

## Conservation and Management Advice

### **SOUND OF GIGHA SPA**

**UK SITE: 9020318**

*JUNE 2022*

This document provides advice to Public Authorities and stakeholders about the activities that may affect the protected features of the Sound of Gigha Special Protection Area (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) to other relevant authorities on the Conservation Objectives for the Sound of Gigha 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](http://www.nature.scot/mpas) or <https://jncc.gov.uk/advice/marine-protected-areas/>

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## 1 Overview of document

This document provides details of the Conservation and Management Advice for the Sound of Gigha Special Protected Area (SPA) and it is divided into eight main sections. The introduction in section 2 gives an overview of the Sound of Gigha SPA and its 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 the SPA. Section 4 describes the protected features and their condition, and section 5 introduces the Conservation Objectives for the site. 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 the site for which they are designated.

Annex 1 sets out the Sound of Gigha 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 name, e.g. Sound of Gigha SPA or in discussion of the specific legislation relating to the site. 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 Sound of Gigha SPA has specifically been designated 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

The Sound of Gigha SPA has been designated to protect four species of inshore wintering waterfowl: great northern diver, Slavonian grebe, common eider and red-breasted merganser, and their supporting habitats. By doing so it contributes 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 Sound of Gigha 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 MPA.

### 2.2 Conservation benefits

The conservation benefits of the Sound of Gigha SPA are:

- Protecting over 20% (approximately 500 birds) of the great-northern diver (an Annex 1 rare and vulnerable species) GB population which regularly winter in this area, representing the third largest concentration of this species in Scotland.
- Protecting over 3% (approximately 40 birds) of the Slavonian grebe (an Annex 1 rare and vulnerable species) GB population which regularly winter in this area, representing the seventh largest concentration of this species in Scotland.

- Supporting important regularly occurring wintering populations of common eider (approximately 1300 birds, 2.2% of GB population) and red-breasted merganser (approximately 120 birds, 1.4% of GB population). Both these species may be present throughout the year with some of the wintering population contributing to the breeding population in the area.
- Protecting sheltered waters with rich marine habitats that support a diversity of pelagic and demersal fish, crustaceans and bivalve molluscs where the protected features can feed, moult and roost.

### **2.3 Wider benefits**

The protected features of the Sound of Gigha 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 Sound of Gigha SPA contribute to benefits for people.

The protected features, especially when taken within the context of the whole MPA and/or 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 this MPA, and to the long-term health of the protected features.

In terms of resources, the MPA has a complex bathymetry: the waters close inshore to Gigha tend to be deep (up to 50m) and deepen further in places to over 100m. The MPA also encompasses a band of relatively shallow water off the Kintyre coast. There are many rocks and skerries, as well as small sheltered bays around Gigha. Gigha Sound is scoured by north-south channels, but offshore the sediments are a mixture of mud, sand and gravel while the very sheltered waters of West Loch Tarbert overlie soft mud sediment. The complexity in physical conditions at this MPA provides for a locally diverse range of marine habitats and associated fauna, including benthic species, fish, shellfish (including juveniles), mammal and bird species, in particular high densities of wintering waterfowl species.

The rich and varied natural resources present within the MPA give rise to a wide range of benefits to people. The unique seascapes and wildlife within the MPA provide opportunities for tourism, recreation (such as surfing, kayaking and diving), and wildlife watching, all of which encourage local jobs and businesses. Fisheries and supporting businesses from local communities within and around the MPA utilise and benefit from the wildlife and the area's fish and shellfish resources. The MPA is a socially valued place by the local community who bought out the island of Gigha in 2002. Resources present within the MPA are also integral to the cultural identity of the people living on Gigha. For example, some place names around Gigha relate to wildlife there, such as *Eun Eilean*, an island off west coast of Gigha, translated as 'Bird Island'. Further benefits relating to health and well-being, food and nutrition also arise from the site's natural resources, resulting in a place where communities and visitors can spend time connecting with and enjoying nature.

The benefits that arise from the functions and natural resources of the MPA are typically small in the context of the whole of Scotland, but some are of greater importance for this MPA and the people that use it. There is potential for benefits to be enhanced. This may be achieved by improving the quantity or quality (health) of the protected features themselves and/or through promoting, for example, more recreational enjoyment or use of natural resources that is compatible with the site's Conservation Objectives.

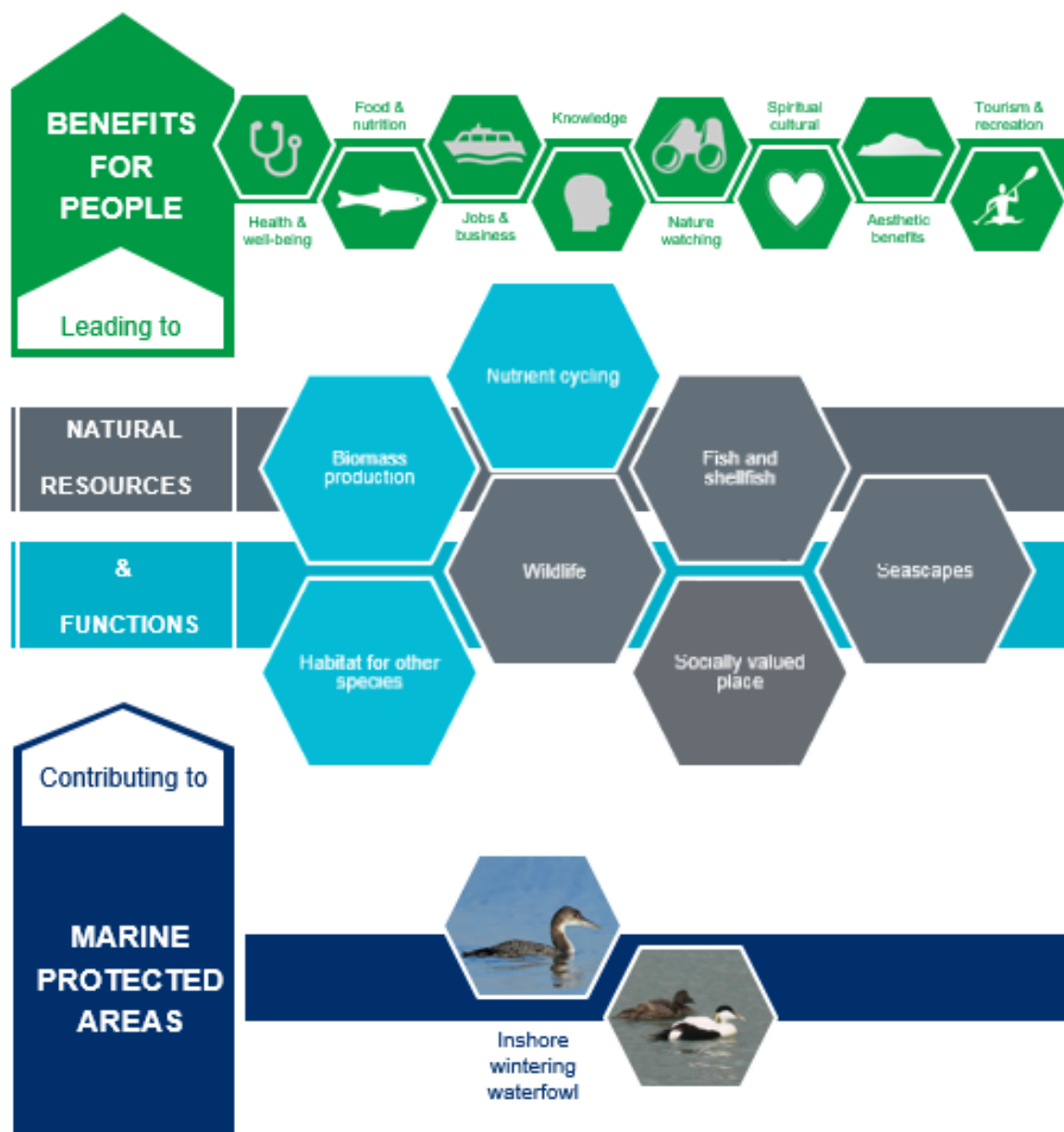


Figure 1. Benefits to people associated with protected features of the Sound of Gigha SPA.

