Infrastructure and Environment

Climate Emergency JSY

Jersey Marine Spatial Plan (JMSP) Marine Protected Area Further Research Report

Marine Resources, Government of Jersey

December 2025

Contents

1. Introduction

In 2024, the first Jersey Marine Spatial Plan (JMSP) was published following multiple drafts, weeks of public consultation and a review by the Environment Housing and Infrastructure Scrutiny Panel. During the States Debate on 22nd October 2024, the JMSP was voted in favour of but was subject to an amendment. This amendment relates to the JMSP as a whole but with a particular focus on the proposed Marine Protected Area (MPA) network. The amendment asks the Minister, and thus the Marine Resources team, to:

"*establish a framework, timeline and tracker for monitoring the implementation of the Jersey Marine Spatial Plan and for conducting any further research on areas remaining for inclusion in the Marine Protected Area Network.*"

The proposed MPA network is split into four categories (Figure 1):

- Initial MPA (to be designated for protection from mobile gear at the earliest opportunity)
- No Take Zone (to be designated for protection for all extractive activities at the earliest opportunity)
- Phased MPA (to be designated for protection from mobile gear by 2030)
- Further research areas (to be surveyed before recommending final boundaries for protection from mobile gear)

MPA in this context refers to areas of seabed where mobile gear fishing (trawling and dredging) is prohibited.

The research areas required further evidence of sensitive habitat and species presence before a decision could be made on their inclusion in the MPA network. This report details the methods and results of the further research and the final planned MPA boundaries resulting from this.

1.1. Further research areas for inclusion in MPA network

One of the most pressing elements of the JMSP is the timeline for the designation of the Marine Protected Area (MPA) network. The areas of importance at this stage in the MSP implementation timeline are the research areas. These are areas that are economically important to the scallop dredging industry but where areas of sensitive habitat have been predicted by the habitat model and have also been reported by a number of commercial and recreational divers. One of the sensitive habitats in question is maerl, a slow growing, coralline red algae that is important for supporting biodiversity and that is also highly sensitive to pressure from dredging activity.

Maerl is a threatened habitat as defined by the OSPAR Commission which is the Convention for the Protection of the Marine Environment of the North-East Atlantic. As signatory to OSPAR, Jersey is required to maintain this habitat in a favourable condition. However, the exact extent and condition of maerl in the research areas needs further evidencing. Maerl occurs in the further research area to the southeast of Jersey and the east of the Ecrehous reef (Figure 1).

The other research areas around the Minquiers and Paternosters reefs (Figure 1) are not modelled to contain maerl. These have been proposed as part of the MPA network because they meet other criteria in the original MPA network, such as being shallow productive habitat, having species rich sediments, containing other OSPAR habitat such as kelp, for blue carbon importance or due to having Ramsar status.

