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# Conservation and Management Advice

## LOCH SUNART TO THE SOUND OF JURA MPA

*JUNE 2025*

This document provides advice to Public Authorities and stakeholders about the activities that may affect the protected features of Loch Sunart to the Sound of Jura Marine Protected Area (MPA). It provides advice from Scottish Natural Heritage, (operating under the name of and hereinafter referred to as NatureScot) under Section 80 of the Marine (Scotland) Act 2010, to public authorities as to matters which are capable of damaging or otherwise affecting the protected features of MPAs, how the Conservation Objectives of the site may be furthered or their achievement hindered and how the effects of activities on MPAs may be mitigated. 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://www2.gov.scot/Topics/marine/marine-environment/mpanetwork

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

www.nature.scot/mpas or www.jncc.defra.gov.uk/scottishmpas

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**Contents**

# 1 Overview of document

This document provides details of the Conservation and Management Advice for Loch Sunart to the Sound of Jura Marine Protected Area (MPA) and it is divided into eight main sections. The introduction in section 2 gives an overview of Loch Sunart to the Sound of Jura MPA 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 marine protected area. 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 Loch Sunart to the Sound of Jura MPA Conservation Objectives. Annex 2 provides supporting information relating to the protected features.

# 2 Introduction

## *2.1 Purpose statement*

The Loch Sunart to the Sound of Jura MPA has been designated to protect flapper skate and geodiversity interests from the Quaternary of Scotland. By doing so it contributes to the Scottish, UK and other wider MPA networks, the conservation of the wider marine environment around Scotland, and progress towards Good Environmental Status. The main purpose of the Loch Sunart to the Sound of Jura MPA is to conserve the protected features in favourable condition. This makes a contribution to the OSPAR MPA network in the North-East Atlantic.

## *2.2 Conservation benefits*

Loch Sunart to the Sound of Jura MPA provides conservation benefits by affording protection to flapper skate (biodiversity feature) and the Quaternary of Scotland (geodiversity feature). In summary the conservation benefits of this designation are:

- Protecting flapper skate; listed by OSPAR as a threatened and/or declining species and considered Critically Endangered in the NE Atlantic by the IUCN.
- It protects large troughs and channels in the seabed which provide key evidence of how glaciers eroded Scotland's fjords during the ice ages of the Quaternary period (the last 2 million years).
- This site provides an excellent example of geodiversity features underpinning biodiversity features. The glaciated troughs and channels that make up the Quaternary of Scotland feature appear to be strongly associated with flapper skate.

## *2.3 Wider benefits*

Loch Sunart to the Sound of Jura MPA provides 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. larval/gamete supply, habitat for other species) 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 Loch Sunart to the Sound of Jura MPA contribute to benefits for people. There can be many complex interactions and dependencies amongst the protected features, their functions, associated natural resources and the benefits we gain from them.

The functions associated with the protected features of Loch Sunart to the Sound of Jura MPA are described in Annex 1, as part of the site's Conservation Objectives. Flapper skate, 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 are fundamental to the continued supply of natural resources and benefits associated with this MPA, and to the long-term health of the protected feature.

The Loch Sunart to the Sound of Jura MPA includes Loch Sunart and extends south down the Sound of Mull. It includes the Firth of Lorn, the Sound of Kerrera, Loch Melfort and the Gulf of Corryvreckan and extends south into the Sound of Jura. Mud habitats are present in the sea lochs and the steep sided, deep trenches on the seabed. Tide swept rocky reefs exist where the seabed is shallower and rocky and the tides are squeezed through narrow sounds and around islands. This range of seabed habitats provides protection and homes for a diversity of associated flora and fauna.

At a wider scale, the elements of the Quaternary of Scotland feature, together with those in adjoining MPAs, provide evidence of past ice-stream dynamics and melting that is key to understanding how today's ice-sheets in Antarctica and Greenland will respond to the effects of climate change. That in turn is crucial to predicting global sea-level rise in the coming decades.

The rich and varied natural resources present within the MPA contribute to a wide range of benefits for people. The wider area supports fish and shellfish, including juveniles, and offers opportunities for tourism, recreational boating, catch and release angling, diving, and wildlife watching, all of which encourage local jobs and businesses. 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.

