Conservation and Management Advice

ST KILDA SPA AND SEAS OFF ST KILDA SPA

UK SITES: 9001031 AND 9020332

DECEMBER 2024

This document provides advice to Public Authorities and stakeholders about the activities that may affect the protected features of the St Kilda Special Protection Area (SPA) and the Seas off St Kilda SPA. It provides advice from Scottish Natural Heritage (SNH) (operating under the name of and hereinafter referred to as NatureScot) under Regulation 33(2) of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) and advice from the Joint Nature Conservation Committee (JNCC) under Regulation 18 of The Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007 (as amended), to other relevant authorities on the Conservation Objectives for the St Kilda SPA and the Seas off St Kilda SPA, and any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species for which the site has been designated. It covers a range of different activities and developments but is not exhaustive. It focuses on where there is a risk to achieving the Conservation Objectives. The paper does not attempt to cover all possible future activities or eventualities (e.g. as a result of accidents) and does not consider cumulative effects.

Further information on marine protected areas and management is available at -

https://www.gov.scot/policies/marine-environment/marine-protected-areas/

For the full range of MPA site documents and more on the fascinating range of marine life to be found in Scotland's seas, please visit -

www.nature.scot/mpas or https://jncc.gov.uk/advice/marine-protected-areas/

Document version control			
Version	**Date**	**Author**	**Reason / Comments**
1	April 2020	Lucy Quinn	First draft
2	July 2020	Lucy Quinn	Second draft to address some comments from JNCC.
3	April 2022	Lucy Quinn	Updated draft for consistency and addressing comments.
4	March 2023	Lucy Quinn	Updated draft following JNCC comments
5	July 2023	Emma Philip	Review
6	July 2023	Lucy Quinn	Update following QA comments
7	August 2023	Emma Philip	QA
8	August 2023	David Maclennan & Ben Ross	Review and sign-off
9	February 2024	Julie Black, Helen Baker	Review and JNCC sign off
10	October 2024	Jen Graham	Minor amendments for consistency checks with other SPAs.

Distribution list			
Format	**Version**	**Issue date**	**Issued to**
Electronic	1	14 April 2020	Emma Philip, Julie Black
Electronic	2	16 July 2020	Roddy MacMinn
Electronic	3	May 2022	Julie Black
Electronic	3	Oct 2022	Bryony Baker, Mike Meadows
Electronic	4	March 2023	Emma Philip
Electronic	7	3 August 2023	David Maclennan & Ben Ross
Electronic	9	February 2024	Julie Black, Helen Baker

Contents

1 Overview of document

This document provides details of the Conservation and Management Advice jointly for the St Kilda Special Protection Area (SPA) and the Seas off St Kilda SPA. This combined Conservation and Management Advice package is divided into eight main sections. The introduction in section 2 gives an overview of the St Kilda SPA and the Seas off St Kilda SPA and their contribution in terms of conservation and wider benefits. Section 3 provides an overview of the roles of the various bodies involved with advising, regulating and managing these SPAs. Section 4 describes the protected features and their condition, and section 5 introduces the Conservation Objectives for the sites. Section 6 describes the threats and pressures to which the protected features are sensitive, and section 7 provides the management advice for these activities. Section 8 identifies what further research and surveys may be required to increase our understanding of how the protected features utilise these marine protected areas.

Annex 1 sets out the combined St Kilda SPA and Seas off St Kilda SPA Conservation Objectives. Annex 2 provides supporting information relating to the protected features.

Throughout this document the term Special Protection Area (SPA) is used in relation to the site names, e.g. St Kilda SPA or Seas off St Kilda SPA, or where discussing specific legislation relating to the sites. Otherwise, the term Marine Protected Area (MPA) is used when discussing the MPA network generally. The term *qualifying features* is used in the Conservation Objectives to refer to those Annex 1 and regularly occurring migratory bird species that the St Kilda and Seas off St Kilda SPAs have specifically been classified to protect. Within the wider document text, the term *protected features* is used to refer both to these specific site features and more generally to species or habitats protected through MPA designations.

2 Introduction

2.1 Purpose statement

St Kilda SPA has been designated to protect 10 species of breeding seabirds, and the Seas off St Kilda designated to protect five species of breeding seabirds, as well as their supporting habitats. By doing so they contribute to the Scottish, UK and OSPAR MPA networks, the conservation of the wider marine environment around Scotland, and progress towards Good Environmental Status within the North-East Atlantic marine region.

The main purpose of the St Kilda SPA and the Seas off St Kilda SPA is to contribute to the Favourable Conservation Status of the protected features in the Atlantic Biogeographic Region. The Conservation Objectives form the framework for establishing appropriate management measures and assessing all future plans and projects that have the potential to affect the protected features of the SPAs.

2.2 Conservation benefits

The conservation benefits of the St Kilda SPA and the Seas off St Kilda SPA are:

- Protecting one of the largest and oldest marine seabird communities in western Europe, and one of the most important in the whole North Atlantic, with the total population of seabirds exceeding 600,000 individuals.
- Protecting over 32% of the UK's breeding gannet population and one of the largest regularly occurring marine aggregation of breeding gannet in UK waters.

- Protecting the following Annex 1 rare and vulnerable species: European storm petrel (approximately 1% of the GB population) and Leach's storm petrel (approximately 9% of the GB population).
- Protecting a nationally important aggregation of breeding seabirds including fulmars, European storm petrels, Leach's storm petrel, Manx shearwater, gannet, great skua, guillemot, razorbill, kittiwake, and puffin.
- Protecting important waters immediately surrounding the seabird breeding colony which birds use for resting, preening and other maintenance activities.
- Protecting important cliff habitats where the seabird protected features can nest.
- Protecting waters with rich marine habitats, including important shelf waters with areas of high productivity, that support a diversity of pelagic and demersal fish, bivalve molluscs, gastropods and crustaceans where the seabirds can feed.

2.3 Wider benefits

The protected features of the St Kilda SPA and the Seas off St Kilda SPA provide ecosystem services locally and to the wider marine ecosystem. We describe these ecosystem services in terms of their functions (the support or provision of something to the wider ecosystem e.g. habitat, nutrient cycling, sediment stabilisation) and natural resources (e.g. fish and shellfish, aggregates, wildlife), which in turn lead to benefits for people.

Figure 1 illustrates how the protected features of the St Kilda SPA and the Seas off St Kilda SPA contribute to benefits for people. There can be many complex interactions and dependencies amongst the protected features, their functions, associated natural resources and the benefits we gain from them.

The protected features, especially when taken within the context of both SPAs and/or the local ecosystem, contribute to certain functions more than others, e.g. biomass production and nutrient cycling and are fundamental to the continued supply of natural resources and benefits associated with these two SPAs, and to the long-term health of the protected features.

In terms of resources, the St Kilda SPA and the Seas off St Kilda SPA jointly are comprised of rocky coastlines, steep cliffs, sea stacks, and large marine areas. The SPAs cover mainly offshore waters and encompasses the St Kilda archipelago, consisting of the four islands of Hirta, Dun, Soay and Boreray, and a number of sea-stacks including Stac an Armin, Stac Lee and Levenish. These islands lie about 70 km west of North Uist in the Outer Hebrides. Water depths range mainly between 40 m and 410 m; shallow areas with less than 100 m depth occur only at the very east of the site, while depths of more than 250 m are reached only in the northwest. The Seas off St Kilda SPA stretches close to the continental shelf edge, and shelf-break fronts are a typical phenomenon at the shelf edge. The combined effect of current and waves creates low-energy seabed environments in most of the site. In the southwest of the site, rock and reef habitats are prevalent; the northwest is dominated by a mosaic of subtidal coarse sediments and sand and muddy sand habitats. These diverse marine and coastal habitats support a variety of natural resources including plankton, fish, shellfish (including juveniles), mammal and bird species, in particular high densities of breeding seabird species.

The rich and varied natural resources present within the marine areas of the SPAs give rise to a wide range of benefits to people. The unique landscapes, seascapes and wildlife provide opportunities particularly for tourism, recreation and wildlife watching, which is a hugely important part of the local economy. The cultural heritage associated with St Kilda as a World Heritage Site and a National Nature Reserve (NNR) is another aspect to the islands' attraction to visitors, which is intimately linked to the seabirds that breed there. Further benefits relating to health and well-being arise from the site's natural resources, resulting in

a place where visitors can spend time connecting with and enjoying nature. Fisheries and supporting businesses from local communities within and around St Kilda utilise and benefit from the wildlife and the area's resources.

Some benefits that arise from the functions and natural resources of the MPAs are high, due to the large numbers of birds present (e.g. nutrient cycling and biomass production). There is potential for benefits to be enhanced by improving the quantity or quality (health) of the protected features themselves.

Figure 1. Benefits to people associated with protected features of the St Kilda SPA and the Seas off St Kilda SPA.

2.4 Contribution to policy commitments

Managing the St Kilda SPA and the Seas off St Kilda SPA to maintain the protected features in favourable condition will ensure the continued provision of the benefits above as well as both sites contribution to:

- An ecologically coherent network of MPAs which are well managed under the OSPAR convention and national legislation.
- Achieving Favourable Conservation Status for the protected features in the Atlantic Biogeographic Region.
- Progress towards achieving Good Environmental Status in relation to maintaining biological diversity and ensuring marine food web abundance and diversity.
- Making a significant contribution to the protection, enhancement and health of the marine area under the National Marine Plan.
- Restoring marine and coastal ecosystems and increasing the environmental status of our seas under the Scottish Biodiversity Strategy.
- Helping to adapt to climate change under The Scottish Climate Change Adaptation Programme.

3 Roles

This document provides advice for the St Kilda SPA and the Seas off St Kilda SPA in relation to activities that may affect the protected features. More detailed advice can be provided to relevant authorities to inform their decision making as required. In doing this, our aim is to ensure the Conservation Objectives for the protected features are met.

The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) (the "Habitats Regulations") and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) (the "Offshore Regulations"), under Regulation 33(2) and Regulation 21 respectively, make special provisions for the protection of European marine sites, requiring SNH (now referred to as NatureScot) and JNCC to advise other relevant authorities of the Conservation Objectives for a site, and also of the operations which may cause deterioration of the habitats or species, or disturbance of species protected in the SPA.

It is the role of the relevant and competent authorities[1] to ensure that the activities they regulate, permit or license do not hinder the achievement of the Conservation Objectives of the St Kilda and Seas off St Kilda SPAs. The management advice in this document is provided to assist authorities in managing the activities outlined in Table 2, section 7 and undertaking Habitats Regulations Appraisals of plans and projects.

Stakeholders can provide additional evidence to support the development of management including local knowledge of the environment and of activities. This will contribute to the development of well-designed and effective management measures.

4 Protected features and status

St Kilda SPA and the Seas off St Kilda SPA have been selected to become part of the UK's SPA network, contributing to Scotland's MPA network, which in turn has been established to

[1] A relevant authority is a body or authority that has a function in relation to land or waters within or adjacent to the site (Regulation 5) and include: a nature conservation body; a local authority; water undertakers; a navigation authority; a harbour authority; a lighthouse authority; a river purification board (SEPA); a district salmon fishery board; and a local fisheries committee. All relevant authorities are competent authorities. A competent authority is defined in Regulation 6 as "any Minister, government department, public or statutory undertaker, public body of any description or person holding a public office". In the context of a plan or project, the competent authority is the authority with the power or duty to determine whether or not the proposal can proceed.

help conserve and recover a range of Scotland's important marine habitats, wildlife, geology and landforms.

The protected features of St Kilda SPA and the Seas off St Kilda SPA are protected within the SPAs throughout the year, irrespective of the season for which they qualified as a protected feature.

A summary of the protected features within St Kilda SPA and the Seas off St Kilda SPA (Table 1) is provided below along with their condition within the site (where known) based on the latest NatureScot Site Condition Monitoring assessment, and the broader conservation status of the protected features. Where a feature is protected in both SPAs, this is stated. Current trends for relevant seabird colonies can be found in JNCC (2021) and are based on trends derived from the Seabird Monitoring Programme (SMP) including, where available, Seabird Counts census data (Burnell *et al.* 2023). Where the SMP data is more recent than the SCM data this has been used to inform the feature condition at the site.

Table 1. Protected features and status for St Kilda SPA and the Seas off St Kilda SPA. Feature condition refers to the condition of the protected feature at a site level. Broader conservation status is the overall conservation status of the feature within the UK and Europe. No assessment on the condition of the features at the Marine Atlantic Biogeographic Region scale is available. The SPA(s) for which the protected feature is designated is also stated within the table.

Protected Feature	Designation (SPA)	Feature condition at site	Assessment year	Broader conservation status UK[2] European region[3]	
Atlantic puffin (breeding)	St Kilda Seas off St Kilda	Unfavourable declining	2019	Red	Endangered
Black-legged kittiwake (breeding)	St Kilda	Unfavourable declining	2016	Red	Vulnerable
Common guillemot (breeding)	St Kilda Seas off St Kilda	Unfavourable declining	2016	Amber	Least Concern
European storm petrel (breeding)	St Kilda Seas off St Kilda	Favourable maintained	2021	Amber	Least Concern
Great skua (breeding)	St Kilda	Unfavourable declining	2023[4]	Red	Least Concern
Leach's storm petrel (breeding)	St Kilda	Favourable, declining	2021	Red	Near Threatened
Manx shearwater (breeding)	St Kilda	Unfavourable no change	2021	Amber	Least Concern

[2] Based on Birds of Conservation Concern 5 (BoCC5), for further details on definitions see Stanbury *et al.* 2024.
[3] Based on BirdLife International, 2021.
[4] Based on Tremlett *et al.* 2024.

Protected Feature	Designation (SPA)	Feature condition at site	Assessment year	Broader conservation status UK[2] European region[3]	
Northern fulmar (breeding)	St Kilda Seas off St Kilda	Unfavourable declining	2016	Amber	Vulnerable
Northern gannet (breeding)	St Kilda Seas off St Kilda	Favourable, maintained	2013	Amber	Least Concern
Razorbill (breeding)	St Kilda	Unfavourable declining	2016	Amber	Least Concern

5 Setting Conservation Objectives

5.1 Background

Under Regulation 33(2) of the Habitats Regulations, NatureScot have responsibility for providing the Conservation Objectives for European marine sites in Scottish territorial waters. Under Regulation 21 of The Offshore Regulations, JNCC have responsibility for providing Conservation Objectives for European marine sites in UK offshore waters. This document presents the respective Regulation 33 and Regulation 21 advice, plus supporting information for the Conservation Objectives. The site-level Conservation Objectives seek to define the contribution that each SPA should make to achieving favourable conservation status for the protected features. They provide the framework for the setting of site conservation measures (management) and for the Habitats Regulations Appraisal of projects and plans.

The Conservation Objectives for St Kilda SPA and the Seas off St Kilda SPA are provided in Annex 1.

5.2 Relationship between feature condition and Conservation Objectives

The Conservation Objectives seek to *maintain* protected features where evidence exists that a feature is in favourable condition in the site, or where there is uncertainty concerning the assessed condition of a feature (see section 4) but no reason to suspect deterioration in condition since designation. Where evidence exists that a feature is declining and/or damaged and therefore not in a favourable condition in the site, the Conservation Objectives will seek to *restore* the protected feature.

Feature condition with respect to breeding seabird features within the Seas off St Kilda SPA (gannet, European storm-petrel, fulmar, guillemot and puffin) is based on the feature's population size at the relevant functionally linked breeding seabird colonies (primarily St Kilda SPA); seabirds foraging in the marine SPA will be from breeding colony SPAs, Sites of Special Scientific Interest (SSSI) and smaller non-designated colonies within foraging range of the Seas off St Kilda SPA and are therefore the same populations. Where features of the Seas off St Kilda SPA are unfavourable at the linked colony SPA (St Kilda SPA) and factors relating to functionally linked sea (i.e. within foraging range of the colony SPA) are identified as potentially affecting feature condition (population size) at the colony, then the feature is also considered unfavourable within the marine SPA (Seas off St Kilda SPA).

European storm petrel, Leach's storm petrel, and gannet are in favourable condition at St Kilda SPA. Therefore, the Conservation Objectives for these protected features seek to *maintain* this condition within the St Kilda SPA. As European storm petrel and gannets are also protected features of the Seas off St Kilda SPA, the condition of these features within

the Seas of St Kilda SPA are also considered favourable. Consequently, the Conservation Objectives for European storm petrel and gannets also seek to *maintain* this condition within the Seas off St Kilda SPA.

Puffin, kittiwake, guillemot, fulmar, great skua, Manx shearwater and razorbill are in unfavourable condition at St Kilda SPA. Therefore, the Conservation Objectives for these protected features seek to *restore* this condition within the St Kilda SPA. As puffin, guillemot and fulmar are also protected features of the Seas off St Kilda SPA, the condition of these features within the Seas of St Kilda SPA are also considered to be in unfavourable condition.

Breeding puffin are in unfavourable condition at St Kilda SPA due to a decline of 36% from around 155,000 pairs at citation (1992) to around 98,800 pairs in 2019. Reasons for the decline in puffins at St Kilda SPA are uncertain however reduction in prey in key foraging areas (including within functionally linked marine areas such as Seas off St Kilda SPA) is considered a potential contributing factor. It is not known if any colony-based factors may also be playing a role. The condition of puffin at St Kilda SPA and the Seas off St Kilda SPA is therefore considered to be unfavourable and consequently, the Conservation Objectives seek to *restore* favourable condition.

