



# Scotland Seasearch: Annual summary report 2018

---



Report Produced by Scotland Coordinator Natalie Hirst

Cover Photo: Natalie Hirst

Coordination during 2018 was overseen in West Argyll and Bute by Owen Paisley and for the wider Scotland region by Natalie Hirst.



## Contents

Surveys.....	3
Courses.....	4
Promotion .....	4
Diving .....	5
Data Summary.....	9
Conclusions .....	10
Acknowledgements.....	10
Appendices.....	11
Appendix 1. Total biotopes recorded during 2018 .....	11
Appendix 2. PMF Biotope records 2018 .....	17
Appendix 3. PMF Species recorded .....	19
All PMF Species recorded.....	<b>Error! Bookmark not defined.</b>

Figure 1 Jim Anderson finding an intact Skate egg on Outliers trip, Limaria hians Flameshell bed from Loch Carron trip (Photo credits: Peter Bardsley) .....	3
Figure 2 Observer training Oban and Kilmarnock (Photo credit: Natalie Hirst) .....	4
Figure 3 Seasearch stand with MCS at the FSC Marine symposium, and in attendance at the MASTS Conference (Photo credits: Natalie Hirst).....	5
Figure 4 Top Left to right- Loch Carron survey divers, North East Dive Observer trainees, Butterfish from Loch Carron (Peter Bardsley), Surveyor training dives at St Abbs, Divers hard at work analysing photos and forms on the Outliers live aboard trip, Painted Goby on Fish ID course (David Kipling), Lump sucker guarding eggs from Eyemouth diving, and Skate egg carefully hidden recorded (and photographed by Peter Bardsley on Outliers trip).....	8
Figure 5 Seasearch record locations 2018 .....	9

## Surveys

During 2018, 18 days organised diving took place, involving more than 54 divers and contributing to a total of 500 forms, a record high for Seasearch Scotland. Overall, including both organised Seasearch activities and forms sent in from divers own independent diving, Scotland contributed 32% of the total forms received by Seasearch nationally (500 out of 1581 forms). Overall the proportion of survey forms compared to observation forms was also very high (35.8% vs. 64%) for Scotland. Overall, 87.16% of dives took place within an MPA.

Highlights of the year included a targeted survey effort on Loch Creran, following its MPA designation to help gap fill known extent of features from SNH Data. No further extent was recorded but a number of unknown patches were confirmed not to contain maerl or Flameshells.

The outliers trip run in August, which although it didn't reach the outliers islands due to bad weather did manage to record live skate eggs on a dive near Cape Wrath, further adding to our knowledge of where Skate may breed- much further North than the current MPA designated area for Skate.

A huge highlight this year has been the collaboration and strengthening of interworking relationships with other conservation organisations around the Seasearch 30<sup>th</sup> anniversary celebrations. Seasearch works with a number of other projects with similar goals to collect data in a usable format and to share it for conservation purposes so this year a large focus was on trying to improve communications to better aid this going forward for the next coming decades.



Figure 1 Jim Anderson finding an intact Skate egg on Outliers trip, *Limaria hians* Flameshell bed from Loch Carron trip (Photo credits: Peter Bardsley)



## Courses

In total, two Observer courses were carried out (excluding those carried out By Argyll and Bute coordinator) in Scotland, and one specialist course with a total of 20 participants.

**20<sup>th</sup> January**- Observer course at Kilmarnock SubAqua club

**June 1<sup>st</sup>** Observer course at The Salmon Bothy, Portsoy

**July 28<sup>th</sup>**- Fish ID course at Lochaline Dive centre



*Figure 2 Observer training Oban and Kilmarnock (Photo credit: Natalie Hirst)*

## Promotion

Seasearch attended a number of events throughout 2018, promoting both Seasearch in general and also the 30<sup>th</sup> Anniversary. Promotion was targeted at recreational divers, and other conservation groups and academia which we either have or would like to build collaborations with in the future towards common goals.

**17/18<sup>th</sup> February** - Great Northern Dive Show: Seasearch had a stand for both days of the event, with Scotland Coordinator Natalie Hirst, Wendy Northway and Paula Lightfoot on hand speaking to divers and signing up for further information or to courses as well as selling materials such as the ID guides.

**24<sup>th</sup> May** - Clyde marine planning workshop. Scotland coordinator Natalie Hirst participated in group discussions to feed into the marine plan, as well as discussion on collaboration ideas, such as survey requirements for the Fairlie Oysters with Clyde Porpoise group. Seasearch has been sent the official consultation notice.

**26<sup>th</sup> May** - Coastal communities' workshop – Attended by Scotland Coordinator Natalie Hirst, undertaking discussion with community groups which Seasearch already identified works with 7 out of 12 groups in attendance. Common theme was the requirement of data and funding to which more well thought out collaboration could help. Seasearch identified the common denominator to data requirements could be to adopt the Seasearch methodology with appropriately trained divers which is already happening with groups such as SSSI, and CAOLAS at Carna island.



**13<sup>th</sup> October** – Field Studies Council Millport marine symposium. Scotland coordinator Natalie Hirst presented a talk on Seasearch in particular 30<sup>th</sup> anniversary and where this might take us in the future in Scotland. Led to links with Fairlie Clyde porpoise group.

