

# Marine Scotland

## Scottish Marine Protected Areas (MPA) Monitoring Strategy

### Supporting Annexes 7 to 8

November 2023

March 2024

## Annex 7: Monitoring activities completed in 2021 & 2022

### Marine Mammals

#### Seals

Table A7.1 provides details of the harbour seal surveys undertaken within SACs in 2021 & 2022. University of St Andrews' Sea Mammal Research Unit (SMRU) undertake biennial counts of pups at the main grey seal breeding colonies in Scotland, with all sites covered in a single year (September to December). Surveys were originally anticipated in 2021 but due to equipment issues were postponed to 2022 colonies in the Inner and Outer Hebrides and Orkney were all surveyed four times in 2022. In addition, NatureScot undertake grey seal breeding surveys in Shetland annually by land and boat. This includes, when possible, the north coast of Fetlar, an SSSI that is not also an SAC. NatureScot surveys were limited in 2022 in Shetland due to adverse weather conditions and staff time constraints. Harbour seal surveys are undertaken by SMRU during the August moult period around the entire Scottish coastline on a five-year rolling programme, with all sites sampled at least once every five years. Grey seals which are incidentally hauled out during these August moult surveys are also counted to form the basis of an independent estimate of grey seal abundance. In 2021 the stretch of coast between Inverness and Berwick-upon-Tweed was surveyed over 1-2 August. In August 2022 the stretch of coast from Cape Wrath down to Loch Hourn (including Skye) and the Western Isles was surveyed. The data are still to be analysed. In addition, NatureScot undertake biennial surveys of Eileanan agus Sgeiran Lios mor SAC to complement the SMRU survey programme. In 2022, the SAC survey was not undertaken Results of SMRU harbour seal moult surveys between 2016 - 2019 [have been published](#) (2021). Links to the published results of surveys undertaken in 2022 will be provided once they are available. The next full harbour seal moult monitoring report produced by SMRU and published by NatureScot is anticipated in 2026, covering surveys between 2020-2024. These surveys are considered Type 1. NatureScot contribute funding towards the harbour seal surveys.

**Table A7.1** Harbour seal surveys undertaken in 2021 & 2022

Species	SAC	Survey dates	Monitoring method
Harbour seals	Firth of Tay and Eden Estuary	1-2 August 2021	Aerial surveys
Harbour seals	Ascrib, Isay and Dunvegan SAC	August 2022	Harbour seals

The [Scottish Marine Animal Stranding Scheme](#) (SMASS) investigates marine mammal strandings around the coast of Scotland to monitor causes of mortality of marine animals. SMASS works closely with the Defra-funded UK Cetacean Strandings Investigation Programme (CSIP) and is coordinated by University of Glasgow. The scheme includes the sampling of seals and receives funding from Scottish Government.

Data from these monitoring efforts contribute to a multitude of scientific projects investigating causes of the observed trends in both species (e.g. [ECOPredS project](#), [Harbour Seal Decline Project](#), [SealPreds](#)). A series of Shetland seal haul-outs have also been monitored since 2020 via a PhD student's project fieldwork investigating killer whale predation of harbour seals.

## Cetaceans

The University of Aberdeen (UoA) and SMRU at St Andrews University continued boat based, photo-identification surveys of the east coast bottlenose dolphin population in 2021 and 2022 to inform estimates of key population parameters, such as population size and distribution. Surveys focussed on the Moray Firth SAC and Firth of Tay and Firth of Forth areas. UoA have also continued to collect passive acoustic monitoring from three locations within the Inner Moray Firth. The CitizenFins project, run by SMRU, completed its third year of data collection in 2022, with particular focus on collecting citizen science photo ID data from areas to the south of existing fieldwork locations. Data collected are considered to be of type 0, 1 and 2. NatureScot contribute funding towards these surveys and projects and use the data to inform SAC condition assessment and reporting obligations.

The [East Coast Marine Mammal Acoustic Survey](#) (ECOMMAS) project collected its tenth year of data in 2022. Passive acoustic sampling is undertaken at 30 sites along the East coast of Scotland between April and November, providing over six months of data collection annually.

The [Collaborative Oceanography and Monitoring for Protected Areas and Species](#) (COMPASS), an inshore passive acoustic monitoring project on the west coast of Scotland, and extended via MarPAMM, collected its fifth and final year of data in 2022. The cross-border network of 10 monitoring sites is strategically placed within MPAs in the region between the Republic of Ireland, Northern Ireland, and Western Scotland, providing year-round data collection.

The marine mammal passive acoustic monitoring network in Scottish waters was recently expanded through SPAN (Scottish Passive Acoustic Network) in March 2023 by Scottish Government Marine Directorate. This array continues data collection at COMPASS and SAMOSAS mooring locations on the west coast, provides additional locations within MPAs and near to ScotWind development sites (west coast and northern isles), and adds to the existing ECOMMAS sites on the east coast.