Breeding kittiwake are in unfavourable condition at the St Kilda SPA due to a decline of 95% from 7830 pairs at citation (1992) to 420 pairs in 2016. The reasons for declines of kittiwakes at this SPA are uncertain however reduction of prey in their foraging areas is considered a key contributing factor. Kittiwake breeding success was found to be related to sandeel abundance and availability (e.g. Daunt *et al.* 2008; Poloczanska *et al.* 2004). Long-term diet studies on the Isle of May have also highlighted a long-term decline in the overall prevalence of sandeels in kittiwake chick diet, concomitant with an increase in the relative prevalence of clupeids in Scottish waters (Wanless *et al.* 2018). No loss or deterioration of suitable nesting habitat (sea-cliffs) has been noted at St Kilda SPA. The condition of kittiwake at the St Kilda SPA is therefore considered to be unfavourable and consequently, the Conservation Objectives seek to *restore* favourable condition.

Breeding guillemot are in unfavourable condition at the St Kilda SPA due to a decline of 55% from 22,700 individuals at citation (1992) to around 10,300 individuals in 2016. The reasons for declines of guillemots at this SPA are uncertain however reduction of prey in their foraging areas (including within functionally linked marine areas such as Seas off St Kilda SPA) is considered a key contributing factor. No loss or deterioration of suitable nesting habitat (sea-cliffs) has been noted at St Kilda SPA. The condition of guillemot at the St Kilda and Seas off St Kilda SPAs is therefore considered to be unfavourable and consequently, the Conservation Objectives seek to *restore* favourable condition.

Breeding fulmar are in unfavourable condition at St Kilda SPA due to a decline of 54% from 62,800 pairs at citation (1992) to around 29,200 pairs in 2016. The reasons for declines of fulmars at this SPA are uncertain however reduction of prey in their foraging areas is considered a key contributing factor. Bycatch in UK waters, particularly from longline fisheries is estimated to be in the thousands annually, with hotspots in northern and western Scottish waters, and may be contributing to population declines (Miles *et al.* 2020; Northridge *et al.* 2023). Fulmars are also known to be sensitive to disturbance, particularly during the incubation period. It is not known if this could be a contributing factor at this SPA. The condition of fulmar at the St Kilda and Seas off St Kilda SPAs is therefore considered to be unfavourable and consequently, the Conservation Objectives seek to *restore* favourable condition.

Breeding great skua are in unfavourable condition at St Kilda SPA due to a decline of 71% from 270 pairs at citation (1992) to 79 pairs (2023). The decline is largely due to an outbreak of highly pathogenic avian flu in 2021 and 2022 (Tremlett *et al.* 2024). Any smaller declines seen in great skuas at this colony preceding 2021 may be due to declines in other seabird species at the colony, which great skuas rely upon for food. The condition of great skua at St Kilda SPA is therefore considered to be unfavourable and consequently, the Conservation Objectives seek to *restore* favourable condition.

Breeding Manx shearwaters are in unfavourable condition at St Kilda SPA due to a decline of 25% from 5000 pairs at citation (1992) to around 3700 in 2021. Reasons for the decline in Manx shearwaters at St Kilda SPA are uncertain however reduction in prey in key foraging areas is considered a potential contributing factor. It is not known if any colony-based factors may also be playing a role. The condition of Manx shearwater at St Kilda SPA and the Seas off St Kilda SPA is therefore considered to be unfavourable and consequently, the Conservation Objectives seek to *restore* favourable condition.

Breeding razorbill are in unfavourable condition at the St Kilda SPA due to a decline of 78% from 3810 individuals at citation (1992) to 820 individuals in 2016. The reasons for declines of razorbills at this SPA are uncertain however reduction of prey in their foraging areas is considered a key contributing factor. No loss or deterioration of suitable nesting habitat (sea-cliffs) has been noted at St Kilda SPA. The condition of razorbills at the St Kilda SPA is therefore considered to be unfavourable and consequently, the Conservation Objectives seek to *restore* favourable condition.

5.3 Conservation priorities

On the rare occasion where the need to favour the management of one protected feature of a site over another, conservation priority will be given to the most important species/habitats to take action for and/or the most important or urgent measures to be taken.

For the St Kilda SPA and the Seas off St Kilda SPA, Leach's storm petrel and European storm petrel are both Annex 1 species considered rare and vulnerable, with Leach's petrel also being on Schedule 1.1 of the Wildlife and Countryside Act 1981 (as amended). The conservation requirements for Annex 1 species should take precedence over the regularly occurring migratory species (puffin, guillemot, razorbill, Manx shearwater, fulmar, gannet, great skua and kittiwake).

There are currently no apparent management conflicts between the protected features. However, given the interactions between predatory great skuas and the other seabird protected features, should future conservation measures be proposed to enhance the population of great skuas, impacts on other protected features will need full consideration.

5.4 Overlapping Protected Areas

The following protected areas overlap with the St Kilda SPA and/or the Seas off St Kilda SPA:

- Geikie Slide and Hebridean Slope Marine Protected Area (MPA)
- St Kilda Site of Special Scientific Interest (SSSI)
- St Kilda Special Area of Conservation (SAC)
- St Kilda National Nature Reserve (NNR)
- St Kilda National Scenic Area (NSA)
- St Kilda World Heritage Site

Conservation measures in the overlapping protected areas need to ensure the Conservation Objectives of all the sites are met. Priority would be given to the SPA and SAC features. There are no apparent management conflicts between the protected features of the protected areas. Site information including the Conservation Objectives for the above sites, are available on SiteLink.

6 Feature sensitivity

The following section provides an overview of the pressures associated with human activities that are most relevant to the protected features. Further information on feature sensitivity, will be made available on Marine Scotland's Feature Activity Sensitivity Tool (FeAST)[5]. The information in FeAST will reflect our current understanding of the interactions between activities, pressures and features. It highlights that activities can give rise to a range of pressures, which the protected features may be sensitive to. Our assessment of sensitivity is based on a feature's tolerance (response to change) and its ability to recover.

6.1 Atlantic puffin, common guillemot and razorbill (breeding)

Auks (guillemot, razorbill and puffins) may be prone to accidental bycatch in fishing nets particularly in surface gears (Miles *et al.* 2020; Northridge *et al.* 2020; Zydelis *et al.* 2013). Depletion of prey resources either due to climate change or industry can also have effects on their populations (Mendel *et al.* 2008). These species are also susceptible to large scale mortality in major oil spills (Mendel *et al.* 2008), particularly during their flightless moult period. Auks may also be susceptible to disease, including avian flu (APHA). There is potential for impacts on auk species due to collision with artificial structures under water (Furness *et al.* 2012). These species may be displaced as a result of marine developments (Peschko *et al.* 2020; 2024; Furness *et al.* 2013) and associated vessel activities (Furness, 2016). Guillemots and razorbills show sensitivity to visual disturbance associated with vessels (Cook & Burton, 2010) and for guillemots, noise disturbance due to marine industry may also occur (Leopold & Camphuysen, 2009). As these are species that feed in the water column, they can be potentially affected by any increase in turbidity that would affect their ability to successfully forage for their prey (Cook & Burton, 2010). (*See also Sandeel sensitivity assessment in FeAST).*

6.2 Black-legged kittiwake (breeding)

Kittiwakes may be susceptible to collision (Furness *et al.* 2013) and displacement (Peschko *et al.* 2020) from marine developments. They may also be vulnerable to oil spills (Mendel *et al.* 2008) and organochlorine pollution (Tartu *et al.* 2015), which can lead to lower adult survival and reduced breeding performance (Tartu *et al.* 2013; Svendsen *et al.* 2018). Kittiwakes are identified as potentially sensitive to bycatch in surface gears in UK waters (Bradbury *et al.* 2017). Kittiwakes may also be susceptible to disease (OSPAR Commission, 2009), including avian flu (APHA). Any reduction in prey items will also have an effect on kittiwake populations (Tasker *et al.* 2000), whether due to climate change (Sandvik *et al.* 2014) or industry (Searle *et al.* 2023; Bicknell *et al.* 2013). (*See also Sandeel sensitivity assessment in FeAST).*

6.3 European storm petrel (breeding)

European storm petrels are highly vulnerable to depredation by introduced mammalian predators (e.g. rats, cats, mink) at their breeding colonies (Mitchell & Newton 2004; Ruffino *et al.* 2009). There are recorded incidences of storm petrel entanglement in fishing gear, most likely during hauling and setting of gillnet fishing gear (Žydelis *et al.* 2013) but sensitivity of European storm petrel to potential bycatch in fisheries operating in UK waters is

[5] http://www.marine.scotland.gov.uk/feast/

judged to be low (Bradbury *et al*. 2017). Human disturbance by trampling has reduced suitable breeding habitat for storm petrels which have caused a shift of habitat from burrows to rocky sites (Cadiou *et al.* 2010). Nestling mortality of storm petrels was significantly higher in areas exposed to high visitor pressure, reducing colony productivity by ≤1.6% (Watson *et al.* 2014). There is a lack of information on pressures and threat in relation to storm petrel prey items, however, should there be a pressure that would affect prey distribution or abundance this could have a consequential effect on the storm petrels ability to successfully breed or survive.

6.4 Great skua (breeding)

Skuas are identified as among the most vulnerable species to collision mortality impacts in offshore wind farms (Furness *et al*. 2013). Skuas are susceptible to capture in longline fisheries (ICES, 2013). Skuas, especially those individuals specialising in seabird predation, can accumulate high levels of contaminants though no population level consequences of this seem apparent (Furness & Ratcliffe, 2004). Illegal shooting of great skuas is known to occur (Furness & Ratcliffe, 2004) but population level impacts are not known. Skuas are susceptible to disease, including avian flu (APHA). Skuas are susceptible to their eggs failing to hatch as a result of disturbance at their breeding colonies (Furness, 1987). Any reduction of prey items (either directly captured or indirectly from kleptoparasitsing other seabirds) could have a subsequent effect on skuas populations. Declines in skua breeding populations and low breeding success have been linked to reduced sandeel abundance (Perkins *et al.* 2018) and decreases in fisheries discards (Caldow & Furness, 2000; Oswald *et al*. 2008).

6.5 Leach's storm petrel (breeding)

Leach's petrels are highly vulnerable to depredation by introduced mammalian predators (e.g. rats, cats, foxes and mice) at their breeding colonies (Phillips *et al.* 1999; BirdLife International, 2022). Attraction to lights and flares and subsequent collisions with oil rigs pose a risk for this species (Hedd *et al.* 2018). Large oil spills represent a relatively unlikely but potentially very severe threat, although due to this bird's large range, it would be likely to affect only a small portion of the population. Human intrusions and disturbance of the nest site has shown that nest desertion can occur, particularly if disturbance is repeated and during the sensitive egg incubation period (BirdLife International, 2022).

6.6 Manx shearwater (breeding)

Manx shearwaters are highly vulnerable to depredation by mammalian predators at their breeding colonies (Furness, 2016). Shearwater species are vulnerable to bycatch in longline and gillnet fisheries (Cortés *et al*. 2018; Žydelis *et al.* 2013). Manx shearwaters can become disorientated by and attracted to artificial light, which may lead to collisions (Newton *et al.* 2004) and even predation or starvation (Syposz *et al.* 2018). Heavy rainfall during incubation period can cause burrows to be flooded and eggs to fail (Brooke, 1990). Manx shearwaters are susceptible to disease, including avian flu (APHA). When at sea, evidence is lacking as to what pressures may impact shearwaters the most (Furness, 2016). Any impact on their prey will also have a subsequent effect on the Manx shearwater populations.

6.7 Northern fulmar (breeding)

Fulmars are one of the main seabird species taken as accidental bycatch in long-line fisheries in the northern hemisphere (Tasker *et al.* 2000; ICES, 2013) and are identified as among the species most sensitive to bycatch in surface gears in UK waters (Bradbury *et al.* 2017). It is estimated that over 4000 fulmar are caught annually in northern and western Scottish waters, representing around 30% of annual mortality (Miles *et al.* 2020). Examination of corpses indicates high levels of plastic ingestion in fulmars, but there is currently a lack of published information on the population level impacts of this (Franeker *et al.* 2011). Fulmars are also vulnerable to diseases such as avian flu (APHA). Human intrusions and disturbance of fulmars at their nest site can cause nest desertion if they are

approached too closely, particularly if there is repeated disturbance during the sensitive egg incubation period. Fulmars are vulnerable to changes in their prey resource, whether due to changes in fisheries practices (Bicknell *et al.* 2013) or to large-scale climatic factors (Thompson & Ollason, 2001).

6.8 Northern gannet (breeding)

Gannets are sensitive to collision with marine developments (Furness *et al.* 2013; ICES, 2015). Gannets are also identified as among the most vulnerable species to bycatch in both surface and pelagic gears in UK waters (Northridge *et al.* 2020; Miles *et al.* 2020; Bradbury *et al.* 2017). They are also sensitive to entanglement in discarded fishing net and other plastic waste (Rodriguez *et al.* 2013). Gannets are vulnerable to diseases such as avian flu (APHA). Displacement as a result of marine development may also occur for gannets. This species may also be susceptible to marine litter ingestion or entrapment at their breeding colony (O'Hanlon *et al.* 2017). As these are a species that feed in the water column, they can be potentially affected by any increase in turbidity that would affect their ability to successfully forage for their prey (Cook & Burton, 2010).

7 Management

7.1 Conservation Measures

The following conservation measures are currently in place for the St Kilda SPA and the Seas off St Kilda SPA:

- The Habitats Regulations require all plans or projects that may have an effect on the protected features of a SPA to be assessed against the Conservation Objectives for that site. This process is known as a Habitats Regulations Appraisal (HRA). An HRA is a statutory procedure that ensures the integrity of the site is maintained. It also provides an opportunity to consider appropriate mitigation that can reduce impacts, avoid adverse effects and permit plans or projects to proceed having taken full account of the protected features of an SPA.

Other relevant measures include:

- Environmental Protection Guidelines (Maritime) exists for the Ministry of Defence (MoD). These guidelines have been developed in consultation with the JNCC and help the MoD manage military activities in a way that will avoid risk of the features not achieving their conservation objectives.
- The St Kilda World Heritage Site has a Management Plan, and relevant measures within this plan include: guidelines to promote responsible access to St Kilda; planned procedures to prevent the introduction of non-native species to the St Kilda archipelago; and a Research Framework which guides and advises on what research can and cannot be carried out at St Kilda. The St Kilda NNR's management plan is covered with this St Kilda WHS management plan.
- No climbing is permitted during the seabird breeding season by National Trust Scotland.
- National Trust Scotland, in combination with Qinetiq, have a strict biosecurity plan in place. The biosecurity plan was designed to deal with the threat from rat incursions but also includes measures to flatworms and has been agreed by the St Kilda Operational Management Group partners. The only large vessel permitted to land is the Qinetiq resupply boat, all other vessels are required to anchor in the bay and

come ashore in smaller boats. Qinetiq have equipment that can be deployed in the event of an incursion incident.

- The 'Biosecurity for Scotland's seabird islands' project (2023 – 2026) funded by Nature Restoration Fund (NRF) and led by Royal Society for the Protection of Birds (RSPB) Scotland, builds on the Biosecurity for LIFE project (2018 – 2023), and aims to permanently remove the threat of introduction and establishment of invasive predators on seabird islands. The project will work with stakeholders to implement and maintain sustainable biosecurity measures including awareness raising, prevention, surveillance, and incursion response. St Kilda SPA is one of the seabird island groups that this project covers.
- The SPA overlaps with St Kilda SSSI, and management changes described on the list of Operations Requiring Consent must have prior consent from NatureScot.
- Existing fisheries measures exist for the St Kilda SAC, which overlaps in part with the St Kilda SPA and Seas off St Kilda SPA. The Inshore Fishing (Prohibiting of Fishing and Fishing Methods) (Scotland) Order 2015, that can be found in full on Sitelink, states that:
- Fishing for sea fish with a dredge, beam trawl, demersal trawl, demersal seine net or set net is prohibited.
- The Seas off St. Kilda SPA is within the International Maritime Organisation (IMO) North West European Particularly Sensitive Area, designated by the IMO under the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex I: Prevention of pollution by oil. This requires the adoption of special mandatory methods for the prevention of sea pollution.

Further information relevant to management of these two SPAs will be developed with stakeholders through the MarPAMM project in Outer Hebrides and added to this document in the future.

7.2 Advice to support management

Table 2 provides NatureScot's and JNCC's advice on management for activities where we consider this may be necessary to achieve the Conservation Objectives for the protected features. The advice is focused on the activities that cause an effect (a pressure) that a feature is sensitive to. Pressures can be physical (e.g. abrasion of the seabed), chemical (e.g. introduction of pollutants) or biological (e.g. removal of prey resources). Different activities may cause the same pressure, e.g. fishing using bottom gears and aggregate dredging both cause abrasion which can damage the surface of the seabed.