**1<sup>st</sup> & 2<sup>nd</sup> November**- MASTS Conference. Attended by Scotland coordinator Natalie Hirst.

**3<sup>rd</sup> December**- St Abb's 3D habitat mapping presentation. Attended by Scotland Coordinator Natalie Hirst, to discuss how Seasearch can provide more ground truth data to feed into models from DDV footage.



*Figure 3 Seasearch stand with MCS at the FSC Marine symposium, and in attendance at the MASTS Conference (Photo credits: Natalie Hirst)*

## Diving

**January 10<sup>th</sup>**- Kilmarnock observer dives at Loch Long

The Kilmarnock sub-aqua club completed the classroom portion of the Observer course in January and subsequently completed two dive days to qualify attendees fully. Dives were carried out at the “Two Piers” dive site, Loch Long near Arrochar. The site offers a sloping entry over mixed ground with some seaweeds leading to soft sediment seabed with outcrops of boulder reef at depth, with life on the Pier legs on return to the shore.

**March 9-11<sup>th</sup>** -Loch Carron

Seasearch has been involved heavily with SNH over the last 18 months following the survey of the PMF Flame shells following damage by a scallop dredger by a group of divers including Seasearchers, which led in part to the designation of the Loch Carron eMPA. Following this, Seasearch liaised with SNH to target areas of data gaps with the aim of better mapping the extent of PMF features in Loch Carron. This area has received a lot of attention from divers who were keen to be involved, and as such we ran a trip for 7 divers with North East Dive RIB, based at Dornie lodges. The diving conditions were difficult due to extremely cold water temperatures, which limited our dive time. Despite this the volunteers completed 2 dives a day over 4 days and successfully recorded data on Flame shells, Horse mussels and maerl from Loch Carron, as well as providing data on gaps in the distribution further south in the Loch.



**March 31<sup>st</sup>- Kilmarnock Observer diving**

Further to the initial wave of Observer diving in January, the remaining participants undertook qualifying dives at the same training site location “Two Piers” dive site, Loch Long near Arrochar.

**April 7/8<sup>th</sup>- Carna Loch Sunart with Bingham Sub-aqua club**

Bingham sub aqua club approached Seasearch in 2017. After successfully completing their observer training with East Anglia Seasearch coordinators, they organised a trip to Carna Island in Loch Sunart in order to improve data on the marine environment for the island- at the request of local business owner and the Carna initiative (whom Seasearch was also in touch with to help make this a coordinated survey effort). This was an ideal collaboration to get volunteers taking ownership of a particular patch, and keen to generate repeat trips and data output over time. The group all carried out further qualifying dives with Coordinator Natalie Hirst over the course of two days, from the club rib and smaller sightseeing vessels provided by the accommodation provider. The collaboration extended to further trips with Owen Paisley west coast coordinator and the East Anglia coordinators.

**June 2<sup>nd</sup>- Observer diving Macduff**

Following the observer training course in Portsoy, we carried out tutor dives the following day at nearby Macduff. Diving was overseen by Coordinator Natalie Hirst. The site is well dived with records now regularly coming from those who attended to which it is their local dive site. The group were continuing on to dive further sites later in the year at Kinlochbervie, and so sent in follow up forms from there to complete their training dives.

**July 4<sup>th</sup>- St Abbs Surveyor diving**

Divers often visit Scotland on holiday from other parts of the country, to which this was an example of taking the opportunity to finish surveyor training dives with an attendee from Southern England . This presented additional challenges of species familiarity but not uncommon throughout Seasearch and easily addressed through the appropriate use of ID guides and post dive debriefing when filling in forms. This was also an opportunity to maintain the relationship Seasearch has with the St Abbs Voluntary marine reserve whom worked with us to deliver Observer training in nearby Eyemouth the previous year.

**July 29<sup>th</sup>- Fish id diving**

The Fish ID course delivered at Loch Aline dive centre incorporated a day boat diving in the local area to implement the ID skills discussed the previous day in the classroom. As all attendees were already experienced Seasearchers it provided an opportunity to gather standard data as well as specialised Fish data. In deed the mornings dive site provided records on Nephrops and seapens whilst looking for Gobies on soft sediment near the boat moorings of Loch Aline.



**August 11-18<sup>th</sup> - Outliers liveaboard**

The outliers liveaboard was a fairly rare opportunity to attempt to get out and survey the Northern outlier islands of Scotland. Unfortunately the weather did not allow for us to get across to the islands, but the trip instead took the opportunity to dive and survey along the Northern most Coast from Orkney across to Cape Wrath including some unique rarely dives sites of caves and gullies not easily accessible by other means than a liveaboard. The trip consisted of 12 divers over 6 days diving and recorded a broad range of species including some lesser recorded species of Anemone and Nudibranchs and live Skate eggs *in situ*.