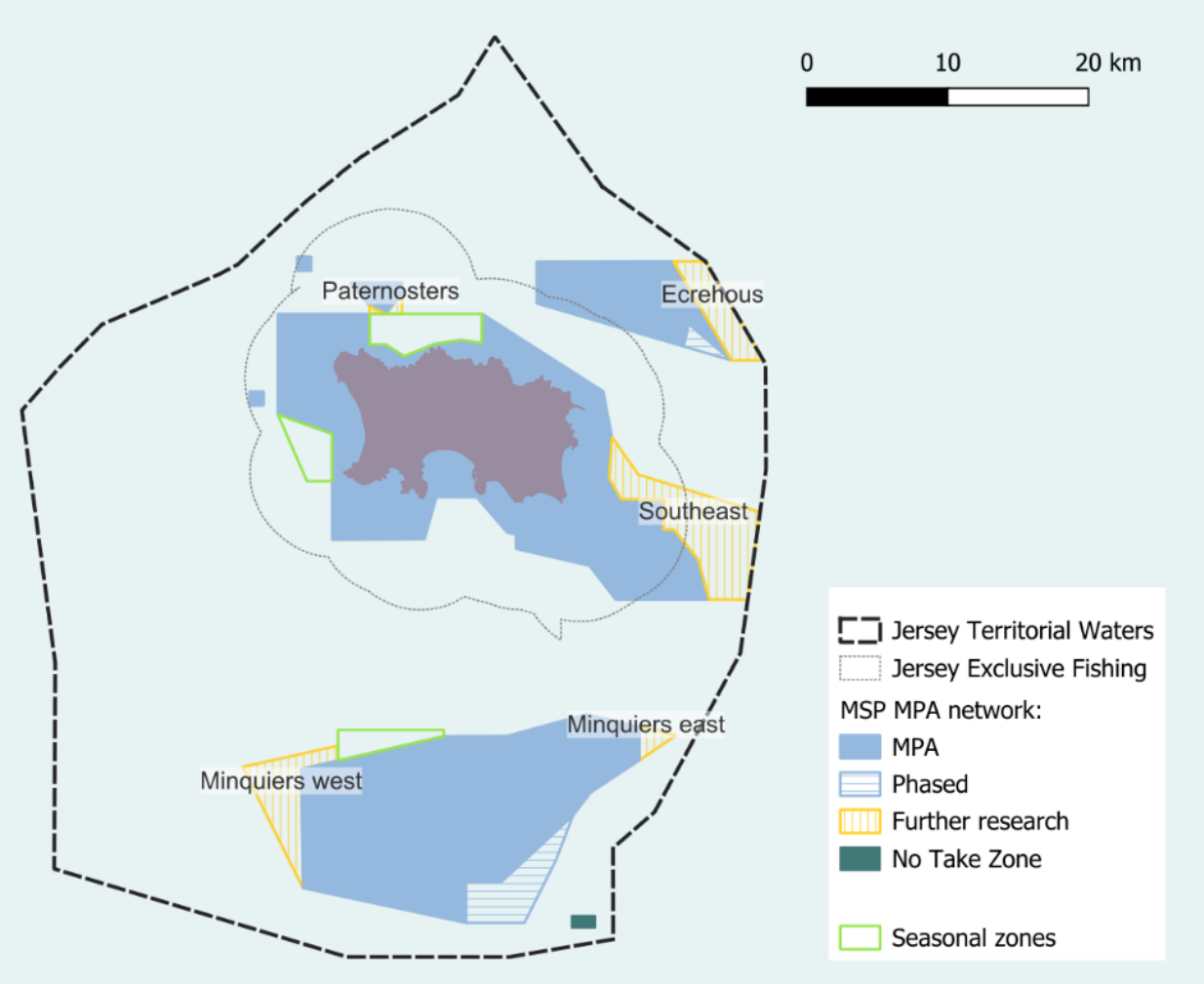


Figure 1. Jersey Marine Spatial Plan agreed Marine Protected Area boundaries. Solid blue = initial MPA; striped blue = phased MPA; and striped yellow = further research areas for future MPA designation, solid dark green = No Take Zone. Light green outline = Seasonal access zones. The name of the further research zones are labelled.

1.2. Mobile gear fleet requested research areas

A further four research areas inside the originally agreed MPA boundary were added following consultation with the mobile gear fishing fleet (Figure 2). These are areas that the mobile gear fishing fleet have highlighted as being important to them at certain times of year and where they believe the seabed is not sensitive enough to warrant protection from mobile fishing:

- South of Corbiere (zone A)
- South of St. Aubins bay (zone B)
- East of Gorey (zone C)
- South of Anquettes (zone D)

Three of these areas (zones A, B and C) were asked to be surveyed to determine if they could be fished in the winter months. These three areas are close to shore and had originally been included in the MPA boundary as they were within 1km of shore and therefore deemed to be in conflict with other users, such as recreational water sports. However, recreational use of the inshore areas decreases significantly over the winter months and these inshore areas provide access to

productive fishing grounds in relatively sheltered areas. The purpose of extending the surveys into these areas was to determine whether there were any sensitive species or OSPAR habitats to allow for a decision to be made on the appropriateness of allowing winter access into these zones.

The fourth and final zone (zone D) to the south of the Anquettes has been requested to be removed from the MPA boundary entirely. This is due to the area being more than 1km from shore, highly economically important to the scallop dredging fleet throughout the year and perceived to not have OSPAR habitats (seagrass, kelp or maerl).

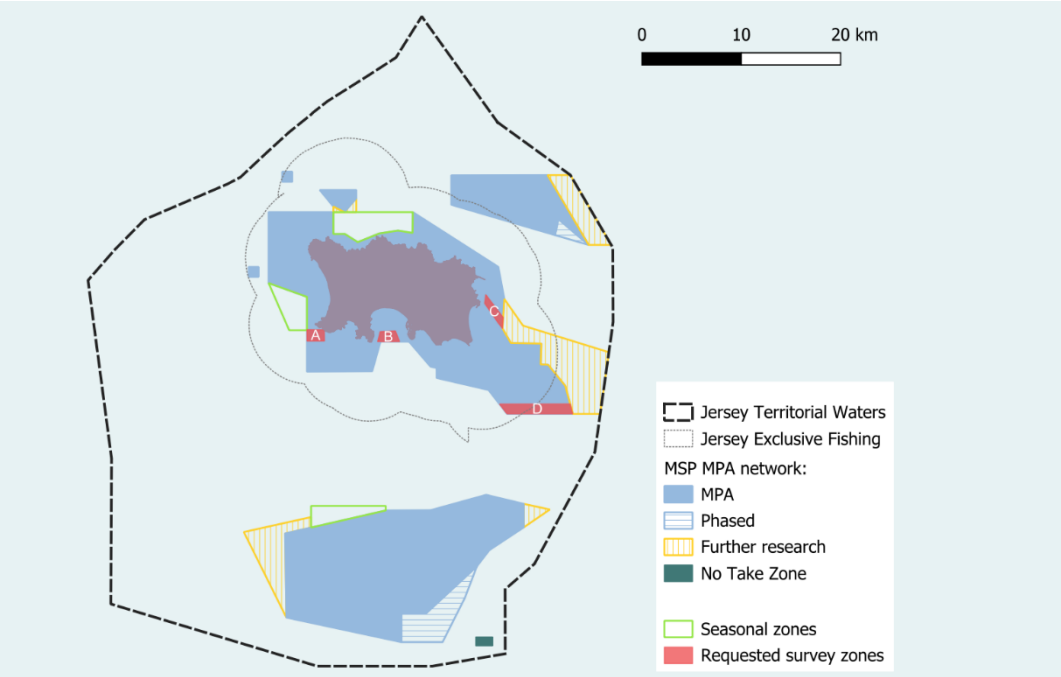


Figure 2. Additional survey zones (A-D) requested by the Jersey Mobile Gear Working Group (red shaded areas).

1.3. Spatial fishing information

Since the MPAs were proposed and accepted in 2024, further information regarding spatial fishing activity has been recorded and analysed. A track record period of 2020 to 2025 has been analysed for VMS (Vessel Monitoring System) and iVMS (inshore Vessel Monitoring System) pings from Jersey and French vessels. Please note that the iVMS units for the Jersey fleet had a phased rollout in March and April 2025 so data does not span the full track record period. This information has been used to produce a heat map of fishing activity in relation to the proposed MPAs. Note that despite filtering the speed for <4.5 knots, there will still be instances where vessels on transit have been included in this analysis due to differing vessel speeds in varying sea conditions.