Our advice takes a risk-based approach, i.e. we are focusing on providing advice where we believe there is a risk to achieving the Conservation Objectives. We have identified risks to achieving the Conservation Objectives where there is an overlap between protected features and activities associated with pressures that the features are sensitive to. We have provided management advice to support public authorities and others in managing these risks. Our advice is based on existing data and information on protected features and relevant activities, and our understanding of the relationships between the features and activities. We have identified a range of management advice:

- management to remove or avoid pressures;
- management to reduce or limit pressures; or
- no additional management required.

For our advice on fisheries management we have also stated where we think this should be 'considered.' This term is included to highlight that an issue exists, but circumstances mean that a specific recommendation for action cannot / or need not be made at this point. However, there is sufficient cause to make fishery managers aware of the issue and for them to consider if a fishery management measure may be helpful in achieving Conservation Objectives – particularly where there may be a synergy between the benefits of management actions for the fishery and the Conservation Objectives for the feature. The term 'recommended' highlights that an issue of fishery-feature interaction exists, there is a reasonable evidence base and a specific recommendation can be made/ justified.

New or other activities not identified within the table would need to be considered on a case-by-case basis.

We recognise that stakeholders can provide local environmental knowledge and more detailed information on activities, including in relation to intensity, frequency and methods. This additional information will help public authorities and others develop more specific management, focussed on the interaction between features and activities. If new information becomes available our management advice may be revised.

Table 2 describes the activities that are considered capable of affecting the protected features. Activities that are considered not likely to affect the protected features (other than insignificantly) are listed in Table 3. Spatial data relating to the location and extent of the activities listed can be accessed on Marine Scotland's National Marine Plan Interactive (where available).

7.3 Best Practice

In our management advice for activities in Table 2 we refer to the development, adoption or use of 'best practice' as a way of managing interactions between activities and the features. Best practice is taken to mean approaches or procedures that are developed and accepted by regulators and relevant stakeholders as being an effective way of dealing with an interaction between a habitat or species and the pressures created by an activity. Much of this best practice is already being implemented by sectors and regulators, e.g. pre-application discussions between developers and regulators, the Scottish Marine Wildlife Watching Code, Scottish Outdoor Access Code, and Technical Standards for Scottish Finfish Aquaculture.

Table 2. NatureScot and JNCC's joint advice to support management for the St Kilda SPA and the Seas off St Kilda SPA for activities which are considered capable of affecting the protected features.
The text under the 'Advice to support management' columns provides NatureScot's management advice for the features in relation to the activities (further details about the terminology used are provided in section 7.2). Where a cell is coloured grey this indicates that management is already in place, this includes where there are existing regulatory requirements for new proposals. Cells are also coloured grey where it is considered there is no additional management required to achieve the Conservation Objectives. An * has been used to highlight those activities to which the advice under '*Boat use associated with both commercial and recreational activities'* also applies. For some activities, the pressures associated with new proposals are considered unlikely to affect some the features either because these activities do not occur in the same locations as the features or the pressure is unlikely to be at levels that can affect the features (see also Table 3). In these cases, we have not provided advice however, where regulated; this does not exempt new plans or projects related to these activities undergoing a Habitats Regulations Appraisal (HRA). Whilst St Kilda and Seas off St Kilda are two separate SPAs, they are functionally linked across both land and sea. Some species are protected features of both SPAs, and in addition all protected features of St Kilda SPA will use marine waters in the Seas off St Kilda SPA, irrespective of whether they're a named qualifier. All features are considered across both SPAs within Table 2.

Activities considered capable of affecting the protected features	**Advice to support management**
	All protected features (Kittiwake, guillemot, fulmar, razorbill, puffin, European storm petrel, great skua, Leach's petrel, Manx shearwater, gannet)
Aircraft (specifically unmanned aerial vehicles (UAV))	**Reduce or limit pressures** (disturbance) associated with UAVs within the SPA through effective mitigation such as: • following the Good Practice Advice for drones and wildlife • seasonal restrictions to avoid sensitive time periods for those protected features most susceptible to disturbance and/or; • spatial restrictions
Boat use associated with both commercial and recreational activities.	**Reduce or limit pressures** (disturbance) associated with boat use during commercial and recreational activities through effective mitigation such as: • following the Scottish Marine Wildlife Watching Code (SMWWC); • seasonal restrictions to avoid sensitive time periods for those protected species most susceptible to disturbance and/or; • production of vessel management plans associated with activities that require a marine licence. This may include agreed routes and for boats, potential seasonal speed restrictions.
Commercial shipping* (includes ferries,	**Reduce or limit pressures** (pollution) associated with commercial shipping. This could require implementation of measures to minimise the risk of oil spill in and around the Seas off St Kilda SPA e.g. through planning measures such

Activities considered capable of affecting the protected features	Advice to support management All protected features (Kittiwake, guillemot, fulmar, razorbill, puffin, European storm petrel, great skua, Leach's petrel, Manx shearwater, gannet)
cargo, tanker vehicles – particularly in relation to shipping of hazardous cargo)	as delineating Areas To Be Avoided (ATBA). **Reduce or limit pressures** (disturbance and potential collision) associated with lighting from shipping. Appropriate mitigation may include seasonal lighting restrictions and management for petrel and shearwater protected features.
Fishing* - demersal mobile/active gear	Whilst we have limited understanding about the extent of interactions between benthic fisheries and prey supporting habitat within the site, a principal objective of the management of the relevant fisheries should be to ensure that the fishing activity does not cause such disturbance to the benthic habitats that it adversely affects the abundance and availability of prey. **Reduce or limit pressures** (removal of prey species and abrasion of prey-supporting habitat) associated with fishing that has the potential to damage seabed habitat (in particular, sandeel habitat, herring spawning grounds) **should be considered.**
Fishing* – hydraulic dredge	Hydraulic dredging has the potential to cause significant disturbance to the sediment habitats that support the prey species of the protected features, particularly for sandeel and herring. A principal objective of the management of the relevant fisheries should be to ensure that the fishing activity does not cause such disturbance to the benthic habitats that it adversely affects the abundance and availability of prey. **Remove or avoid pressures** (removal of prey species and disturbance of prey-supporting habitat) associated with hydraulic fishing that has the potential to damage seabed habitat (in particular, sandeel habitat, herring spawning grounds) **is recommended.**
Fishing* – static gear	**Remove or avoid pressures** (entanglement) associated with the use of all static nets. Spatial exclusion of all static nets in areas identified as being important for auks (as identified from habitat and dive depth preferences) **is recommended**.
Fishing* – pelagic	**Remove or avoid pressures** (removal of key prey species) associated with fishing for sandeels. There is no current targeted sandeel fishery within the SPA, this position should be retained. Pelagic fishing for herring/sprat may occur within or around the SPA. We **recommend** that a principal objective of the

Activities considered capable of affecting the protected features	Advice to support management All protected features (Kittiwake, guillemot, fulmar, razorbill, puffin, European storm petrel, great skua, Leach's petrel, Manx shearwater, gannet)
	management of the fishery should be ensuring that the fishing activity does not prevent or disrupt the availability of prey species i.e. it should be considered as part of a broader ecosystem-based approach to management of this fishery.
Fishing* – long-lining (not including jigging)	Long-lining (pelagic and demersal) may occur within or around the SPA(s). Our current understanding is that long-line fisheries are largely restricted to offshore waters. Site-specific measures for long-lining are not currently considered appropriate due to the scale of the fishery, and the wide-spread interaction with seabirds. However, there is evidence of seabird bycatch in long-line (not jigging) fisheries which **we recommend** require wider seas management measures. **Reduce or limit pressures** (bycatch) associated with any pelagic or bottom-set long-line fishing **is recommended,** where wider seas measures overlap with Seas off St Kilda SPA, with particular regard to fulmars, petrels, shearwaters and gannet.
Military activities	**Reduce or limit pressures** (disturbance) associated with military activities by ensuring the MoD Environmental Protection Guidelines encompass the Seas off St Kilda SPA, noting any seasonal sensitivities of the protected features to minimise disturbance.
Oil and gas	**Remove or avoid** any future oil or gas development in or near (within 10km of) the Seas off St Kilda SPA.
Renewable energy (inc. wind)	**Remove or avoid pressures** (disturbance, displacement, collision, loss or damage to prey supporting habitats) for any new marine renewable proposals within the Seas off St Kilda SPA There are new marine renewable development proposals within connectivity to the St Kilda SPA. Mitigation should focus on **reducing or limiting pressures** (disturbance, displacement, collision) on the protected features.
Tourism & recreation (includes leisure boat users, anglers, kayaking, diving, walkers, climbing).	**No additional management** for existing recreational marine activities (includes yachting, angling, sea kayaking, diving, leisure boating, wildlife watchers) providing the Scottish Marine Wildlife Watching Code (SMWWC) is followed by water-borne recreational users. *Existing management requiring landing permission for cruise ships in place.* **No additional management** requirements' for land-based tourism activities (walking), providing the Scottish Outdoor Access Code is followed. *Existing management in place restricting climbing during the seabird breeding season.*

Activities considered capable of affecting the protected features	Advice to support management
	All protected features (Kittiwake, guillemot, fulmar, razorbill, puffin, European storm petrel, great skua, Leach's petrel, Manx shearwater, gannet)
	Reduce or limit pressures (disturbance) of the protected features if in the future there is evidence of impacts at particular locations and/or if there is major increase in intensity or type of water-based or land-based pursuits within the St Kilda SPA or Seas off St Kilda SPA.
Scientific survey/research	**No additional management** for current level of scientific research. Within the St Kilda SPA there are research guidelines within the St Kilda management plan (see section 7.1).
Wildlife tour operators	**No additional management** providing the Scottish Marine Wildlife Watching Code (SMWWC) is followed by water-borne recreational users and the Scottish Outdoor Access Code is followed for land-based recreational users. The National Trust ranger meets all visitors to the islands and gives a briefing on St Kilda, including responsible access. **Reduce or limit pressures (disturbance)** associated with an increase in wildlife tour operators if in the future there is evidence of impacts at particular locations and/or if there is an increase in intensity of these pursuits within the SPAs.

Table 3. Activities that are considered not likely to affect the protected features (other than insignificantly) [6]

Activity	Comments
Anchorages & moorings	Beyond pressures associated with the vessel movement (covered in Table 2), we are not aware of any further pressures that have the potential to cause an adverse effect on the protected features.
Fishing – static gear – Creels (including lobster, crabs and *Nephrops*)	Fishing using creels is fairly limited within the MPA due to the remoteness of the site. Whilst there is the potential for entanglement for diving species such as auks, the occurrence is rare and therefore we consider this method poses a low risk to the protected features. Pressures associated with the vessel movement is covered in Table 2.
Fishing – line-fishing - jigging.	Beyond pressures associated with the vessel movement (covered in Table 2), this activity is not expected to have the potential to cause an adverse effect on the protected features.

[6] Only the specific examples of activities listed in the table have been excluded, rather than the broad activity types. New plans or projects will still need to be considered by the relevant competent authority (see Annex 1 for further details).

8 Research and survey

We recognise that there are still important gaps in our understanding and knowledge of the features of this site. We will identify research and survey projects to inform our understanding of these aspects. The knowledge gaps identified below are not a commitment to undertake this work. However, by highlighting these gaps we hope to inform future discussions with parties interested in undertaking research in this site and/or on these features, to help direct research and improve understanding of monitoring needs. The following list of research and survey needs is not prioritised and is not exhaustive. Any further research within St Kilda World Heritage Site will need to be compatible with the St Kilda Research Guidelines, as per the management plan.

- Establish adequate baseline information for supporting habitats and prey species and gain an understanding of which prey items are the most important at a local scale within the SPA for all protected features.
- Establish a marine bird monitoring programme that informs changes in species populations and distributions at a site and SPA network level, and which may include monitoring of the supporting prey, habitats and processes within the SPA.
- Further understanding required on the reasons behind the protected features' decline at the SPA. Productivity estimates at the SPA would be beneficial to help understand this decline.
- Further ecological studies of all protected features habitat preferences and use, and movements within the SPA.
- Better understanding on the implications of new offshore developments around the site on the protected features.
- Oceanographic studies, such as sea temperature and acidity levels, how these might change in future, and the effects of such changes on prey availability for birds.
- Studies of food availability and competition for food between different fish predators (e.g., birds, seals, dolphins, porpoises, whales) in relation to fisheries policy.
- Improved understanding of what supporting processes the key prey species are reliant upon within the SPA.
- Additional research is required to better understand the relationships between the impact of dredging and benthic trawling on supporting habitats, their ability to support suitable prey and any consequential effect this may have on protected features.
- Understanding of the impact of tourism on the protected features at the SPA.
- Investigation is required to assess the potential impact of highly pathogenic avian flu on the protected features both within the SPA and at a wider scale, in particular for gannet and great skua.
- Research required on the evolution of the HPAI virus, exposure and survival rates in affected seabird species following the 2021-2023 HPAI outbreak.
- Evaluate the potential mitigations that could be put into place to limit disease spread should another outbreak of HPAI occur at this, or any other SPAs.
- Improved understanding of what supporting processes the key prey species are reliant upon within the Seas of St Kilda SPA.
- Better understanding of temporal foraging strategies of fulmar and great skua and whether there are any differences between daytime and night-time attraction of these species to fishing.
- An up-to-date systematic survey is required for the petrel protected features.

Annex 1. St Kilda SPA and the Seas off St Kilda SPA Conservation Objectives

The box below provides the high-level Conservation Objective statements for St Kilda SPA and the Seas off St Kilda SPA.

The full Conservation Objectives, which includes site-specific advice and information on the qualifying features that form part of these SPAs, are provided in the tables that follow. The site-specific advice and information provides more detail in relation to each of the high level Conservation Objective statements for each feature, e.g. detail on the seasonal timings and what the supporting habitats and prey are for the qualifying features.

Information is also provided below on how minor changes to features should be considered and the influence of environmental change on features, particular in relation to climate change. Temporary impacts on the qualifying features resulting from plans or projects can only be permitted where there is certainty that the features will be able to quickly recover. Further details on the potential for each qualifying feature to recover are described in more detail in Annex 2 '*Factors determining the potential of features to recover'*.

A definition of the terms used is in the Glossary (Annex 3).

The * denotes a qualifying feature that is an assemblage feature only.

<table>
<tr><th>St Kilda SPA</th><th>Seas off Kilda SPA</th></tr>
<tr><td>Qualifying features:
Atlantic puffin (Fratercula arctica)
Black-legged kittiwake* (Rissa tridactyla)
Common guillemot* (Uria aalge)
European storm petrel (Hydrobates pelagicus)
Great skua (Stercorarius skua)
Leach's storm petrel (Oceanodroma leucorhoa)
Manx shearwater* (Puffinus puffinus)
Northern fulmar* (Fulmarus glacialis)
Northern gannet (Morus bassanus)
Razorbill* (Alca torda)</td><td>Qualifying features:
Atlantic puffin* (Fratercula arctica)
Common guillemot* (Uria aalge)
European storm petrel* (Hydrobates pelagicus)
Northern fulmar* (Fulmarus glacialis)
Northern gannet (Morus bassanus)</td></tr>
<tr><td colspan="2">St Kilda SPA and Seas off St Kilda SPA also support:
Breeding seabird assemblage</td></tr>
<tr><td colspan="2">1. To ensure that the qualifying features of the St Kilda SPA and the Seas off St Kilda SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.

2. To ensure that the integrity of the St Kilda SPA and the Seas off St Kilda SPA are restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

2a. The populations of qualifying features are viable components of the relevant SPAs.

2b. The distributions of the qualifying features throughout the St Kilda SPA and the Seas off St Kilda SPA are maintained by avoiding significant disturbance of the species.

2c. The supporting habitats and processes relevant to qualifying features and their prey/food</td></tr>
</table>

resources are maintained, or where appropriate restored, at St Kilda SPA and/or Seas off St Kilda SPA.

1. To ensure that the qualifying features of St Kilda SPA and the Seas off St Kilda SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.

Achieving FCS is defined in terms of the natural range and population of the species and the extent of habitat necessary for long-term maintenance of populations. There is an important role for all protected sites in the UK in defining, achieving and maintaining FCS for any habitat or species. Achieving FCS requires that each parameter is either stable or increasing, exceeds the relevant reference value and has good prospects of continuing to do so in the foreseeable future (JNCC, 2018). Favourable Conservation Status (FCS) is assessed across the Marine Atlantic Biogeographic Region with individual SPAs and SPA networks contributing to FCS.

The conservation status will be taken as 'favourable' when:
• population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
• the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;
• there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis;

When carrying out appraisals of plans and projects against these Conservation Objectives, it is not necessary to understand the status of the qualifying features within each individual SPA in this Biogeographic Region. The focus of the appraisal should be to understand whether the integrity of both St Kilda SPA and Seas off St Kilda SPA would be maintained. If this is the case, then its contribution to FCS across the qualifying features' biogeographic range will be met. Similarly, when determining whether management measures may be required to ensure that the Conservation Objectives for both SPAs are achieved, the focus should be on maintaining the contribution that it makes to FCS. Further advice on how these appraisals should be focussed in relation to maintaining site integrity for each SPA is provided by Conservation Objective 2 (including parts a, b and c). If broader information (status, trends) on the qualifying features is available, it should be used to provide context to the site-based appraisal.

Note '*Appropriate'* within this part of the Conservation Objectives is included to indicate that the contribution to FCS varies from site to site, and feature to feature.