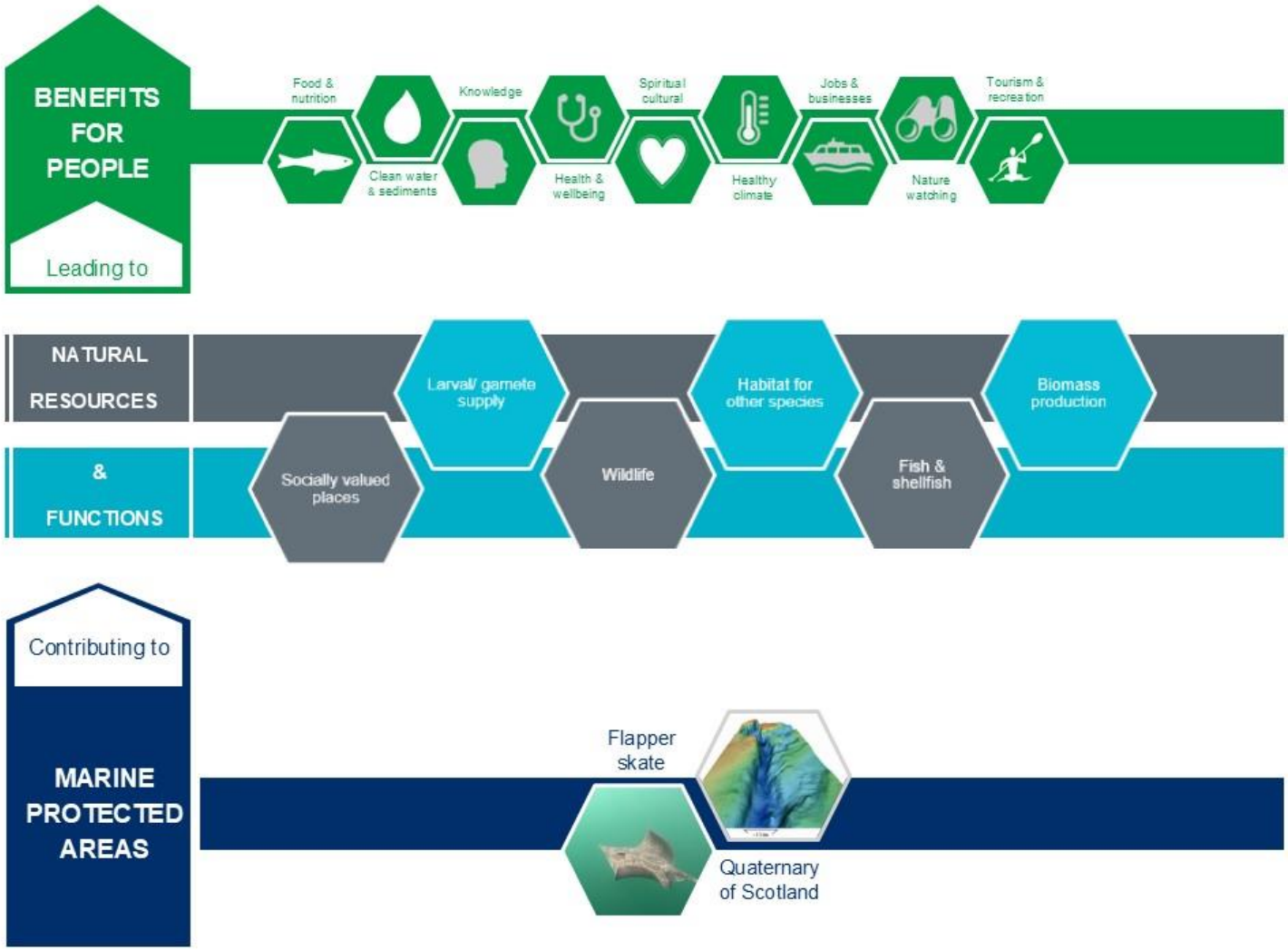


**Figure 1** *Benefits to people associated with protected features of the* Loch Sunart to the Sound of Jura *MPA.*

### *2.4 Contribution to policy commitments*

Managing this MPA to conserve flapper skate and the Quaternary of Scotland geodiversity feature will ensure the continued provision of the benefits above as well as the site's contribution to:

- An ecologically coherent network of MPAs which are well managed under the OSPAR convention and national legislation.
- The protection of flapper skate which is an OSPAR threatened and/or declining species and a Priority Marine Feature.
- Progress towards achieving Good Environmental Status in relation to biological diversity and marine food webs.
- Protection, enhancement and health of the marine area under the Marine (Scotland) Act 2010.
- 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 National Adaptation Plan by increasing the resilience of species.

## 3 Roles

This document provides advice for Loch Sunart to the Sound of Jura MPA 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.

Section 80 of the Marine (Scotland) Act 2010 gives NatureScot the remit to provide advice and guidance to public authorities as to the matters which are capable of damaging or otherwise affecting the protected features of Nature Conservation MPAs, how the conservation objectives of the site may be furthered or their achievement hindered, and how the effects of activities on MPAs may be mitigated.

It is the role of public authorities to ensure that the activities they regulate, permit or licence do not hinder the achievement of the Conservation Objectives of Loch Sunart to the Sound of Jura MPA. The management advice in this document is provided to assist public authorities in managing the activities outlined in Table 2 and carrying out their duties under Section 82 and 83 of the Marine (Scotland) Act 2010.

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 Loch Sunart to the Sound of Jura MPA has been selected to become part of Scotland's MPA network that in turn has been established to help conserve and recover a range of Scotland's important marine habitats, wildlife, geology and landforms.

Table 1 provides a summary of the protected features within the MPA, their condition within the site, and where applicable, their broader conservation status.

The locations and extent of the protected features within the Loch Sunart to the Sound of Jura MPA are shown on Figure 2. This may have been superseded by more up-to-date information on extent/distribution of features since the publication of this document. The most up-to-date distribution of the biodiversity features described will be available to view at National Marine Plan Interactive[1].

**Table 1.** Protected features and condition for the Loch Sunart to the Sound of Jura MPA. Feature condition refers to the condition of the protected feature assessed at a site level. Broader conservation status is the overall condition of the feature throughout its range as outlined by the footnotes.

| Protected Feature | Feature condition | Assessment date | Broader conservation status (NE Atlantic) |
|---|---|---|---|
| Flapper Skate | Favourable | 2022 | OSPAR: Threatened and/or Declining[#]<br>IUCN: Critically Endangered* |
| Quaternary of Scotland | Favourable | 2014 | N/A |