The distribution of fishing effort differs between the Jersey (Figure 3) and French (Figure 4) mobile gear vessels. This is to be expected to some extent as French vessels cannot fish within Jerseys three-mile exclusive fishing zone. However, there are also differences in spatial usage outside of the three-mile exclusive fishing zone, with French vessels showing greatest fishing effort in the southeast of Jerseys waters (east of the Minquiers), whereas Jersey vessels are primarily targeting the east coast of Jersey, the southeast of the Ecrehous and the northwest of the Minquiers. This

will in part be due to travel times from the closest ports, with the Jersey fleet accessing scallop grounds closer to St. Helier, and the French vessels accessing scallop grounds closer to Granville.

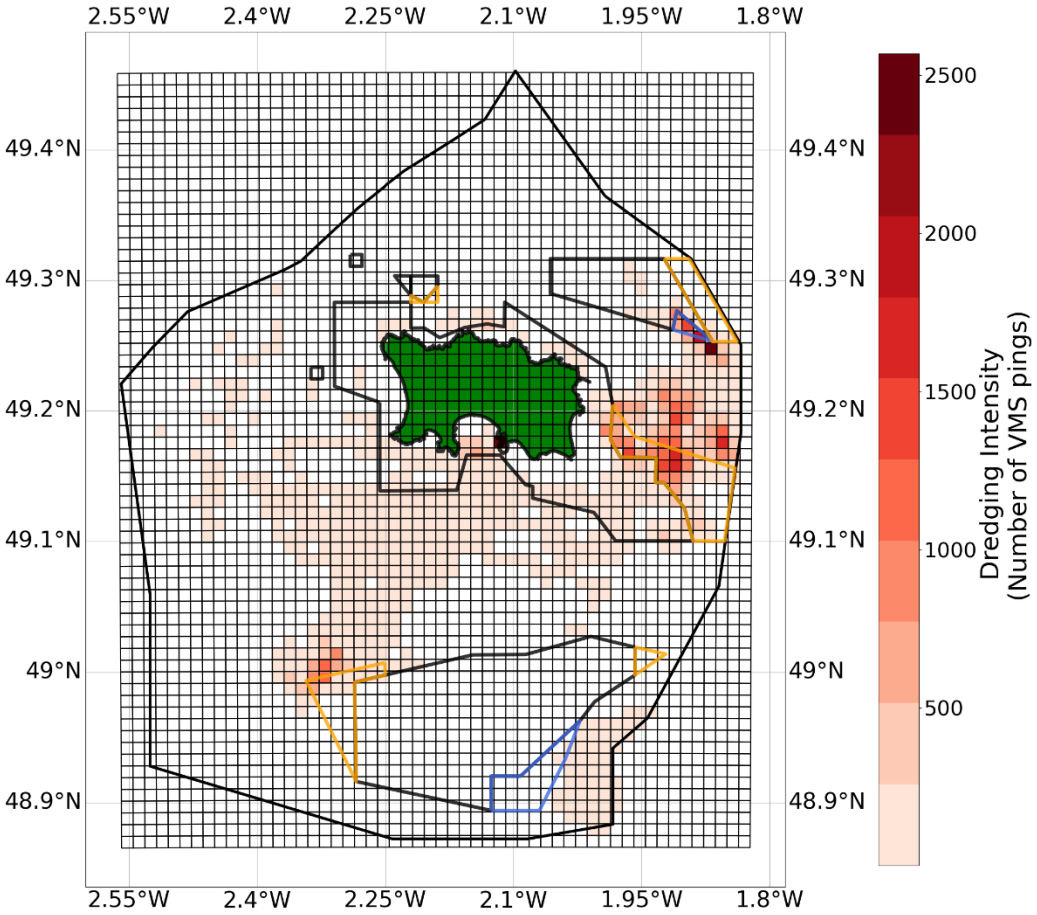


Figure 3. 1km2 spatially gridded iVMS GPS pings in Jersey's territorial waters for all 11 permitted Jersey mobile gear vessels. All iVMS data with a vessel speed <4.5 knots in a 5-year track record period spanning July 2020 to July 2025 are included. Please note that the iVMS units for the Jersey fleet had a phased rollout in March and April 2025 so data does not span the full track record period. This analysis includes instances where the 11 mobile gear vessels may have used metiers other than trawling and dredging (e.g. potting), this is expected to have a very small impact on the overall fishing pattern of the mobile gear fleet. Please note that the ping rate for Jersey vessels is every three minutes. The proposed MPA zones from the Marine Spatial Plan are also shown, core MPA zones are shown in black, phased zones are shown in blue and further research zones are shown in gold.