Whilst the St Kilda and the Seas off St Kilda are two separate SPAs, they are functionally linked across both the land and sea. Some species are protected features of both SPAs, and in addition all protected features of the St Kilda SPA will use marine waters in the Seas off St Kilda SPA, irrespective of if they are a named qualifier or not. Therefore, factors affecting one SPA may also affect the other.

2. To ensure that the integrity of the St Kilda SPA and the Seas off St Kilda SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

This objective recognises that puffin, kittiwake, guillemot, great skua, fulmar, Manx shearwater and razorbill are in unfavourable condition during the breeding season at the St Kilda SPA and consequently site integrity is compromised. The objective recognises that there may be a mixture of on-site and off-site factors at St Kilda SPA which are contributing towards the continual decline in some of the qualifying features' populations. As the St Kilda SPA and the Seas off St Kilda SPA are functionally linked, factors within the Seas off St Kilda SPA could affect the features in both Seas off St Kilda SPA and in St Kilda SPA, and vice versa.

For the St Kilda SPA and the Seas off St Kilda SPA, when carrying out appraisals of plans or projects, the focus of the appraisal should be to understand the impact of the plan or project on site integrity. For qualifying features that are favourable condition this means maintaining that condition. For those that are in unfavourable condition, it means ensuring that the plan or project does not prevent or reduce the potential for recovery. The expectation is not for the plan or project to restore site integrity. Should the plan or project compromise the ability of the qualifying features to recover (e.g. result in a further decline or accelerate the rate of decline, or prevent a recovery from occurring), then the St Kilda SPA and/or Seas off St Kilda SPA will not make an appropriate contribution to achieving FCS across the Atlantic Biogeographic Region. Similarly, when determining whether management measures are required to meet the Conservation Objectives, the focus is on ensuring the conditions are appropriate to support recovery and subsequently restore site integrity. Further advice on how these appraisals should be focussed in relation to site integrity is provided in 2a, b and c.

The breeding seabird assemblages are not considered further in the Conservation Objectives as each qualifying feature and 'named qualifier' of the assemblages are addressed individually.

Temporary impacts on these objectives resulting from plans or projects can only be permitted where there is a high degree of certainty that the features will be able to quickly recover from the impact and that impacts do not prevent the ability of unfavourable features to fully recover in the long-term.

Environmental changes

This Conservation Objective recognises that the qualifying features are part of a complex, dynamic and multi-dimensional marine environment. Marine birds depend on environmental conditions (for example water movement, up-wellings and prevailing weather) which vary over time and space. Consequently, marine bird species are exposed to a wide range of drivers of change. 'Environmental changes' for the purpose of these Conservation Objectives means any change to the qualifying features reflecting both natural population dynamics and also broader environmental changes (i.e. those related to climate change and environmental variability, management of which is beyond the scope of the SPA). The impact of human activities on the SPAs that can be managed will not be considered as part of the broader context of environmental change (i.e. where required they should be managed).

Some site-level changes are natural and are not a direct result of human influences (e.g. population fluctuations arising from factors such as variable breeding success or weather conditions across the wintering range / shifts or changes in prey availability resulting from variability in environmental factors processes such as water temperature and movements). Changes in the qualifying features' distribution and use of the SPAs, which are brought about by entirely natural drivers, directly or indirectly, are normally considered compatible with the SPA's Conservation Objectives.

There may also be historical human influences that have now ceased but have modified and continue to drive change within the sites. It is also recognised that climate change pressures could affect the qualifying features within the sites. These changes cannot be prevented, so the Conservation Objectives seek at a site level to take account of them and where possible, improve the qualifying species' resilience to environmental change when considering future plans or projects. The magnitude of the future impacts will depend on the nature, scale, duration and intensity of the activity and the qualifying features tolerance and ability to recover from such an impact.

Additionally, management of human activities at a wider scale (i.e. regional, Scotland or the area covered by an international agreement such as the OSPAR convention) may also affect the qualifying features associated with the sites (either by making a positive contribution or having a negative impact). Wider scale impacts may affect the ability of the qualifying features to recover from site level changes, and therefore additional precaution over the impacts of any future human activities may be necessary.

An assessment of whether a change is natural or anthropogenic, or a combination of both, will need to be looked at on a case-by-case basis.

In relation to the St Kilda SPA, the Seas off St Kilda SPA and their qualifying features, the following effects of environmental change (climate change) are relevant. These effects should be taken into account when considering plans and projects as additional pressures may reduce the qualifying features' resilience to climate change, and conversely climate change impacts may start to hinder their ability to recover from human activities.

- ***All marine birds:*** Under climate change, sea temperatures are predicted to increase, sea levels will rise and there could be increases in the frequency of stormy conditions. Increased levels of atmospheric CO_2 will also result in ocean acidification. Any of these factors could cause changes in bird abundance and distribution at the SPA due to changes in prey (species, availability and distribution).
- ***Seabirds:*** climate change may result in effects at wintering grounds or in other parts of the overall breeding range which could have subsequent effects on their breeding population and distributions. For any burrow or hole nesting species (puffin and Leach's storm petrel) an increase in rainfall due to climate change could also have adverse effects during the incubation period which may result in increased mortality of eggs or chicks due to a flooded burrow or hole. Climatic changes may also result in colonies being more prone to soil erosion which would in turn mean reduced habitat availability for burrowing species. In coastal breeding sites, increased flooding associated with storm tides may also cause nest site failures in breeding seabirds (Mendel *et al.* 2008). Increased storminess could also affect cliff-nesting seabirds, as eggs or chicks are more likely to be dislodged by waves, wind or rain. Parent birds may also find

foraging more difficult during storms, reducing their ability to maintain their own body condition whilst also incubating or feeding chicks.

- ***Auks (puffin, guillemot, and razorbill):*** Auks may be vulnerable to extreme weather events, particularly winter storms, which have been linked to adult mortality and winter 'wreck' events (BirdLife International, 2022). Decreased survival rates in these species have been linked to in increased sea temperatures and stronger winds (Votier *et al.* 2008, Sandvik *et al.* 2005).
- ***Kittiwake:*** Breeding phenology is affected by climate change, with a trend in later breeding being seen in kittiwakes (Wanless *et al.* 2009; Frederiksen *et al.* 2004a). Kittiwake breeding populations are highly vulnerable to the impacts of climate change on the population dynamics and distribution of their preferred prey (Sandvik *et al.* 2014; Russell *et al.* 2015; Frederiksen *et al.* 2004b).
- ***European storm petrel, Leach's storm petrel:*** Studies on Leach's storm petrels demonstrated that breeding success was lower in years of higher global mean temperature (Mauck *et al.* 2018). The potential impacts of climate change on European storm petrel in the UK are unclear (Pearce-Higgins *et al.* 2011). Other storm petrel species have shown timing of breeding is associated with food supply, which in turn is associated with climate conditions (Drummond & Leonard, 2009; Bedolla-Guzmán *et al.* 2017).
- ***Great skua:*** Great skua are potentially vulnerable to direct and indirect (through changes to prey dynamics) impacts of climate change (Oswald *et al.* 2008).
- ***Manx shearwater***: The potential impacts of climate change on Manx shearwater in the UK are uncertain (Russell *et al.* 2015).
- ***Fulmar:*** The species which has been identified as sensitive to climate change. Studies have demonstrated a link between a large-scale climatic factor, the North Atlantic Oscillation (NAO) on both survival and reproduction. Survival in fulmars, particularly of females, has been shown to be influenced by the NAO (Grosbois & Thompson 2005). Reproductive success at this colony has also been linked to winter NAO and lagged winter NAO, with year to year variation in breeding success strongly related to oscillations in the NAO (Thompson & Ollason 2001; Lewis *et al.* 2009).
- ***Gannet:*** Gannets can travel great distances from their nest site to forage and are able to exploit a wide range of prey. Hence, they may have greater potential than some other seabird species to adapt to climate change. However, in the North West Atlantic, a century-long population trend of northern gannets correlated with warming surface water conditions and increased mackerel availability on a decadal scale, indicating that climate change effects on diet is likely for this species (Montevecchi & Myers, 1997).

2a. The populations of qualifying features are viable components of St Kilda SPA and Seas off St Kilda SPA.

This objective seeks to specifically protect the qualifying features from ***significant*** mortality, injury or removal that can lead to a long-term decline of the feature(s) within the sites. It protects the features from significant risk of incidental killing and injury from activities both within and outwith the site(s). Impacts and effects are considered 'significant' where they could result in a permanent or long-term reduction or continued decline in the population and consequently, reduction in the contribution St Kilda SPA and/or the Seas off St Kilda SPA make to the maintenance of the qualifying features in their natural range in the UK. It should be ensured that the qualifying features are protected from anthropogenic pressures that could lead to a significant long-term decline in numbers using the sites. Ensuring the capacity of St Kilda SPA and the Seas off St Kilda SPA to support all the essential behaviours and activities required to support viable populations of the qualifying features in the relevant season(s) are addressed by Conservation Objectives 2b and 2c.

At a site level, the population is considered to be viable if the species can carry out their life cycle functions relevant to the season(s) they are present, irrespective of dependencies such as immigration.

For breeding qualifying features, the viability of the species within St Kilda SPA and the Seas off St Kilda SPA is intrinsically linked to their ability to access and use breeding habitat in areas of functionally linked land and sea outwith the sites, in addition to the ability of the sites to support breeding adult survival and chick-rearing.

When assessing the effects of any plan or project consideration should also be given to whether impacts outwith the SPA(s) could affect achievement of this Conservation Objective. This Conservation Objective is considered to be met if the conditions to support all the species' essential behaviours and activities within the site(s) are in place. This includes:

- avoiding effects within and outwith the site(s) that could prevent or reduce the ability of the populations of qualifying features to recover.
- avoiding effects within and outwith the site(s) that could lead to a permanent reduction in the populations of qualifying features through mortality, injury, or impacts caused by disturbance, displacement, barrier effects or reduction in mobile prey resources.
- maintaining the species' ability to use all areas of importance within the site(s) (to be considered under Conservation Objective 2b)
- maintaining access to, and availability of, supporting habitats and prey within the site(s) (to be considered under Conservation Objective 2c).

Where known, the populations of the qualifying features should be maintained at or above site reference populations, as detailed below. The site reference population may be revised from the baseline at designation where a) there is evidence to show that a population's size has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period (generally equivalent to at least one generation length for the given species) and/or b) to reflect any wider strategic objectives for the species (e.g. national or international species action plan). Where there is evidence to show that a qualifying feature has historically been more abundant than the stated minimum target and current level, the ongoing capacity of the site(s) to accommodate the feature at such higher levels in future should also be taken into account.

All qualifying features are protected throughout the sites, throughout the year. This means that irrespective of the season for which they are designated, the qualifying features are protected during both their breeding and non-breeding seasons when using the respective SPAs.

Temporary short-term changes in the populations due to human activity may be considered not to compromise the Conservation Objectives within the site(s) provided it can be demonstrated that the populations of any affected qualifying features can fully recover. Factors limiting the recovery of the qualifying features include: the average generation times, population growth rates, availability of prey and the timing and duration of the activity around vulnerable stages of their life cycles such as during moulting or chick-rearing period.

Direct mortality can arise from: collision (above and underwater); entanglement (incidental bycatch); predation, disease, flooding events, and pollution. Indirect mortality can arise from loss of or damage to prey or prey-supporting habitats (e.g. through harvesting; physical removal of or

damage to seabed; nutrient enrichment; changes to water temperature, salinity, or flows; introduction of invasive non-native species (INNS); pollution). Indirect mortality can arise from reduced ability to capture or access prey arising from e.g. increased water turbidity or displacement from foraging areas.

For all qualifying features at the Seas off St Kilda SPA an estimate of the number of each qualifying feature making use of the site is not available. The average figures from European Seabirds at Sea (ESAS) data used for site selection purposes gave an indication of the relative importance of this site. However, it represented only a snapshot of usage because the entire population of the relevant breeding colonies are not at sea at any one time and are not solely confined to those areas identified as SPA. The total number of individuals using the site over the breeding season will be well in excess of the estimate used for site selection purposes and will reflect turnover within the site. The Seas off St Kilda SPA has been selected primarily on the basis of the area supporting a dense seabird population, which is a reflection of the food availability within this highly productive area. The qualifying features should be able to carry out their life cycle functions relevant to the season(s) they are present, irrespective of dependencies such as immigration.

Seabirds foraging in the Seas off St Kilda SPA will be from breeding colony SPAs, Sites of Special Scientific Interest (SSSI) and smaller non-designated colonies within foraging range of the Seas off St Kilda SPA, but primarily are expected to be from St Kilda SPA.

The site-specific information includes a site reference population for St Kilda SPA that is considered the most appropriate for assessments of plans and projects. Where this is based on the citation population at classification or recent surveys, the site reference population is rounded using standard procedures (Stroud *et al.* 2001).

Feature	**Site-specific advice**	**Site-specific information**
Atlantic puffin	Ensure the breeding population of puffins has the ability to recover to the site reference population. ***and*** Ensure puffins are not at significant risk from injury or mortality.	The site reference population for puffins at the St Kilda SPA is 155,000 pairs (1992 citation). The last available count at the St Kilda SPA showed this figure has decreased to around 98,800 pairs (2019). Puffin populations have been generally increasing within the UK (long-term trend between 1969-2000) (Harris & Wanless, 2004). However, recent trends show that puffins have decreased by 15% since Seabird 2000 (1998-2002), and in Scotland they have decreased by 21% (Burnell *et al.* 2023). Reasons for the decline in puffins at the St Kilda SPA when across the UK they are increasing is unknown. It may be related to changes in prey availability within the marine environment, although on-site factors may also be playing a role. The long-term recovery of puffins at the St Kilda SPA is intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA, which includes the Seas off St Kilda SPA. When assessing the effects of any plan or project consideration should therefore also

	and Ensure puffins can move safely between the site and important areas of functionally linked sea outwith the sites.	be given to whether impacts on the population whilst outwith the SPA(s) could affect achievement of this Conservation Objective.
European storm petrel	Maintain the breeding population of European storm petrels at a stable or increasing trend relative to the current site reference population. ***and*** Ensure European storm petrels are not at significant risk from injury or mortality. ***and*** Ensure European storm petrels can move safely between the site and important areas of functionally linked sea outwith the sites.	The site reference population for European storm petrels at St Kilda SPA is 850 pairs (1992 citation). In 2000, St Kilda SPA count was around 1000 pairs. In 2021 a mean count calculated from modelling estimated there being around 5000 pairs. Whilst count data for this species is inherently difficult due to their nesting habits, the counts suggest the population is stable or increasing at the St Kilda SPA. There is insufficient information on European storm petrels to assess a long-term UK trend, though there is a suggestion from limited information that between 1999-2011 their populations may have increased (Bolton *et al.* 2010; JNCC, 2021). From the limited data available, trends suggest that European storm petrels in the UK have increased by 41% since Seabird 2000 (1998-2002) and 48% in Scotland (Burnell *et al.* 2023) The long-term maintenance of European storm petrels at the St Kilda SPA is intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA, including within the Seas off St Kilda SPA. When assessing the effects of any plan or project consideration should therefore also be given to whether impacts on the population whilst outwith the SPA(s) could affect achievement of this Conservation Objective.
Great skua	Ensure the breeding population of great	The site reference population for great skuas at St Kilda SPA is 270 pairs (1992 citation). In 2019 this figure was stable at around 210 pairs (2019). However, in 2023 a count of only 79 pairs were

	skuas has the ability to recover to the site reference population. ***and*** Ensure great skua are not at significant risk from injury or mortality. ***and*** Ensure great skuas can move safely between the site and important areas of functionally linked sea outwith the site.	recorded. Great skuas have experienced a 14% increase in Scotland since Seabird 2000 (1998-2002) (Burnell *et al.* 2023). Monitoring in 2023 indicated a decline of 76% in Scotland due to avian flu (Tremlett *et al.* 2024). The most recent decline at Foula SPA can be attributed primarily to highly pathogenic avian flu. In summer of 2021 and 2022 the great skua population was greatly impacted by this disease. However, it is not yet known how this may impact the population at the site in future years. The long-term recovery of great skuas in the St Kilda SPA is intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA. When assessing the effects of any plan or project consideration should therefore also be given to whether impacts on the population whilst outwith the SPA could affect achievement of this Conservation Objective.
Leach's storm petrel	Maintain the breeding population of Leach's storm petrel at a stable or increasing trend relative to the current site reference population. ***and*** Ensure Leach's storm petrels are not at significant risk from injury or mortality.	The site reference population for Leach's storm petrels at St Kilda SPA is 5,000 pairs (1992 citation). In 2000 the St Kilda SPA count showed a population increase to around 45,000 pairs. However, the latest count data available has shown the population has since declined by 80% to around 9200 pairs (2021). From the latest Seabirds Count data the long-term trend for Leach's storm petrel is decreasing (Burnell *et al.* 2023). Leach's storm petrel has decreased by 79% in the UK and Scotland since Seabird 2000 (1998-2002) (Burnell *et al.* 2023). The long-term maintenance of Leach's storm petrel in the St Kilda SPA is intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA. When assessing the effects of any plan or project consideration should therefore also be given to whether impacts on the population whilst outwith the SPA could affect achievement of this Conservation Objective.