# This is the status for Region II – Celtic Sea under the OSPAR Convention.
* As assessed by the IUCN Red List (2024).

[1] https://marinescotland.atkinsgeospatial.com/nmpi/

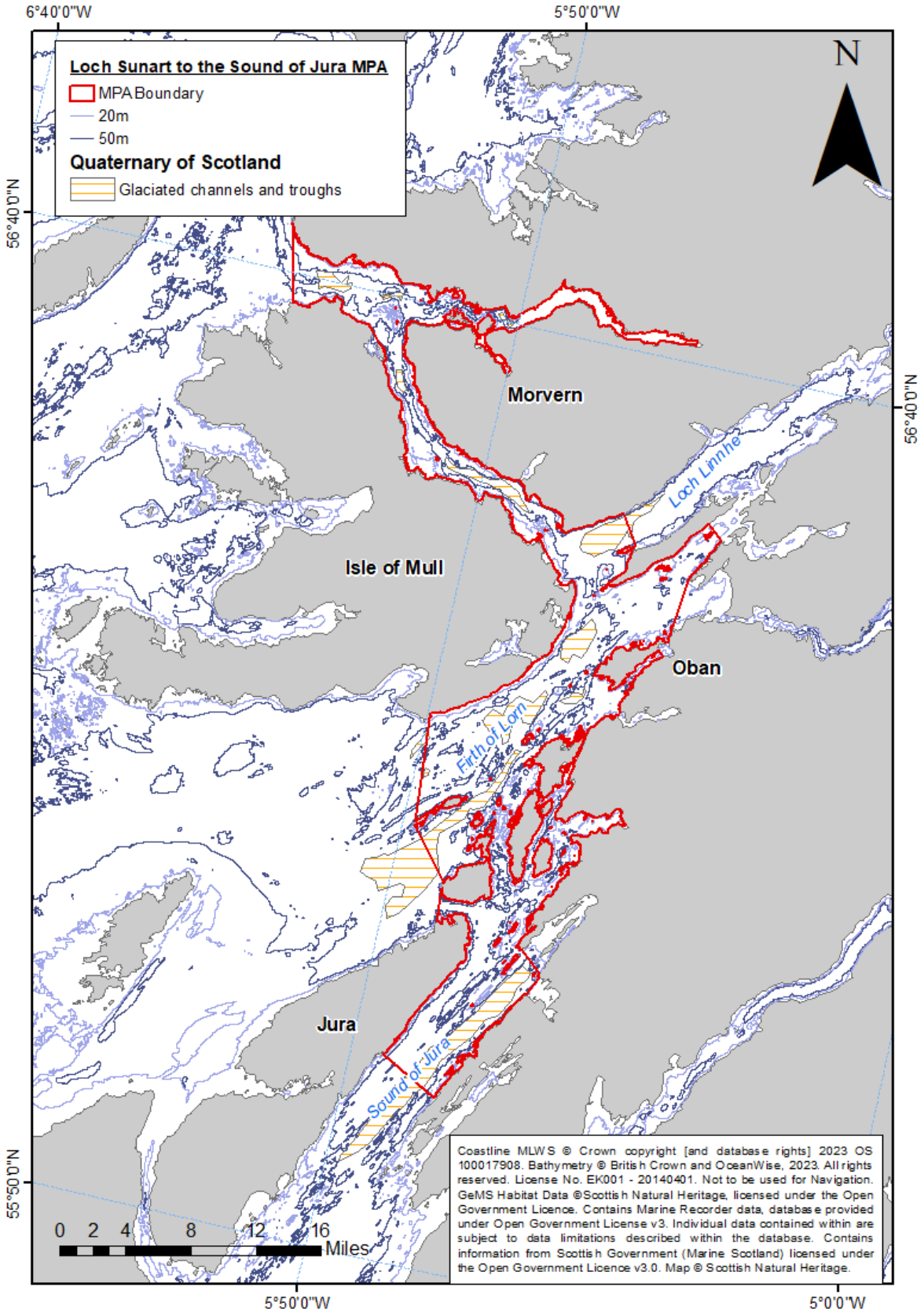


**Figure 2** *Location of the Loch Sunart to the Sound of Jura MPA and distribution of the geodiversity feature. The flapper skate protected feature is not shown on the map as they will be widely distributed throughout the MPA.*

# 5 Conservation objectives

## *5.1 Background*

Conservation objectives set out the desired quality of the protected features within the Loch Sunart to the Sound of Jura MPA (Annex 1) and they are in place at the time the site is formally designated. They provide the framework for the setting of site conservation measures (management) and for public authorities in managing the activities outlined in Table 2 and carrying out their duties under Section 82 and 83 of the Marine (Scotland) Act 2010.

## *5.2 Relationship between feature condition and Conservation Objectives*

The Conservation Objectives seek to *conserve* protected features of a MPA 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 designation. Where evidence exists that a feature is declining and/or damaged and therefore is in unfavourable condition in the site, the Conservation Objectives will seek to *recover* the protected feature.

The protected features are in favourable condition at Loch Sunart to the Sound of Jura MPA and therefore the Conservation Objectives seek to *conserve* this condition.

## *5.3 Overlapping Protected Areas*

The following protected areas overlap with, or are immediately adjacent to, the Loch Sunart to the Sound of Jura MPA:

- Ardnamurchan SSSI
- Ardura – Auchnacraig SSSI
- Bernera Island SSSI
- Cnuic agus Cladach Mhuile SPA
- Drimnin to Killundine Woods SSSI
- Garbh Shilos SSSI
- Garvellachs SSSI
- Glas Eileanan SSSI
- Firth of Lorn SAC
- Inner Hebrides and the Minches SAC
- Inninmore Bay SSSI
- Jura, Scarba and the Garvellachs SPA
- Kinuachdrach SSSI
- Loch Sunart NCMPA
- Mull Oakwoods SAC
- Sea of the Hebrides NCMPA
- South Kerrera and Gallanach SSSI
- Sound of Mull Cliffs SSSI

- Sunart SAC
- Tayvallic Juniper and Coast SAC
- Tayvallich Juniper and Fen SSSI
- West Coast of Jura SSSI
- West Tayvallich Pennisula SSSI

Conservation measures in the overlapping protected areas need to ensure the Conservation Objectives of all the sites are not affected. Priority would be given to the SAC and SPAs.

There are no apparent management conflicts between the protected features of the Loch Sunart to the Sound of Jura MPA and the protected features of the other overlapping areas.

Site information including the Conservation Objectives for the MPAs overlapping Loch Sunart to the Sound of Jura MPA are available on SiteLink.

## 6 Feature sensitivity

The following sections provide an overview of the pressures most relevant to the protected features. Further information on feature sensitivity, can be found on the NatureScot webpage - Feature Activity Sensitivity Tool (FeAST)[2] and also for the features not covered by FEAST, Marine Evidence based Sensitivity Assessment (MarESA)[3]. 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 Flapper skate*

Flapper skate adults and juveniles are considered to have medium sensitivity to surface abrasion, as they may be able to avoid activities causing this pressure. Flapper skate adults are considered to have low sensitivity to collision since they spend limited time in water shallower than 20 m (Thorburn *et al*. 2021) and are large. Flapper skate are assessed as having a low sensitivity to noise although there is no published work on this topic.

Adults and juveniles are at risk of being captured in trawls and dredges and although they are required to be returned unharmed (Council regulation 2020/123, as amended by The Common Fisheries Policy (Amendment etc.) (EU Exit) Regulations 2020) and SSI 2012 No 63) they could be damaged during this process and assessed as having a medium sensitivity. See also the MPA Fisheries Guidance note for flapper skate.

Flapper skate eggs are considered to have high sensitivity to surface abrasion since they could be damaged in trawls or dredges and even if they survive could be

[2] https://feature-activity-sensitivity-tool.scot/search-feature
[3] https://www.marlin.ac.uk/sensitivity/sensitivity_rationale

returned to the seabed in suboptimal conditions for embryo development. Flapper skate eggs are considered to have medium sensitivity to changes in siltation. If eggs were buried by silt this could prevent flow of water through the egg case and prevent embryo development.