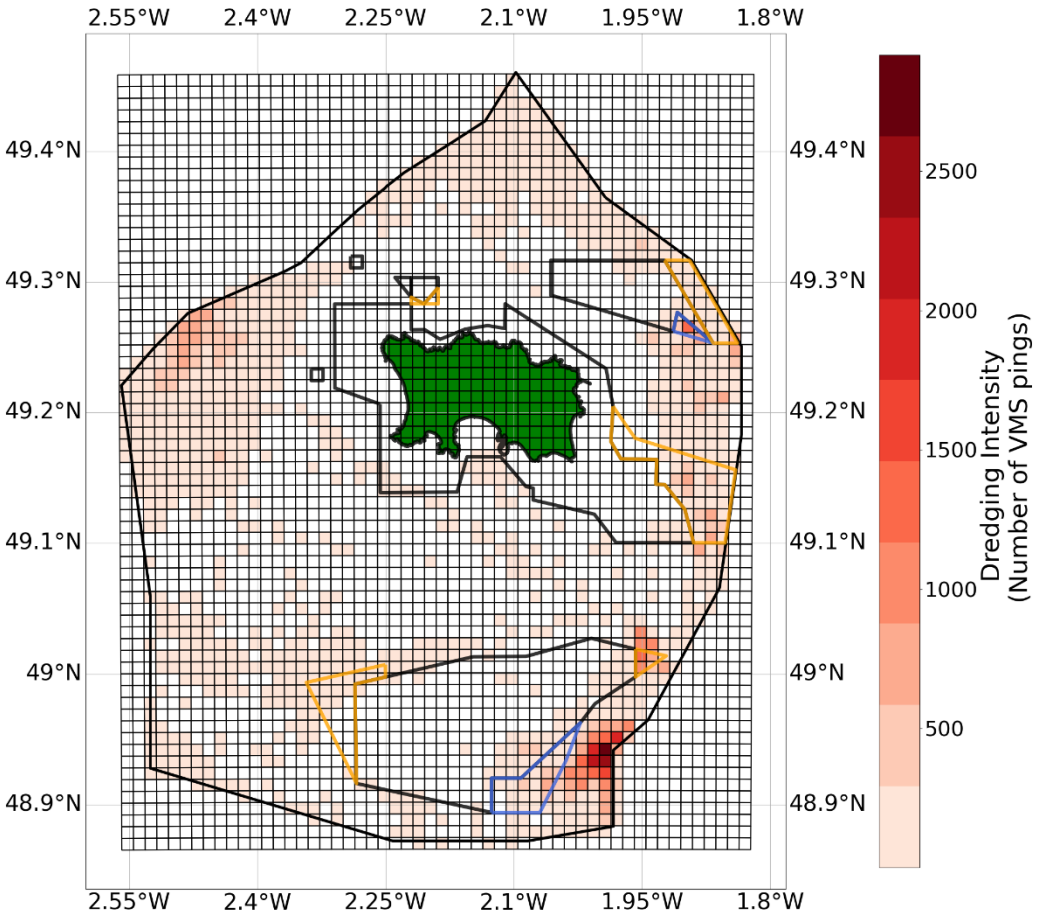


Figure 4. 1km2 spatially gridded VMS GPS pings in Jersey's territorial waters for all licensed French mobile gear vessels. All VMS data with a vessel speed <4.5 knots in a 5-year track record period spanning July 2020 to July 2025 are included. This analysis includes instances where the mobile gear vessels may have used metiers other than trawling and dredging (e.g. potting), this is expected to have a very small impact on the overall fishing pattern of the mobile gear fleet. Please note that the ping rate for French vessels is every hour. The proposed MPA zones from the Marine Spatial Plan are also shown, core MPA zones are shown in black, phased zones are shown in blue and further research zones are shown in gold.

This spatial fishing information is referred to throughout this report in relation to the habitat information collected over 2025 to determine areas of low sensitive habitat that are economically important to mobile fishing fleets.

2. Research aims

In all research areas, drop cameras were used to determine hotspots of sensitive habitat. Sessile and low mobility species diversity were also recorded to better understand species-habitat associations in the research areas. Sessile species and low mobility species here refers to marine species that are attached to the substrate, such as sponges and soft corals, or that are slow moving, such as urchins and starfish. The term 'sessile' will be used throughout the rest of this document for simplicity. Sessile species are typically confined to the habitat on which they settle, with no means of relocating should environmental conditions change, and are therefore a good indicator of localised biodiversity on the seafloor.

Where maerl was present, further surveys using grab samples were carried out to understand the condition of the maerl and to obtain a percentage weight of maerl in each sample. This was to enable the classification of maerl habitats into one of the various categories defined by Natural England (Table 2).

2.1. Criteria for designation of further MPAs

2.1.1. Non-maerl habitat

Four of the further research areas were not modelled to contain maerl. These areas are the east and west of the Minquiers plateau (in the south of Jersey's waters) and the southeast and southwest of the Paternosters Ramsar area (in the north of Jersey's waters, Figure 1). The expected habitats and sensitive species in these areas were reef (bedrock and boulders), infaunal rich sediments, OSPAR habitat (kelp) and sessile species such as seafans. These areas have only been assessed using the drop camera method to identify areas of OSPAR habitat, sensitive species or high biodiversity.

1.1.1. Maerl habitat

Two of the further research areas are over maerl habitat; as predicted by modelling or recorded by underwater video surveys. The larger of these areas is to the southeast of Jersey and the other, smaller area, is located to the east of the Ecrehous reef (Figure 1).

A Natural England report has provided the first classification of maerl bed categories[1]. Consideration has been given to different categories of maerl and coverage of maerl. Categories are based on density of maerl and the underlying substratum and include 'dense maerl', 'maerl sediment', 'sparse maerl', 'maerl veneer' and 'potential maerl' (Table 1). Within these categories are different groupings based on a combination of coverage (% cover), physical size (m^2 of habitat) and live to dead composition.

[1] Axelsson, M.B. (2023). A categorisation system for maerl bed habitats in England. NERR123. Natural England.

*Table 1. Taken from the Natural England Report[1]. Categories of maerl bed habitats in England. (*live/dead fraction part of total % cover column; substratum = characterising/dominant substrata).*