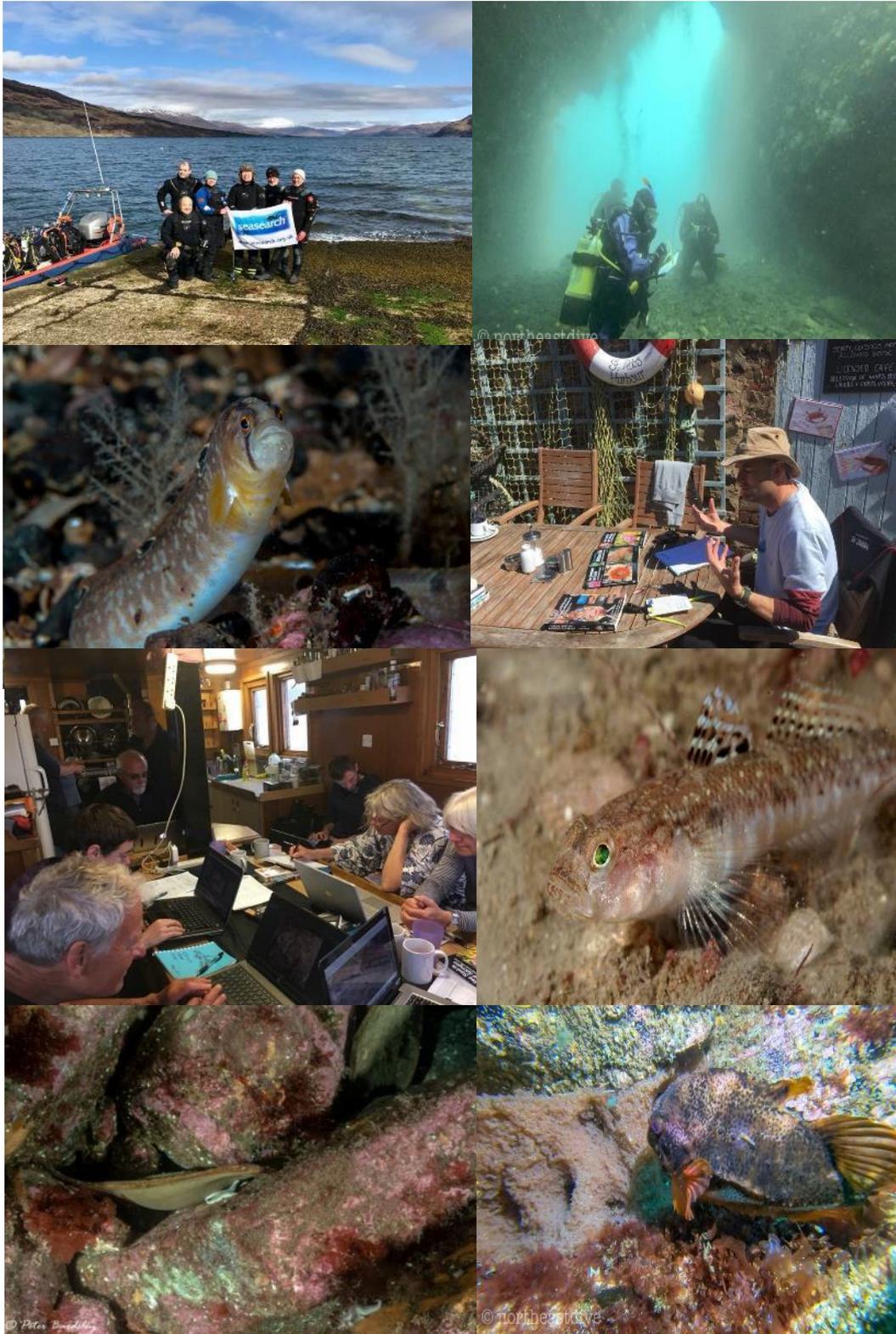


Figure 4 Top Left to right- Loch Carron survey divers, North East Dive Observer trainees, Butterfish from Loch Carron (Peter Bardsley), Surveyor training dives at St Abbs, Divers hard at work analysing photos and forms on the Outliers live aboard trip, Painted Goby on Fish ID course (David Kipling), Lump sucker guarding eggs from Eyemouth diving, and Skate egg carefully hidden recorded (and photographed by Peter Bardsley on Outliers trip.

## Data Summary

In total 500 forms were received and input to Marine Recorder. The resulting Snapshot contains 325 survey events, 558 samples and 16274 individual taxon records.

Figure 6 below shows locations of all records received in Scotland in 2018.

In total 138 biotopes were recorded from all forms, See **Appendix 1**. Of the total biotopes recorded, 26 were Priority Marine Features (See **Appendix 2**) and were recorded across 41276 separate entries to forms.

In total 14 PMF species were recorded across 325 forms, totalling 4550 individual records, see **Appendix 3**.