### *6.2 Quaternary of Scotland (glaciated channels / troughs)*

The processes which formed the glaciated channels / troughs no longer exist and therefore the feature has no recovery potential. However, these landforms have been eroded largely in bedrock, and as such are highly resistant and are considered not sensitive to human activities. Where any parts of these landforms may have been eroded in sediment, they may have medium sensitivity to (e.g.) sub-surface abrasion.

## 7 Management

### *7.1 Advice to support management*

Table 2 provides NatureScot's advice to support 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 or biological. Different activities may cause the same pressure, e.g. fishing using bottom-contacting gears and aggregate dredging both cause abrasion that can damage the surface of the seabed and associated species.

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

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

For our advice on fisheries management we have also stated where we think this should be 'considered' or 'recommended'. The term 'considered' is included to highlight that a fishery-feature interaction 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 and for them to consider if a fishery management measure may be helpful in achieving the 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 a fishery-feature interaction exists, there is a reasonable evidence base and a specific recommendation can be made / justified.

New or other activities 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.

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).

### *7.2 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[4] and Technical Standards for Scottish Finfish Aquaculture[5].

### *7.3 Conservation Measures*

The following conservation measures are currently in place for the Loch Sunart to the Sound of Jura MPA:

- Activities and developments subject to licensing that could affect the protected features of the MPA also need to be assessed. Authorities need to determine whether if by carrying out their duties e.g. permitting an activity to take place, it would hinder the achievement of the Conservation Objectives of the MPA. This is referred to as an assessment under Section 82 or Section 83 of the Marine (Scotland) Act 2010.
- *Fishing – demersal mobile/active gear and static gear* – The deployment of fishing gear (both active and passive) is prohibited within the Loch Sunart to the Sound of Jura in accordance with The Loch Sunart to the Sound of Jura Marine Conservation Order 2016. Fishing with creels and parlour creels is not included in the prohibition. Between January the 1st and March the 31st, and between October the 1st and December the 31st, the deployment of a mechanical dredge or demersal trawl (without the attachment and use of tickler chains) is allowed in certain areas (described in Schedule 2).

[4] https://www.nature.scot/professional-advice/land-and-sea-management/managing-coasts-and-seas/scottish-marine-wildlife-watching-code
[5] https://www.gov.scot/publications/technical-standard-scottish-finfish-aquaculture/

**Table 2. NatureScot's advice to support management for Loch Sunart to the Sound of Jura MPA for activities that are considered capable of affecting the proposed 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. An * has been used to highlight those activities to which the advice under 'Boat use associated with both commercial and recreational activities' also applies. Cells are also coloured grey where it is considered there is no additional management required to achieve the Conservation Objectives. 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). Note that advice is not given for the geodiversity protected features and advice will be provided on a case-by-case basis.

**Egg laying areas** - Currently there is one identified egg laying area (Campbell Rock, Loch Melfort) within Loch Sunart to the Sound of Jura MPA which is described further in the conservation objectives in Annex 1. Skate eggs have been found recently in an area adjacent to the site boundary. Further work will be carried out to determine if they extend to within the site. There is currently a lack of evidence of other egg laying areas or important areas for juveniles within the MPA, but if evidence if found then we would expect them to be taken into account and this document and advice will be updated accordingly.

| **Activities considered capable of affecting the proposed protected features** | **Advice to support management for Flapper skate** | |
|---|---|---|
| | **Adults** | **Egg laying areas** |
| **Aquaculture*** | **Reduce or limit pressures**<br>Minimise the risk of mortality, injury and disturbance associated with new fish farms and significant modifications to existing fish farms including entanglement, the lethal control of predators | **Remove or avoid pressures**<br>Avoid potential impacts from pressures associated with new farms and undeveloped consents as well as the expansion or relocation of existing farms (e.g. physical and waste depositional footprints, including the anchoring/mooring of any associated vessels/infrastructure), by avoiding overlap with flapper skate egg-laying areas. |

| Activities considered capable of affecting the proposed protected features | Advice to support management for Flapper skate | |
|---|---|---|
| | **Adults** | **Egg laying areas** |
| **Anchorages*** | *Pressure unlikely to affect feature* | **No additional management** required for current anchorages.<br><br>**Remove or avoid pressures**<br>Avoid the potential effects from pressures associated with new anchorages (e.g. abrasion and siltation and physical change) by avoiding overlap with identified egg laying areas. |
| **Cables and pipelines*** | *Pressure unlikely to affect feature* | **Remove or avoid pressures**<br>Avoid the potential impacts from pressures associated with new cables and pipelines (e.g. abrasion, physical change and siltation), by avoiding overlap with identified egg laying areas. |
| **Coastal development e.g. construction of piers, slipways, jetties etc.*** | **Reduce or limit pressures**<br>Reduce the potential risks of disturbance to flapper skate from activities associated with high source levels of underwater noise within elasmobranch hearing range (~20Hz – 1kHz) or from barotrauma e.g. pile-driving and blasting (note there is no published work for flapper skate directly). We encourage early pre-application discussions to discuss techniques and methods to decrease the potential impacts from underwater noise on flapper skate. This may involve noise abatement technology, pile management strategies etc. | **Remove or avoid pressures**<br>Avoid the likely effects from pressures associated with new coastal development (e.g. siltation, abrasion, physical change and chemical contamination) by avoiding overlap with identified egg laying areas. |
| **Fishing - demersal mobile/active gear*** | **Reduce or limit pressures**<br>Management measures to reduce or limit demersal mobile/active fishing within the Loch Sunart to the | **Remove or avoid pressures**<br>The exclusion of mobile/active bottom-contacting gear over identified flapper skate egg-laying areas ***is recommended***, to avoid potential impacts from pressures |