Category	Group	Maerl bed habitat	Physical size	Structure	% cover	Live/dead*	Substratum
A	1	**Dense Maerl** 'live & dead'	≥25m²	3D; raised; ≥10cm depth	≥20%	≥5% live	Maerl
	2	**Dense Maerl** 'dead'	≥25m²	3D; raised; ≥10cm depth	≥20%	0% live ≥20% dead	Maerl
	3	**Dense Maerl** 'live & dead'	<25m²	3D; raised; ≥10cm depth	≥20%	≥5% live	Maerl
B	1	**Maerl Sediment** 'live and dead'	≥25m²	3D / 2D	≥5% ≤20%	5% Live and dead	Gravel, sand, mud, mixed
	2	**Maerl Sediment** 'dead'	≥25m²	2D	≥5% ≤20%	Dead	Gravel, sand, mud, mixed
	3	**Maerl Sediment** 'live and dead'	Patchy	2D	≥5% ≤20%	5% Live and dead	Gravel, sand, mud, mixed
C	1	**Sparse Maerl** 'live and dead'	Sparse	2D	<5% ≥1%	Live and/or dead	Gravel, sand, mud, mixed
	2	**Scattered Maerl** 'live and dead'	Scattered	2D	<1%	Live and/or dead	Gravel, sand, mud, mixed
D	1	**Maerl Veneer** Live and dead, static	≥25m²	2D	≥20%	≥5% live	Rock
	2	**Maerl Veneer** Live and dead, mobile	≥25m²	2D	≥20%	≥5% live	Rock
	3	**Maerl Veneer** 'live and dead, static'	patchy	2D	≥5% ≤20%	≥5% live	Rock
E	1	**Potential Maerl** *Lithothamnion* sp. or *Phymatolithon* sp.	Lacking detail	Lacking detail	Lacking detail	Live and/or dead	Any suitable, near horizontal

In Jersey, most of the maerl beds are a mix of live and dead maerl, and form a mixed habitat with shells, sand, pebbles and cobbles. There are often boulders interspersed within the maerl beds. In some cases, the maerl will be a veneer (thin layer) over bedrock. This is still deemed as being maerl habitat. For the purpose of this research, any maerl habitat, veneer or otherwise, will be considered for protection if it meets categories A1-3, B1 or D1-2 as defined in the Natural England report. The key defining features of these categories are a combination of a defined area of maerl that is more than 25m² and that also has a percentage of maerl between 5-20% (maerl sediment) or more than 20% (dense maerl).

Both live and dead maerl are considered as habitats in their own right[2] and both support greater biodiversity than adjacent, less complex sediments[3][4]. It is for this reason that both live and dead

[2] E.V. Sheehan, D. Bridger, M.J. Attrill (2015) The ecosystem service value of living versus dead biogenic reef. Estuarine, Coastal and Shelf Science. Vol. 154, Pages 248-254. https://doi.org/10.1016/j.ecss.2014.12.042

[3] C.M. Jackson, N.A. Kamenos, P.G. Moore & M. Young, 2004. Meiofaunal bivalves in maerl and other substrata; their diversity and community structure. Vol. 58, Pages 48-60. https://doi.org/10.1080/00785236.2004.10410212

[4] Blampied, 2022. A socio-economic and ecological approach to informing sustainable marine management in Jersey, Channel Islands, Chapter 5. PhD, University of Plymouth. Pages 149-195.

maerl will be included in the maerl coverage totals when surveying the Jersey MPA research areas. It should be mentioned that areas considered for protection may not end up included in the MPA. The boundaries of the MPA will need to contain the best representation of maerl habitat while also being easily navigable (simple in shape with straight lines). The same is true for non-maerl habitat in that hotspots of sensitive species and habitats will be prioritised for inclusion in the MPA network.

2. Survey design and methods

2.1. Drop cameras

To assess the distribution of sensitive habitat or species, drop cameras were used to record images of the seabed in the research areas on a 500m x 500m point survey grid (Figure). The drop camera consisted of a stainless-steel frame of 50 cm in height with an underwater camera attached facing towards the seafloor. At each pre-determined grid point, the video was set to record and the drop camera was lowered to the seafloor before being brought back on board and the video turned off. This was repeated for each survey point (n=456).