#### 2.4 Contribution to policy commitments

Managing the Sound of Gigha SPA to maintain the protected features in favourable condition, will ensure the continued provision of the benefits above as well as the MPA's 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, particularly 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 Sound of Gigha SPA in relation to activities that may affect the protected features. More detailed advice can be provided to public 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”) under Regulation 33(2), make special provisions for the protection of European marine sites, requiring SNH (now referred to as NatureScot) 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<sup>1</sup> to ensure that the activities they regulate, permit or license do not hinder the achievement of the Conservation Objectives of the Sound of Gigha SPA. The management advice in this document is provided to assist authorities in managing the activities outlined in 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**

The Sound of Gigha SPA has been selected to become part of the UK’s SPA network, contributing to Scotland’s MPA network, which in turn has been established to help conserve and recover a range of Scotland’s important marine habitats, wildlife, geology and landforms.

The protected features of the Sound of Gigha SPA are protected within the SPA throughout the year, irrespective of the season for which they qualified as a protected feature.

Table 1 provides a summary of the protected features within the MPA, 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.

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<sup>1</sup> 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.

**Table 1. Protected features and status for the Sound of Gigha SPA.**

Feature condition refers to the condition of the protected feature at a site level<sup>2</sup>. Broader conservation status is the overall condition of the feature within the UK and Europe. No assessment on the condition of the feature at the Marine Atlantic Biogeographic Region scale is available.

Protected Feature	Feature condition at site	Assessment date <sup>3</sup>	Broader conservation status	
			UK <sup>3</sup>	European region <sup>4</sup>
Great northern diver (non-breeding season)	Favourable	<i>Not yet assessed</i>	Amber	Least Concern
Slavonian grebe (non-breeding season)	Favourable	<i>Not yet assessed</i>	Red	Near Threatened
Common eider (non-breeding season)	Favourable	<i>Not yet assessed</i>	Amber	Endangered
Red-breasted merganser (non-breeding season)	Favourable	<i>Not yet assessed</i>	Amber	Near Threatened

## 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. These 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 the Sound of Gigha SPA are provided in Annex 1.

### 5.2 Relationship between feature condition and Conservation Objectives

The Conservation Objectives seek to *maintain* protected SPA features where evidence exists that it 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 site selection. 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.

The Sound of Gigha SPA was designated in 2020. The protected features have not been assessed since designation however corroborative evidence suggests there is no reason to

<sup>2</sup> The protected features have not been assessed since designation, however corroborative evidence suggest there is no reason to suspect deterioration in condition since site selection (SNH, 2019). Hence, the feature condition is provided as condition at site selection.

<sup>3</sup> Based on Birds of Conservation Concern 5 (BoCC5), for further details on definitions see Stanbury *et al.* 2021.

<sup>4</sup> Based on BirdLife International, 2021.

suspect deterioration in condition since site selection. Therefore, the Conservation Objectives for the Sound of Gigha SPA seek to *maintain* this 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 Sound of Gigha SPA, great northern diver and Slavonian grebe are Annex 1 species. The conservation requirements for Annex 1 species should take precedence over the regularly occurring migratory species (common eider and red-breasted merganser). There are no apparent management conflicts between the protected features.

### **5.4 Overlapping Marine Protected Areas**

The following MPAs overlap with the Sound of Gigha SPA:

- Inner Hebrides and the Minches Special Area of Conservation (SAC)
- Loch Sween MPA

Conservation measures in the overlapping marine areas need to ensure the Conservation Objectives of the Sound of Gigha SPA and the overlapping sites are met. Priority would be given to the SPA and SAC features. There are currently no known management conflicts between the protected features of the MPAs.

Site information for the MPAs overlapping the Sound of Gigha SPA, including the Conservation Objectives, 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, can be found at Marine Scotland's [Feature Activity Sensitivity Tool \(FeAST\)](#)<sup>5</sup>. The information in FeAST reflects 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 Great northern diver (non-breeding)**

Great northern diver populations are considered sensitive to mortality through entanglement as incidental bycatch (Furness, 2016) and collision. There is evidence of great northern divers being sensitive to above water collision with physical structures (Furness *et al.* 2013) and potentially sensitive to underwater collision (Furness *et al.* 2012). Great northern divers are susceptible to mortality arising from oil spills, and in some instances this has had long-term impacts on local wintering populations, which may reflect poor recruitment in associated breeding populations (Heubeck, 1997). There is limited information on disturbance and displacement, although great northern divers have been recorded as taking evasive avoidance action at distances of several kilometres from approaching vessels (Jarrett *et al.* 2018) and have been identified as potentially sensitive to displacement associated with marine development (Furness *et al.* 2012; 2013). The habitat associations and prey preferences of great northern divers are poorly understood, but loss or damage of

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<sup>5</sup> <http://www.marine.scotland.gov.uk/feast/>

prey supporting habitat and/or reduction in food resources could have an impact on great northern divers.

### **6.2 Slavonian grebe (non-breeding)**

Slavonian grebes are considered sensitive to mortality through entanglement in fishing gears and incidental bycatch (Mendel *et al.* 2008; Bradbury *et al.* 2017). They are also considered to be sensitive to above water collision with physical structure (Furness *et al.* 2013).

Slavonian grebes are also highly susceptible to oil pollution which has been shown to cause high winter mortality (Thom, 1986). A number of sources highlight the behavioural sensitivity of Slavonian grebe to vessel movements (Mendel *et al.* 2008; Jarrett *et al.* 2018) and they are assessed as having high potential vulnerability to disturbance and displacement due to marine development (Furness *et al.* 2013). They are also assessed as vulnerable to disturbance and changes in water clarity associated with aggregate extraction or dredging (Cook & Burton, 2010). The habitat associations and prey preferences of Slavonian grebes are poorly understood, but loss or damage of prey supporting habitat or reduction in food resources at a site level could have an impact on Slavonian grebes.

### **6.3 Common eider (non-breeding)**

Eiders are sensitive to mortality through collisions with marine developments and physical structures (e.g. Dierschke & Garthe, 2006; Larsen & Guillemette, 2007), entanglement as bycatch (Mendel *et al.* 2008; Žydelis *et al.* 2013) particularly near the seabed (Bradbury *et al.* 2017) and exposure to pollutants (Carboneras *et al.* 2017), including oil spills (Mendel *et al.* 2008). Eiders are also sensitive to physical disturbance including displacement by built structures (Furness *et al.* 2013) and are frequently recorded taking evasive flights in association with vessel movements (Jarrett *et al.* 2018). The level to which eider can become habituated to vessel movements is uncertain (Garthe & Hüppop, 2004; Schwemmer *et al.* 2011; Larsen & Laubek, 2005). The impact of some of these pressures may be greatest during their flightless moult period between July and mid-September, when large flocks aggregate in favoured locations and it is difficult for them to move away (Waltho & Coulson, 2015). Eider populations are also vulnerable to changes in availability of favoured bivalve prey (Cervencel *et al.* 2015; Mendel *et al.* 2008). (See also *Horse mussel bed sensitivity assessment in FeAST*). Studies in the Wadden Sea showed that eider can switch to a secondary prey source (surf clams), when blue mussel and common cockle numbers were severely reduced and eiders will move between foraging areas in response to prey depletion (Camphuysen *et al.* 2002). However, the ability to switch prey successfully may be limited. Loss of body condition and mortality are associated with loss of prey resources (Camphuysen *et al.* 2002; Beukema 1993; Laursen *et al.* 2009).