| Activities considered capable of affecting the proposed protected features | Advice to support management for Flapper skate | |
|---|---|---|
| | **Adults** | **Egg laying areas** |
| | Sound of Jura MPA ***are recommended***. – *existing management in place (see section 7.3).* | associated with this (e.g. mortality of eggs and impact on suitability of habitat to support eggs as a result of surface abrasion, siltation and physical change). |
| **Fishing - static gear*** | **Remove or avoid pressures**<br>Management measures to remove or avoid fishing with long-lines, drift nets and nets set on the seabed (tangle, trammel, gill) ***is recommended*** (to avoid mortality of adults through bycatch or entanglement). | **Remove or avoid pressures**<br>Management measures to remove or avoid fishing with long-lines, drift nets and nets set on the seabed (tangle, trammel, gill) from identified flapper skate egg laying areas ***is recommended*** (to avoid mortality of adults through bycatch or entanglement). |
| | | **Reduce or limit pressures**<br>Management measures to reduce or limit the intensity of creel fishing within identified flapper skate egg-laying areas ***should be considered*** to reduce potential impacts from pressures associated with creeling (physical impact, surface abrasion). |
| **Fishing – recreational*** | **Reduce or Limit Pressures**<br>All angling for flapper skate is catch and release and should ideally be carried out from a boat to avoid injury to skate when landing on the shore. Reduce risk of death or injury when angling for skate by following best practice handling guides. | |
| **Marine deposit sites*** | *Pressure unlikely to affect feature* | **Remove or avoid pressures**<br>Avoid the potential impact from pressures of new deposit sites and or reopening of disused/closed sites (e.g. siltation and chemical contamination affecting eggs directly or indirectly via changing habitat) to ensure that identified egg-laying areas are maintained in extent and suitability. |
| **Military - planned exercises*** | **Reduce or limit pressures**<br>Reduce the risks of potential disturbance to flapper skate from activities associated with high source | **Reduce or limit pressures** (disturbance) associated with military activities by ensuring the MoD Environmental Protection Guidelines encompass the Loch Sunart to the |

| Activities considered capable of affecting the proposed protected features | Advice to support management for Flapper skate | |
|---|---|---|
| | **Adults** | **Egg laying areas** |
| | levels of underwater noise in hearing range (~20Hz – 1kHz) or barotrauma (e.g. sonar activities, explosives) or potential impacts to eggs and egg-laying areas from seabed surface activity by following the advice of Environmental Protection Guidelines (Maritime) (EPG(M)) when in the vicinity of MPAs. The Maritime Environmental and Sustainability Assessment Tool (MESAT) will be used to undertake an assessment when military exercises are required contrary to the advice of EPG(M). See Royal Navy - Environmental Protection for more details. | Sound of Jura MPA, noting any seasonal sensitivities of the protected features to minimise disturbance. |
| **Moorings*** | *Pressure unlikely to affect feature.* | **Remove or avoid pressures**<br>Avoid the potential effects from pressures associated with new moorings (e.g. physical impact, abrasion, siltation and physical change) by avoiding overlap with identified flapper skate egg-laying areas. |

| Activities considered capable of affecting the proposed protected features | Advice to support management for Flapper skate | |
|---|---|---|
| | **Adults** | **Egg laying areas** |
| **Ports and Harbours[6]*** | **Reduce or limit pressures**<br>Reduce the risks of disturbance to flapper skate from activities associated with high source levels of underwater noise (e.g. pile-driving and blasting). We encourage early pre-application discussions to discuss techniques and methods to decrease the impacts from underwater noise – this may involve noise abatement technology, pile management strategies etc[7]. | **Remove or avoid pressures**<br>Avoid the potential impacts from pressures associated with new ports and harbour development (e.g. abrasion, physical change and siltation), by avoiding overlap with identified flapper skate egg-laying areas. |
| **Renewable energy*** | **Reduce or limit pressures**<br>Reduce the risk of renewable energy development acting as a barrier to species movement. | **Remove or avoid pressures**<br>Avoid the potential impacts from pressures associated with renewable energy development (e.g. abrasion, physical change and siltation), by avoiding overlap with identified flapper skate egg-laying areas. |

[6] The advice on boat use (see activity 'Boat use associated with both commercial and recreational activities') in relation to Ports and Harbours only applies to boats doing work on behalf of a Port or Harbour Authority i.e. the risks associated with vessels being used by others needs to be considered by those organisations and individuals and are not the responsibility of the Port or Harbour Authority.

[7] JNCC Guidelines for minimising risks of injury from piling and blasting (http://jncc.defra.gov.uk/pdf/jncc_guidelines_piling%20protocol_august%202010.pdf, http://jncc.defra.gov.uk/pdf/JNCC_Guidelines_Explosives%20Guidelines_August%202010.pdf).

| Activities considered capable of affecting the proposed protected features | Advice to support management for Flapper skate | |
|---|---|---|
| | **Adults** | **Egg laying areas** |
| **Scientific survey/research (incl. scientific diving/citizen science)*** | **Reduce or limit pressures**<br>Pressures associated with scientific survey and studies (including diving and citizen science) with the potential to cause impacts, disturbance to or removal of flapper skate should be minimised. An assessment of risk (including cumulative) and agreement of methodology and/or best practice would achieve this, either through the Marine Licence exempted activity process, or through consideration of unlicensed activities (as described in the Marine (Scotland) Act 2010 –Section 95). | **Reduce or limit pressures**<br>Pressures associated with scientific survey and studies (including diving and citizen science) with the potential to cause impacts, disturbance to or removal of flapper skate eggs, or the alteration of identified egg-laying areas should be minimised. An assessment of risk (including cumulative) and agreement of methodology and/or best practice would achieve this, either through the Marine Licence exempted activity process, or through consideration of unlicensed activities (as described in the Marine (Scotland) Act 2010 –Section 95). |
| **Seismic and other broadscale acoustic surveys*** | **Reduce or limit pressures**<br>Minimise the potential impact of pressures associated with seismic or other acoustic surveys which may cause injury or disturbance to flapper skate (e.g. high source levels in hearing range (~20Hz- 1kHz), barotrauma, and cumulative sound issues). We encourage early engagement to discuss techniques and methods to decrease the potential impacts from underwater noise on flapper skate. | *Pressure unlikely to affect feature* |

**Table 3.** Activities that are considered not likely to affect the proposed protected features (other than insignificantly).

| Activity | Comments |
|---|---|
| **Commercial hand diving for scallops or other species** | Existing or new commercial hand diving for shellfish species is considered unlikely to disturb flapper skate (other than insignificantly) or cause impacts to their eggs or identified egg laying areas habitat. Commercial, hand-gathered shellfish species occur on different substrate to the boulder and cobble habitat where eggs have been found at this site. |
| **Recreational diving** | Recreational diving involving the *in situ* observation of marine life is considered unlikely to disturb flapper skate (other than insignificantly) or cause impacts to the eggs, or identified egg laying areas provided that the eggs are not handled (although see Scientific survey/research in Table 2). |

## 8 Research and survey requirements

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 requirements 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 aid monitoring priorities. The following list of research and survey needs is not prioritised and is not exhaustive.