There are three UK cetacean monitoring schemes currently active in Scottish waters supported by UK Government and Scottish Government –

- International Small Cetaceans in European Atlantic waters and the North Sea (SCANS) surveys
  - Bycatch Monitoring Programme; observers onboard fishing vessels monitoring cetacean bycatch
  - The Scottish Marine Animal Stranding Scheme (SMASS)
-

The international Small Cetaceans in European Atlantic waters and the North Sea (SCANS) surveys are large-scale ship and aerial surveys undertaken to study the distribution and abundance of cetaceans in European Atlantic waters. There have been four such surveys, conducted roughly every 10 years (previously 1994, 2005, 2016), with the last survey completed in 2022. These large-scale surveys have recently been increased to six yearly to help improve status assessment and meet our surveillance responsibilities. The survey provides robust data on presence/absence and distribution of cetaceans across the region. Note that the 2016 survey has a data gap in the North-West offshore waters that was not able to be surveyed. The surveys are co-ordinated at an international scale involving support from governments of several countries. Data from all SCANS surveys will be published to the [Joint Cetacean Data Programme](#), an international resource to improve standardisation and accessibility of cetacean survey data from across the North East Atlantic.

The Bycatch Monitoring Programme is a scheme that actively monitors bycatch across a range of fisheries as well as considers the effectiveness of potential bycatch mitigation initiatives. The outputs provide routine evidence to help inform management and mitigation of marine mammal bycatch. The project is funded by Defra and Scottish Government with SMRU contracted to manage the implementation of the programme. Further monitoring of bycatch is undertaken by CEFAS and Scottish Government Marine Directorate, contributing to the wider bycatch evidence base for UK waters.

Alongside the previously described seal stranding monitoring, SMASS maintains surveillance on strandings around the Scottish coast with support from a network of volunteers and widespread reporting. They carry out post-mortem examinations on a subset of stranded animals based on identified priorities, with the aim of determining contributing causes and ultimately cause of death where possible.

Whale and Dolphin Conservation (WDC) carried out boat based photo-identification surveys during 2021 and 2022 collecting drone footage of Risso's dolphins within the North-East Lewis MPA, in order to aid understanding of the dolphins' use of the site, as well as their health and condition. WDC also deployed 3 C-PODs within the MPA, to record odontocete vocalisations. Data collected are of Types 0 and 1. NatureScot contribute funding towards these boat-based surveys. There are also Shorewatch sites within all the west-coast cetacean MPAs collecting additional sightings data from land.

Hebridean Whale and Dolphin Trust (HWDT) continued their programme of survey work in 2021 & 2022, contributing to their long-term dataset of west coast marine mammal data, including from within North-East Lewis MPA, Sea of the Hebrides MPA and Inner Hebrides and the Minches SAC. Summer (April to October) data collection conducted on 18 research expeditions, included effort-related acoustic boat-based surveys and incidental visual sightings and photo-ID. Further acoustic data surveys were proposed for later in 2021 to improve winter data coverage. In 2022 surveys, well as information on cetacean distribution, HWDT also collected data on anthropogenic parameters (e.g. underwater noise and entanglement). Towed acoustic data surveys in the winter months provide critical year-round monitoring (particularly for harbour porpoise). Over 93 hours of acoustic recordings

---

were collected during winter expeditions in 2022 (October to March). Data collected are of types 0, 1 and 2. NatureScot contribute funding towards these surveys.

## Marine birds

2021 was the final survey season of the [Seabirds Count census](#) (2015-2021), The Seabirds Count census (2015-2021), the fourth seabird colony census of Britain and Ireland, is completed. Seabirds Count was developed by the Seabird Monitoring Programme and is being coordinated by JNCC. The results were [published](#) on 16 November 2023.

In 2022 an outbreak of Highly Pathogenic Avian Influenza (HPAI) caused significant mortality to several species of marine birds. As a result, some monitoring from this period may not be representative of current populations at many of the Scottish seabird colonies. Ongoing monitoring is crucial for understanding the long-term impact of HPAI on our marine birds.

2021 census surveys in Scotland focussed on shearwaters, petrels, gulls, skuas and remote western islands. Cliff and ground-nesting seabirds at the Flannan Isles, North Rona, Small Seal Islands (Shillay), Sanda, Rum and Skye were co-ordinated by the Scottish Government Marine Directorate's Science, Evidence and Data (SED) Division (formally Marine Scotland Science (MSS)) and funded through the EC Interreg [MarPAMM project](#). In addition, the MarPAMM project also funded a whole island survey of Rum for Manx shearwater and the Lewis Peatlands for gulls and skuas. When the census results are published in 2023, they will feed into NatureScot's Common Standards Monitoring Programme. JNCC continue to co-ordinate monitoring of the three key sites at Canna, Isle of May and Fair Isle.

Additional seabird monitoring work was undertaken by NatureScot on National Nature Reserves at Forvie, Noss, Hermaness, the Isle of May and Rum. Further monitoring studies of relevance to MPA assessment and reporting requirements were also undertaken in 2021 through collaborative, NGO-led and volunteer-driven contributions. This included monitoring undertaken by organisations such as the Royal Society for the Protection of Birds (RSPB) on their reserves, the National Trust for Scotland (NTS) on St Kilda, Mingulay and Berneray, and the Scottish Wildlife Trust (SWT) on Handa.