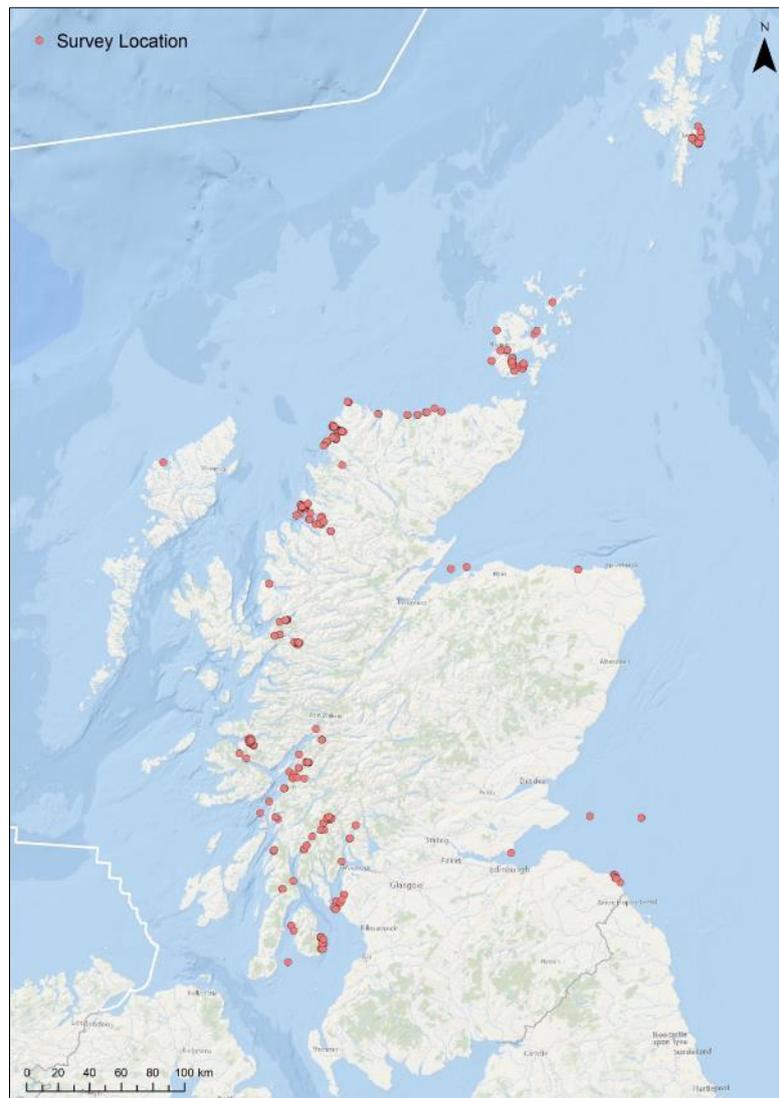


Figure 5 Seasearch record locations 2018



## Conclusions

This year has been both the celebration of 30 years since the first official Seasearch record, but also a record year for the most number of forms submitted to date. This was due in part to more focused effort on courses and mentoring attendees through qualification to continuing to collect forms independently, as well as a greater presence at promotional events such as workshops and seminars to encourage collaborations which result in surveys and data, but also testament to the independent commitment of volunteers to gather data when the reasons for why it is so vitally required are presented clearly and forefront at all times. This combination allows for extensive data collection across a wide geographic area with accuracy and momentum, which will hopefully continue over the coming years.

## Acknowledgements

A huge thank you to all the volunteer divers who gave freely of their time and energy in 2018. They include in particular; Chris Wood, Jim Anderson, Iain Dixon, Peter Bardsley, Sarah Bowen, David Kipling, Cathy and Chris Hollingdale, Becky Hitchin and George Brown, Skipper Bob Anderson and Chris Hollingdale, the St Abbs marine reserve as well as Argyll and Bute Coordinator Owen Paisley.

Seasearch in Scotland gratefully acknowledge the financial support provided by Scottish Natural Heritage and Marine Conservation Society.

 [www.facebook.com/groups/seasearch.scotland/](https://www.facebook.com/groups/seasearch.scotland/)

Seasearch is a partnership between the Marine Conservation Society (MCS), The Wildlife Trusts, statutory nature conservation bodies and others, co-ordinated nationally by MCS and co-ordinated and delivered locally in Scotland by SNH and MCS through local Seasearch co-ordinators. For more information on Seasearch and to see all of the partners involved nationally, please visit [www.seasearch.org.uk](http://www.seasearch.org.uk) or email [info@seasearch.org.uk](mailto:info@seasearch.org.uk)



## Appendices

### Appendix 1. Total biotopes recorded during 2018

<b>Biotope</b>	<b>Description</b>
CR	Circalittoral rock (and other hard substrata)
CR.FCR.Cv	Circalittoral caves and overhangs
CR.FCR.Cv.SpCup	Sponges, cup corals and anthozoans on shaded or overhanging circalittoral rock
CR.FCR.FouFa	Circalittoral fouling faunal communities
CR.FCR.FouFa.Aasp	Ascidiella aspersa on circalittoral artificial substrata
CR.FCR.FouFa.AdigMsen	Alcyonium digitatum and Metridium senile on moderately wave-exposed circalittoral steel wrecks
CR.HCR.XFa	Mixed faunal turf communities
CR.HCR.XFa.ByErSp	Bryozoan turf and erect sponges on tide-swept circalittoral rock
CR.HCR.XFa.CvirCri	Corynactis viridis and a mixed turf of crisiids, Bugula, Scrupocellaria, and Cellaria on moderately tide-swept exposed circalittoral rock
CR.HCR.XFa.SpAnVt	Sponges and anemones on vertical circalittoral bedrock
CR.HCR.XFa.SwiLgAs	Mixed turf of hydroids and large ascidians with Swiftia pallida and Caryophyllia smithii on weakly tide-swept circalittoral rock
CR.LCR	Low energy circalittoral rock
CR.LCR.BrAs	Brachiopod and ascidian communities
CR.LCR.BrAs.AmenCio	Solitary ascidians, including Ascidia mentula and Ciona intestinalis, on wave-sheltered circalittoral rock
CR.LCR.BrAs.AmenCio.Ant	Solitary ascidians, including Ascidia mentula and Ciona intestinalis, with Antedon spp. on wave-sheltered circalittoral rock
CR.LCR.BrAs.AmenCio.Bri	Dense brittlestars with sparse Ascidia mentula and Ciona intestinalis on sheltered circalittoral mixed substrata
CR.LCR.BrAs.AntAsH	Antedon spp., solitary ascidians and fine hydroids on sheltered circalittoral rock
CR.LCR.BrAs.LgAsSp	Large solitary ascidians and erect sponges on wave-sheltered circalittoral rock
CR.LCR.BrAs.NeoPro	Neocrania anomala and Protanthea simplex on sheltered circalittoral rock
CR.LCR.BrAs.NeoPro.FS	Neocrania anomala and Protanthea simplex on very wave-sheltered circalittoral rock
CR.LCR.BrAs.NeoPro.FS	Neocrania anomala and Protanthea simplex on very wave-sheltered circalittoral rock