- Analysis of DNA samples collected from flapper skate in the MPA and comparison to flapper skate DNA samples collected around Scotland to determine if the MPA is protecting genetic diversity of the flapper skate population in Scotland.
- Further research to investigate presence / absence of eggs in the site.
- Further research to investigate presence / absence of juveniles in the site.
- Continued tracking of tagged skate to provide more detail on residency / site fidelity and transience and connectivity of important sites for flapper skate.
- Further detailed geophysical and sedimentological study of seabed landforms and their composition, to better understand the history of glacial erosion and deglaciation.

## Annex 1. Loch Sunart to the Sound of Jura MPA Conservation Objectives

The box below provides the high-level Conservation Objective statements. The full Conservation Objectives, which includes site-specific advice and information on the features of this MPA, are provided in the tables that follow.

These tables are grouped split by feature type, i.e. mobile species and geomorphology. The site-specific advice and information provide more detail in relation to each of the high-level Conservation Objective statements for each feature type, e.g. detail on the extent of a habitat within a site and what the supporting features are for a species.

Information is also provided below on how minor changes to features should be considered and the influence of environmental change on features, particularly in relation to climate change for context.

A definition of the terms used is in the Glossary.

A map of the MPA, the location of the features and the place names mentioned in the site-specific information is provided in Figure 2.

| **Loch Sunart to the Sound of Jura MPA** |
| --- |
| **Protected features**:<br>Mobile species – Flapper skate<br>Geomorphological features – Quaternary of Scotland (glaciated channels / troughs) |
| The Conservation Objectives of the Loch Sunart to the Sound of Jura MPA, are that the protected features<br>• so far as already in favourable condition, remain in such condition; and<br>• so far as not already in favourable condition, be brought into such condition, and remain in such condition.<br><br>“Favourable condition”, with respect to a mobile species of marine fauna, means that<br>a) the species is conserved or, where relevant, recovered to include the continued access by the species to resources provided by the MPA for, but not restricted to, feeding, courtship, spawning or use as nursery grounds;<br>b) the extent and distribution of any supporting features upon which the species is dependent is conserved or, where relevant, recovered; and<br>c) the structure and function of any supporting feature, including any associated processes supporting the species within the MPA, is such as to ensure that the protected feature is in a condition which is healthy and not deteriorating.<br><br>“Favourable condition”, with respect to a feature of geomorphological interest, means that<br>a) its extent, component elements and integrity are maintained;<br>b) its structure and functioning are unimpaired; and |

c) its surface remains sufficiently unobscured for the purposes of determining whether the criteria in paragraphs (a) and (b) are satisfied.

For the purpose of determining whether a feature of geomorphological interest is sufficiently unobscured under paragraph (c), any obscuring of that feature entirely by natural processes is to be disregarded.

For the purpose of determining whether a protected feature is in favourable condition any alteration to that feature brought about entirely by natural processes is to be disregarded.

| **Consideration of minor changes to features** |
|---|
| Temporary short-term and/or minor changes in the proposed protected features due to human activity may be considered not to compromise the Conservation Objectives and will be considered on a case-by-case basis.<br><br>Assessments should consider the timing, duration and scale of the impact on the features and their ability to recover. Factors determining the potential for features to recover following temporary deterioration vary between features. These are described in more detail in Annex 2 ‘‘*Factors determining the potential for features to recover’*. |

| **Environmental change** | |
|---|---|
| The Conservation Objectives recognise and acknowledge that the protected features of the MPA are part of a complex, dynamic and multi-dimensional marine environment. Mobile species are exposed to a wide range of drivers of change. This may include changes to the habitats or resources that they rely on during their natural life cycle, and also broader environmental changes, i.e. those related to climate change and environmental variability that are beyond the scope of the MPA.<br><br>Any alterations to the proposed protected features that are brought about entirely by natural processes are to be disregarded when assessing against the Conservation Objectives.<br><br>In relation to the Loch Sunart to the Sound of Jura MPA and its protected features, the following effects of climate change are relevant as outlined below. These effects should be taken into account when considering plans and projects within Loch Sunart to the Sound of Jura MPA as additional pressures may reduce the protected feature’s resilience to climate change, and additionally climate change impacts may start to hinder their ability to recover from human activities. | |
| Flapper skate | Adult flapper skate are mobile and capable of swimming large distances yet remain resident or exhibit site fidelity to selected areas such as the Loch Sunart to the Sound of Jura MPA (Neat *et al*., 2015). Skate eggs, juveniles and adults are thought to require different habitats to sustain them through the different life stages (Hoff 2008, Dodd *et al.,* 2022). Climate change is expected to produce a shift in the range of flapper skate as it is anticipated they will track water temperature changes in order to remain within their ecological niche. This has the potential to move them away from optimal physical |

| | |
|---|---|
| | conditions (e.g. temperature, salinity and water flow) for the development of eggs, the growth of juveniles and the reproduction of adults and may hinder their ability to recover from impacts caused by human activities. In a recent paper flapper skate were described as inhabiting more variable and cooler areas which suggests they might be relatively resilient to climate change requiring less range shift (Frost *et al*., 2020). Flapper skate are associated with deep (100-150 m) glaciated channels / troughs. Recent work showed seasonal variation in depth use by flapper skate with high occupancy of glaciated channels / troughs in summer and a movement to shallower water (25–75 m) in the winter (Nov-Apr, Thorburn *et al*. 2021). Therefore, if the temperatures at any of these habitats are altered as a result of climate change it could place the flapper skate at increased risk. Ecosystem change involving the loss of apex predators such as flapper skate could also lead to an alteration in ecosystem functioning, however it is possible that the ecological niche vacated by flapper skate could be filled by another species, which also alters its range because of climate change. |
| Quaternary of Scotland | As erosional features formed by ice over millennia, the glaciated channels / troughs are likely to be resistant to climate-change-driven large-scale changes in water flow, wave exposure and sedimentation. |