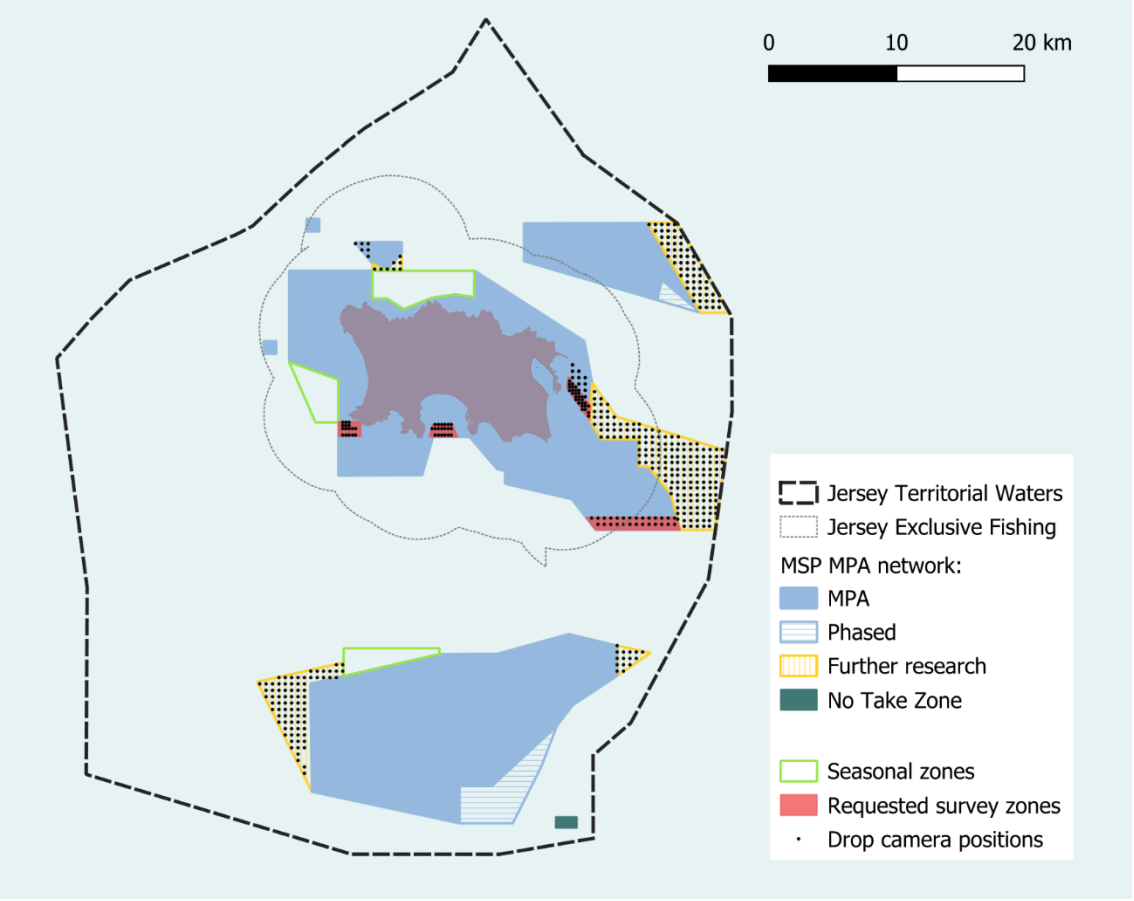


Figure 5. Research areas with 500m x 500m point grid showing where the drop cameras were deployed. Three of the inshore additional research areas (Corbiere, St. Aubins and east Gorey) were surveyed on a finer resolution.

From these images, a range of metrics were recorded including a) the substrate (all locations), b) presence of sessile species, such as seafans and branching sponges (non-maerl habitat only)

and c) the percentage cover of live and dead maerl (maerl habitat only). For maerl habitat, only downward facing cameras were used. For other habitats, both downward facing and outward facing cameras were used to classify the habitat type and record presence of sessile species. Maerl cover was estimated into categories of 0, 1, 2, 5, 10, 20, 30, 40, 50, 60, 70, and 80%, and then further grouped into categories of low (0-10%), medium (10-45%), and high (>45%) maerl categories for visualisation in QGIS.

An important note on sessile species diversity; only obvious and identifiable species were recorded. It is not an absolute measure of the total diversity but allows for relative comparisons in sessile diversity to be made between the sites assessed in this study. A table of species can be found in the appendix (Table 4). All algae species were grouped into red, green or brown, with exception of kelp which was recorded separately. All species are presence/absence with the exception of Seafans (*Eunicella verrucosa*) for which individual fans were counted as they are a species of interest and listed on the Wildlife (Jersey) Law 2021.

2.2. Maerl specific surveys

In areas where maerl was present, additional surveys were undertaken to better understand the condition of the maerl. These surveys included grab samples and video transects, the methods of which are detailed below.

2.2.1. Maerl grab sample surveys

Grab samples were taken from a subset of the identified maerl areas form the drop cameras. Three categories of maerl percentage covers were surveyed based on an average of four sample points in close proximity; high maerl (>40 % on average), medium maerl (10 – 40 % on average) and low maerl (< 10% on average)(Figure 6). It was not possible to get four samples in close proximity from each category at the Ecrehous further research area due to the patchiness of maerl and the size of the area, therefore only two grab samples were taken from each.

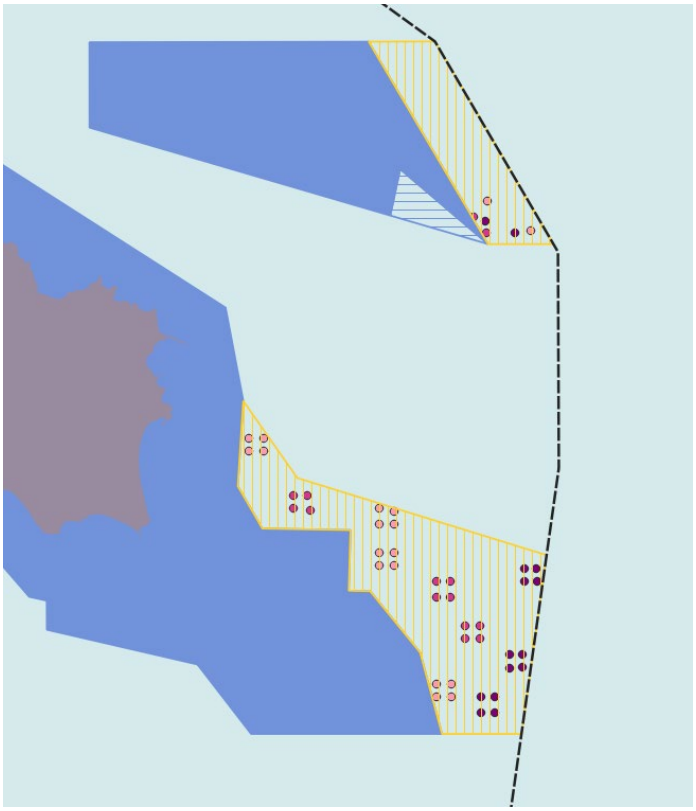


Figure 6. Grab sample locations in the Southeast and Ecrehous further research areas. Light pink = low maerl, medium pink = medium maerl, red = high maerl based on drop camera estimates.

A 0.2m^2 Van Veen grab was used to obtain a sample of sediment and maerl. The sediment and maerl from the grab sample was sieved to remove sediment <5mm in size. A 250 mL subsample of the >5mm sediment and maerl was taken to be separated by hand into live maerl (>50% live pink material), bleaching maerl (1-49% live pink material), dead maerl (no live pink material) and other sedimentary material (Figure 7). Each of these categories were then dried separately at 50°C overnight and then weighed to give a proportion of live, bleaching and dead maerl to other material in the sample.

The live, dead and bleaching maerl was pooled to give a total weight of maerl. The percentage weight of maerl in the grab samples was split into three categories of High, Medium, and Low and an average weight was calculated for each category.

Figure 7. Maerl grab sample split into, live maerl (left), bleaching maerl (middle), dead maerl (right) and other material (sediment and shells, top right).