Biotope	Description
CR.MCR	Moderate energy circalittoral rock
CR.MCR.EcCr	Echinoderms and crustose communities
CR.MCR.EcCr.AdigVt	Alcyonium digitatum and faunal crust communities on vertical circalittoral bedrock
CR.MCR.EcCr.CarSp	Caryophyllia smithii, sponges and crustose communities on wave-exposed circalittoral rock
CR.MCR.EcCr.CarSp.Bri	Brittlestars overlying coralline crusts, Parasmittina trispinosa and Caryophyllia smithii on wave-exposed circalittoral rock
CR.MCR.EcCr.CarSwi	Caryophyllia smithii and Swiftia pallida on circalittoral rock
CR.MCR.EcCr.CarSwi.Aglo	Caryophyllia smithii, Swiftia pallida and Alcyonium glomeratum on wave-sheltered circalittoral rock
CR.MCR.EcCr.FaAlCr	Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
CR.MCR.EcCr.FaAlCr.Adig	Alcyonium digitatum, Pomatoceros triqueter, algal and bryozoan crusts on wave-exposed circalittoral rock
CR.MCR.EcCr.FaAlCr.Car	Caryophyllia smithii with faunal and algal crusts on moderately wave-exposed circalittoral rock
CR.MCR.EcCr.FaAlCr.Pom	Faunal and algal crusts with Pomatoceros triqueter and sparse Alcyonium digitatum on exposed to moderately wave-exposed circalittoral rock
CR.MCR.EcCr.FaAlCr.Sec	Alcyonium digitatum with Securiflustra securifrons on tide-swept moderately wave-exposed circalittoral rock
CR.MCR.EcCr.UrtScr	Urticina felina and sand-tolerant fauna on sand-scoured or covered circalittoral rock
IR	Infralittoral rock (and other hard substrata)
IR.FIR.IFou	Infralittoral fouling seaweed communities
IR.FIR.SG	Infralittoral surge gullies and caves
IR.FIR.SG.CC.BalPom	Balanus crenatus and/or Pomatoceros triqueter with spirorbid worms and coralline crusts on severely-scoured vertical infralittoral rock
IR.FIR.SG.CC.Mo	Coralline crusts and crustaceans on mobile boulders or cobbles in surge gullies
IR.FIR.SG.CrSpAsAn	Anemones, including Corynactis viridis, crustose sponges and colonial ascidians on very exposed or wave surged vertical infralittoral rock
IR.FIR.SG.CrSpAsDenB	Crustose sponges and colonial ascidians with Dendrodoa grossularia or barnacles on wave-surged infralittoral rock
IR.FIR.SG.DenCcor	Dendrodoa grossularia and Clathrina coriacea on wave-surged vertical infralittoral rock
IR.FIR.SG.FoSwwCC	Foliose seaweeds and coralline crusts in surge gully entrances
IR.HIR.KFaR.Ala	Alaria esculenta on exposed sublittoral fringe bedrock
IR.HIR.KFaR.FoR	Foliose red seaweeds on exposed lower infralittoral rock