### **6.4 Red-breasted merganser (non-breeding)**

Red-breasted mergansers are considered sensitive to mortality through entanglement in fishing gears and incidental bycatch (Mendel *et al.* 2008; Žydelis *et al.* 2013). A number of sources highlight the sensitivity of red-breasted mergansers to vessel movements (Mendel *et al.* 2008; Jarrett *et al.* 2018) and also appear more sensitive than other waterfowl to sudden loud noise (Jarrett *et al.* 2018). They are also considered potentially vulnerable to disturbance and displacement due to marine development (Furness *et al.* 2013). Red-breasted mergansers may be particularly vulnerable to disturbance during post-breeding moult where they become flightless (e.g. Craik *et al.* 2011). The habitat associations and prey preferences of red-breasted mergansers are poorly understood, but loss or damage of prey supporting habitat or reduction in food resources at a site level could have an impact on red-breasted mergansers.

## 7 Management

### 7.1 Conservation Measures

The following conservation measures are currently in place for the Sound of Gigha 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:

- For the Sound of Gigha SPA there is a shellfish water protected area, in association with a river basin management plan, which covers part of the SPA, in West Loch Tarbet. The aim is to maintain good water quality in these areas so shellfish can be harvested for safe human consumption.
- Loch Sween MPA has fishing order restrictions<sup>6</sup> associated with the site including: no suction dredge, mechanical dredge, beam trawl, demersal trawl or hand gathering to take place over a specific area. In the overlapping section with the Sound of Gigha SPA a derogation exists that permits mechanical dredge (between hours of 07:00-21:00 Monday to Friday), demersal trawl and hand gathering by vessel less than 75 gross tonnes.

Further information relevant to management of this MPA will developed with stakeholders through the [MarPAMM project](#)<sup>7</sup> in Argyll, and added to this document in the future.

### 7.2 Advice to support management

Table 2 provides NatureScot'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

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<sup>6</sup> See Fishing Order information and map at <https://sitelink.nature.scot/site/10419>

<sup>7</sup> <http://www.mpa-management.eu/>

- 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. Where management measures are required, the development of these would be undertaken through discussion with the relevant stakeholders.

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 and Technical Standards for Scottish Finfish Aquaculture.

**Table 2. NatureScot’s advice to support management for the Sound of Gigha 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).

Activities considered capable of affecting the protected features	Advice to support management	
	Great northern diver, Slavonian grebe, red-breasted merganser	Common eider
Aquaculture - finfish*	<p><b>No additional management</b> required for existing finfish farms provided management of entanglement pressures at finfish farms within the SPA follow current and evolving best practice with respect to cage mesh size and tensioning, and the use of anti-predator nets.</p> <p><b>Remove or avoid pressures</b> (entanglement due to set nets) in new finfish farms by prohibiting the use of set (gill) nets for recapture of escaped farmed stock within the SPA.</p> <p><b>Reduce or limit pressures</b> (entanglement, disturbance, displacement, reduction of prey supporting habitats) associated with proposed new, consented inactive, or existing fish farms that are proposing to expand or relocate through appropriate mitigation such as:</p> <ul style="list-style-type: none"> <li>• Application of best practice, monitoring and reporting of incidences of bird entanglement, ensuring cage mesh sizes and tensioning are</li> </ul>	<p><b>No additional management</b> required for existing finfish farms provided management of entanglement pressures at finfish farms within the SPA follow current and evolving best practice with respect to cage mesh size and tensioning, and the use of anti-predator nets.</p> <p><b>Remove or avoid pressures</b> (entanglement due to set nets) in new finfish farms by prohibiting the use of set (gill) nets for recapture of escaped farmed stock within the SPA.</p> <p><b>Reduce or limit pressures</b> (entanglement, disturbance, displacement, reduction of prey supporting habitats) associated with proposed new, consented inactive, or existing fish farms that are proposing to expand or relocate through appropriate mitigation such as:</p> <ul style="list-style-type: none"> <li>• Application of best practice, monitoring and reporting of incidences of bird entanglement, ensuring cage mesh sizes and tensioning are appropriate.</li> <li>• Seasonal limitation and/or defining routes for maintenance vessels, in particular to avoid important</li> </ul>

Activities considered capable of affecting the protected features	Advice to support management	
	Great northern diver, Slavonian grebe, red-breasted merganser	Common eider
	<p>appropriate.</p> <ul style="list-style-type: none"> <li>Seasonal limitation and/or defining routes for maintenance vessels, in particular to avoid important foraging areas for non-breeding protected features (as identified from habitat and dive depth preferences).</li> <li>Spatial limitation to avoid damaging or restricting access to prey-supporting habitats of protected features.</li> <li>Careful siting of any new aquaculture developments.</li> </ul>	<p>foraging areas for non-breeding eider (as identified from habitat and dive depth preferences).</p> <ul style="list-style-type: none"> <li>Spatial limitation to avoid damaging or restricting access to prey-supporting habitats of eider.</li> <li>Careful siting of any new aquaculture developments.</li> </ul>
<b>Aquaculture – shellfish*</b>	<p><b>No additional management required for existing shellfish farms</b> provided management of entanglement pressures at shellfish farms within the SPA follow current and evolving best practice with respect to net mesh sizes and tensioning and use of anti-predator nets.</p> <p><b>Reduce or limit pressures</b> (disturbance, displacement, reduction of prey supporting habitats) associated with proposed new shellfish farms or renewed use of vacant sites through appropriate mitigation such as:</p> <ul style="list-style-type: none"> <li>Seasonal limitation and/or defining routes for maintenance vessels, in particular to avoid important foraging areas for non-breeding protected features.</li> <li>Spatial limitation to avoid damaging or restricting access to prey-supporting habitats of protected features.</li> <li>Careful siting of any new shellfish farms.</li> </ul>	<p><b>No additional management required for existing shellfish farms</b> provided management of entanglement pressures at shellfish farms within the SPA follow current and evolving best practice with respect to net mesh sizes and tensioning and use of anti-predator nets.</p> <p><b>Reduce or limit pressures</b> (disturbance, displacement, reduction of prey supporting habitats) associated with proposed new shellfish farms or renewed use of vacant sites through appropriate mitigation such as:</p> <ul style="list-style-type: none"> <li>Seasonal limitation and/or defining routes for maintenance vessels, in particular to avoid important foraging areas for non-breeding protected features.</li> <li>Spatial limitation to avoid damaging or restricting access to prey-supporting habitats of protected features.</li> <li>Careful siting of any new shellfish farms.</li> </ul> <p><b>Remove or avoid pressures</b> (mortality) associated with</p>