Monitoring of the recently classified marine SPAs has also commenced. A Digital Aerial Survey (DAS) of wintering waterfowl in the Solway Firth SPA was commissioned by NatureScot and Natural England in early spring 2021.

NatureScot have completed analysis of the wintering waterfowl citizen science surveys and DAS of the Moray Firth SPA. The reports were published in early 2023<sup>1</sup>. Monitoring of Scapa Flow SPA and North Orkney SPA has been undertaken by Digital Aerial Survey (DAS), commissioned by NatureScot. The results of these surveys are expected to be published in early 2024.

---

<sup>1</sup> Reports on the [findings of the 2019/20 surveys](#) and [approaches to waterfowl monitoring](#) are published on the NatureScot website.

Wetland Bird Survey (WeBS) counts continue to be undertaken monthly throughout the winter months by volunteers. The Winter Gull Roost Survey (WinGS) is due to start in winter 2023, should funding be forthcoming from all partner organisations (includes the SNCBs and Defra). BTO are leading in carrying out the surveys at a UK-scale.

For both breeding and non-breeding marine birds, we rely on a substantial effort from volunteer surveyors, RSPB reserves, WeBS, NTS monitoring and special projects funded by industry or government (through SED) to gather monitoring information on protected sites.

Site condition monitoring (SCM) was undertaken at several SPAs in 2022 to assess the presence and condition of protected features. Seabird monitoring work was undertaken by NatureScot on National Nature Reserves including Forvie, Noss, Hermaness, the Isle of May and Rum. Organisations such as the Royal Society for the Protection of Birds (RSPB) also carried out monitoring on their reserves, the National Trust for Scotland (NTS) on St Kilda, Mingulay and Berneray, and the Scottish Wildlife Trust (SWT) on Handa.

Through collaborative efforts between organisations additional monitoring or site checks took place in light of the HPAI outbreak. These included: Rum NNR for Manx shearwaters, St Abb's Head for guillemots, several gannet colonies including Bass Rock, Hermaness and Troup Head, and sites in Shetland and Orkney for skuas, including Foula, Fair Isle, Fetlar, Calf of Eday, Eday and Rousay.

Surveillance of beached birds was also undertaken in 2022 in order to monitor the presence of HPAI in dead birds. Surveillance was undertaken by a network of volunteers and staff from collaborating organisations and reported via the Epicollect app. Surveillance was planned around key colonies and SPAs for both seabirds and inshore wintering waterfowl. Opportunistic reporting of dead and sick birds is anticipated to continue into 2023.

In 2018, JNCC began a pilot study to test the feasibility of implementing a low cost, volunteer-based, Seabirds at Sea monitoring programme. The [Volunteer Seabirds at Sea](#) (VSAS) pilot was delivered in partnership with CalMac Ferries and formed part of their Marine Awareness Programme. Funding for the pilot was provided by JNCC, NatureScot and Scottish Government Marine Directorate, with CalMac Ferries providing free passage on their ferries during surveys. Surveys, which began in 2019, had to be postponed due to the pandemic but recommenced in autumn 2021 on two of CalMac's routes that allow surveyors to work outside. The programme has expanded in routes and in numbers of volunteers and mentors now trained up (close to 100). Funding for this scheme is provided by JNCC and NatureScot. Further training courses are expected to take place in 2023.

## **Fish**

### **Sandeels**

A distribution model of suitable benthic habitat for lesser sandeel *Ammodytes marinus* was developed by Scottish Government Marine Directorate's SED Division

---



and published in 2021. This model was used to inform a sandeel survey on *MRV Alba na Mara* (SED cruise ID 1321A) around the west coast of Scotland in September - October 2021. The aim of the survey was to determine the abundance and size of sandeels in the sediment. Various locations across the region were sampled using a dredge and a Day grab, including sites within North-east Lewis MPA, Shiant East Bank MPA and Sea of the Hebrides MPA. The data have now been processed and showed good agreement with the distribution model of suitable benthic habitat for lesser sandeel *Ammodytes marinus* developed by Scottish Government Marine Directorate's SED Division and published in 2021. The 2021 distribution model is considered an appropriate tool to describe sandeel distribution in the considered area.

## Flapper skate

Two remote camera surveys were undertaken within and adjacent to the Red Rocks and Longay MPA in the Inner Sound of Skye in August and September 2021. Designated on an urgent basis in March 2021, the new survey work entailed drop-down video sampling and the use of Remotely Operated Vehicle (ROV) techniques to locate and chart the distribution of flapper skate eggs and potentially suitable egg-laying habitat (Type 0).

To help place the Red Rocks survey work into context, additional surveys of known flapper skate egg-laying grounds were undertaken in Shetland (13-14 July 2021) and are expected to take place in Orkney in 2022 (in collaboration with the EC Interreg [SeaMonitor project](#)).