Biotope	Description
IR.HIR.KFaR.FoR.Dic	Foliose red seaweeds with dense <i>Dictyota dichotoma</i> and/or <i>Dictyopteris membranacea</i> on exposed lower infralittoral rock
IR.HIR.KFaR.LhypR	<i>Laminaria hyperborea</i> with dense foliose red seaweeds on exposed infralittoral rock
IR.HIR.KFaR.LhypR.Ft	<i>Laminaria hyperborea</i> forest with dense foliose red seaweeds on exposed upper infralittoral rock
IR.HIR.KFaR.LhypR.Pk	<i>Laminaria hyperborea</i> park with dense foliose red seaweeds on exposed lower infralittoral rock
IR.HIR.KSed.LsacSac	<i>Laminaria saccharina</i> and/or <i>Saccorhiza polyschides</i> on exposed infralittoral rock
IR.HIR.KSed.Sac	<i>Saccorhiza polyschides</i> and other opportunistic kelps on disturbed sublittoral fringe rock
IR.HIR.KSed.XKScrR	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock
IR.LIR	Low energy infralittoral rock
IR.LIR.IFaVS.MytRS	<i>Mytilus edulis</i> beds on reduced salinity infralittoral rock
IR.LIR.K	Silted kelp communities (sheltered infralittoral rock)
IR.LIR.K.LhypCape	Silted cape-form <i>Laminaria hyperborea</i> on very sheltered infralittoral rock
IR.LIR.K.LhypLsac.Ft	Mixed <i>Laminaria hyperborea</i> and <i>Laminaria saccharina</i> forest on sheltered upper infralittoral rock
IR.LIR.K.LhypLsac.Gz	Grazed, mixed <i>Laminaria hyperborea</i> and <i>Laminaria saccharina</i> on sheltered infralittoral rock
IR.LIR.K.LhypLsac.Pk	Mixed <i>Laminaria hyperborea</i> and <i>Laminaria saccharina</i> park on sheltered lower infralittoral rock
IR.LIR.K.Lsac	<i>Laminaria saccharina</i> on very sheltered infralittoral rock
IR.LIR.K.Lsac.Gz	Grazed <i>Laminaria saccharina</i> with <i>Echinus</i> , brittlestars and coralline crusts on sheltered infralittoral rock
IR.LIR.KVS	Kelp in variable or reduced salinity
IR.LIR.KVS.Cod	<i>Codium</i> spp. with red seaweeds and sparse <i>Laminaria saccharina</i> on shallow, heavily-silted, very sheltered infralittoral rock
IR.LIR.Lag	Submerged fucoids, green or red seaweeds (low salinity infralittoral rock)
IR.LIR.Lag.FChoG	Mixed fucoids, <i>Chorda filum</i> and green seaweeds on reduced salinity infralittoral rock
IR.MIR	Moderate energy infralittoral rock
IR.MIR.KR	Kelp and red seaweeds (moderate energy infralittoral rock)
IR.MIR.KR.Ldig	<i>Laminaria digitata</i> on moderately exposed sublittoral fringe rock
IR.MIR.KR.Ldig.Bo	<i>Laminaria digitata</i> and under-boulder fauna on sublittoral fringe boulders
IR.MIR.KR.Ldig.Ldig	<i>Laminaria digitata</i> on moderately exposed sublittoral fringe bedrock



Biotope	Description
IR.MIR.KR.Lhyp	Laminaria hyperborea and foliose red seaweeds on moderately exposed infralittoral rock
IR.MIR.KR.Lhyp.Ft	Laminaria hyperborea forest and foliose red seaweeds on moderately exposed upper infralittoral rock
IR.MIR.KR.Lhyp.GzFt	Grazed Laminaria hyperborea forest with coralline crusts on upper infralittoral rock
IR.MIR.KR.Lhyp.GzPk	Grazed Laminaria hyperborea park with coralline crusts on lower infralittoral rock
IR.MIR.KR.Lhyp.Pk	Laminaria hyperborea park and foliose red seaweeds on moderately exposed lower infralittoral rock
IR.MIR.KR.LhypT	Laminaria hyperborea on tide-swept, infralittoral rock
IR.MIR.KR.LhypT.Ft	Laminaria hyperborea forest, foliose red seaweeds and a diverse fauna on tide-swept upper infralittoral rock
IR.MIR.KR.LhypT.Pk	Laminaria hyperborea park with hydroids, bryozoans and sponges on tide-swept lower infralittoral rock
IR.MIR.KR.LhypTX	Laminaria hyperborea on tide-swept infralittoral mixed substrata
IR.MIR.KR.LhypTX.Ft	Laminaria hyperborea forest and foliose red seaweeds on tide-swept upper infralittoral mixed substrata
IR.MIR.KR.LhypTX.Pk	Laminaria hyperborea park and foliose red seaweeds on tide-swept lower infralittoral mixed substrata
IR.MIR.KR.LhypVt	Laminaria hyperborea on moderately exposed vertical rock.
IR.MIR.KR.XFoR	Dense foliose red seaweeds on silty moderately exposed infralittoral rock
IR.MIR.KT	Kelp and seaweed communities in tide-swept sheltered conditions
IR.MIR.KT.LsacT	Laminaria saccharina with foliose red seaweeds and ascidians on sheltered tide-swept infralittoral rock
IR.MIR.KT.XKT	Mixed kelp with foliose red seaweeds, sponges and ascidians on sheltered tide-swept infralittoral rock
IR.MIR.KT.XKTX	Mixed kelp and red seaweeds on infralittoral boulders, cobbles and gravel in tidal rapids
LR.LLR.F	Fucoids on sheltered marine shores
LR.LLR.F.Asc.X	Ascophyllum nodosum on full salinity mid eulittoral mixed substrata
SS	Sublittoral sediment
SS.SBR.PoR.Ser	Serpula vermicularis reefs on very sheltered circalittoral muddy sand
SS.SBR.SMus	Sublittoral mussel beds (on sublittoral sediment)
SS.SBR.SMus.ModCvar	Modiolus modiolus beds with Chlamys varia, sponges, hydroids and bryozoans on slightly tide-swept very sheltered circalittoral mixed substrata