**MOBILE SPECIES**

| **(a) Species is conserved** | | |
|---|---|---|
| The boxes below provide the site-specific advice on the '*species is conserved'* element of the Conservation Objectives. Information on '*Continued access by the species to resources provided by the MPA for, but not restricted to, feeding, courtship, spawning or use as nursery grounds'* is provided separately below. | | |
| **Feature** | **Site specific advice** | **Site specific information** |
| Flapper skate | Flapper skate within the Loch Sunart to the Sound of Jura MPA are not at significant risk from injury or killing. | This Objective seeks to conserve flapper skate by minimising the risk to the animals from injury or killing. For the purposes of MPA assessments flapper skate are only protected when they are within the site. Any activities that take place within or outside the MPA that could potentially kill or injure flapper skate in the MPA should be considered in assessments.<br><br>The interpretation of 'significant' risk from killing or injury will depend on factors including the scale of the impact, the duration of the activity and measures that are put in place to minimise the risk. An important consideration is whether any killing or injury would result in reduced densities within the site, from which recovery cannot be expected. Flapper skate are classed as Critically Endangered by the IUCN. The MPA is the only area in North-east Atlantic and the world where the movement of flapper skate has been studied and they have been shown to be resident and / or exhibit site fidelity. Significant levels of killing or injury within the MPA therefore could affect flapper skate at a wider scale due to the importance of the MPA as a potential source for the recovery of the species in Scotland.<br><br>The MPA complements existing fisheries measures for the protection of flapper skate provided by both domestic legislation (SSI 2012 No 63) and Council regulation 2020/123, as amended by The Common Fisheries Policy (Amendment etc.) (EU Exit) Regulations 2020) prohibiting the retention on board or landing of flapper skate (and blue skate) by both commercial and recreational fishers.<br><br>Activities should consider flapper skate in the MPA via consenting processes and focus on pressures from activities likely to cause injury to adults, juveniles or eggs. |

| **(a) Continued access by the species to resources provided by the MPA for, but not restricted to, feeding, courtship, spawning or use as nursery grounds.** | | |
|---|---|---|
| The boxes below provide the site-specific advice on the '*continued access…'* element of the Conservation Objectives. Information on '*The species is conserved'* is provided separately above. | | |
| **Feature** | **Site specific advice** | **Site specific information** |
| Flapper skate | Conserve the access for flapper skate to resources provided by the MPA.<br><br>***and***<br><br>Conserve the access of flapper skate to resources within the site by avoiding significant disturbance. | For the purposes of the MPA assessments any activities, whether they take place within or outside the MPA, should be considered if they have the potential to reduce access to resources within the MPA by flapper skate.<br><br>A key resource in this context is the glaciated channels / troughs (100-150 m depth) potentially used as refuges from increased water temperatures in the summer. Access to glaciated channels / troughs and potential shallower egg-laying or juvenile nursery areas could be restricted by physical barriers and /or significant disturbance.<br><br>There may be other resources/supporting habitat important for flapper skate. Note that whilst there is evidence of flapper skate eggs in shallow (20–50 m) cobble / boulder habitats at Red Rocks and Longay MPA (Dodd *et al.,* 2022), and flapper skate eggs have been observed in Loch Sunart to the Sound of Jura MPA, currently only one egg laying area (20 eggs for a number of years) has been identified in the site (Campbell Rock, Loch Melfort) MPA. This area has been referred to as an egg laying area, rather than a egg nursey, as whilst eggs have been found at a high density, they do not cover a wide area (see Hoff, 2016 for egg nursery definitions). Very little is known about habitat preferences of juvenile skate, although there is anecdotal evidence from prawn fishers who have reported catching them on prawn ground (mud in 20 - 30m, *pers. comm.* James Thorburn).<br><br><u>Physical barriers</u><br>Only large-scale or multiple physical barriers or obstructions are likely to restrict access to resources to the extent that may result in significant impacts.<br><br><u>Significant disturbance</u> |

| | | |
|---|---|---|
| | | Angling for adult flapper skate has the potential to cause physical damage, physiological stress (Cole *et al.,* 2024) and irregular post-release behaviour in the individuals captured (Lavender *et al*., 2022). This can include occasional premature deposition of eggs by pregnant females (Benjamins *et al*., 2021). It is currently not clear how significant these disturbances are to flapper skate egg laying behaviour. Angling has been linked to morbidity and mortality for other elasmobranchs (e.g. Skomel, 2007, Gallagher *et al*., 2017), but continued recapture of flapper skate by anglers at the same site suggests disturbance and damage of adults captured is minimal (Neat *et al*., 2015 and evidence from Skatespotter, Jan 2022).<br><br>Disturbance could also potentially occur from activities causing underwater noise at high sources levels (within elasmobranch/skate hearing range, ~20Hz - 1kHz or via barotrauma), although note there is no published literature for flapper skate and this is assumed from literature on elasmobranchs in general (Casper *et al.*, 2012). Underwater presence of commercial or recreational divers is not considered to cause significant disturbance in light of available video evidence (from elsewhere) of apparent normal skate behaviour captured by recreational divers whilst in close proximity (e.g. video from Kinlochbervie in 2016).<br><br>It is considered that 'significant disturbance' could result in the following effects:<br>• long term decline in the use of the site by flapper skate, and consequently a reduced numbers of eggs being laid there; and<br>• changes to flapper skate behaviour such that it reduces the ability of the species to use the site and a subsequent reduced number of eggs being laid there.<br><br>Interpretation of significant disturbance will depend on the context, i.e. duration of disturbance, but particular focus should be on cumulative disturbances from multiple or repeated activities that prevent or significantly restrict or alter flapper skate behaviours |