Scottish Government Marine Directorate completed a stereo video survey of West Coast inshore waters in August 2021 (SED cruise ID 1021A), covering an area extending southwards from the North Minch to the Clyde estuary. In total 79 stereo baited remote underwater video (stereo-BRUV) stations (including six within the Red Rocks and Longay MPA) were sampled with preliminary analysis revealing the presence of *Dipturus* spp. Water samples were collected close to selected stereo-BRUV stations at depths 5 and 10 metres above the seabed with the aim of further developing non-invasive methods for detecting species presence.

Tissue samples (a small piece of the apron between the horns) were collected from eggs in Red Rocks and Longay MPA in the spring of 2020. These samples are stored for DNA analysis at the University of Aberdeen with the aim being to determine if female skate visit the egg nursery there repeatedly. So far it has proved difficult to obtain good quality DNA from the samples but work continues to develop the techniques.

Data collection on adult skate in the Loch Sunart to the Sound of Jura MPA and further afield in Scotland continues via [angler lead PIT tagging and photo identification of skate](#). This tag - recapture data was used to [produce more accurate estimates of growth and age at maturity of flapper skate](#). The Scottish Government Marine Directorate and NatureScot funded Movement Ecology of Flapper Skate project at the University of St Andrews involving acoustic tracking of flapper skate within the Loch Sunart to the Sound of Jura MPA closed at the end of 2021. The acoustic array purchased via the MEFS project was loaned to the SeaMonitor project

---

and was deployed until the spring of 2023. The acoustic tracking data produced will provide more detail on the longer flapper skate movements and connectivity to other sites important for flapper skate.

In 2021 the SeaMonitor project fitted five satellite tags on flapper skate in the Mull of Galloway with a view to observing whether they travel from there to Northern Ireland or the Loch Sunart to the Sound of Jura MPA. Funds were secured from the Scottish Nature Restoration Fund in 2021/22 to purchase additional satellite tags for future deployment on flapper skate, porbeagle shark, tope shark and spurdog. In addition, funds were secured to deploy acoustic tags on tope sharks to take advantage of a proposed acoustic array for basking sharks in the Sea of the Hebrides MPA.

## Gadoids and Elasmobranchs

SG completed a stereo video survey of West Coast inshore waters in September - October 2022 (SED cruise ID 1422A), in the Minches, covering an area extending north from the northern boundary of Sea of the Hebrides MPA and at sites in Loch Nevis. This survey took place outside of the nearby MPAs but has relevance to the monitoring of PMFs and other elasmobranchs presence at the regional level (including within the Loch Sunart to Sound of Jura MPA, North-east Lewis MPA, Shiant East Bank MPA and Sea of the Hebrides MPA). The survey recorded gadoid and elasmobranch presence (including detections of *Dipturus spp.* and *Squalus acanthias*) and is being processed and combined with previous SG surveys, within and around MPAs to the West of Scotland, to develop elasmobranch and gadoid distribution models in Scottish waters (including all MPAs). Water samples were collected close to selected stereo-BRUV stations with the aim of further developing non-invasive methods for detecting species presence and MPA monitoring. While the results of eDNA analyses are still being processed and combined with a previous survey with stations distributed from the North Minch to the Clyde estuary (SED cruise ID 1021A), positive detection of flapper skate (*Dipturus intermedius*) have been recorded.

## Basking sharks

Survey work to deploy five towed camera tags on basking sharks in the Sea of Hebrides MPA went ahead in August 2021, with the intention of building on work to investigate group/social behaviour below the surface and help determine if breeding occurs in the site. However, unfortunately no sharks were sighted, by the team or by others working in the area, despite considerable searching. This is very unusual, and may be a reflection of other environmental conditions (water temperature/timings of plankton blooms) or just not in the right place at right time. Interestingly, shortly after our fieldwork, large groups of basking sharks were encountered by divers and snorkellers in County Clare in Ireland, indicating that sharks were still on known migratory routes, but perhaps slightly later in the year.

An acoustic tag trial to investigate fine detailed movements of individual basking sharks around the areas of the Sea of the Hebrides MPA where they are spotted more frequently at the surface began in 2022. The outputs are intended to aid ongoing management discussions, conservation and potentially monitoring. The

---



acoustic tags can operate for up to 5 years, providing data when in close proximity to receivers deployed but also when close to other receivers around Scotland deployed by other researchers. The technology may also facilitate a cost effective monitoring solution for the site.

An acoustic array of 10 ARC was deployed in summer 2022 in the Gunna Sound area by Alba. Field work was carried out in August 2022 to attempt to deploy acoustic tags on basking sharks, but unfortunately none were sighted. The acoustic array was serviced in February 2023 and all ARC were working, although two had been displaced, presumably by trawlers. These two ARC will be redeployed when weather opportunities and staff/crew availability arise. The approach to field work for August 2023 is being altered to allow a more effective searching capability to increase success chances of deploying acoustic tags on basking sharks. Further camera tag work to investigate social behaviour and trialling of image sonar may also be used if there are successful sightings.