Biotope	Description
SS.SBR.SMus.ModHAs	Modiolus modiolus beds with fine hydroids and large solitary ascidians on very sheltered circalittoral mixed substrata
SS.SBR.SMus.ModT	Modiolus modiolus beds with hydroids and red seaweeds on tide-swept circalittoral mixed substrata
SS.SBR.SMus.MytSS	Mytilus edulis beds on sublittoral sediment
SS.SCS	Sublittoral coarse sediment (unstable cobbles and pebbles, gravels and coarse sands)
SS.SCS.CCS	Circalittoral coarse sediment
SS.SCS.CCS.Nmix	Neopentadactyla mixta in circalittoral shell gravel or coarse sand
SS.SCS.CCS.PomB	Pomatoceros triqueter with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles
SS.SCS.ICS	Infralittoral coarse sediment
SS.SCS.ICS.SLan	Dense Lanice conchilega and other polychaetes in tide-swept infralittoral sand and mixed gravelly sand
SS.SMp	Sublittoral macrophyte-dominated communities on sediments
SS.SMp.KSwSS	Kelp and seaweed communities on sublittoral sediment
SS.SMp.KSwSS.LsacCho	Laminaria saccharina and Chorda filum on sheltered upper infralittoral muddy sediment
SS.SMp.KSwSS.LsacR	Laminaria saccharina and red seaweeds on infralittoral sediments
SS.SMp.KSwSS.Pcri	Loose-lying mats of Phyllophora crispa on infralittoral muddy sediment
SS.SMp.KSwSS.Tra	Mats of Trailliella on infralittoral muddy gravel
SS.SMp.Mrl	Maerl beds
SS.SMp.Mrl.Lgla	Lithothamnion glaciale maerl beds in tide-swept variable salinity infralittoral gravel
SS.SMp.Mrl.Pcal	Phymatolithon calcareum maerl beds in infralittoral clean gravel or coarse sand
SS.SMp.Mrl.Pcal.R	Phymatolithon calcareum maerl beds with red seaweeds in shallow infralittoral clean gravel or coarse sand
SS.SMp.SSgr.Zmar	Zostera marina/angustifolia beds on lower shore or infralittoral clean or muddy sand
SS.SMu	Sublittoral cohesive mud and sandy mud communities
SS.SMu.CFiMu	Circalittoral fine mud
SS.SMu.CFiMu.BlyrAchi	Brissopsis lyrifera and Amphiuira chiajei in circalittoral mud
SS.SMu.CFiMu.SpnMeg	Seapens and burrowing megafauna in circalittoral fine mud
SS.SMu.CFiMu.SpnMeg.Fun	Seapens, including Funiculina quadrangularis, and burrowing megafauna in undisturbed circalittoral fine mud
SS.SMu.CSaMu	Circalittoral sandy mud
SS.SMu.CSaMu.VirOphPmax	Virgularia mirabilis and Ophiura spp. with Pecten maximus on circalittoral sandy or shelly mud
SS.SMu.IFiMu	Infralittoral fine mud
SS.SMu.IFiMu.Are	Arenicola marina in infralittoral mud



Biotope	Description
SS.SMu.IFiMu.PhiVir	Philine aperta and Virgularia mirabilis in soft stable infralittoral mud
SS.SMu.ISaMu	Infralittoral sandy mud
SS.SMx.CMx	Circalittoral mixed sediment
SS.SMx.CMx.CIloModHo	Sparse Modiolus modiolus, dense Cerianthus lloydii and burrowing holothurians on sheltered circalittoral stones and mixed sediment
SS.SMx.CMx.CIloMx	Cerianthus lloydii and other burrowing anemones in circalittoral muddy mixed sediment
SS.SMx.CMx.CIloMx.Nem	Cerianthus lloydii with Nemertesia spp. and other hydroids in circalittoral muddy mixed sediment
SS.SMx.CMx.OphMx	Ophiothrix fragilis and/or Ophiocomina nigra brittlestar beds on sublittoral mixed sediment
SS.SMx.IMx	Infralittoral mixed sediment
SS.SMx.IMx.Lim	Limaria hians beds in tide-swept sublittoral muddy mixed sediment
SS.SMx.IMx.Ost	Ostrea edulis beds on shallow sublittoral muddy mixed sediment
SS.SSa	Sublittoral sands and muddy sands
SS.SSa.CFiSa	Circalittoral fine sand
SS.SSa.CMuSa	Circalittoral muddy sand
SS.SSa.IFiSa	Infralittoral fine sand
SS.SSa.IMuSa.AreISa	Arenicola marina in infralittoral fine sand or muddy sand
SS.SSa.IMuSa.EcorEns	Echinocardium cordatum and Ensis spp. in lower shore and shallow sublittoral slightly muddy fine sand

