2 Design and delivery of the compensation measures

157. Prior to consent the Applicant will continue to identify the pressures facing these sites (as described above) and undertake necessary investigative work to identify those sites best suited to deliver the proposed compensation measures. Bespoke measures will then be developed for each of the relevant sites. In the event that compensation for guillemot and/or razorbill is deemed necessary by the Secretary of State, further detail on monitoring and adaptive management would be secured through the implementation and monitoring plan to be agreed with the species – specific steering groups that would be formed in accordance with the DCO. .

7.3 Delivery Mechanism

158. Should compensation be required measures will be delivered with the full consent of, and in full collaboration with the relevant landowners and managers at each site. The Applicant will continue to liaise with landowners to secure the necessary land rights to facilitate delivery of the measures. Discussions will be continued with The Crown Estate to facilitate this process. Once the measures or suites of measures to be implemented at each site are defined, the Applicant will seek to ensure that all other required consents and approvals are in place. The delivery mechanism will be discussed with relevant stakeholders as part of the species-specific consultation groups, aiming to identify appropriate project design and stakeholder coordination.

7.4 Monitoring, adaptive management, and reporting

159. Options for monitoring, subsequent adaptive management (should it be required) and reporting will be developed as the details of the specific pressures at each site and the most appropriate management measures are identified. The final details will be presented in the Guillemot Compensation Implementation and Monitoring Plan (GCIMP) and the Razorbill Compensation Implementation and Monitoring Plan (RCIMP) (if required) that will be developed post-consent in consultation with the relevant steering group.

7.4.1 Further Research Requirements

160. There is a strong baseline for understanding guillemot and razorbill, as well as wider seabird responses to human disturbance. However, it is acknowledged that there are some knowledge gaps which will continue to be explored and final agreement on which would be subject to discussions post consent.

7.5 Funding

161. The anticipated costs of the development, implementation and ongoing maintenance and monitoring of the proposed additional measures are outlined in Table 7.2 below. These costs are expected to represent an upper limit and will be refined further as the measures are progressed.

162. These costs are also included within the Compensation Funding Statement (document reference 7.9) which outlines how the Applicant and its ultimate parent companies would fund compensation measures should they be required.

Table 7.2: Estimated cost for the delivery of the additional measures for Guillemot and Razorbill

Phase	Cost
Devex	£282,576
Capex	£1,500,000
Opex	£2,241,750
Total	£4,024,326

7.6 Programme

163. An indicative program for the identification and establishment of the management measures 1 year prior to the installation of any wind turbine tower (as defined in the DCO), is presented in Table 7.3 below.

Table 7.3: Indicative programme for additional measures for compensation for guillemot and razorbill

	Year					
Activity	2024	2025	2026	2027	2028	2029
Identification of management measures for each site						
Expected DCO Outcome						
Securing necessary consents and land rights (if required)						
Implementation of measures						
Turbine installation						

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