A desk based feasibility study to use high definition satellite imagery for basking shark monitoring is a project on reserve funding list, if resources and funding become available during financial year 2022/2023.

In 2022, funds were secured by NatureScot from the Scottish Nature Restoration Fund to purchase acoustic tags for tope sharks to take advantage of a proposed acoustic array for basking sharks in the Sea of the Hebrides MPA.

## Seabed habitats

### Inshore

NatureScot and Scottish Government Marine Directorate completed a series of monitoring studies within nearshore MPAs and PMF areas in 2021 (see Table A7.2 for an overview).

**Table A7.2** Scottish nearshore MPA benthic habitat monitoring surveys undertaken by NatureScot and Scottish Government Marine Directorate in 2021.

MPA or area	Features of interest (and pressures investigated)	Type of monitoring	Organisation(s)	MSS cruise ID
Loch Creran SAC / MPA	Serpulid reefs / <i>Didemnum vexillum</i>	Type 1	NatureScot	n/a
South Arran MPA and adjacent proposed PMF mgt. areas	Burrowed mud, coarse mixed sediments (effectiveness of fisheries mgt. measures)	Types 1 & 2	NatureScot/MSS	1121a
Fair Isle MPA	Sea caves. Also some weather contingency sampling of seagrass beds in Orkney and horse mussel and flame shell beds in Scapa Flow (proposed PMF mgt. areas)	Type 1	NatureScot	-

Sound of Harris and west of Harris (OH MarPAMM area)	Seagrass beds, maerl beds, mixed sediments	Type 1	NatureScot	-
Loch Carron MPA	Flame shell beds (diver survey exploring recovery from dredging; effects of creeling)	Types 2 & 3	NatureScot	-
MarClim	Rocky shores in Clyde, Solway, SE Coast, NE Coast, NW Coast, N Coast and Outer Hebrides. Included new MPA sampling locations (community trends and effects of climate change)	Type 2	NatureScot	-
NE Coast <i>Sabellaria spinulosa</i> survey	<i>Sabellaria spinulosa</i>	Type 0 - 1	SED/NatureScot	0921a

Project reports from the NatureScot-led / commissioned surveys undertaken in 2021 will be made available on the [NatureScot information library web pages](#).

NatureScot and Scottish Government Marine Directorate completed a series of monitoring studies within nearshore MPAs and PMF areas in 2022 (see Table A7.3 for an overview).

**Table A7.3** Scottish nearshore MPA benthic habitat monitoring surveys undertaken by NatureScot and Scottish Government Marine Directorate in 2022.

MPA or area	Features of interest (and pressures investigated)	Type of monitoring	Organisation(s)	SG cruise ID
Loch Creran SAC / MPA	Serpulid reefs / <i>Didemnum vexillum</i>	Type 1	NatureScot	n/a
Inner Hebrides (Sound of Arisaig SAC and the Inner sound)	Maerl beds	Type 1	NatureScot	0822a
South Arran MPA and adjacent proposed PMF mgt. areas	Burrowed mud, coarse mixed sediments (effectiveness of fisheries mgt. measures)	Types 1 & 3	NatureScot/SED	0822a
Loch Teacuis	Serpulid reefs	Type 1	NatureScot	n/a

Project reports from the NatureScot-led / commissioned surveys undertaken in 2022 will be made available on the [NatureScot information library web pages](#).

## Offshore

JNCC and SED undertook an offshore seabed monitoring survey of the [Faroe-Shetland Sponge Belt \(FSSB\) MPA](#) on *Scotia* (survey code 1121S) from 20 August to 6 September 2021 (see [survey blog](#) for more information).

The aim of survey was to acquire a robust initial sentinel monitoring (Type One) dataset within FSSB to contribute to the development of a monitoring time-series for FSSB, against which the rate and direction of change in the condition of the MPA features can be inferred in the long term.

The survey focussed on monitoring the two habitat feature types (deep-sea sponge aggregations and offshore subtidal sands and gravels) and also gathered data to provide information on the oceanographic conditions in the Faroe-Shetland Channel.

184 stations were sampled with the drop frame camera, taking over 15,000 photographs of the seabed and 10 camera chariot transects and 11 CTD stations were completed. In addition, JNCC's deep-sea Hamon grab was successfully tested at five stations.

JNCC and MSS undertook an offshore seabed monitoring survey of the [West of Shetland Shelf](#) (WSS) MPA on the *Scotia* (survey code 0922S) from 20<sup>th</sup> July to 5<sup>th</sup> August 2022. The MPA is designated for the Offshore subtidal sands and gravels habitat.

The aim of the 0922S survey was to acquire baseline investigative monitoring data for sublittoral sands prior to the implementation of fisheries management measures and to acquire sentinel monitoring of the sublittoral coarse sediments within WSS to monitor the direction and rate of any change in the condition of the coarse sediments over the long-term.