	and Ensure Leach's storm petrels can move safely between the site and important areas of functionally linked sea outwith the site.	
Manx shearwater	Ensure the breeding population of Manx shearwaters has the ability to recover to the site reference population. ***and*** Ensure Manx shearwaters are not at significant risk from injury or mortality. ***and*** Ensure Manx shearwaters can move safely between the site and important areas of functionally linked sea outwith the site.	The site reference population for Manx shearwaters at the St Kilda SPA is 5,000 pairs (1992 citation). The last available count at St Kilda SPA (in 2021) showed this figure has decreased to around 3700 pairs. There is currently insufficient information on Manx shearwater populations to assess a long-term UK trend, however, recent census suggests that the population has increased by 134% (Burnell *et al.* 2023). The long-term recovery of Manx shearwaters at the St Kilda SPA is intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA. When assessing the effects of any plan or project consideration should therefore also be given to whether impacts on the population whilst outwith the SPA could affect achievement of this Conservation Objective.
Northern gannet	Maintain the breeding population of gannet at	The site reference population for gannets at St Kilda SPA is 50,000 pairs (1992 citation). The latest count data available for St Kilda SPA showed an increase of gannets to 60,000 pairs (2013 count).

	a stable or increasing trend relative to the current site reference population. ***and*** Ensure gannets are not at significant risk from injury or mortality. ***and*** Ensure gannets can move safely between the site and important areas of functionally linked sea outwith the sites.	Gannets in the UK have increased by 38% since the last gannet census (2003-2005) and have increased by 40% in Scotland in the same period In summers of 2021 and 2022, gannet populations were affected by avian flu, monitoring in 2023 indicated a decline of 22% in Scotland due to avian flu (Tremlett *et al.* 2024). The long-term maintenance of gannets in the St Kilda SPA is intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA, including within the Seas off St Kilda SPA. When assessing the effects of any plan or project consideration should therefore also be given to whether impacts on the population whilst outwith the SPA(s) could affect achievement of this Conservation Objective.
Black-legged kittiwake	Ensure the breeding population of kittiwake has the ability to recover to the site reference population. ***and*** Ensure kittiwake are not at significant risk from injury or mortality. ***and***	The site reference population for kittiwakes at St Kilda SPA is 7,800 pairs (1992 citation). The latest count data available for the St Kilda SPA showed a decrease of kittiwakes to 420 pairs (2016). Kittiwake populations have declined in both Scotland and the UK, with decreases of 42% in their UK population since Seabird 2000 (1998-2002) and 57% in Scotland (Burnell *et al.* 2023). It is acknowledged that due to the steep national decline in kittiwakes it will be difficult to recover the kittiwake population to the site reference population. Reasons for the decline in kittiwakes at the St Kilda SPA, are not fully understood but are likely to be related to off-colony factors affecting their food supply. Wider pressures on kittiwakes, such as climate change or disease, may limit the potential for kittiwakes to achieve Favourable Conservation Status. Therefore, when assessing the effects of any plan or project, consideration should be given to ensuring that the plan or project will not hinder the ability to recover. This will help ensure resilience within the wider kittiwake population.

	Ensure kittiwakes can move safely between the site and important areas of functionally linked sea outwith the site.	Plans or projects should also ensure that kittiwakes are not at significant risk from injury or mortality either within or outwith the SPA. The long-term recovery of kittiwakes at the St Kilda SPA is also intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA. When assessing the effects of any plan or project consideration should therefore also be given to whether impacts on the population whilst outwith the SPA could affect achievement of this Conservation Objective.
Common guillemot	Ensure the breeding population of guillemots has the ability to recover to the site reference population. ***and*** Ensure guillemots are not at significant risk from injury or mortality. ***and*** Ensure guillemots can move safely between the site and important areas of functionally linked sea outwith the sites.	The site reference population for guillemots at the St Kilda SPA is 23,000 pairs (1992 citation). The latest count data available for St Kilda SPA shows this number has decreased to around 10,300 pairs (2016). No factors at the breeding colony appear to be the cause of this decline and thus the decline is more likely to relate to their food supply in the marine environment. Guillemot populations in the UK decreased by 8% since Seabird 2000 (1998-2002) and 31% in Scotland (Burnell *et al.* 2023). No factors at the breeding colony appear to be the cause of this decline and thus the decline is likely to relate to their food supply in the marine environment. The long-term recovery of guillemot in St Kilda SPA is intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA, including within the Seas off St Kilda SPA. When assessing the effects of any plan or project consideration should therefore also be given to whether impacts on the population whilst outwith the SPA(s) could affect achievement of this Conservation Objective.
Northern fulmar	Ensure the breeding population of fulmars has the ability to recover to the site	The site reference population for fulmars at St Kilda SPA is 63,000 pairs (1992 citation). The latest count data available for St Kilda SPA shows this number has decreased to 29,000 pairs (2016). Fulmar populations in the UK have decreased by 35% since Seabird 2000 (1998-2002). In Scotland fulmar have decreased by 37% (Burnell *et al.* 2023).

	reference population. and Ensure fulmars are not at significant risk from injury or mortality. ***and*** Ensure fulmars can move safely between the site and important areas of functionally linked sea outwith the sites.	Reasons for the decline in fulmars at St Kilda SPA are most likely to relate to changes in prey availability within the marine environment and the impact of bycatch in longline fisheries. On-site factors have not been identified, although it is known that fulmars are prone to disturbance, particularly during the incubation period. The long-term recovery of fulmars in the St Kilda SPA is intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA, including within the Seas off St Kilda SPA. When assessing the effects of any plan or project consideration should therefore also be given to whether impacts on the population whilst outwith the SPA(s) could affect achievement of this Conservation Objective.
Razorbill	Ensure the breeding population of razorbills has the ability to recover to the site reference population. ***and*** Ensure razorbills are not at significant risk from injury or mortality. ***and*** Ensure razorbills can move safely between the site and important	The reference population for razorbills at the St Kilda SPA is 3,800 pairs (1992 citation). The latest count data available for St Kilda SPA shows this number has decreased to 840 pairs (2015 and 2016 counts). UK razorbill populations have increased by 18% since Seabird 2000 (1998 – 2000). However, in Scotland the opposite trend is emerging with razorbill populations having decreased by 2% in the same period (Burnell *et al.* 2023). Reasons for the decline in razorbills at the St Kilda SPA, when nationally they are increasing, are most likely to relate to changes in prey availability within the marine environment. The long-term recovery of razorbills at the St Kilda SPA is also intrinsically linked to their ability to access and use habitats in areas of functionally linked sea outwith the SPA. When assessing the effects of any plan or project consideration should therefore also be given to whether impacts on the population whilst outwith the SPA could affect achievement of this Conservation Objective.

	areas of functionally linked sea outwith the site.	

2b. The distributions of the qualifying features throughout St Kilda SPA and Seas off St Kilda SPA are maintained by avoiding significant disturbance of the species.
This objective seeks to ensure that the qualifying features can continue to use and access all areas within the St Kilda SPA and the Seas off St Kilda SPA used for feeding, moulting, roosting, loafing, shelter and other maintenance activities. Changes in the distribution of the qualifying features are most likely to be brought about through disturbance, therefore this objective relates to avoiding significant disturbance. Changes in distribution may also result from shifts in prey distributions; this is considered under objective 2c. Disturbance associated with human activity may take a variety of forms including: noise, light, sound, vibration, trampling, presence of people, animals and structures, as well as displacement and barrier effects on the species. The type of disturbance, its duration and the area over which the qualifying features are likely to be affected are important considerations in any appraisal of disturbance. Disturbance can, for example, result in changes to feeding or roosting behaviour, increased energy expenditure due to increased time spent moving to avoid stressors , abandonment of nest sites and desertion of supporting habitat (both within or outside the protected area where appropriate). This may affect long-term survival, successful chick rearing in the current or subsequent breeding season, feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their distribution within the sites contracts. 'Significant disturbance' should be interpreted to mean disturbance that affects the integrity of the sites through alteration of the distribution of the qualifying features such that recovery cannot be expected or effects can be considered long term. It is expected that significant disturbance will lead to more than a transient effect on the distribution of the qualifying features. It may result in the following types of effect: • Contributes to the long-term decline in the use of the sites by the qualifying features. • Changes to the distribution of the qualifying features on a continuing or sustained basis. • Changes to the qualifying features behaviour such that it reduces the ability of the species to survive, breed or rear their young. There are two main ways in which the qualifying features' continued access to suitable resources could be restricted and distribution affected and this is where assessments should be focussed: 1. Large scale physical barriers, or; 2. Significant disturbance which alters their distribution within the sites or disrupts important behaviours.

Temporary short-term disturbances due to human activity may be considered not to compromise the Conservation Objectives within the sites provided it can be demonstrated that the population can fully recover with a high degree of certainty. Factors limiting the recovery of the qualifying features include the timing, frequency and duration of the activity around vulnerable stages of their life cycle such as during moulting or chick-feeding period.

All qualifying features are protected throughout the sites, throughout the year. We anticipate that some locations within the St Kilda SPA and the Seas off St Kilda SPA will be more, or less, important than others for individual species. Distributions within the sites may also change over time in response to a range of abiotic and biotic factors (e.g. changes in abundance or quality of prey resources at particular locations, numbers of each qualifying feature within the sites, seasonal fluctuations or trends in prevailing weather conditions etc.). In some cases detailed bespoke surveys of bird numbers and distributions, to determine qualifying features' current usage of particular locations within a proposal's area of influence, may be required to complete the necessary assessments.

Direct displacement/redistribution of the qualifying features can arise from: barriers to movement to and between foraging and roosting or nesting locations; and visual disturbance (e.g. associated with vessel movements). Indirect displacement/redistribution can arise from loss of or damage to prey or prey-supporting habitats (e.g. through harvesting; physical removal of or damage to seabed; nutrient enrichment; changes to water temperature, salinity, or flows; introduction of INNS; pollution (e.g. light, noise, chemical)).

For all qualifying features: Disturbance to foraging birds may reduce the time spent feeding or cause them to move to different areas that are less energetically profitable. Disturbance that creates an avoidance response or disrupts/reduces incubation, chick-rearing, foraging or resting behaviour can also put increased energetic demands on birds during an already energetically expensive season. Ensuring safe movement within and between the breeding colony and those areas used for foraging, roosting and other maintenance behaviours (see also 2c) is important to meet the energetic demands required to achieve or maintain body condition needed to support migration and successful breeding and for subsequent winter survival,. Barriers to movement may reduce access to preferred foraging habitat and cause sub-optimal foraging.

Feature	**Site-specific advice**	**Site-specific information**
Atlantic puffin	Ensure puffins continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site (s). ***and***	Puffins are migratory species which remain offshore during the non-breeding period and move from their breeding grounds such as St Kilda SPA and wintering grounds potentially near the Azores, Canary Islands, north-west Africa and the western Mediterranean. They are present at St Kilda SPA from mid-March until end of August. In some exceptional years adults may still be feeding chicks in September. Puffins have their flightless moult period from beginning February-mid March. Puffins will be widely distributed throughout the Seas off St Kilda SPA waters, using both inshore and offshore pelagic and shelf-waters in which to forage, roost and for other maintenance activities. Foraging is largely restricted to dive depths of up to 70m, although their average dive depth is around 35m (Harris & Wanless 2011; Ropert-Coudert *et al.* 2018). Their mean maximum foraging

	Avoid significant disturbance to puffins and ensure individuals can move safely between these areas within the site (s).	range in the breeding period is 137.1 +/- 128.3km, though they can range up to 383km (Woodward *et al.* 2019). However, when feeding chicks birds generally forage within 10km of their colony. In spring, puffins assemble close inshore in large rafts on the water pre-breeding, where courtship takes place (Snow & Perrins, 1998). Puffins will often roost on the sea at night and will forage early in the morning, returning to their chicks for provisioning (Boag & Alexander, 1998). At their St Kilda SPA breeding colony, puffins will nest underground in burrows, often dug into grassy maritime slopes or will nest amongst boulder screes or cracks in sea cliffs where grassy habitat is sparse. During the fledgling period young will leave their burrow at night and make their way to the sea.
Black-legged kittiwake	Ensure kittiwakes continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site. ***and*** Avoid significant disturbance to kittiwakes and ensure individuals can move safely between these areas within the site.	Kittiwakes are migratory species with the vast majority of adults from North Atlantic colonies such as the St Kilda SPA appearing to winter in the west Atlantic between Newfoundland and the mid-Atlantic ridge with the relatively small numbers wintering in the North Sea and west of the British Isles. Kittiwakes are present at St Kilda SPA during their breeding period from mid-April to end of August. However feeding aggregations may still be seen around the Scottish coast until late October/early November. They will therefore be present during both the breeding and non-breeding seasons. In the St Kilda SPA kittiwakes will nest on steep, coastal cliffs and offshore stacks, and require access to areas of freshwater which they require for bathing. For roosting, they may use manmade walls and sandy shores. Kittiwakes at the St Kilda SPA will use both inshore waters within 1km of their colony for loafing, preening, bathing and other important maintenance behaviours, and further offshore waters and shelf waters for foraging. In the breeding period, the mean maximum foraging range for kittiwakes is 156.1+/- 144.5km, though they will forage further, with a maximum range of 770km (Woodward *et al.* 2019). After breeding, kittiwakes will also use sandy beaches near their breeding grounds to moult in large flocks of individuals.
Common guillemot	Ensure guillemots continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site. ***and***	Guillemots remain near their breeding colonies throughout the year and will continue to attend their breeding sites at St Kilda SPA frequently during the non-breeding period, particularly from February onwards. From the beginning of August to mid-October they will remain on the waters by Seas off St Kilda SPA, where adults will undergo a flightless moult period. Their breeding season is from April until mid-August. Guillemots will nest on bare cliff ledges at the St Kilda SPA in dense colonies. They use areas close to the coast as well as offshore waters in which to forage, rest, and carry out other maintenance activities. In the breeding period, the foraging range of common guillemot has a mean maximum of 73.2 ± 80.5 km, with a maximum range of 338km (Woodward *et al.* 2019). Guillemots

	Avoid significant disturbance to guillemots and ensure individuals can move safely between these areas within the site.	forage both at the seabed (demersal) and within the water column (pelagic), primarily during daylight hours (Wakefield *et al.* 2017). They have an average dive depth of 42m, though can forage up to 200m depth (Ropert-Coudert *et al.* 2018). Guillemots may fly in small groups and will often form large rafts on the sea close in the colony before heading out on a foraging trip. When ready to fledge the chick will leave the nest site and joins the male of the pair on the sea, where they travel further out to sea together and remain close for around two months (Harris & Wanless, 2003).
European storm petrel	Ensure European storm petrels continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site. ***and*** Avoid significant disturbance to European storm petrels and ensure individuals can move safely between these areas within the site.	Storm petrels are a migratory species which migrate from their Scottish breeding colonies to more southerly locations for their winter especially off west Africa, South Africa. They are present at St Kilda SPA from mid-May to end of October. Outside of the breeding season they are strictly oceanic. Storm petrels nest mainly in burrows or crevices in the St Kilda SPA, and they will generally only return to their burrow during darkness. The foraging range of European storm petrels is estimated as being around 336km (Woodward *et al.* 2019). Storm petrels forage during the day over deep waters but are also present in shallower water over the shelf. They may also move closer inshore to their breeding colonies at night time. European storm-petrels are widely distributed throughout the Seas of Kilda SPA. Given their extensive forging range storm-petrels are able to use the entire site.
Great skua	Ensure great skuas continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site. ***and*** Avoid significant	Great skuas are a migratory species. Few birds remain in the North Sea in winter, with the main wintering distribution ranging from the Celtic Sea to southern Europe and to the coast of northwest Africa. The Bay of Biscay is of particular importance for wintering birds (Furness, 2007; Magnusdottir *et al.* 2012). They are present at St Kilda SPA during the breeding period from April to mid-September. Great skuas nest on wet, grassy moorland by sea cliffs at St Kilda SPA, across most of the SPA outwith the village area. Great skuas have a mean maximum foraging range of 443.3+/- 487.9km during the breeding season, but may forage over 1000km (Woodward *et al.* 2019). Great skuas can dip under the surface or grab from the surface and will not generally dive under (Snow & Perrins, 1998), though they can submerge up to 0.5m (Furness, 1987). Great skuas feed only during the