## Appendix 2. PMF Biotope records 2018

Biotope	Description
SS.SBR.SMus.MytSS	Mytilus edulis beds on sublittoral sediment
IR.LIR.IFaVS.MytRS	Mytilus edulis beds on reduced salinity infralittoral rock
SS.SMu.CFiMu.Spnmeg	Seapens and burrowing megafauna in circalittoral fine mud
SS.SMx.IMx.Lim	Limaria hians beds in tide-swept sublittoral muddy mixed sediment
SS.SBR.SMus.ModT	Modiolus modiolus beds with hydroids and red seaweeds on tide-swept circalittoral mixed substrata
SS.SBR.SMus.ModHAs	Modiolus modiolus beds with fine hydroids and large solitary ascidians on very sheltered circalittoral mixed substrata
SS.SBR.SMus.ModHAs	Modiolus modiolus beds with fine hydroids and large solitary ascidians on very sheltered circalittoral mixed substrata
SS.SBR.SMus.ModCvar	Modiolus modiolus beds with Chlamys varia, sponges, hydroids and bryozoans on slightly tide-swept very sheltered circalittoral mixed substrata
SS.SMu.CFiMu.BlyrAchi	Brissopsis lyrifera and Amphiuira chiajei in circalittoral mud
SS.SMp.KSwSS	Kelp and seaweed communities on sublittoral sediment
IR.HIR.KFaR.LhypR	Laminaria hyperborea with dense foliose red seaweeds on exposed infralittoral rock
IR.MIR.KR.LhypT	Laminaria hyperborea on tide-swept, infralittoral rock
IR.MIR.KR.LhypTX	Laminaria hyperborea on tide-swept infralittoral mixed substrata
IR.MIR.KR.Lhyp	Laminaria hyperborea and foliose red seaweeds on moderately exposed infralittoral rock
IR.LIR.KVS	Kelp in variable or reduced salinity
IR.LIR.Lag	Submerged fucoids, green or red seaweeds (low salinity infralittoral rock)
SS.SMp.Mrl	Maerl beds
SS.SCS.CCS.Nmix	Neopentadactyla mixta in circalittoral shell gravel or coarse sand
SS.SMx.IMx.Ost	Ostrea edulis beds on shallow sublittoral muddy mixed sediment
CR.MCR.EcCr.CarSwi	Caryophyllia smithii and Swiftia pallida on circalittoral rock
CR.HCR.XFa.SwiLgAs	Mixed turf of hydroids and large ascidians with Swiftia pallida and Caryophyllia smithii on weakly tide-swept circalittoral rock
SS.SMp.SSgr.Zmar	Zostera marina/angustifolia beds on lower shore or infralittoral clean or muddy sand



Biotope	Description
SS.SBR.PoR.Ser	Serpula vermicularis reefs on very sheltered circalittoral muddy sand
IR.MIR.KT	Kelp and seaweed communities in tide-swept sheltered conditions
IR.MIR.KR.LhypTX	Laminaria hyperborea on tide-swept infralittoral mixed substrata



### Appendix 3. PMF Species recorded

Species Name	Form Number	SACFORN
<i>Arctica islandica</i>	SC18/005; SC18/090; SC18/121; SC18/125; SC18/128; SW18/137; SW18/144;	R; C; R; O; O; R; R;
<i>Dipturus batis</i>	SC18/188; SC18/193;	R; R;
<i>Gadus morhua</i>	NT18/165; NT18/166; SC18/025; SC18/068; SC18/071; SC18/084; SC18/093; SC18/108; SC18/162; SC18/170; SC18/224; SC18/245; SC18/252; SC18/253; SC18/263; SW18/099; SW18/100; SW18/103; SW18/104; SW18/110; SW18/112; SW18/114; SW18/117; SW18/128; SW18/136; SW18/142; SW18/162; SW18/163; SW18/164; SW18/176; SW18/179; SW18/183; SW18/196; SW18/198;	C; O; O; R; O; O; R; O; R; O; O; O; R; F; R; O; O; O; R; R; O; R; O; R; R; R; R; O; R; O; R; R; R; O;
<i>Halichoerus grypus</i>	SC18/226; SC18/236; SC18/257;	R; O; R;
<i>Leptometra celtica</i>	SC18/031; SC18/033; SC18/138; SW18/076; SW18/101; SW18/141; SW18/147; SW18/181;	O; O; R; R; F; R; C; R;
<i>Lophius piscatorius</i>	NT18/167; NT18/169; SC18/052; SC18/080; SC18/112; SC18/114; SC18/134;	R; R; R; R; R; R; R;
<i>Lutra lutra</i>	SW18/142	R
<i>Merlangius merlangus</i>	SW18/165; SW18/167;	F; A;
<i>Molva molva</i>	NT18/166; NT18/169; NT18/170; NT18/172; NT18/181; SC18/014; SC18/092; SC18/099; SC18/108; SC18/110; SC18/114; SC18/117; SC18/118; SC18/141; SC18/160; SC18/164; SC18/197; SC18/205; SC18/212; SW18/081;	R; R; O; R; R; R; R; R; R; R; R; R; R; R; R; R; R; R; R; R;
<i>Palinurus elephas</i>	SC18/092; SC18/119; SC18/139; SC18/159; SC18/179; SC18/205;	R; R; R; R; R; R;
<i>Parazoanthus anguicomus</i>	SC18/092	R
<i>Phoca vitulina</i>	SW18/169	R
<i>Pollachius virens</i>	NT18/166; NT18/167; NT18/168; SC18/014; SC18/056; SC18/068; SC18/071; SC18/090; SC18/091; SC18/092; SC18/093; SC18/099; SC18/110; SC18/135; SC18/137; SC18/164; SC18/170; SC18/219; SC18/241; SC18/257; SC18/261; SC18/262; SW18/098; SW18/104; SW18/106; SW18/108; SW18/109; SW18/110; SW18/112; SW18/114; SW18/117; SW18/124; SW18/127; SW18/128; SW18/129; SW18/139; SW18/141; SW18/143;	F; C; F; C; R; O; O; C; C; S; O; R; O; R; R; O; O; F; C; O; C; O; O; O; C; C; F; F; C; O; F; C; F; C; O; F; O; C;
<i>Pomatoschistus minutus</i>	SC18/133; SW18/158; SW18/181; SW18/192;	F; F; F; O;