Activities considered capable of affecting the protected features	Advice to support management	
	Great northern diver, Slavonian grebe, red-breasted merganser	Common eider
		new shellfish farms including the lethal control of eider.
<b>Boat use associated with both commercial and recreational activities</b>	<p><b>Reduce or limit pressures</b> (disturbance) associated with new boat use during commercial and recreational activities through effective mitigation such as:</p> <ul style="list-style-type: none"> <li>• following the <a href="#">Scottish Marine Wildlife Watching Code</a> (SMWWC).</li> <li>• seasonal and/or spatial restrictions to avoid sensitive time periods for those protected species most susceptible to disturbance and/or;</li> <li>• 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.</li> </ul>	
<b>Dredging/extraction of material (includes navigational, maintenance, and capital dredging)*</b>	<p><b>No additional management</b> for existing maintenance dredging (ports and harbours).</p> <p><b>Reduce or limit pressures</b> (disturbance, damage of supporting habitat) associated with new capital dredging projects and associated maintenance dredging through appropriate mitigation such as:</p> <ul style="list-style-type: none"> <li>• spatial limitations to avoid damaging supporting habitat within foraging dive ranges of all protected features and/or;</li> <li>• seasonal restrictions.</li> </ul>	<p><b>No additional management</b> for existing maintenance dredging (ports and harbours).</p> <p><b>Reduce or limit pressures</b> (disturbance, damage of supporting habitat) associated with new capital dredging projects and associated maintenance dredging through appropriate mitigation such as:</p> <ul style="list-style-type: none"> <li>• spatial limitations to avoid damaging supporting habitat within foraging dive ranges of eider and/or;</li> <li>• seasonal restrictions.</li> </ul>
<b>Fishing - demersal mobile/active gear (inc. mechanical trawls and benthic trawls)*</b>	<p>Whilst we have limited understanding about the extent of interactions between benthic fisheries and prey supporting habitat within the site, we <b>recommend</b> that 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.</p> <p><b>Reduce or limit pressures</b> (removal of prey species and abrasion of prey-supporting habitat) associated with fishing that has the potential to damage seabed</p>	<p>Whilst we have limited understanding about the extent of interactions between benthic fisheries and prey supporting habitat, we <b>recommend</b> that a principal objective of the management of the relevant fisheries should be to ensure that the fishing activity does not cause such damage to the benthic habitats that it adversely affects the availability of prey to bottom-feeding eider.</p> <p>The prey of eider are benthic species (particularly molluscs but also other marine invertebrates) which are associated with habitats within the site. Consideration of site-based management to avoid adverse impact on prey availability</p>

Activities considered capable of affecting the protected features	Advice to support management	
	Great northern diver, Slavonian grebe, red-breasted merganser	Common eider
	habitat (in particular, sandeel habitat).	may be appropriate.
<b>Fishing – hydraulic dredges*</b>	<p>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. We <b>recommend</b> that 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.</p> <p><b>Remove or avoid pressures</b> (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).</p>	<p>Hydraulic dredging has the potential to cause significant disturbance to the sediment habitats that support the prey species of the protected features. We <b>recommend</b> that 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 of bottom-feeding eider.</p> <p><b>Remove or avoid pressures</b> (removal of prey species and disturbance of prey-supporting habitat) associated with hydraulic fishing that has the potential to damage seabed habitat.</p>
<b>Fishing – static gear*</b>	<p><b>Remove or avoid pressures</b> (entanglement) associated with the use of all set nets. Spatial exclusion of static nets in areas identified as being important for great northern diver and Slavonian grebe (as identified from habitat and dive depth preferences) between mid-September and mid-May each year <b>is recommended</b>.</p> <p><b>Remove or avoid pressures</b> (entanglement) associated with the use of all static nets. Spatial exclusion of static nets in areas identified as being important for red-breasted merganser (as identified from habitat and dive depth preferences) <b>is recommended</b>.</p>	<p><b>Remove or avoid pressures</b> (entanglement) associated with the use of all static nets. Spatial exclusion of static nets in areas identified as being important for eider (as identified from habitat and dive depth preferences) <b>is recommended</b>.</p>

Activities considered capable of affecting the protected features	Advice to support management	
	Great northern diver, Slavonian grebe, red-breasted merganser	Common eider
<b>Fishing – pelagic: pelagic trawls and seines*</b>	<p><b>Remove or avoid pressures</b> (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.</p> <p>Pelagic fishing for herring/sprat may occur within or around the SPA. We <b>recommend</b> that a principal objective of the management of the fishery should be ensuring that the fishing activity does not prevent or disrupt the availability of prey species for divers, Slavonian grebe or red-breasted merganser, i.e. it should be considered as part of a broader ecosystem-based approach to management of this fishery.</p>	<i>Pressure unlikely to affect this feature.</i>
<b>Marine disposal sites*</b>	<b>Reduce or limit pressures</b> (disturbance, smothering of prey supporting habitat, changes in water clarity) associated with new, or re-opened, disposal sites within or adjacent to the SPA.	
<b>Ports and harbours</b>	<p><b>No additional management</b> for established activities at ports and harbours within the Sound of Gigha SPA.</p> <p><b>Reduce or limit pressures</b> (disturbance, displacement, loss or damage to prey-supporting habitat) associated with new development proposals or expansion of ports and harbours within or adjacent to the SPA. Appropriate mitigation may include:</p> <ul style="list-style-type: none"> <li>• spatial limitations to avoid damaging supporting habitat within foraging dive range of the protected features and/or;</li> <li>• seasonal restrictions during construction to avoid periods when birds are present.</li> </ul>	
<b>Tourism &amp; recreation* (includes angling, yachting, diving, surfing, kayaking, sail boats, motor boats)</b>	<p><b>No additional management</b> for existing recreational activities (includes yachting, angling, sea kayaking, leisure boating, surfing, diving) providing the <a href="#">Scottish Marine Wildlife Watching Code (SMWWC)</a> is followed by water-borne recreational users. The SMWWC highlights why birds are sensitive to disturbance and offers practical advice on how to avoid disturbance.</p>	<p><b>No additional management</b> for existing recreational activities (includes yachting, angling, sea kayaking, leisure boating, surfing, diving) providing the <a href="#">Scottish Marine Wildlife Watching Code (SMWWC)</a> is followed by water-borne recreational users. The SMWWC highlights why birds are sensitive to disturbance and offers practical advice on how to avoid disturbance.</p>

Activities considered capable of affecting the protected features	Advice to support management	
	Great northern diver, Slavonian grebe, red-breasted merganser	Common eider
	<p><b>Reduce or limit pressures</b> (disturbance, displacement) where an increase by water-borne recreational activities demonstrates there is evidence of impacts at particular locations and/or if there is major increase in intensity of these pursuits within the SPA. There would be potential for some zonation of measures across the site given that great northern divers, Slavonian grebes and red-breasted mergansers exhibit behavioural sensitivity to disturbance.</p>	<p><b>Reduce or limit pressures</b> (disturbance, displacement) where an increase by water-borne recreational activities demonstrates there is evidence of impacts at particular locations and/or if there is major increase in intensity of these pursuits within the SPA.</p>
<b>Seaweed harvesting</b>	<p><b>No additional management</b> is recommended for existing seaweed harvesting activities for hand-harvesting.</p> <p><b>Reduce or limit pressures</b> (disturbance) associated with new seaweed harvesting developments.</p> <p><b>Remove or avoid pressures</b> (disturbance, removal of prey supporting habitat) associated with mechanical harvesting of seaweed (in particular of kelp).</p>	
<b>Wildlife tour operators*</b>	<p><b>No additional management for existing wildlife tours</b> providing the Scottish Marine Wildlife Watching Code is followed by Wildlife tour operators. The <a href="#">Scottish Marine Wildlife Watching Code (SMWWC)</a> should be followed by water-borne recreational users. The SMWWC highlights why birds are sensitive to disturbance and offers practical advice on how to avoid disturbance.</p> <p><b>Reduce or limit pressures</b> (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 SPA. There would be potential for</p>	<p><b>No additional management for existing wildlife tours</b> providing the Scottish Marine Wildlife Watching Code is followed by Wildlife tour operators. The <a href="#">Scottish Marine Wildlife Watching Code (SMWWC)</a> should be followed by water-borne recreational users. The SMWWC highlights why birds are sensitive to disturbance and offers practical advice on how to avoid disturbance.</p> <p><b>Reduce or limit pressures</b> (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 SPA.</p>

Activities considered capable of affecting the protected features	Advice to support management	
	Great northern diver, Slavonian grebe, red-breasted merganser	Common eider
	some zonation of measures across the site given that great northern divers, Slavonian grebes and red-breasted mergansers exhibit behavioural sensitivity to disturbance.	