	disturbance to great skuas and ensure individuals can move safely between these areas within the site.	day (Furness, 1987). Breeding skuas will often bathe communally in freshwater, though will also bath in seawater where freshwater sites do not exist (Furness, 1987). At St Kilda SPA numerous puddles and streams across the island are used for bathing, particularly at Glen Mor.
Leach's storm petrel	Ensure Leach's storm petrel continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site. ***and*** Avoid significant disturbance to Leach's storm petrel and ensure individuals can move safely between these areas within the site.	Leach's storm petrel are a migratory species which migrate from their Scottish breeding colonies to more tropical waters, especially off west Africa, South Africa and some reaching the Indian Ocean. They are present at St Kilda SPA from May-mid-October. Leach's storm petrels at the St Kilda SPA nest in burrows or amongst crevices in rock, boulders or walls and will only return to land during the night (BirdLife International, 2022). Leach's petrels are highly pelagic and forage during the day in deep (more than 1,950m) and relatively unproductive waters over and beyond continental slopes, on average 400-830km from their colonies (Pollet *et al.* 2014; Hedd *et al.* 2018). This species has a mean foraging range of 657km (Woodward *et al.* 2019).
Manx shearwater	Ensure Manx shearwater continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site. ***and*** Avoid significant disturbance to Manx shearwater and ensure	Breeding Manx shearwaters will be present at St Kilda SPA from April to the middle of October. They will then migrate further south to winter off the Atlantic coast of South America (BirdLife International, 2022). Non-breeding birds may still visit breeding colonies during the breeding season (Newton, Thompson & Mitchell 2004). Manx shearwaters at the St Kilda SPA will nest in burrows which may be within grass or amongst boulder scree. Burrows within grass have been previously found to be between 70cm-3m long (Brooke, 1990). Burrows tend to be close together and may be lined with vegetation (Snow & Perrins, 1998). Manx shearwaters will use the marine waters for foraging, loafing, preening, bathing, and other important maintenance behaviours. Manx shearwaters have a mean maximum foraging range of 1346.8+/- 1018.7km when associated with a breeding colony, but the maximum foraging distance recorded is 2890km in the breeding period (Woodward *et al.* 2019). Manx shearwaters forage by

	individuals can move safely between these areas within the site.	pursuit-plunging from around 1-2m and pursuit diving, either alone or in small flocks. Manx shearwaters have been recorded diving up to 55m, with a mean maximum of 31m (Shoji *et al.* 2016). Manx shearwater will form large rafts near breeding colonies in the evening before the birds return to their burrows at night (McSorley *et al.* 2008). As the evening progresses the rafting birds tend to come closer inshore (Wilson *et al.* 2008).
Northern fulmar	Ensure fulmar continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site(s). ***and*** Avoid significant disturbance to fulmar and ensure individuals can move safely between these areas within the site(s).	Fulmars have their main breeding period at St Kilda SPA from April to mid-September. Despite dispersing large distances during the non-breeding period, fulmars will regularly visit their colonies over the non-breeding period and thus will be present at St Kilda SPA at some stage throughout the yearly cycle. Fulmars at St Kilda SPA will nest on grassy ledges by cliffs, or on the ground around stone buildings, with a small scrapping and pieces of vegetation on the ground. Fulmars at Seas off St Kilda SPA will forage in the offshore waters, often over shelf break waters. They have a large foraging range of 542.3 ±657.9km during the breeding period, though distances of 2890km have been recorded (Woodward *et al.* 2019). Given the extensive foraging ranges of this species, fulmars from various colonies across the UK and Ireland could be making use of the Seas off St Kilda SPA, although evidence suggests that it is a particularly important foraging resource for individuals tracked from the St Kilda SPA (Edwards, 2015). Fulmars forage both during the day and at night. They are surface feeding predators and scavengers, able to dive usually less than 5m (Edwards *et al.* 2013).
Northern gannet	Ensure gannets continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site(s). ***and*** Avoid significant disturbance to gannets and ensure individuals	Gannets breeding at the St Kilda SPA will be present from mid-February until the end of September. After their breeding period they will then depart for their wintering areas in the North Sea or off West Africa. Gannets nest in dense colonies on the cliffs within St Kilda SPA and will construct nests from seaweed, plants, earth and debris from the sea (Nelson, 2010). Gannets will be widely distributed throughout the Seas off St Kilda SPA waters. They forage over shelf waters, and in water closer to shore, depending on where their prey are. Gannets can plunge dive to around 11m, but can then carry out wing-propelled pursuit to deeper depths of around 24m. Gannets have a mean maximum foraging range of 315.2+/- 194.2 km during the breeding period, but the maximum foraging distance recorded can be over 700km (Woodward *et al.* 2019). Gannets tracked during the breeding period from the St Kilda in 2010 demonstrated extensive use of the north-west Scotland seas, around the Outer Hebrides and further north towards Orkney and

	can move safely between these areas within the site(s).	beyond towards the Faroes (Wakefield *et al.* 2013). Gannets from the St Kilda are largely segregated in their foraging in the breeding season from other gannetries, due to density-dependent competition (Wakefield *et al.* 2013). This suggests that the majority of gannets foraging in the Seas off St Kilda SPA will originate from the St Kilda SPA breeding gannet population.
Razorbill	Ensure razorbill continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated with the site. ***and*** Avoid significant disturbance to razorbill and ensure individuals can move safely between these areas within the site.	Razorbills will be present during their breeding period at the St Kilda SPA from March to September. They will then undergo a flightless moult period from mid-August to end of October and may winter in UK waters or move further east to Norway or Denmark (Furness, 2015). It is not known where razorbills from St Kilda SPA winter. Razorbills at the St Kilda SPA will nest in crevices in cliffs, often mixing with common guillemots on the same ledges. They may also nest amongst boulders and rocks on grassy slopes or rocky beaches (BirdLife International, 2022). In the breeding period, razorbills have a mean maximum foraging range of 88.7 ± 75.9km (Woodward *et al*. 2019). Razorbills are pursuit divers which make frequent dives of up to 140m, though average dive depth is around 15m (Ropert-Coudert *et al.* 2018). Most dives are under one minute. Razorbills will regularly roost on the sea overnight and may drift with the tide during their rest (Cooper *et al.* 2018).

2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate restored, at St Kilda SPA and/or Seas off St Kilda SPA.
This objective seeks to maintain the current extent, quality and distribution of supporting habitats within the sites as well as ensure a sufficient food supply within the sites. It also recognises however, that the populations of breeding puffin, kittiwake, guillemot, fulmar and razorbill using the St Kilda SPA are in unfavourable condition and that this may, in part, be due to a reduction in prey within the Seas off St Kilda SPA causing declines at the breeding colonies. The qualifying features require suitable habitat for breeding, shelter, roosting, foraging, loafing, moulting and other maintenance activities. The variety, quality, abundance and availability of food resources on which the qualifying features depend is important for ensuring adult fitness, survival and breeding success. The supply of food resources is supported by environmental processes. In the marine environment, supporting habitats refer to the characteristics of the seabed and water column relevant to their use by the qualifying features. Supporting processes relates to wider oceanographic processes such as up-wellings, tidal flows, hydrological movements which may be necessary for the habitat, and thus affects nutrient cycling and prey distribution.

In the terrestrial environment, supporting habitats refer to the characteristics of the cliffs, vegetation and other terrestrial habitats, relevant to their use by the qualifying features. Supporting processes relates to wider processes such as factors affecting coastal erosion, factors affecting vegetation formation, and nutrient flow into freshwater bodies, all of which will influence the habitat types and prey distribution available for the qualifying features.

Maintenance of prey species and their supporting habitats is important to maintain the conditions required to support the qualifying features populations.

Temporary short-term changes in supporting habitat and/or food resources due to human activity may be considered not to compromise the Conservation Objectives within the sites provided it can be demonstrated with a high degree of certainty that the populations of any affected qualifying features can fully recover. The species-specific information includes a summary of available information on food resources and where known, the distribution of the key supporting habitats and associated processes within the St Kilda and Seas off St Kilda SPAs.

There is currently insufficient information to support quantitative advice on the environmental processes associated with the supporting habitats and prey of the qualifying features at the St Kilda SPA and Seas off St Kilda SPA.

Feature	**Site-specific advice**	**Site-specific information**
Atlantic puffin	Maintain or enhance the extent and distribution of the supporting habitats for puffins within the sites. ***and*** Ensure the variety and abundance of food resources and the condition of supporting habitats and associated processes have the ability to recover at St Kilda SPA and Seas off St Kilda SPA. ***and*** Existing water quality should be maintained any increase in nutrients, turbidity or contaminants where this	Puffins use grassy maritime slopes, boulder scree or cracks in sea cliffs and rocky slopes for nesting. Feathers, grass, other vegetation, or seaweed may be taken into the burrow as burrow lining (Harris & Wanless, 2011). Puffins will use both inshore and offshore pelagic and shelf-waters in which to forage, roost and for other maintenance activities. Foraging is largely restricted to dive depths of up to 70m (Harris & Wanless, 2011). Puffins' diet will consist of a number of different pelagic and demersal fish, including: sandeels, clupeids, gadoids, sprat, whiting, saithe, haddock, with typical fish sizes being up to 20cm (Harris & Wanless, 2011). Within UK waters, puffins rely heavily on sandeels as prey with between 60 and 90% of their diet reported to be sandeel throughout the North Sea (Furness, 2002). Breeding success of puffins has been shown to correlate with availability of sandeels (Macdonald *et al.* 2015). Puffins can also prey on planktonic crustaceans, including *Calanus* copepods, euphausids amphipods such as *Parathemisto libellula*; pteropod molluscs; the squid *Illex illecebrosus*; and polychaete worms (Harris & Wanless, 2011).

	could reduce supporting habitats and/or prey, should be avoided.	Prey supporting habitats for puffin at Seas off St Kilda SPA are currently unknown. The key supporting habitats within St Kilda SPA for puffins may be availability of grassy slopes and suitable soil for their burrows. Should erosion of soil occur this could reduce the availability of suitable burrowing habitat for the puffins. The key supporting processes for puffins at Seas off St Kilda SPA are not well known but may include water quality (nutrients and turbidity) and water flow. As they are a species that feeds in the water column, they can be potentially affected by any increase in turbidity that would affect their ability to successfully forage for their prey (Cook & Burton, 2010).
European storm petrel	Maintain the extent and distribution of the supporting habitats for European storm petrels within the sites. ***and*** Maintain the variety and abundance of food resources and the condition of supporting habitats and associated processes at St Kilda SPA and Seas off St Kilda SPA. ***and*** Existing water quality should be maintained any increase in nutrients, turbidity or contaminants where this could reduce supporting habitats and/or prey, should be avoided.	Storm petrels require suitable habitat for nesting in burrows or crevices in St Kilda SPA. Their nest will usually be in a tunnel with little or no vegetation, though occasionally grass, bracken or seaweed may be used to form a nest within the burrow or crevice (Snow & Perrins, 1998). Storm petrels will use deep waters as well as shallower water over the shelf for foraging. Whilst most foraging takes place in pelagic and offshore areas, evidence exists that storm petrels may also forage in inshore marine waters. They have been recorded moving close inshore at night to exploit intertidal benthic organisms that migrate into the water column at high tides (Mitchell & Newton, 2004). Storm-petrels tend to avoid coastal areas during the day which is likely to be a predator-avoidance behaviour (Bolton, 2021) but have been observed feeding inter-tidally nocturnally (Thomas *et al*. 2006). Storm petrels will feed predominantly during the day, mainly on the wing by pattering, hovering and snatching, though they can rest on the water (Snow & Perrins, 1998) and may dive for food to a depth of not more than 0.5m (Flood *et al.* 2009). They will occasionally follow ships and attend trawlers (Bird Life International, 2022). Their diet will consist of mainly small fish (including from families Gadidae, Ammodytidae, Myctophidae, herring and sprats) as well as taking squid, surface crustaceans, zooplankton (including Ichthyoplankton) and medusa (including Copepoda, Euphausiacea, Chaetognatha, Anthomedusae). They will also feed on offal and carrion may be scavenged where available (Snow & Perrins, 1998). Whilst they are more generally known as being pelagic foragers of oceantic and neretic organisms, they have also been found to forage on littorial (Gobiidae) and suprabenthic intertidal

		organisms (mainly isopods Cirolanidae) (D'Elbee & Hemery, 1998). The key supporting habitats within St Kilda SPA for storm petrels may be availability of grassy slopes and suitable soil for their burrows. Should erosion of soil occur this could reduce the availability of suitable burrowing habitat for the storm petrels. The key supporting processes for storm petrels at Seas off St Kilda SPA are not well known but in the breeding season they are usually found in the intermediate offshore and suboceanic zones between littoral and deep ocean, from 10°C isotherm to 25°C isotherm (Snow & Perrins, 1998). Stone *et al.* (1995) found storm petrels were present in deep waters, out to the shelf edge and into the deep sea, primarily in waters >50m, with a peak in the outer shelf area (100-200m).
Great skua	Maintain or enhance the extent and distribution of the supporting habitats for great skuas within the site. ***and*** Ensure the variety and abundance of food resources and the condition of supporting habitats and associated processes at St Kilda SPA has the ability to recover. ***and*** Existing water quality should be maintained any increase in nutrients, turbidity or contaminants where this could reduce supporting habitats and/or prey, should be avoided.	Great skuas will use grassy moorlands by sea cliffs at St Kilda SPA for nesting. They may also use freshwater environments within the SPA to bathe communally, though will also bath in seawater where freshwater sites do not exist (Furness, 1987). They will use the surrounding marine waters and further offshore waters for foraging. Great skuas are diurnal foragers who will kleptoparasitise other seabirds for their food as well as being a predator and a scavenger (Furness, 1987). They will often feed in groups, especially when shoaling fish are near the surface. Great skuas can dip under the surface or grab from the surface and will not generally dive under (Snow & Perrins 1998), though they can submerge up to 0.5m (Furness, 1987). Great skuas are opportunistic feeders with a wide prey base including adults, chicks and eggs of other seabird species, terrestrial mammals, pelagic fish, demersal fish from fishery discards, prey gained from kleptoparasitims of other seabirds, and carrion, when they have the opportunity to scavenge any (Furness, 1987). Where sandeels are available, adults preferentially feed their chicks on the high quality prey item of sandeels, compared to e.g. fishery discards such as haddock or whiting (Furness, 1987). Colony location may affect prey type consumed: in one study comparing pellets it was found that on St Kilda 44-65% of great skua pellets contained seabirds, compared to on Foula where only 12% of pellets did (Phillips *et al.* 1997), though it is not known if this pattern remains in recent years. The supporting processes for great skuas may be indirectly linked to what their prey

		and host species require. In the St Kilda SPA the availability of suitable nesting habitat will also be important.
Leach's storm petrel	Maintain the extent and distribution of the supporting habitats for Leach's petrel within the site. ***and*** Maintain the variety and abundance of food resources and the condition of supporting habitats and associated processes at St Kilda SPA. ***and*** Existing water quality should be maintained and any increase in eutrophication or water turbidity, where this could reduce supporting habitats and/or prey, should be avoided.	Leach's petrel at the St Kilda SPA require grass for burrows, or crevices, rock, boulders or walls for nesting habitat. They will forage in pelagic waters over shelf break and continental slope deep waters. They feed during the day and return to their burrows at night. They may use deeper waters to rest in large flocks, often tightly packed together (Camphuysen, 2007). Leach's petrels feed by dipping and pattering, with a smaller proportion of birds feeding by surface seizing (Camphuysen, 2007). Their diet comprises mainly of small fish, squid, planktonic crustaceans and offal from fishing vessels (BirdLife International, 2022). They may also follow marine mammals, feeding on leftovers or faeces. The supporting processes for Leach petrels at the St Kilda SPA may relate to the availability of suitable grass, rocks and boulders for nesting. In marine waters, they are more commonly recorded foraging in areas with steep salinity and sea surface temperature gradients as well as in areas of strong currents in continental shelf waters, in deep waters (Camphuysen, 2007) and in areas of convergence (BirdLife International, 2022).
Northern gannet	Maintain the extent and distribution of the supporting habitats for gannets within the sites. ***and*** Maintain the variety and abundance of food resources and the condition of supporting habitats and associated processes at St Kilda SPA and Seas off St Kilda SPA.	Gannets require suitable habitat for breeding, foraging, loafing, and other maintenance activities within the St Kilda SPA and the Seas off St Kilda SPA. Gannets forage over shelf waters, and in water closer to shore. Gannets will plunge dive to around 11m, but can then carry out wing-propelled pursuit to deeper depths of around 24m within the water column. At breeding grounds they will use cliff habitat to nest colonially. Gannets have a flexible diet and are capable of exploiting a wide variety of pelagic fish prey, including: sandeel, haddock, whiting, blue whiting, cod, saithe, mackerel, sprat, herring and red gurnard. Gannets may also take advantage of fishery discards, though the level of this will differ depending on the individual (Votier *et al.* 2010).