2.2.2. Maerl underwater transects

A selection of different maerl categories identified using the drop camera methods above were further surveyed using a combination of Remotely Operated Vehicle (ROV) and towed video to determine the area (m^2) of maerl habitat. For each maerl category area (Figure 6), the northwestern point of the four grab replicates was chosen to standardise the data collection. The ROV or towed video was used to video a transect along the seabed over the three categories of maerl habitat (high, medium and low). Video length ranged from 81 m to 269 m. These videos were then later analysed to assess the extent of maerl in meters to determine the continuity of maerl.

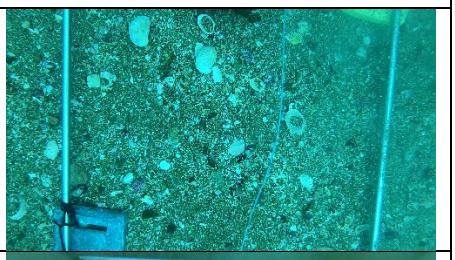
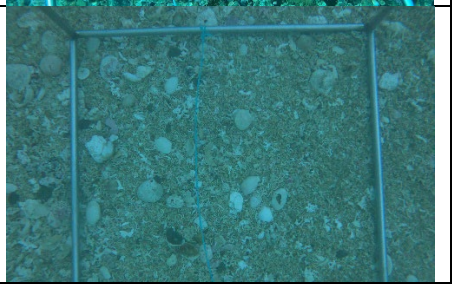
3. Results

The results first summarise the habitat information observed on the drop cameras to categorise the key habitat types in the further research areas and the mobile gear industry requested areas. The results are then split into each individual survey area to present the findings and recommendations.

3.1. Drop camera surveys (habitat and sensitive species distribution)

Five broad habitat types were identified across all of the further research areas (Table 2), using the European Nature Information System (EUNIS) classification system. Two of these habitats, A5.13 and A5.14, have been grouped together for the analysis as they are composed of the same substrate, coarse sediments, but occur at slightly different depths. In some areas there were two habitat types observed on the same drop camera (i.e. maerl bordering circalittoral rock), and in these instances, the dominant habitat type was recorded.

Table 2. Examples of habitat types recorded on the drop cameras.

EUINS	Description	Example image
A4.13	Mixed faunal turf communities on circalittoral rock (bedrock and boulders characterised by sessile fauna).	
A5.13/ A5.14	Infralittoral and circalittoral coarse sediment (coarse sand, gravelly sand, shingle).	
A5.23	Infralittoral fine sand (clean sands which occur in shallow water).	
A5.43	Infralittoral mixed sediments (mosaics of shell, cobbles and pebbles embedded in mud, sand or gravel).	
A5.51	Maerl beds (beds of maerl in coarse clean sediments of gravels and clean sands).	

3.2. Further research area results

These results are presented for each individual research area with a recommendation for their inclusion, partial inclusion or removal from the final MPA boundary.

3.2.1. Paternosters

3.2.1.1. Habitat composition and sessile diversity

The habitats at the Paternosters further research areas to the northwest of Jersey were a combination of coarse sediments (A5.14), mixed sediments (A5.43) and circalittoral rock (A4.13, Figure 8). Overall sessile diversity was 1.4 ±1.7, with higher diversity associated with circalittoral rock (A4.13, 3.4 ± 1.1, Table 55). A further area to the northwest of the Paternosters MPA boundary

was surveyed and was found to be primarily coarse sediments (A5.14), with a mean sessile diversity of 1 ± 1.4.