**Table 3. Activities that are considered not likely to affect the protected features (other than insignificantly) <sup>8</sup>**

Activity	Comments
<b>Anchorage and moorings</b>	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.
<b>Cables and pipelines (inc. power interconnectors and telecom cables).</b>	There are pressures associated with vessel movements (covered in Table 2) during both installation and in maintenance of the pipes, and there is a potential both temporary and permanent seabed habitat destruction. However, due to the scale of it and the low occurrence of this activity in this area, we consider this poses a low risk to the conservation objectives.
<b>Fishing – static gear – Creels (including lobster, crabs and <i>Nephrops</i>)</b>	Creels (including lobster, crabs and <i>Nephrops</i> ). Fishing using creels is widespread throughout the MPA. Whilst there is the potential for entanglement for all the protected features, the occurrence is thought to be rare and therefore we consider this method poses a low risk to the protected features. Pressures associated with the vessel traffic from this pressure is covered under Table 2.
<b>Fishing – mobile gear – line fishing (including jigging)</b>	Long-line fisheries are largely restricted to offshore waters and therefore pose a low risk to the protected features. Pressures associated with the vessel traffic from this pressure is covered under Table 2.
<b>Fishing – cockle hand gathering, diver collection of bivalves, and hand gathering of mussels and oysters</b>	Whilst some hand gathering may be occurring within the SPA, due to the scale of it and the low occurrence of these activities in the SPA, we consider this poses a low risk to the conservation objectives.

<sup>8</sup> 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.

- 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.
- 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 the protected features.
- Further ecological studies of all protected features habitat preferences and use, and movements within the Sound of Gigha SPA.
- Habitat mapping work required on prey supporting habitats for all protected features within the Sound of Gigha SPA.
- Further observations required to ascertain if Slavonian grebes have their moult within the Sound of Gigha SPA.
- Studies on the origin of the wintering populations of the protected features, in particular data is lacking on great northern divers and Slavonian grebes.
- Studies of the energetic/survival consequences of great northern divers', Slavonian grebes' and red-breasted mergansers' behavioural sensitivity to visual disturbance, including within the Sound of Gigha SPA;
- 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.

## Annex 1. Sound of Gigha SPA Conservation Objectives

The box below provides the high-level Conservation Objective statements for the Sound of Gigha SPA.

The full Conservation Objectives, which includes site-specific advice and information on the qualifying features that form part of this SPA, 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).

<b>Sound of Gigha SPA</b>
Qualifying features: <ul style="list-style-type: none"><li>• Great northern diver (<i>Gavia immer</i>)</li><li>• Slavonian grebe (<i>Podiceps auritus</i>)</li><li>• Common eider (<i>Somateria mollissima mollissima</i>)</li><li>• Red-breasted merganser (<i>Mergus serrator</i>)</li></ul>
1. To ensure that the qualifying features of the Sound of Gigha SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2. To ensure that the integrity of the Sound of Gigha SPA is maintained in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:
2a. The populations of the qualifying features are viable components of the site.
2b. The distributions of the qualifying features throughout the site are maintained by avoiding significant disturbance of the species.
2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained.

**1. To ensure that the qualifying features of the Sound of Gigha SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.**

Achieving Favourable Conservation Status (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). 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 at a site level. If the site Conservation Objectives are met then the site's contribution to FCS across the qualifying features' biogeographic range will be maintained. Similarly, when determining whether management measures may be required to ensure that the Conservation Objectives for this SPA 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 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.

**2. To ensure that the integrity of the Sound of Gigha SPA is maintained in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:**

The aim at this SPA is to maintain the qualifying features in a favourable condition as a contribution to its wider favourable conservation status. When carrying out appraisals of plans or projects, or determining whether management measures are required, the focus is maintaining site integrity, specifically by meeting the Objectives outlined in 2a, 2b and 2c. If these are met then site integrity will continue to be maintained. Note that not all of these may be relevant for every activity being considered. Any impacts on the Objectives shown in 2a, 2b or 2c must not persist such that they prevent the maintenance of site integrity.

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 SPA 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 site, 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 site. It is also recognised that climate change pressures could affect the qualifying features within the site. 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 this site (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 Sound of Gigha SPA and its 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 protected features' resilience to climate change, and conversely climate change impacts may start to hinder their ability to recover from human activities.

- **All qualifying features:** Under climate change, sea temperatures are predicted to increase, sea levels will rise and there could be increases in the frequency of stormy conditions. Any of these factors could cause changes in bird abundance and distribution at the SPA due to changes in prey (species, availability and distribution), both in marine waters and in intertidal areas. Climate change may result in effects at their breeding grounds or in other parts of the overall wintering range which could have subsequent effects on their wintering populations and distributions.
- **Great northern diver** - There is no species-specific evidence on the potential impacts of climate change or environmental variability for this species in the non-breeding season.
- **Slavonian grebe:** In southern breeding areas, climate change may reduce the availability of invertebrate prey through drying of wetlands (BirdLife International, 2019). There is no species-specific evidence on the potential impacts of climate change or environmental variability for these species in the non-breeding season.
- **Common eider.** Rising winter temperatures have been identified as a driver for declines in the mussel stocks that eider feed on in the Wadden Sea (Nehls *et al.* 2006).
- **Red-breasted merganser:** Recent apparent shifts in wintering range may be linked to a longer-term trend of relatively mild winters (Holt *et al.* 2011).

## 2a. The populations of qualifying features are viable components of the site.

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 site. It protects the features from significant risk of incidental killing and injury from activities both within and outwith the site. 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 the Sound of Gigha SPA makes 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 site.

At a site level, all qualifying features are 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. In the Sound of Gigha SPA, this means that overwinter survival should not significantly decrease for non-breeding birds and birds that have overwintered on this site should have good enough body condition to be able to migrate to their breeding grounds and breed successfully.

When assessing the effects of any plan or project consideration should also be given to whether impacts outwith the SPA 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 are in place. This includes:

- avoiding effects within and outwith the site that could prevent or reduce the ability of the populations of qualifying features to recover.
- avoiding effects within and outwith the site 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 (to be considered under Conservation Objective 2b)
- maintaining access to, and availability of, supporting habitats and prey within the site (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 to accommodate the feature at such higher levels in future should also be taken into account.

**All qualifying features are protected throughout the whole site, 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 SPA.

Temporary short-term changes in the populations due to human activity may be considered not to compromise the Conservation Objectives within the site 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); and pollution. Indirect mortality can arise from reduction of 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, the site-specific information includes a site reference population 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). The GB population estimates are taken from Musgrove *et al.* 2013 and UK trend information from Frost *et al.* 2018.**