	and Existing water quality should be maintained and any increase in eutrophication or water turbidity, where this could reduce supporting habitats and/or prey, should be avoided.	Prey taken may differ markedly in size from 0-group sandeels (mean = 7.8 cm) to haddock (29.1 cm) and trout (34.0 cm) (Hamer *et al.* 2000). Information is lacking on the supporting processes for gannets at the Seas off St Kilda SPA, but may relate to water quality (nutrients) and water flow. Wind regimes may also affect their flight heights and flight speeds. Tracked gannet were found to spend more time actively foraging during stronger winds (Lane, Spracklen & Hamer, 2019). Supporting processes for gannets at the St Kilda SPA may relate to availability of cliff habitat.
Razorbill	Maintain or enhance the extent and distribution of the supporting habitats for razorbills within the sites. ***and*** Ensure the variety and abundance of food resources and the condition of supporting habitats and associated processes have the ability to recover at St Kilda SPA and Seas off St Kilda SPA. ***and*** Existing water quality should be maintained and any increase in eutrophication or water turbidity, where this could reduce supporting habitats and/or prey, should be avoided.	Razorbills at the St Kilda SPA require suitable habitat for breeding, foraging, resting, and other maintenance activities. They may use crevices and ledges on cliffs, boulders, rocks on grassy slopes, or rocky beaches for their nesting habitat. They will use inshore waters for foraging, but may also feed further offshore in deeper pelagic waters, particularly preferring to feed at shelf waters due to their productivity (Linnebjerg *et al.* 2013). Razorbills will also use the marine waters for roosting overnight and will drift with the tide during their rest (Cooper *et al.* 2018). Razorbills are a pursuit diver which make frequent, shallow dives in the pelagic zone (Thaxter *et al.* 2010; Linnebjerg *et al.* 2013). They have a foraging depth of up to 140m (Jury 1986) though average dive depth is 15m (Ropert-Coudert *et al.* 2018) and most dives are under 1 minute (Ropert-Coudert *et al.* 2018). Razorbills will feed on small fish (e.g. sandeels, clupeids, capelin, sprat, juvenile herring and cod), crustaceans and polychaetes (Wakefield *et al.* 2017). They may also steal fish from puffins at certain colonies (Snow & Perrins, 1998). Razorbill distribution has been linked to substrate type, relating to their main prey item, the sandeel (Wakefield *et al.* 2017). The key supporting processes for razorbill at the St Kilda SPA in the terrestrial environment may relate to suitable cliff-nesting habitat. In the surrounding waters by St Kilda SPA supporting processes may include water quality (nutrients and turbidity), tidal cycles, water temperature and water flow. As they are a species that feeds in the water column, they can be potentially affected by any increase in turbidity that would affect their ability to successfully forage for their prey (Cook & Burton, 2010). Razorbills tend to use areas where mixing of cool and higher sea

		surface temperatures exist (Wakefield *et al.* 2017).
Common guillemot	Maintain or enhance the extent and distribution of the supporting habitats for razorbills within the sites. ***and*** Ensure the variety and abundance of food resources and the condition of supporting habitats and associated processes have the ability to recover at St Kilda SPA and Seas off St Kilda SPA. ***and*** Existing water quality should be maintained and any increase in eutrophication or water turbidity, where this could reduce supporting habitats and/or prey, should be avoided.	Guillemots at the St Kilda SPA require suitable habitat for breeding, foraging, resting, and other maintenance activities. They will use cliff ledges as their nesting habitat. Guillemots use areas close to the coast as well as offshore waters in which to forage and rest. Guillemots forage both at the seabed (demersal) and within the water column (pelagic) up to 200m, primarily during daylight hours (Wakefield *et al.* 2017). Breeding guillemot feed on small schooling fish including sandeels, clupeids, capelin, sprats and juvenile herring and cod (Wakefield *et al.* 2017). They may also consume molluscs, marine worms, squid, crustaceans and amphipods. Studies on St Kilda show annual variation in guillemot chick diet: in 2011 sandeels were present in between 45% of samples, clupeids were present in 32% and gadoids in 14%, with 'small silvery fish' (likely to be rockling) comprising 9%. In 2008 sandeels were dominant, also gadoid and clupeid were present, but rockling relatively scarce in the sample. In 2007, diet was fairly evenly split between juvenile rockling, sandeels and gadoid, and the indigestible pipefish (Money 2006-2008; Prior, 2011). The key supporting processes for guillemots at St Kilda SPA in the terrestrial environment will relate to the suitable cliff-nesting habitat. The key supporting processes for guillemots at the Seas off St Kilda SPA are water quality (nutrients and turbidity), tidal cycles, and water flow. As they are a species that feeds in the water column, they can be potentially affected by any increase in turbidity that would affect their ability to successfully forage for their prey (Cook & Burton, 2010). Guillemots have been shown to show a weak preference for frontal regions and for substrate containing a relatively low proportion of gravel (Wakefield *et al.* 2017). Guillemots have also been observed to forage in riptides (Wanless *et al.* 1990). Studies have also demonstrated guillemots foraging in areas at fronts between thermally distinct bodies of water (BirdLife International, 2022).

Northern fulmar	Maintain or enhance the extent and distribution of the supporting habitats for fulmars within the sites. ***and*** Ensure the variety and abundance of food resources and the condition of supporting habitats and associated processes have the ability to recover at St Kilda SPA and Seas off St Kilda SPA. ***and*** Existing water quality should be maintained and any increase in eutrophication or water turbidity, where this could reduce supporting habitats and/or prey, should be avoided.	Fulmars require suitable habitat for breeding, foraging, loafing, and other maintenance activities within the St Kilda SPA and the Seas off St Kilda SPA. Fulmars at St Kilda SPA will use grassy ledges by cliffs for nesting habitat as well as man-made walls. Fulmars at the Seas off St Kilda SPA will forage in the offshore waters, often over shelf break waters, feeding within 5m of the surface. Fulmars forage both during the day and at night. They have a wide ranging prey base, with their main prey items being: small fish, zooplankton (especially copepods and amphipods), shrimp, squid, jellyfish, crustaceans, offal from fisheries, carrion (BirdLife International, 2022). At St Kilda, a study showed that 71% of regurgitates consisted of pelagic zooplankton (Furness & Todd, 1984), perhaps as a result of St Kilda's proximity to the shelf break and deep oceanic water. A later study (Hamer *et al.* 1997) found that fulmar chick diet on St Kilda was mostly small juvenile fish. The key supporting processes for fulmars at Seas off St Kilda SPA may relate to shelf breaks, where there are areas of high biological productivity due to the oceanic thermal fronts (Edwards *et al.* 2013).
Manx shearwater	Maintain the extent and distribution of the supporting habitats for Manx shearwaters within the site. ***and*** Maintain the variety and abundance of food resources and the condition of supporting habitats and associated processes at St Kilda SPA. ***and***	Manx shearwater require suitable habitat for breeding, foraging, loafing, preening, and other maintenance activities within the St Kilda SPA. Manx shearwaters require grass or boulder scree for nesting habitat. Burrows tend to be close together and may be lined with vegetation (Snow & Perrins, 1998). Manx shearwaters use marine foraging areas both close to their breeding sites and further offshore (Guilford *et al.* 2009). Manx shearwater will form large rafts near breeding colonies in the evening before the birds return to their burrows at night (McSorley *et al.* 2008) and as the evening progresses the rafting birds tend to use closer inshore waters for resting (Wilson *et al.* 2008). Manx shearwaters forage by pursuit-plunging from around 1-2m and pursuit diving, either alone or in small flocks. Manx shearwaters have been recorded diving up to 55m (Shoji *et al.* 2016). This species feeds predominantly during the day (Snow & Perrins, 1998). Manx shearwaters feed mainly on small shoaling fish (e.g. clupeids

	Existing water quality should be maintained and any increase in eutrophication or water turbidity, where this could reduce supporting habitats and/or prey, should be avoided.	and sandeels), but also squid (including members of the family Ommastrephidae, Cranchiidae, Gonatidae, Onychoteuthidae and Mastigoteuthidae), crustaceans and offal (BirdLife International, 2022). The key supporting processes within the St Kilda SPA for Manx shearwaters may be availability of grassy slopes and suitable soil for their burrows. Should erosion of soil occur this could reduce the availability of suitable burrowing habitat for this species. Supporting processes within the marine environment may include water quality (nutrients) and water flow. Wind regimes may also affect their flight heights and flight speeds. Studies have shown the importance of fronts to Manx shearwaters, indicating that these are important features for this species to forage along and at (Shoji *et al.* 2015).
Black-legged kittiwake	Maintain or enhance the extent and distribution of the supporting habitats for kittiwakes within the sites. ***and*** Ensure the variety and abundance of food resources and the condition of supporting habitats and associated processes have the ability to recover within St Kilda and the Seas off St Kilda SPAs. ***and*** Existing water quality should be maintained and any increase in eutrophication or water turbidity, where this could reduce supporting habitats and/or prey, should be avoided.	Kittiwakes at the St Kilda SPA will use steep, coastal cliffs and offshore stacks for nesting. Their nest is made of compacted mud, grass, feathers and occasionally seaweed (Snow & Perrins, 1998). Kittiwakes require access to areas of freshwater for bathing and for roosting they may use manmade walls and sandy shores. Kittiwakes at the St Kilda SPA will use both inshore waters within 1km of their colony for loafing, preening, bathing and other important maintenance behaviours, and further offshore waters and shelf waters for foraging. Kittiwakes may also use sandy beaches to moult in flocks of individuals. Kittiwakes are omnivorous, with a diet consisting predominantly of shoaling marine fish and invertebrates (e.g. squid and shrimps) obtained just below or under (up to 4m) the sea surface. During the breeding season they may also feed on intertidal molluscs, crustaceans (e.g. crayfish), earthworms and plant matter (del Hoyo *et al.* 1996) and may use seaweed for foraging due to the association of seaweed with benthic infauna (Goodship & Furness, 2019). Sandeel are a particularly important prey item in some areas, as well as sprat, rockling and gadoids. When fishing, they will often feed in small flocks. Information is lacking on the supporting habitats for kittiwakes at the St Kilda SPA, but may relate to the availability of cliff nesting habitat. In the marine environment the

		supporting processes may relate to water quality (nutrients and turbidity) and water flow.

Annex 2. Supporting information

Factors determining the potential for feature recovery.

Feature	Factors determining the potential for feature recovery
Atlantic puffin	The estimated generation length for puffins is 14.2 years (Bird *et al.* 2020). Puffins can live up to around 40 years old (Fransson *et al.* 2010), though more commonly to less than 30 years (Harris & Wanless, 2011). Most birds do not visit their breeding colony until 2-3 years old (Snow & Perrins, 1998) and age at first breeding is usually 6 years old (Bird *et al.* 2020). Puffins have one clutch per year with a single egg (Snow & Perrins, 1998), meaning they have a low reproductive rate. This means any effect which causes a decline in numbers could limit the ability for the population to recover. Young leave their burrow at night and make their way to the sea when ready to fledge (Snow & Perrins, 1998), which can be a vulnerable time for the fledged puffins. Adult survival rates have been estimated at 0.913 (Bird *et al.* 2020) and average productivity rate is 0.617 (Horwsill & Robinson, 2015). Any effect on adult mortality can potentially have serious effects on breeding numbers. As with other long-lived seabird species, the adult will balance parental investment into their current breeding attempt with their own need to survive, and future reproductive attempts. In winter, puffins use marine waters outwith their breeding colony waters with some individuals reaching the Azores, Canary Islands, north-west Africa, the western Mediterranean, and the west Atlantic, though many remain within the North Sea (Harris & Wanless, 2011). Pressures at their wintering grounds or during their flightless moult period between February and mid-March may have subsequent consequences for their breeding period. In spring, birds will assemble in large rafts on the water pre-breeding, where courtship takes place, close inshore near their breeding areas (Snow & Perrins, 1998). Disturbance during this time may have consequences for the breeding season. Puffins display a high degree of nest site fidelity and will often use the same burrows across different years (Harris & Wanless, 2011), which may limit individual ability to adapt to changes within these areas and hence potential for population recovery from perturbations. Puffins are pursuit divers and are dependent on high quality fish, such as juvenile sandeels or herring, for successful chick rearing (Wanless *et al.* 2005; Harris *et al.* 2007; Miles *et al.* 2015). Their specialised tongue enables them to capture several fish in one dive and if intended for young can be stacked across the beak (Snow & Perrins, 1998). In years of poor sandeel availability they have demonstrated an ability to forage for alternative prey resources (Harris *et al.* 2007; Wanless *et al.* 2005), however this switch of prey resource may have a consequence on productivity or adult survival. Puffins, as with other auk species, have a high wing loading, meaning that there is a high energetic cost of flight (as seen in guillemots and razorbills, see Thaxter *et al.* 2010). This may mean if they have to travel further to find food they may suffer energetically (Masden *et al.* 2010).

Common guillemot	Guillemot estimated generation length is 14.8 years and age of first breeding is 4 years (Bird *et al.* 2020). Guillemots can live in excess of 40 years (Fransson *et al.* 2010), though the average lifespan is likely to be less than 25 years. Guillemots lay a single egg and will not relay if the egg is lost (Snow & Perrins, 1998), meaning they have a slow reproductive rate. As with many species, productivity of first-time breeders is relatively low, and for guillemots stabilises from the fifth breeding attempt (Crespin *et al.* 2006). When ready to fledge the chick will leave the nest site and joins the male of the pair on the sea, where they then travel further out to sea together and remain close for around two months (Harris & Wanless, 2004). In this post-fledgling period, the chicks will be vulnerable to predation at this lifestage being less able to escape predators (from late July-end of August during fledging). Adult survival is estimated as being 0.935 (Bird *et al.* 2020) and average productivity 0.672 (Horswill & Robinson, 2015). Any effect on adult mortality can potentially have serious effects on breeding numbers. As with other long-lived seabird species, the adult will balance parental investment into their current breeding attempt with their own need to survive, and future reproductive attempts. The majority of guillemots in UK waters during the non-breeding season are likely to be from UK colonies (Furness, 2015). Few adults move beyond UK waters, although immatures range more widely during the non-breeding season (Furness, 2015). Non-breeding adults tend to remain near their breeding colonies throughout the year and attend their nest ledges, except during their flightless moult period from beginning of August to mid-October. Pressures during this moult period, where adults will be flightless for 1-2 months, could have a subsequent effect on reproduction or survival. Guillemots are not particularly agile in the air and they find take-off from water difficult (Bédard, 1985), which may limit their ability to avoid e.g. fast moving vessels. A guillemot's foraging technique means that they only carry one fish back to their chick at a time, whereas other auk species can carry multiple fish. This limits the quantity of prey they can bring back to their chick each day. As guillemots can dive deeply, they can feed both at the seabed (on demersal prey) and in the water column (on pelagic prey) (Wakefield *et al.* 2017), meaning they may have more flexibility in the prey items they can forage on, depending on their availability. Guillemots, as with other auk species, have a high wing loading, meaning that there is a high energetic cost of flight (Thaxter *et al.* 2010). This may mean if they have to travel further to find food they may suffer energetically (Masden *et al.* 2010).
European storm petrel	European storm petrels estimated generation length is 13.8 years (Bird *et al.* 2020). The maximum recorded age for storm petrel is 38 years, though the average lifespan is around 11 years old (BTO, 2019). They first breed in their 4th or 5th year (Snow & Perrins, 1998). Similar to other procelliforms, storm petrels lay a single egg with only one clutch per year, meaning they have a very low reproductive rate. Their incubation (38-50 days) and chick rearing (56-86 days) periods (Snow & Perrins 1998) are also long, even in comparison to other seabird species. Feeding visits by parents may be daily for the chick but will drop off closer to fledging period (Snow & Perrins, 1998). Adult survival rates have been estimated as 0.88 (Bird *et al.* 2020). No data on productivity has been produced for UK colonies (Mitchell & Newton, 2004). Any effect on adult mortality can potentially have serious effects on breeding numbers. European storm petrels are a migratory species which will migrate to more southerly locations for their winter, especially off west Africa and South Africa (Snow & Perrins 1998). Pressures in their wintering grounds and on migration

	could limit potential for populations to recover from impacts arising in breeding areas. Unusual for migratory petrels, storm petrel wing moult begins whilst still at the breeding grounds (Arroyo *et al.* 2004) and they continue their whole moult slowly over a 7-8 month period (Bolton & Thomas 2001). Primary wing moult may occur as early as June for non-breeders or failed breeders (Warham, 1996; Arroyo *et al.* 2004), and typically in September for current breeders (Bolton & Thomas, 2001). Storm petrels are highly site faithful to their burrow (Mainwood, 1976). High site fidelity may limit individual ability to adapt to changes within breeding areas and hence potential for population recovery from perturbations. At their breeding sites, storm petrels rely on being able to hear their mate or chick calling in the burrow to know which burrow is theirs, in combination with their burrow's smell (Snow & Perrins, 1998). Any disruptions to them being able to hear their mate or chick calling could have implications for their breeding attempt. The physiology of storm petrels with their legs being placed so far back along their body means they are unable to walk on land (RSPB, 2019), instead having to shuffle on their tarsi. This means they are particularly vulnerable to predation from mammalian or large gull predators when on land. European storm-petrels are generally pelagic foragers but also regularly forage inshore and are sometimes observed following fishing vessels (D'Elbée and Hémery 1998; Thomas *et al.* 2006). They forage at the sea surface and their diet consists of squid, crustaceans and plankton (D'Elbée and Hémery 1998; Thomas *et al.* 2006).
Great skua	Estimated generation length for great skua is 15.0 years with their age of first breeding being between 6-7 years (Bird *et al.* 2020). This is a long generation length which makes this species less resilient to recovery from factors which either directly or indirectly effect their population. Their maximum lifespan has been recorded as around 33 years (Bird *et al.* 2020). Great skuas have one brood with a clutch size of normally 2 eggs (10-20% of pairs lay a single egg); they may relay if they lose their eggs early in the season (Furness 1987). Adult survival rates have been estimated at 0.915 (Bird *et al.* 2020) and average productivity is 0.651 (Horswill & Robinson, 2015). The high adult survival suggests that any effect on adult mortality can potentially have serious effects on population numbers. Great skuas are a migratory species with the main wintering distribution ranging from the Celtic Sea to southern Europe and to the coast of northwest Africa (Furness, 2007). Few birds remain in the North Sea in winter. The Bay of Biscay is of particular importance for wintering birds (Magnusdottir *et al.* 2012). Great skuas from the UK breeding colonies that migrate from the Celtic Sea to the coast of West Africa may be subject to pressures there that could limit the potential for populations to recover from impacts arising in wintering areas (e.g. bycatch over winter period). Skuas are site faithful to their territory (Furness, 1987); such high site fidelity may limit individual ability to adapt to changes within breeding areas and hence potential for population recovery from perturbations. Great skuas are known to be opportunistic foragers who will kleptoparasitise other seabirds for their food as well as being a predator and a scavenger (Furness, 1987). Great skuas have a wide prey base (Furness, 1987) which may mean they are more resilient to changes in particular prey populations and abundance. They have been known to be able to increase predation on other