Due to technical issues with the cameras, only 86 of the 250 planned camera stations were completed. Difficulties were encountered in collecting Hamon grab sediment samples as stations which were expected to be 'sand' often turned out to consist of either a thin veneer of sand over harder substrates or a mixture of sand and cobbles. There were 132 successful grabs from 254 attempts.

---

## **Annex 8: A forward-look work programme for MPA and wider seas biodiversity monitoring – 2023 & 2024**

The tables on the following pages provide a summary of proposed MPA-related marine biodiversity survey and monitoring work to be undertaken, co-ordinated or commissioned by Scottish Government (SG), NatureScot (NS) and the Joint Nature Conservation Committee (JNCC) over the next few years. Whilst primarily MPA-related, this includes studies facilitated by MS research vessels (e.g. MASTS cruise time allocations). The tables encompass work on marine mammals, fish and seabed habitats.

The survey proposals for 2023 and beyond are indicative only at this stage and subject to revision.

Work on marine waterbirds (as outlined in Annex 4 of the original [MPA Monitoring Strategy](#)) will also continue e.g. SCARABBS, RBBP, WeBS, NEWS. Monitoring of reserves by partner organisations particularly RSPB, NTS and Ringing Groups will contribute to future monitoring as before.

A wide range of other NGO-led and volunteer-driven surveys continue to make an invaluable contribution to MPA assessment and reporting obligations. These studies have not been incorporated in the forward-look programme. NatureScot is currently working with relevant external partners to ensure that future NatureScot funding helps improve the evidence-base upon which decisions relating to Scotland's marine natural heritage are made. This includes prioritising MPA-related monitoring.

---

2023

Feature group	Feature(s)	Location	Description of works	Type(s)	Organisation(s)
Marine mammals	Harbour seals	South-East Islay Skerries SAC	Aerial surveys during harbour seal moult (August) around coastline from Loch Hourn down to the Solway Firth border	Type 1	SMRU / NatureScot
		Eileanan agus Sgeiran Lios mor SAC	Boat surveys during harbour seal moult (August) in Eileanan agus Sgeiran Lios mor SAC	Type 1	NatureScot
	Grey seals	Faray and Holm of Faray SAC	Biennial aerial surveys of the main grey seal breeding colonies in Scotland. (September to December)	Type 1	SMRU
		Isle of May SAC			
		Monach Isles SAC			
		North Rona SAC			
		Treshnish Isles SAC			
		Berwickshire and North Northumberland Coast SAC			
	Shetland	Annual boat/land based grey seal breeding surveys of main colonies in Shetland	Type 1	NatureScot	
	Bottlenose dolphins	Moray Firth SAC	Passive acoustic array at 31 locations along the east coast (April to November) of Scotland.	Type 0	MSS
Photo-identification studies of bottlenose dolphins in the east coast population - Moray Firth surveys			Type 1	University of Aberdeen	
Photo-identification studies of bottlenose dolphins in the east coast population - Firth of Tay and Firth of Forth surveys				St Andrews University	

Feature group	Feature(s)	Location	Description of works	Type(s)	Organisation(s)
	Harbour porpoise	Inner Hebrides and the Minches SAC	Passive acoustic array at 10 locations within the SAC (year round) Towed PAM (inc. winter data) & continuation of SPUE survey for cetaceans and basking shark on west coast	Type 0 Type 0	EMFF/MSS HWDT
	Risso's dolphin	North-East Lewis MPA	Photo-identification studies of population & fixed PAM	Type 1	WDC
	Minke Whale	Sea of the Hebrides MPA	SPUE survey for cetaceans and minke whale on west coast	Type 1	WDC
	Cetaceans	UK EEZ	Bycatch monitoring through on-board observer programme	Type 2	Co-ordinated by SMRU
	Marine mammals	Scotland	Strandings investigations lead by SMASS around the coast of Scotland with post-mortem examinations taking place in situ or in facilities at University of Glasgow	Type 2	SMASS/ University of Glasgow
<b>Fish</b>	Tope Basking shark	Sea of Hebrides MPA	Acoustic tagging of basking sharks and potentially tope with a small array covering Gunna Sound and SW Tiree to investigate rates of individual annual returns and potentially estimate numbers using area.  Collection of SPUE of cetaceans and basking sharks on west coast by HWDT.  Further camera tag work to investigate social behaviour and determine if breeding occurs in site. Potentially further trialling of image sonar to detect groups of sharks.	Type 0 & 1	NatureScot / MSS/ University of Exeter /
	Flapper Skate	Loch Sunart to Sound of Jura MPA	PIT tags and photo-ID mark-recapture analysis	Type 1	SAMS/Nature Scot