Feature	Site-specific advice	Site-specific information
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Great northern diver	Maintain the population of non-breeding great northern divers at a stable or increasing trend relative to the site reference population.	The site reference population for great northern divers at the Sound of Gigha SPA is 510 individuals (5 year mean 2004/5-2007/8 <sup>9</sup> ), representing more than 20% of the GB non-breeding population (for the period 2004/05-2008/09). Great northern diver numbers in both Scotland and the UK have been generally increasing since at least 1993/94. However, in Europe, their populations are expected to decline by 30-49% between 2000-2029 (BirdLife International, 2019).
Slavonian grebe	Maintain the population of non-breeding Slavonian grebe at a stable or increasing trend relative to the site reference population.	The site reference population for Slavonian grebes at the Sound of Gigha SPA is 37 individuals (5 year mean 2008/09-2012/13), representing over 3% of the GB non-breeding population (for the period 2004/05-2008/09). Slavonian grebe (non-breeding) numbers in both Scotland and the UK have increased substantially since 1993/94, but the trend more recently (from 2005/06 to 2016/17) is declining.
Common eider	Maintain the population of non-breeding common eider at a stable or increasing trend relative to the site reference population.  <b>and</b>  Ensure common eider can move safely between the site and important areas of functionally linked land outwith the site.	The site reference population for eiders at the Sound of Gigha SPA is 1300 individuals (5 year mean 2004/05-2007/2008), representing approximately 2% of the GB population (for the period 2004/05-2008/09). Eider numbers in both Scotland and the UK have declined by 22.5% since at least 1980/81.  Adjacent shorelines (outwith the Sound of Gigha SPA) may also be used for roosting and during the breeding season will be used for nesting and brooding. When assessing the effects of any plan or project consideration should therefore also be given to whether population impacts outwith the SPA could affect achievement of this Conservation Objective.
Red-breasted merganser	Maintain the population of non-breeding red-breasted merganser at a stable or increasing trend relative to the site reference population.  <b>and</b>  Ensure red-breasted mergansers can move safely between the site and important areas of functionally	The site reference population for red-breasted mergansers at the Sound of Gigha SPA is 120 individuals (5 year mean 2004/05-2007/2008), representing over 1% of the GB population (for the period 2004/05-2008/09). Red-breasted merganser numbers in the UK have declined by 21.3% since 2005/06 but remain 31.6% higher than in 1980/81.  Red-breasted mergansers from the Sound of Gigha SPA will use functionally linked land and freshwater environments outwith the SPA during the breeding season for nesting and brooding, and may also use areas of freshwater in the non-breeding season. When assessing the effects of any plan or project consideration should therefore also be given to whether population impacts outwith the SPA could affect

<sup>9</sup> For further details on original survey data see Lawson *et al.* 2015.

linked land outwith the site.

achievement of this Conservation Objective.

**2b. The distribution of the qualifying features is maintained throughout the site 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 Sound of Gigha 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 successful chick rearing in the subsequent breeding season (related to poor winter condition of adult birds), feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their distribution within the site contracts.

'Significant disturbance' should be interpreted to mean disturbance that affects the integrity of the site 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 site 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 that prevent access and use of the site, or;
2. Disturbance which alters their distribution (displacement) within the site or disrupts important behaviours.

Direct displacement of the qualifying features can arise from: barriers off-site that reduce or prevent movement to and between foraging and roosting locations; and visual disturbance (e.g. associated with vessel movements). Indirect displacement 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)).

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 roosting behaviour can also put increased energetic demands on birds. Ensuring safe movement within and between areas used for foraging, roosting and other maintenance behaviours (see also 2c) is important to meet the energetic demands required for winter survival and to achieve or maintain body condition needed to support subsequent migration and successful breeding. Barriers to movement may reduce access to preferred foraging habitat and cause sub-optimal foraging.

**All qualifying features are protected throughout the whole site, 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 SPA.

We anticipate that some locations within the Sound of Gigha SPA will be more, or less, important than others for individual species. Distributions within the site 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 site as a whole, 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 proposals area of influence, may be required to complete the necessary assessments.

Temporary short-term disturbances due to human activity may be considered not to compromise the Conservation Objectives within the site provided it can be demonstrated that the population can fully recover. 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.

Feature	Site-specific advice	Site-specific information
Great northern diver	<p>Ensure great northern divers continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated within the site.</p> <p><b>and</b></p> <p>Avoid significant disturbance to great northern divers and ensure individuals can move safely between these areas within the site.</p>	<p>Great northern divers are long distant migrants, moving annually between northern breeding grounds, predominately in Iceland, Greenland and Baffin Island and more southerly wintering grounds such as the Sound of Gigha SPA. They are present at the Sound of Gigha SPA from October until mid-May, with a small number of non-breeders remaining throughout the year. Their flightless moult period is generally from February until mid-April, but at the Sound of Gigha SPA may begin earlier in January (D.C. Jardine, <i>pers comm</i>).</p> <p>Great northern diver are widely distributed at the Sound of Gigha SPA, with concentrations around the northern end of Gigha and in the channel between the mainland, and the island being recorded. The open coastal waters and more sheltered marine waters are used for foraging, roosting, and maintenance activities. Foraging is largely restricted to dive depths of down to 55m (Robbins, 2017), although typically they forage in shallower waters (Woodward &amp; Humphreys, 2018).</p>

		<p>Non-breeding birds have been observed forming communal rafts in deeper waters at sunset, where it is assumed they remain to roost at night (e.g. Shackleton, 2012). It is not yet known if great northern divers at this SPA use communal rafts in the same way.</p>
Slavonian grebe	<p>Ensure Slavonian grebes continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated within the site.</p> <p><b>and</b></p> <p>Avoid significant disturbance to Slavonian grebes and ensure individuals can move safely between these areas within the site.</p>	<p>Slavonian grebes from the north-west Europe (large-billed) biogeographic population are migrants which move from their breeding ground in Iceland, Faeroes, Scotland and northern Norway to more southerly wintering grounds such as the Sound of Gigha SPA. They are present at the Sound of Gigha SPA from mid-September to late April, with some returning mid-August. A post-breeding moult of primaries is thought to occur before arrival in the wintering grounds, however some Slavonian grebes have been observed in primary moult within the Sound of Gigha SPA (D.C. Jardine, <i>pers.comm</i>).</p> <p>Within the Sound of Gigha SPA Slavonian grebes were distributed mostly in inshore waters, such as those close to Rhunahaeorine Point. However, this was based on limited spatial coverage of WeBS data and it is likely other areas within the Sound of Gigha SPA will be suitable for this species. The sheltered, inshore marine areas are used for foraging, roosting and maintenance activities. Foraging is largely restricted to water depths from 4-14m, with an optimum of 6-9m (Sonntag <i>et al.</i> 2009).</p>
Common eider	<p>Ensure common eider continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated within the site.</p> <p><b>and</b></p> <p>Avoid significant disturbance to common eider and ensure individuals can move safely between these areas within the site.</p>	<p>Eiders are present throughout the year at the Sound of Gigha SPA. Their non-breeding season is from September to mid-April, with their flightless moult period being from July to mid-September.</p> <p>In the non-breeding season, the highest densities of eiders have been recorded around the north end of Gigha and in the channel between the mainland and the island, but they had a widespread distribution within the Sound of Gigha SPA. The shallow, sheltered bays are used for foraging, moulting and roosting. Eiders prefer to moult in sheltered waters free from disturbance (Waltho &amp; Coulson 2015).</p> <p>Foraging is largely restricted to waters less than 10m deep (Woodward &amp; Humphreys, 2018), although dive depths of 60m have been identified when in pursuit of prey (Waltho &amp; Coulson 2015). Roost locations are not known within the SPA but may include offshore locations as well as ashore on adjacent shorelines when sheltering from prevailing weather (Cramp &amp; Simmons, 2004).</p>

<p>Red-breasted merganser</p>	<p>Ensure red-breasted merganser continue to have access to and can utilise all optimal habitats suitable for all relevant aspects of their life cycle associated within the site.</p> <p><b>and</b></p> <p>Avoid significant disturbance to red-breasted merganser and ensure individuals can move safely between these areas within the site.</p>	<p>Red-breasted mergansers are present throughout the year at the Sound of Gigha SPA. The wintering population of this species within the Sound of Gigha SPA may include birds from breeding grounds within Britain and Ireland, from Iceland, and some European birds (Wernham <i>et al.</i> 2002; Wright <i>et al.</i> 2012). Their non-breeding season is from mid-August to late March, with a flightless moult period occurring between mid-July-late August for males) and mid-August-late September for females).</p> <p>Red-breasted mergansers were largely recorded within the narrow confines of West Loch Tarbert and the channel between the south-east of Gigha and the mainland. They use coastal habitats, normally less than 2km from land, more usually within 850m from shore (Craik <i>et al.</i> 2011; Kirby <i>et al.</i> 1993) and have a preference for clear, shallow water, between 0-10m though usually less than 4m deep (BirdLife International, 2019). They may roost further offshore in waters up to 12m deep (Craik <i>et al.</i> 2011). It is not currently known whether red-breasted mergansers in the Sound of Gigha have a similar pattern of roosting in slightly deeper waters. When moulting they tend to do so in small coastal or near-coastal groups (Cramp &amp; Simmons, 2004).</p>
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**2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained.**

This objective seeks to maintain the current extent, quality and distribution of supporting habitats within the site as well as ensure a sufficient food supply within the site.