| **(b) Extent and distribution of any supporting feature and<br>(c) Structure and function of any supporting feature, including any associated processes supporting the species** | | |
|---|---|---|
| **Feature** | **Site specific advice** | **Site specific information** |
| Flapper skate | Conserve the extent and distribution of any supporting feature upon which flapper skate are dependent<br><br>***and***<br><br>Conserve the structure and function of supporting features, including processes to ensure flapper skate are healthy and not deteriorating | The main supporting feature for flapper skate that there is evidence for are the glaciated channels/troughs (100-150 m depth) found within the MPA. This habitat is part of the Quaternary of Scotland geodiversity feature (see feature description below for further detail).<br><br>There may be other supporting habitats important for flapper skate, such shallow (20-50 m) cobble / boulder used for egg laying, or other habitats to support emerging juveniles. Note that whilst there is evidence of flapper skate eggs on shallow (20-50 m) cobble / boulder habitat in Red Rocks and Longay MPA, currently only one egg laying area (Campbell Rock, Loch Melfort) has been identified within Loch Sunart to the Sound of Jura MPA. This area has been referred to as an egg laying area, rather than a egg nursey, as whilst eggs have been found at a high density, they do not cover a wide area (see Hoff, 2016 for egg nursery definitions). Very little is known about habitat preferences of juvenile skate, although there is anecdotal evidence from prawn fishers who have reported catching them on prawn ground (mud in 20 - 30m, *pers. comm.* James Thorburn).<br><br><u>Extent and distribution</u><br>Assessments should focus on activities associated with pressures that can reduce the supporting habitat footprint or its distribution across the site. Examples include surface and sub- surface abrasion, physical change and siltation.<br><br><u>Structure and function</u><br>Assessments should focus on activities associated with pressures that can damage or alter the physical and biological nature of the supporting habitats. |

**<u>GEOMORPHOLOGICAL FEATURES</u>**

| a) Extent, component elements and integrity | | |
|---|---|---|
| **Feature** | **Site specific advice** | **Site specific information** |
| Quaternary of Scotland - *glaciated channels / troughs* | Conserve the extent, component elements and integrity of the Quaternary of Scotland feature. | Component elements refers to the landforms which make up the feature, namely glaciated channels/troughs, whilst integrity relates to the collective assemblage of these landforms and their inter-relationships.<br><br>The glaciated channels/troughs are created by the channelled flow of ice, mostly over bedrock that is otherwise resistant to erosion (Summerfield, 1991). They are considered to be highly resistant to human activities and to have no or low sensitivity to pressures arising from human activities. A loss in their extent, component elements or integrity is therefore not anticipated. However, some parts of the landforms may be eroded into glacial sediments. These are somewhat less resistant to erosion and some loss from human activities may be possible.<br><br>Assessments should focus on activities which may involve significant abrasion or disruption of the seabed. Assessments should consider the scale of the impact or activity in relation to individual component elements and to the full feature. |

| (b) Its structure and functioning are unimpaired | | |
|---|---|---|
| **Feature** | **Site specific advice** | **Site specific information** |
| Quaternary of Scotland - *glaciated channels / troughs* | Conserve the structure and functioning of the feature so that they are unimpaired. | The structure of the Quaternary of Scotland feature is considered not sensitive where the landforms are in bedrock. In contrast, the structure of landforms consisting of sediment can be sensitive to pressures arising from human activities. Activities involving the physical removal of sediments or sub-surface abrasion/penetration of the seabed may lead to a loss of structure in such landforms.<br><br>In its entirety the feature has a function of ‘scientific importance’ for the understanding of Quaternary ice sheet dynamics and late glacial climate change (Brooks, 2013; Stoker et al., 2009). This function may be impaired by activities which are detrimental to its extent, component elements and integrity of the feature, as set out above. |

| | | |
|---|---|---|
| | | Assessments should therefore focus on activities which have the potential to involve significant abrasion or disruption of seabed sediments. |

| **(c) Its surface remains sufficiently unobscured for the purposes of determining whether the criteria in paragraphs (a) and (b) are satisfied.** | | |
|---|---|---|
| **Feature** | **Site specific advice** | **Site specific information** |
| Quaternary of Scotland - *glaciated channels / troughs* | Conserve the surface of the feature so that it remains sufficiently unobscured for the purposes of determining whether the criteria in conservation objectives (a) and (b) are satisfied. | Assessments should focus on whether the activity or development has the potential to significantly obscure the surface of the *glaciated channels/troughs*, to the extent that conservation objectives (a) and (b) could not be fully assessed. Whilst the feature as a whole is unlikely to be obscured, assessments should consider the degree to which any part of the component landforms might be obscured. As the size and nature of the landforms varies, the type of data and/or assessment required will vary likewise. |

## Annex 2. Supporting information

### Factors determining the potential for features to recover

*Flapper skate*

Life history characteristics of flapper skate make them vulnerable and limit their ability to recover: their fecundity is unknown but is thought to be low, their eggs have a long incubation period (18 months, Benjamins *et al*., 2021) and their age at sexual maturity is high, between 9-26 years for females and 7-16 years for males (Regnier *et al*., 2021). Their vulnerability is evidenced from historical fishing practices and their current status of Critically Endangered in the North-east Atlantic (IUCN), and their inclusion on the OSPAR list of threatened and / or declining species and habitats (as the common skate). The habits of the different life history stages of the flapper skate are not yet fully understood but it is thought that adults, juveniles and eggs spend the majority of their time in different habitats; this should be recognised in assessments.

*Quaternary of Scotland*

The processes which formed the component elements of the Quaternary of Scotland geodiversity feature no longer exist and therefore the feature has no recovery potential.

## Glossary for Conservation Objectives

| Conservation Objective term | Definition |
|---|---|
| Extent (and distribution) | The “extent” of a feature is the total area that it covers. This should also include consideration of the “distribution” i.e. how it is spread out within the MPA. A feature could be continuous and contained within one area, dispersed in smaller patches over a wider area, or as a mosaic with other habitats/features. Indeed, it could also be a combination of these. |
| Favourable condition | Favourable condition for each protected feature type for NC MPAs is defined in the box at the start of Annex 1 which summarises the conservation objectives for the site. |
| Function | The habitat must be able to be maintained in terms of the growth and reproduction of the habitat-forming species (e.g. through self-recruitment of larvae) and also help to maintain the provision of essential ecosystem services that the habitat provides. The text within the supplementary advice explains function in relation to both of these factors for the feature concerned where information is available. |
| Supporting environment | 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. |
| Structure | The structure of a habitat/feature includes what it is created from and what it requires to exist, e.g. habitat forming species, geological features or sediment; the depth of the substrate or thickness or height of the biogenic structures from the seabed; biogenic material forming the structure should still retain a live component where this exists at baseline. |

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