Feature group	Feature(s)	Location	Description of works	Type(s)	Organisation(s)
Seabed habitats	PMF mgt. areas	Various including Loch Eribol, Loch Bracadale, Eddrachilles etc	Drop-down video surveys to improve our knowledge of PMF features in PMF area.	Type 1	NatureScot / MSS Alba cruise 0523a
	Subtidal sandbanks	Sound of Barra SAC	Infaunal sampling in repeat monitoring boxes, combined with video sampling of maerl and coarse sediment habitats to establish baseline from which to assess effectiveness of management measures.	Type 1 & 3	NatureScot / MSS Alba cruise 0523a
	Maerl beds; maerl or coarse shell gravel; seagrass beds	South Arran MPA	Diver monitoring of established transects. Seagrass bed mapping (drone/echosounder techniques validated by snorkelers)	Types 1 & 3	NatureScot
	Flame shell beds	Wester Ross and Loch Carron MPAs and Inner Sound	Video, infaunal, diver and acoustic surveys to assess presence, condition, recovery, and effectiveness of management measures	Types 0, 1 & 3	NatureScot & NatureScot / MSS ( <i>Alba cruise 0523a</i> )
		Loch Carron MPA	Diver surveys to assess effects of creeling	Type 1	Heriot-Watt University / NatureScot
	Flame shell beds, serpulid reefs	Loch Creran SAC / MPA	Repeat diver monitoring of relocatable, subtidal <i>Didemnum vexillum</i> invasive non-native species monitoring stations.	Type 2	Heriot-Watt University / NatureScot
	Rocky shores	Shetland and the Inner Hebrides	Continuation of MarClim rocky shore survey work (broad community changes incl. effects of climate change)	Type 2	SAMS - funded NatureScot / MS
	Burrowed mud	Central Fladen	A day grab survey of the burrowed mud feature will take place in June 2023.	Type 1	JNCC / MSS ( <i>Scotia</i> )

Feature group	Feature(s)	Location	Description of works	Type(s)	Organisation(s)
	Annex 1 bedrock and stony reef	Pobie Bank	This survey in July\August 2023 aims to collect the 2 <sup>nd</sup> point in a monitoring time series using video and still imagery from a drop camera. If possible, side scan data will be used to fill in the gaps in the acoustic coverage for the site. This data will be used to produce a new habitat map for the site.	Type 1	JNCC / MSS ( <i>Scotia</i> )
<b>Birds</b>	Divers, grebes, seaducks and European shag	Outer Firth of Forth and St Andrews Bay Complex SPA or Moray Firth SPA	Digital Aerial Surveys of inshore wintering waterfowl during winter 2023/34	Type 1	NatureScot
	Wintering gulls (all species except kittiwake)	UK-wide but including Outer Firth of Forth and St Andrews Bay Complex SPA and Solway Firth SPA	Winter Gull Roost Survey (WinGS). Last surveyed 2005.	Type 1	BTO led, funded by SNCBs and government bodies.
	Breeding seabird colonies	Scotland	Key seabird colonies to be monitored under SCM. Additional proposed sites include: East Caithness Cliffs, Flannan Isles, Mingulay and Berneray, North Rona and Sule Sgeir, Sanda Islands, Shiant Isles, St Kilda, Priest Island (Summer Isles), Fair Isle, Ailsa Craig, Noss, Foula, Hoy, Rousay, Staffa, Stroma, Sule Skerry and Sule Stack, Sumburgh Head, Hermaness and Handa.	Type 1	Collaboration across organisations, including NatureScot, RSPB, BTO
	Breeding seabird colonies	Scotland	Additional sites have been added to 2023 monitoring as a result of HPAI impacts.	Type 1	NatureScot, RSPB

## 2024

The seal surveys are planned with SMRU as part of their 5-year rolling programme covering the entire Scottish coastline but may be subject to revision depending on weather conditions and logistics. The cetacean monitoring work for the 2024 season is currently under discussion with key partner organisations; the existing memorandum of agreements with partners complete at the end of 2023/24. The aim in future is to develop a strategic programme of monitoring work for the cetacean MPAs from 2024 onwards. Similarly, there is ongoing dialogue with partners and experts to develop a programme of monitoring for elasmobranchs and other fish species from 2024 onwards. The seabed habitat survey proposals for 2024 are indicative only at this stage and may be subject to revision with focus and scope of programme currently subject to discussion.

Feature group	Feature(s)	Location	Description of works	Type(s)	Organisation(s)
Marine mammals	Harbour seals	Yell Sound Coast SAC	Aerial surveys during harbour seal moult (August) around the North Coast, Orkney and Shetland coastline.	Type 1	SMRU/ NatureScot
		Mousa SAC			
		Sanday SAC			
	Grey seals	Faray and Holm of Faray SAC	Biennial aerial surveys of the main grey seal breeding colonies in Scotland. (September to December).	Type 1	SMRU
		Isle of May SAC			
		Monach Isles SAC			
		North Rona SAC			
		Treshnish Isles SAC			
		Berwickshire and North Northumberland Coast SAC			
Shetland	Biennial aerial surveys of the main grey seal breeding colonies in Scotland. (September to December).	Type 1	NatureScot		