The qualifying features require suitable habitat for 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 (including for over-wintering species). The supply of food resources is supported by environmental processes.

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.

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 site 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 Sound of Gigha SPA.

The overall water body condition status relevant to the Sound of Gigha SPA was assessed as “Good” in 2020<sup>10</sup>. This assessment includes consideration of water chemistry, pollutants, the physical condition of the water body, plant and animal communities, including plankton, and the risk from invasive non-native species.

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 Sound of Gigha SPA.

Feature	Site-specific advice	Site-specific information
Great northern diver	<p>Maintain the extent and distribution of supporting habitats for great northern diver within the site.</p> <p><b>and</b></p> <p>Maintain the variety and abundance of food resources and the condition of supporting habitats and associated processes.</p> <p><b>and</b></p> <p>Existing water quality should be maintained and any increase in nutrients, turbidity or contaminants where this could reduce supporting habitats and/or prey, should be avoided.</p>	<p>Great northern divers require suitable habitat within the SPA for foraging, loafing, moulting and roosting. In Scotland, great northern divers occur along rocky shores, in sheltered bays and channels as well as open coastal waters. These habitats are used for foraging in the water column and on the seabed (down to 55m depth). Open waters are also used potentially for loafing, moulting and roosting.</p> <p>The limited data available on non-breeding season diet show the principal food resource of great northern divers is fish, including both pelagic and benthic species. Fish species taken will be influenced by what is locally and most readily available, but can include: haddock, cod, herring, sprats and gurnard, eels, along with smaller species such as sandeels, pipefish, gobies, flatfish and butterfish. They also opportunistically on crustaceans, including crabs (Woodward &amp; Humphreys, 2018). Local observations within the Sound of Gigha SPA have recorded great northern divers bringing benthic prey, mostly flatfish and crabs, to the surface to eat (D.C. Jardine, <i>in prep.</i>), suggesting these prey items may be of particular importance within this SPA.</p> <p>Information on prey habitat associations is currently lacking for the Sound of Gigha SPA.</p> <p>The key supporting processes for great northern divers at the Sound of Gigha SPA</p>

<sup>10</sup> <https://www.sepa.org.uk/data-visualisation/water-classification-hub/>

		are not well known but may include water quality (nutrients and turbidity), tidal cycles, and water flow.
Slavonian grebe	<p>Maintain the extent and distribution of supporting habitats for Slavonian grebe within the site.</p> <p><b>and</b></p> <p>Maintain the variety and abundance of food resources and the condition of supporting habitats and associated processes.</p> <p><b>and</b></p> <p>Existing water quality should be maintained and any increase in nutrients, turbidity or contaminants where this could reduce supporting habitats and/or prey, should be avoided.</p>	<p>Slavonian grebes require suitable habitat within the SPA for foraging, loafing, and roosting. In Scotland, Slavonian grebes occur in sheltered inshore marine areas with sandy substrates associated with their main prey items (Woodward &amp; Humphreys, 2018). These habitats are used for foraging in the water column (down to 14m).</p> <p>The limited information available on non-breeding season diet show the principal food resource of Slavonian grebes is a range of fish species, though may occasionally take crustaceans, insects and molluscs opportunistically (Woodward &amp; Humphreys, 2018). Fish species taken will be influenced by what is locally and most readily available, but can include: gobies, sandeels, stickleback, and sculpins. Information on prey habitat associations is limited.</p> <p>The key supporting processes for Slavonian grebes at the Sound of Gigha SPA are not well known but may include water quality (nutrients and turbidity), tidal cycles, and water flow. Slavonian grebes prefer high water quality, which has been related to the efficiency of catching fish (Summers &amp; Mavor, 1995). As Slavonian grebes are visual feeders it is possible that an increase in water turbidity could affect their foraging ability or have an effect on their prey species (Cook &amp; Burton, 2010).</p>
Common eider	<p>Maintain the extent and distribution of supporting habitats for common eider within the site.</p> <p><b>and</b></p> <p>Maintain the variety and abundance of food resources and the condition of supporting habitats and associated processes.</p> <p><b>and</b></p>	<p>Eiders require suitable habitat within the SPA for foraging, loafing, moulting and roosting. In Scotland, eiders occur in sheltered bays with rocky, stony or hard substrates associated with their main prey items. Foraging in these habitats occurs on the seabed (down to 10m depth). Open waters are also used potentially for loafing, moulting and roosting.</p> <p>Eider have a wide variety of prey items. Their principal food resource is benthic bivalves, in particular blue mussels, and other species such as the common cockles, razor clams and clams. They also take shore crabs other marine invertebrates, including gastropods, and fish (Woodward &amp; Humphreys, 2018; Waltho &amp; Coulson, 2015).</p>

	<p>Existing water quality should be maintained and any increase in nutrients, turbidity or contaminants where this could reduce supporting habitats and/or prey, should be avoided.</p>	<p>Eider dive from the surface to pluck their prey from the seabed and typically feed in water depths of under 10m. They prefer areas where there are high abundances of benthic molluscs and actively select particular sizes of their preferred prey (Nehls &amp; Ketzenberg, 2002). Eiders may be attracted to artificial structures that support mussel populations (Heubeck &amp; Mellor, 2013; Cervenci <i>et al.</i> 2015).</p> <p>Benthic habitats capable of supporting the principal bivalve and/or gastropod prey species of eider may be relatively extensive in area within the SPA and the prey distributions and abundance within suitable habitats will vary both spatially and temporally. However some areas within accessible foraging depths are likely to more consistently support relatively higher biomass of benthic prey. Information on these locations is currently lacking for the Sound of Gigha SPA.</p> <p>The key supporting processes for eiders at the Sound of Gigha SPA are water quality (nutrients and turbidity), tidal cycles, and water flow. Eiders exhibit increased feeding activity at low tide when mussel beds are more accessible and in the morning and towards dusk. In Scotland, greater numbers were observed during ebb tides on an exposed west-facing coast and during slack tides and in mornings and evenings in a strongly tidal area (Robbins, 2011; 2012). Eider appear to be unable to feed in currents faster than ~1.2 m s<sup>-1</sup> (Heath <i>et al.</i> 2010). High turbidity may also affect eiders, potentially by limiting their visibility (Dickson &amp; Smith, 2013), or reducing growth of mussel prey (Nehls, 2000). The causal links between eider numbers and water turbidity however are unclear.</p>
Red-breasted merganser	<p>Maintain the extent and distribution of supporting habitats for red-breasted merganser within the site.</p> <p><b>and</b></p> <p>Maintain the variety and abundance of food resources and the condition of supporting habitats and associated processes.</p> <p><b>and</b></p>	<p>Red-breasted mergansers require suitable habitat within the SPA for foraging, loafing, moulting and roosting. In Scotland, red-breasted mergansers occur in open coast habitats with clear, shallow waters and have been associated with both rocky and sandy substrates. The sheltered waters of West Loch Tarbert, where red-breasted mergansers have a high distribution, overlies soft mud sediment. Foraging in these habitats occurs within the water column (down to 12m depth). Open, deeper waters are also used potentially for loafing, moulting and roosting.</p> <p>The limited information on non-breeding season diet suggests that red-breasted merganser feeds principally on small (generally less than 8–10 cm but up to 15cm long) fish. Fish species taken will be influenced by what is locally most readily available, but can include: gobies, sandeels, flounder, butterfish, herring, sprat,</p>