	seabirds in times of poor fish supply, showing they have a degree of foraging plasticity.
Black-legged kittiwake	Kittiwake estimated generation length is 9.8 years and age of first breeding is 4 years old (Bird *et al.* 2020). Maximum age recorded is around 29 years (Fransson *et al.* 2010). Kittiwake clutch size is 2 (1-3) (Snow & Perrins, 1998). Fledglings typically depart colonies between late July and mid-August, dispersing rapidly from colonies, leaving the area about 10 days on average after their first flight (Coulson, 2011). Adult survival rates vary with period and colony but range from 0.8-0.93, with an average survival of 0.854 (Coulson, 2011; Horswill & Robinson, 2015). Any effect on adult mortality can potentially have serious effects on breeding numbers. As a long-lived seabird species, the adult will balance parental investment into their current breeding attempt with their own need to survive, and future reproductive attempts. A wide-scale tracking study found that the vast majority of adults from North Atlantic colonies appear to winter in the west Atlantic between Newfoundland and the mid-Atlantic ridge with the relatively small numbers wintering in the North Sea and west of the British Isles coming mostly from colonies in the British Isles or in the Barents Sea (Furness, 2015). Feeding aggregations may be seen around the Scottish coast until late October/early November (Forrester *et al.* 2007). Numbers of kittiwakes passing through UK waters in spring and autumn vary strongly from year to year apparently in relation to weather conditions (Furness, 2015). Pressures in these wintering or passage grounds could limit potential for populations to recover from impacts arising in breeding areas. Adult moult may begin during the breeding season but in general will occur after breeding. This species will often moult in large flocks of several thousand individuals on sandy beaches between the breeding grounds and the open sea (BirdLife International, 2022). Any pressure (e.g. disturbance) to these moulting flocks may have subsequent effects on their energy expenditure and hence their survival. Kittiwakes are surface feeders and are therefore limited to those prey found in the upper 1m of the sea (Snow & Perrins, 1998). Kittiwakes have a high reliance on sandeel as their main prey (Daunt *et al.* 2008), and as such are judged to be one of the most vulnerable species in terms of breeding success in relation to sandeel abundance (Furness & Tasker, 2000). This means they may be less resilient to a loss of sandeel prey resource, and thus their recovery would be compromised. Variation in breeding season diet composition however exists between colonies, regions and years, reflecting availability of different fish prey species in space and time (Ruffino *et al.* 2023).
Leach's storm petrel	Estimated generation length of Leach's petrel is 14.8 years with age at first breeding being 5 years old (Bird *et al.* 2020). Their maximum age recorded is 36 years old (Bird *et al.* 2020). Similar to other procelliforms, Leach's petrels lay a single egg with only one clutch per year possible, which means they have a very low reproductive rate. Their incubation (41-42 days) and chick rearing (63-70 days) periods are also long in comparison to other seabird species (Snow & Perrins, 1998). Adult survival rates have been estimated to be 0.84 (Bird *et al.* 2020), though lower rates have been noted (0.78-0.79) (Fife *et al.* 2015; Morse & Buchheister, 1977). Any effect on adult mortality can potentially have serious effects on breeding numbers. As a long-lived seabird species, the adult will balance parental investment into their current breeding attempt with their own need to survive, and future reproductive attempts.

	94% of the UK breeding population breed on four islands in the St Kilda archipelago. This means that should anything affect this breeding population, it could have a detrimental effect on the UK population as a whole.
Northern fulmar	Estimated generation length is 25.3 years (Bird *et al.* 2020), one of the longest in any bird species, meaning they may be less resilient to any negative effects on their population. Fulmars generally begin breeding ~10 years old (Dunnet, 1991) and can continue to breed into old age; some individuals still recorded as breeding in their late 40s (P.Thompson, unpub.data). Maximum longevity is recorded as being 51 years (Bird *et al.* 2020). Reproduction rates in fulmars are slow with clutch size being 1 egg, one clutch per year. Fulmars may not breed every year (Ollason & Dunnet, 1988), deferring by at least a year if poor food conditions exist such that the adult cannot reach good body condition to breed, or if the bird's partner has not returned and a new partnership may need to establish. Adult survival rates have been estimated at 0.971 (Bird *et al.* 2020), one of the highest of all seabird species, and average productivity as 0.419 (Horswill & Robinson, 2015). Changes in adult survival rates are most likely to drive population change. The fulmar non-breeding population will be mixed individuals across many differing colonies. Tracked birds from Scotland disperse during the non-breeding period to the West Atlantic, to the Labrador Sea, across to the Barents Sea and northern Norway, to the west of Ireland, and some may remain within North Sea waters (Quinn, 2014). There are sex differences in foraging such that female fulmars tracked from Scotland travelled further on average and towards the West Atlantic, compared to males which on average remained closer to the colony over the non-breeding period (Quinn, 2014). There therefore may be different pressures in the wintering grounds for females and males. Despite dispersing large distances in the non-breeding period, from November onwards fulmars will regularly visit their breeding colonies; from January onwards numbers will increase at the colony (Quinn, 2014). In April, breeding fulmars undertake a pre-laying exodus (Macdonald, 1977), an important period of foraging to ensure body condition is ready for the energetically expensive egg laying period. Fulmars may be particularly sensitive to disturbance during their egg laying period, and may abandon their nest if disturbed, leaving the egg vulnerable to predation. During chick-rearing it is common for both pair members to forage away from the nest (Mallory *et al.* 2008), leaving the chick to defend itself with its ability to expel oil and vomit. Fulmars are highly site faithful, which may limit individual ability to adapt to changes within these areas and hence potential for population recovery from perturbations. The majority of the fulmar's primary moult is usually post-breeding during September and October (Quinn, 2016). It is thought that individuals undergoing wing moult may remain largely flightless for the period of wing moult (Warham, 1996), thus making them more vulnerable to pressures during this time. In a typical year, a full wing and tail moult should be completed by the end of February (Ginn & Melville, 2000). In unusual years (e.g. 2004, during a winter wreck event), 60% of birds examined from a wreck were still in primary moult in February, compared to 8% in a normal year (van Franeker, 2004), indicating in years of poor food supply the energetically expensive period of moult may be delayed or arrested. Fulmars have a wide prey base (BirdLife International, 2022), so they should be more resilient to changes in prey abundance. However, in the past, population increases and decreases have been linked to changes in anthropogenic food sources such as offal discharges (Tasker, 2004). Fulmars are surface feeders

	which scavenge on anything that looks like prey. Thus, can be more susceptible to ingesting non-prey items, such as marine litter. Fulmars have the ability to forage widely across large distances (Woodward *et al.* 2019) which means they may be more resilient to changes in prey abundances closer to their breeding colonies.
Razorbill	Estimated generation length of razorbills is 16.4 and they are a long-lived species, having been recorded to live up to 42 years old (Bird *et al.* 2020). Razorbills first breed around 5 years old (Horswill & Robinson, 2015) and, as with other auks, only lay 1 egg (Snow & Perrins, 1998). Razorbills may defer breeding for a year when conditions are not favourable. Adult survival rates have been estimated at 0.906 (Bird *et al.* 2020) and productivity as 0.570 (Horswill & Robinson, 2015). As with other long-lived seabird species, the adult will balance parental investment into their current breeding attempt with their own need to survive, and future reproductive attempts. Razorbills breed around the north Atlantic in eastern North America, Greenland, the White Sea, Norway, Denmark, Iceland, Faroe Islands, GB, Germany and France (BirdLife International, 2019; Furness, 2015). Razorbills wintering in UK waters are thought to derive mainly from breeding populations in the UK, Iceland, Faroe Islands and Norway (Furness, 2015). Scottish breeding razorbills are thought to move east to southwest Norway and Denmark, or the southern North Sea to winter (Furness, 2015). Pressures in these wintering grounds, especially during their vulnerable flightless moult period (from mid-August-end of October), could limit potential for populations to recover from impacts arising in breeding areas. Nest site fidelity has been shown to be high in razorbills (Harris & Wanless, 1989), which may limit individual ability to adapt to changes within their breeding areas, and hence potential for population recovery from perturbations. Razorbills are pursuit divers which tend to make frequent, shallow dives in the pelagic zone (Thaxter *et al.* 2010; Linnebjerg *et al.* 2013). Razorbills will regularly roost on the sea overnight and will drift with the tide during their rest (Cooper *et al.* 2018), which may make them more vulnerable to pressures that occur during the night. Highest rates of feeding for chicks have been recorded at dawn (Condor, 1950), suggesting this is a particularly important time for them to commute between foraging grounds and their breeding colony. Razorbills, as with other auk species, have a high wing loading, meaning that there is a high energetic cost of flight (Thaxter *et al.* 2010). This may mean if they have to travel further to find food they may suffer energetically (Masden *et al.* 2010).
Manx shearwater	Estimated generation length for Manx shearwater is 19.8 years (Bird *et al.* 2020), which is a long generation time, meaning they may be less resilient to any negative effects on their population. Manx shearwaters have been recorded as reaching 50 years old (Bird *et al.* 2020), though average age has been purported to be around 10 years old (Brooke, 1990). Age at first breeding is around 5 years old (Horswill & Robinson, 2015) but can be as old as 8 or 9 years (Brooke, 1990). Similar to other procelliforms, Manx shearwater lay a single egg with only one clutch per year possible, meaning they have a very low reproductive rate. Their incubation (47-55 days) and chick rearing (62-76) periods are also long, even in comparison to other seabird species (Snow & Perrins, 1998). Adult survival rates have been estimated at 0.925 (Bird *et al.* 2020), and average productivity as 0.697 (Horswill & Robinson, 2015). This high survival rate means that any effect on adult mortality could potentially have serious effects on the population.

	Manx shearwater are transequatorial migrants wintering off the Atlantic coast of South America below the equator (BirdLife International, 2022; Guilford *et al.* 2009). Pressures in the Manx shearwater wintering grounds (e.g. bycatch in fisheries) could limit potential for populations to recover from impacts arising in breeding areas. Non-breeding birds may still visit breeding colonies during the breeding season (Newton, Thompson & Mitchell 2004) and from late February their calls can be heard at their breeding colonies again (Brooke, 1990). This species is known to be site faithful (Brooke, 1990). High site fidelity may limit individual ability to adapt to changes within breeding areas and hence potential for population recovery from perturbations. Pressures at the breeding colony itself (e.g. mammalian predation) could also limit potential for populations to recover from impacts airing in the marine foraging areas. The physiology of the Manx shearwater with their legs being placed so far back along their body means they are not good at walking on land (Brooke, 1990), which makes them vulnerable to predation from mammalian or large gull predators. At their breeding sites, Manx shearwaters rely on being able to hear their mate or chick calling in the burrow to know which burrow is theirs, in combination with their burrow's smell (Snow & Perrins, 1998). Any disruptions to them being able to hear their mate or chick calling could have implications for their breeding attempt. Manx shearwaters are sensitive to light pollution, particularly attracting younger shearwaters leading to collisions, predation or starvation (Syposz *et al.* 2018). This may have a subsequent effect on recruitment into the population. Manx shearwaters forage by pursuit plunging and pursuit diving. Whilst foraging close to their breeding rounds is common, Manx shearwaters have the ability to forage much further afield in the breeding period (Woodward *et al.* 2019), which means they may be more resilient to changes in prey abundances close to their breeding colonies. Manx shearwater will form large rafts near breeding colonies in the evening before the birds return to their burrows at night (Brooke, 1990; McSorley *et al.* 2008). Any pressure which would detrimentally affect their evening rafts, could have an effect on their return to their burrow.
Northern gannet	Estimated generation length of gannets is 15.0 years and the maximum longevity recorded is 37.4 years (Bird *et al.* 2020). Age of first breeding is 5 years old (Horswill & Robinson, 2015). Northern gannets lay a single egg; incubation is 42-46 days and chick rearing 84-97 days (Snow & Perrins, 1998), one of the longest chick rearing periods of any seabird species. Chicks fledge with large fat stores and begin migration by swimming, independent from their parents (Wanless, 2002) until their fat load is reduced. Their productivity is estimated at 0.700 (Horswill & Robinson, 2015). Local productivity rates have been linked to parental experience and increase sequentially between the first and the fourth breeding attempt (Nelson, 2010). Adult survival is estimated as being 0.940 (Bird *et al.* 2020), one of the highest of all seabirds. Wanless *et al.* (2006) found that about 30% of young survive to an age of four years with annual survival over the first four years of life increasing gradually from 0.424 to 0.895 before reaching this adult value. Any effect on adult mortality can potentially have serious effects on breeding numbers. Gannets leave their colonies mainly between August-October, with their subsequent migration taking up to four weeks to complete, as birds spend time sitting on the water or foraging locally rather than travelling consistently towards their goal (Kubetzki *et al.* 2009). Gannets from Bass Rock, Scotland have been tracked to their wintering grounds further south in the southern North Sea and English Channel, the Bay of Biscay and Celtic Sea, in the Mediterranean Sea

	and off West Africa (Kubetzki *et al.* 2009) Pressures in wintering grounds (e.g. entanglement in fishing gears) could limit potential for populations to recover from impacts arising in summer foraging areas. Gannets have the ability to forage large distances during the breeding period (Woodward *et al.* 2019) and have a wide prey base, meaning they may be more resilient to changes in prey abundances close to their breeding colonies. Spatial partitioning of foraging grounds among breeding adults from different colonies, as revealed by tracking data, (Wakefield *et al*. 2013) may mean that there is some limitation in where they will forage. Newly fledged gannets may be potentially vulnerable (e.g. to collision or pollution) when initially moving away from their natal colonies by swimming. However, given high natural mortality rate among juveniles, it is changes in adult survival rates that are most likely to drive population change (Wanless *et al*. 2006).

Annex 3: Glossary for Conservation Objectives and References

Glossary

Conservation Objective term	Definition
Distribution	The “distribution” is how the qualifying feature is spread out within the site.
Favourable condition	This refers to the assessed condition of a feature through Site Condition Monitoring. Features considered to be in favourable condition for the purposes of these Conservation Objectives are those that have an assessed condition of either: • Favourable declining - The attribute targets set for the natural feature have been met, but evidence suggests that its condition will worsen unless remedial action is taken. • Favourable Maintained - the attribute targets set for the natural features have been met, and the natural feature is likely to be secure on the site under present conditions. • Favourable Recovered - the condition of the natural feature has recovered from a previous unfavourable condition, and attribute targets are now being met.
Generation length	Generation length is “the average age of parents of the current cohort”. Generation length therefore reflects the turnover rate of breeding individuals in a population (IUCN, 2019).
Maintain	Where a qualifying feature of the SPA is assessed as being in favourable condition the conservation objective is ‘maintain’. This means that the various attributes of the feature should be kept at that favourable level. This can include increasing/improving condition as well, but not a permanent decline.
Marine birds	This term encompasses true seabirds and waterfowl (seaducks, divers, and grebes).
Metapopulation	A group of connected populations of a species within a defined area, where the individual populations may interact with one another.
Restore	Where a qualifying feature of the SPA is assessed as being in unfavourable condition the conservation objective is ‘restore’. This means that the various attributes of the feature should be returned to the favourable level by increasing/improving condition.
Site integrity	The integrity of a site is defined in general terms as the coherence of its ecological structures and function, across its whole area, which enables it to sustain the habitat, complex of habitats and and/or the levels of populations of the species for which it was designated.
Site reference population	This refers to the estimated population figure for the site and should be used to form the basis of carrying out HRAs. In most cases, the site reference population will be the baseline population (figure at designation). However, where recent surveys show a population to have increased or stayed stable, the current population is considered the most appropriate population figure to use for HRA’s.
Supporting habitats and processes	This includes the following environmental conditions (but is not limited to) which are important for maintaining/restoring the protected features, e.g. hydrography and supporting water currents, chemical water quality parameters, suspended sediment levels, radionuclide levels.

Conservation Objective term	Definition
Unfavourable condition	This refers to the assessed condition of a feature through Site Condition Monitoring. Features considered to be in unfavourable condition for the purposes of these Conservation Objectives are those that have an assessed condition of either: • Unfavourable recovering - One or more of the attribute targets have not been met on the site, but management measures are in place to improve the condition. • Unfavourable no change - One or more of the attribute targets have not been met, and recovery is unlikely under the present management and activity on the site. • Unfavourable declining - One or more of the attribute targets have not been met, evidence suggests that condition will worsen unless remedial action is taken.
Waterfowl	Encompasses seaducks, grebes and divers.

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