Feature group	Feature(s)	Location	Description of works	Type(s)	Organisation(s)
	Cetaceans	UK EEZ	Bycatch monitoring through on-board observer programme	Type 2	Co-ordinated by SMRU
	Marine Mammals	Scotland	Photo-identification studies of bottlenose dolphins in the east coast population - Firth of Tay and Firth of Forth surveys	Type 1	St Andrews University
			Strandings investigations lead by SMASS around the coast of Scotland with post mortem examinations taking place in situ or in facilities at University of Glasgow.	Type 2	SMASS/ University of Glasgow
	Harbour Porpoise	Inner Hebrides and the Minches SAC	Towed PAM (inc. winter data) & continuation of SPUE survey for cetaceans and basking shark on west coast	Type 0	HWDT
	Risso's dolphin	North-East Lewis MPA	Photo-identification studies of population & fixed PAM	Type 1	WDC
Minke whale	Sea of the Hebrides MPA	SPUE survey for cetaceans and minke whale on west coast	Type 1	WDC	

Feature group	Feature(s)	Location	Description of works	Type(s)	Organisation(s)
Fish	Tope Basking shark	Sea of Hebrides MPA	<p>Acoustic tagging work to continue investigation of rates of individual annual returns and potentially estimate numbers using area.</p> <p>Potentially further camera tagging work to investigate social behaviour and determine if breeding occurs in site.</p> <p>Collection of SPUE data for basking shark as part of HWDT's cetacean monitoring programme (currently in the process of setting up the next MoU to continue this work).</p> <p>Desk based work to investigate feasibility of use of high definition satellite imagery for monitoring, if feasible may run contract to purchase data and analyse.</p>	Type 0 & 1	NatureScot / MSS/ University of Exeter / HWDT
	Flapper Skate	Loch Sunart to Sound of Jura MPA	PIT tags and photo-ID mark-recapture analysis	Type 1	SAMS / NatureScot
Seabed habitats	Burrowed mud; flame shell beds	Upper Loch Fyne & loch Goil MPA	Small vessel DDV, infaunal sampling, diving.	Type 1	NatureScot
	PMF mgt. areas	Various - scale of works TBC	Drop-down video surveys to establish baseline conditions prior to the introduction of fisheries management measures (dependant on timescales) monitoring strategy for PMF areas under consideration	Type 1	NatureScot

Feature group	Feature(s)	Location	Description of works	Type(s)	Organisation(s)
	Maerl beds	Wyre and Rousay Sounds MPA	Small vessel DDV, infaunal sampling, diving.	Type 1	NatureScot
	Flame shell beds, serpulid reefs	Loch Creran SAC / MPA	Repeat diver monitoring of relocatable, subtidal <i>Didemnum vexillum</i> invasive non-native species monitoring stations.	Type 2	Heriot-Watt University / NatureScot
	Subtidal sandbanks	Sound of Barra SAC	Small vessel DDV, infaunal sampling, diving – shallower maerl and seagrass	Type 1 & 3	NatureScot
	Annex 1 bedrock stony & biogenic reef	Wyville Thomson Ridge SAC	Video and still imagery data of epifaunal communities will be collected using a drop camera.	1	JNCC, MSS
<b>Birds</b>	Divers, grebes, seaducks and European shag	Scotland	Digital Aerial Surveys of inshore wintering waterfowl during winter 2024/25.	Type 1	NatureScot
	Breeding and non-breeding marine birds at sea	UK-wide	Continued VSAS surveys planned for 2024.	Type 1	JNCC, NatureScot
	Wintering gulls (all species except kittiwake)	Scotland	WinGS survey to continue into winter of 2024/2025	Type 1	BTO
	Breeding seabird colonies	Monach Isle MPA, Clyde Sill MPA, East Caithness Cliffs MPA	Key seabird colonies to be monitored as normal under SCM.	Type 1	Collaboration across organisations, including NatureScot, RSPB, BTO



Feature group	Feature(s)	Location	Description of works	Type(s)	Organisation(s)
	Black guillemot	Small Isles MPA, Fetlar to Haroldswick MPA, Papa Westray MPA, East Caithness Cliffs MPA	Camera trapping and nocturnal census with thermal camera to determine presence and activity of mammalian predators on the MPAs. Use of time-lapse cameras to establish black guillemot fishing activities and trail cams set at nest locations to check for breeding activity and kleptoparasitism rates.	Type 2	NatureScot
	Black guillemot		Boat surveys. Last surveys were in 2013.	Type 1	NatureScot



© Crown copyright 2024



This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit [nationalarchives.gov.uk/doc/open-government-licence/version/3](https://nationalarchives.gov.uk/doc/open-government-licence/version/3) or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: [psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk).

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

This publication is available at [www.gov.scot](http://www.gov.scot)

Any enquiries regarding this publication should be sent to us at

The Scottish Government  
St Andrew's House  
Edinburgh  
EH1 3DG

ISBN: 978-1-83601-004-3 (web only)

Published by The Scottish Government, March 2024

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA  
PPDAS1423354 (03/24)

W W W . g o v . s c o t