	<p>Existing water quality should be maintained and any increase in nutrients, turbidity or contaminants where this could reduce supporting habitats and/or prey, should be avoided.</p>	<p>sticklebacks and coalfish, as well as amphipods and other crustacea (e.g. brown shrimp and shore crab) (Woodward &amp; Humphreys, 2018; Cramp &amp; Simmons, 2004). Given largely mobile fish prey of red-breasted merganser, linkages to supporting benthic habitats are poorly defined.</p> <p>The key supporting processes for red-breasted merganser at the Sound of Gigha SPA are water quality (nutrients and turbidity), tidal cycles, and water flow. Red-breasted mergansers show a preference for clear, shallow waters not affected by heavy wave action, strong tidal flows or eddies. It is likely this is related to efficiency of foraging, both in visually spotting prey and in the prey capture itself.</p>
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## Annex 2. Supporting information

### *Factors determining the potential for feature recovery.*

Feature	Factors determining the potential for feature recovery
<p><b>Great northern divers</b></p>	<p>Great northern divers have a relatively long generation length estimated at 11.3 years and a maximum longevity of around 30 years (Bird <i>et al.</i> 2020). Adults first breed at 3 years with a clutch size of 2 (1-3) eggs (Cramp &amp; Simmons, 2004). Adult survival rates have been estimated at 0.915 (Bird <i>et al.</i> 2020) and average productivity as 0.543 (Horswill &amp; Robinson, 2015). With a low fecundity and population stability relying on high levels of adult survival, any pressure on adult survival would quickly have an adverse effect on great northern diver population numbers.</p> <p>Great northern divers use marine waters off Scotland’s coasts in their non-breeding season between October and mid-May. They exhibit high site fidelity, which may limit individual ability to adapt to changes within wintering areas and hence potential for population recovery from perturbations. Great northern divers may be particularly sensitive to disturbance on their wintering grounds during their pre-breeding flightless moult period on their wintering grounds between February and mid-April.</p> <p>The birds wintering in GB waters are thought to derive mainly from the European breeding population in Iceland, Greenland and Baffin Island (total population estimated at 700-1,300 pairs, which equates to 1,400-2,600 mature individuals, BirdLife International, 2019) with a very small proportion coming from eastern Canada (Furness, 2015). Pressures in these breeding grounds (e.g. human disturbance and pollution of inland breeding lakes) could limit potential for populations to recover from impacts arising in wintering areas.</p>
<p><b>Slavonian grebe</b></p>	<p>Slavonian grebes have an estimated generation length of 4.4 years and a maximum longevity of 13 years (Bird <i>et al.</i> 2020), which is relatively short for waterfowl and lower than in true seabirds. Adults first breed at 2 years (Bird <i>et al.</i> 2020) with a clutch size of 4-5 eggs (Cramp &amp; Simmons, 2004). Productivity estimates are lacking for this species, though an average of 1.9 fledged chicks per clutch was recorded from one colony (Cramp &amp; Simmons, 2004) and a similar species, great crested grebe, has average productivity of 1.275 (<math>\pm 0.0.35SD</math>) (Horswill &amp; Robinson, 2015). Adult survival rate has been estimated as being 0.728 (Bird <i>et al.</i> 2020). Slavonian grebe population stability is therefore likely to rely on high levels of adult survival, and any pressure on adult survival would quickly have an adverse effect on Slavonian grebe population numbers.</p> <p>Slavonian grebes depend on sheltered, shallow inshore marine waters in their non-breeding season between mid-September and late April. This may restrict their potential to occupy alternative wintering areas in event of habitat loss or displacement.</p> <p>The birds wintering in GB waters are thought to derive mainly from the large-billed NW European population breeding in Iceland, Faeroes (occasional) and North Norway (Cramp &amp; Simmons, 2004) estimated at 4,600 – 6,800 birds (Wetlands International, 2015; 2018). Pressures in these breeding grounds (e.g. human disturbance and pollution or acidifications of inland breeding lakes (Mendel <i>et al.</i> 2008)) could limit potential for populations to recover from impacts arising in wintering areas.</p>

<p><b>Common eider</b></p>	<p>Eiders have a relatively long generation length estimated at 11.2 years and a maximum longevity of around 38 years (Bird <i>et al.</i> 2020). Females first breed at 3 years with a clutch size typically of 4-6 eggs (Cramp &amp; Simmons, 2004). Adult survival rates from older studies are highly variable, but have been estimated as 0.872 (Bird <i>et al.</i> 2020), with annual productivity being 0.379 (Horswill &amp; Robinson, 2015). The critical factor for the long-term survival of the species appears to be the survival rate of young ducklings (Waltho &amp; Coulson, 2015) and both disease outbreaks and poor breeding female condition have been associated with mass mortality in this species (BirdLife International, 2019).</p> <p>Eiders are dispersive partial migrants, resident year round in Scotland. The non-breeding season extends from September to mid-April during which period large flocks may form. Males start to assemble from June or early July and are joined by post-breeding females 3-4 weeks later forming aggregations during the flightless post-breeding moult period between July to mid-September (Cramp &amp; Simmons, 2004). Eider are especially vulnerable to disturbance at sea during this period. Flightless young ducklings also form crèches at sea, guarded by females.</p> <p>Eider nest on the ground in loose colonies usually in areas free of mammalian predators (Waltho &amp; Coulson, 2015), including coastal islands and islets along low-lying rocky coasts, on coastal shores and spits, on islets in brackish and freshwater lagoons, coastal lakes and rivers or on tundra pools (BirdLife International, 2019). Pressures in these breeding grounds (e.g. human disturbance and depredation by introduced mammals) could limit potential for populations to recover from impacts arising at sea.</p>
<p><b>Red-breasted merganser</b></p>	<p>Red-breasted mergansers have an estimated generation length of 5.7 years and a maximum longevity of around 21 years (Bird <i>et al.</i> 2020). Adult survival rates have been estimated as 0.62 (Bird <i>et al.</i> 2020). Adults first breed at 2 years old and clutch size is 8-10 eggs (Cramp &amp; Simmons, 2004). Studies in Finland recorded average young reared per pair over three years of between 0.7-2.0 (Cramp &amp; Simmons, 2004).</p> <p>Red-breasted mergansers are dispersive partial migrants, resident year round in Scotland. The non-breeding season extends from mid-August to late March. Their behavioural sensitivity to visual disturbance and noise may be of particular importance during their post-breeding flightless moult period (August-September) when birds gather in coastal or near-coastal waters, prior to migration to wintering grounds.</p> <p>The birds wintering in GB waters include British breeding birds, the majority of the Icelandic breeding population, and some European birds (Wernham <i>et al.</i> 2002; Wright <i>et al.</i> 2012). Pressures in breeding grounds (e.g. non-native mammalian predators, human persecution; BirdLife International, 2019) could limit potential for populations to recover from impacts arising in wintering areas.</p>

### 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: <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Favourable Recovered - the condition of the natural feature has recovered from a previous unfavourable condition, and attribute targets are now being met.</li> </ul>
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	<p>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:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Unfavourable declining - One or more of the attribute targets have not been met, evidence suggests that condition will worsen unless remedial action is taken.</li> </ul>
Waterfowl	Encompasses seaducks, grebes and divers.

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