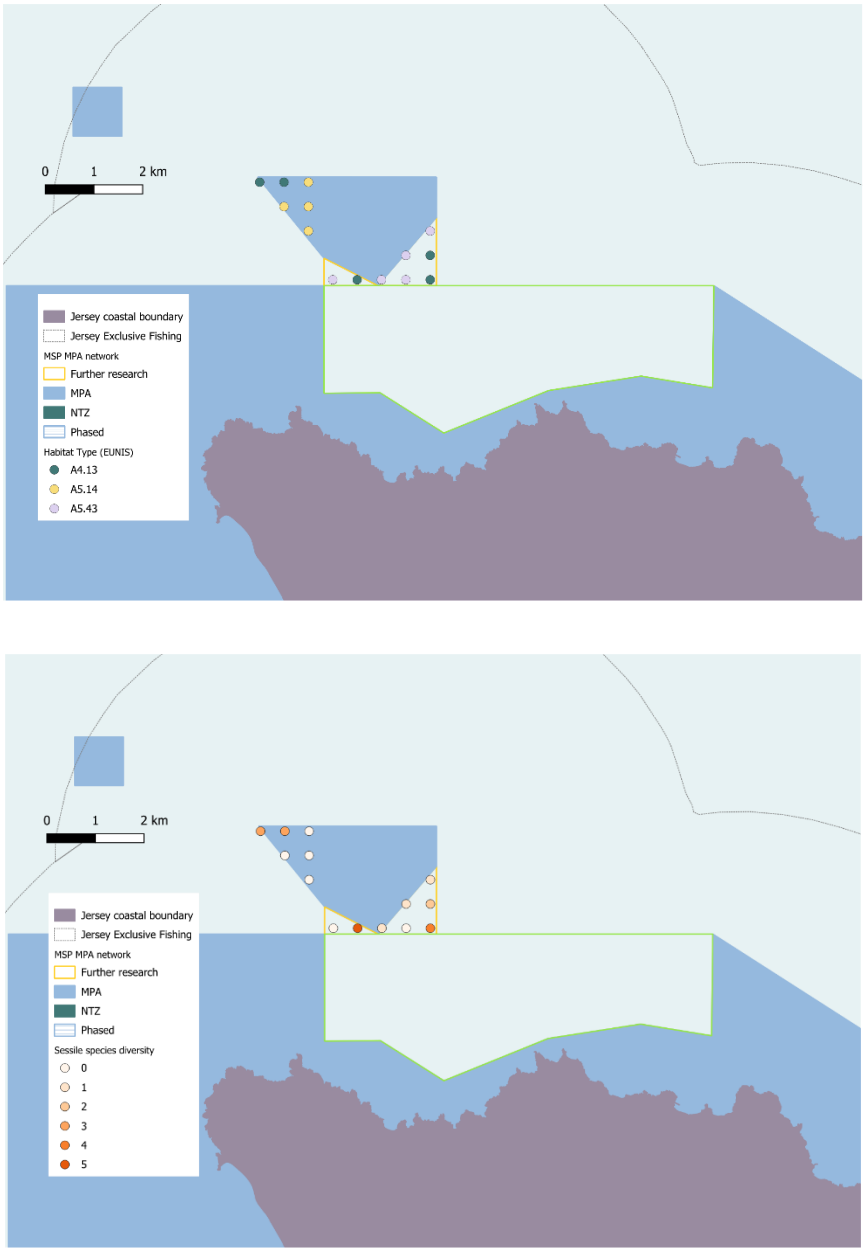


Figure 8. Habitat composition (top) and sessile diversity and seafan counts (bottom) in the Paternosters further research zone.

3.2.1.2. Recommendation

The recommendation is only to include a small portion to the southwest of the Paternosters MPA, due to the presence of circalittoral rock which had relatively high sessile biodiversity observed on the drop cameras, including a seafan (*Eunicella verrucosa*) which is protected under the Wildlife (Jersey) Law 2021. Relatively low sessile biodiversity was found in the Southeast further research area and it has therefore not been recommended for inclusion in the MPA.

The northwest area of the Paternosters MPAs was surveyed as this was an addition to the MPA based on consultation with the mobile gear industry who had suggested adding this area in return

for keeping the southern areas open to mobile fishing. The habitat types in the northwest area were primarily coarse sediment with low sessile species diversity. This area to the northwest is also not included in the Ramsar boundary and it is therefore recommended to remove this area from the MPA boundary.

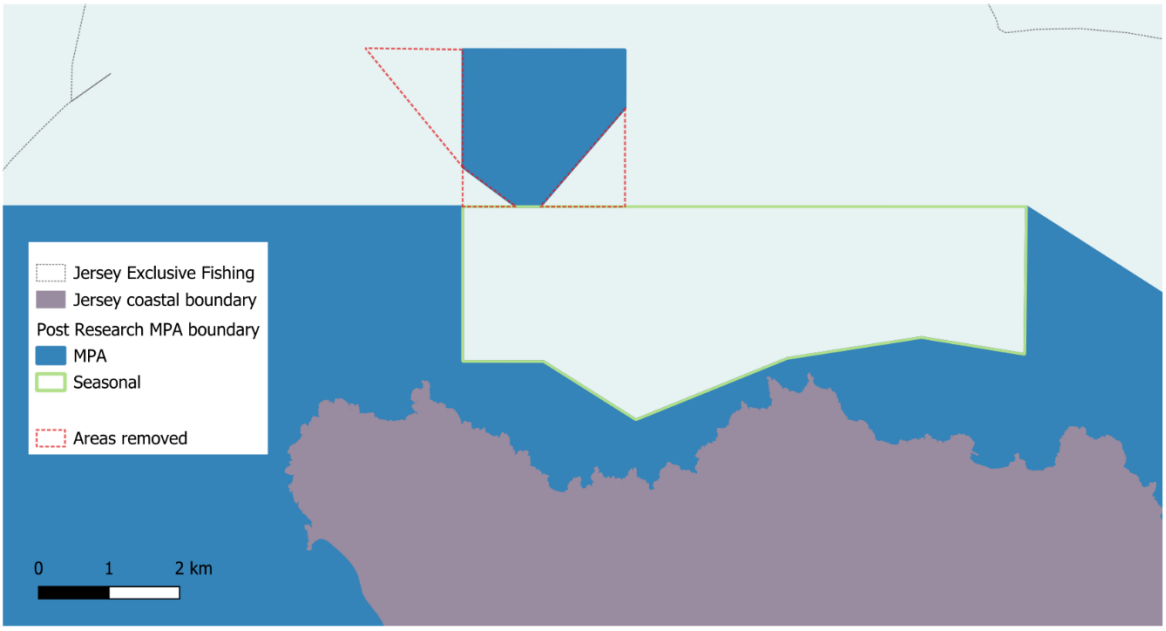


Figure 9. Recommended new boundary to Paternosters MPA (top blue polygon).

3.2.2. Minquiers

3.2.2.1. Habitat composition and sessile diversity

The Minquiers further research areas, both east and west, were primarily composed of three habitat types: coarse sediment (A5.14), mixed sediments (A5.43) and circalittoral rock (A4.13) (Figure 10). There was one occurrence of kelp dominated rock (A3.21) in the eastern Minquiers further research zone. While the habitats composition was largely the same between the east and west further research areas at the Minquiers, the sessile diversity was higher in the west for all three habitat types, with the greatest sessile diversity observed on circalittoral rock in the west (3.4 ± 2, Figure 10, Table 5), compared to 2 ± 0.8 in the east. Mixed sediments in Minquiers west were also more diverse, with 1.4 ± 1.6, compared to 0.4 ± 0.7 in the east. Seafans contributed to the diversity on both circalittoral rock (A4.13) and mixed sediments (A5.43) in the west Minquiers. The number of seafans observed from both downward facing and outward facing cameras at each drop camera location is labelled in Figure 11.

Coarse sediment diversity was greater at Minquiers west but was generally low. Coarse sediment diversity is typically driven by infaunal species and therefore the full diversity of these habitat is not able to be commented on in this report as infaunal species are not visible using drop camera methods, this is true of all locations surveyed.

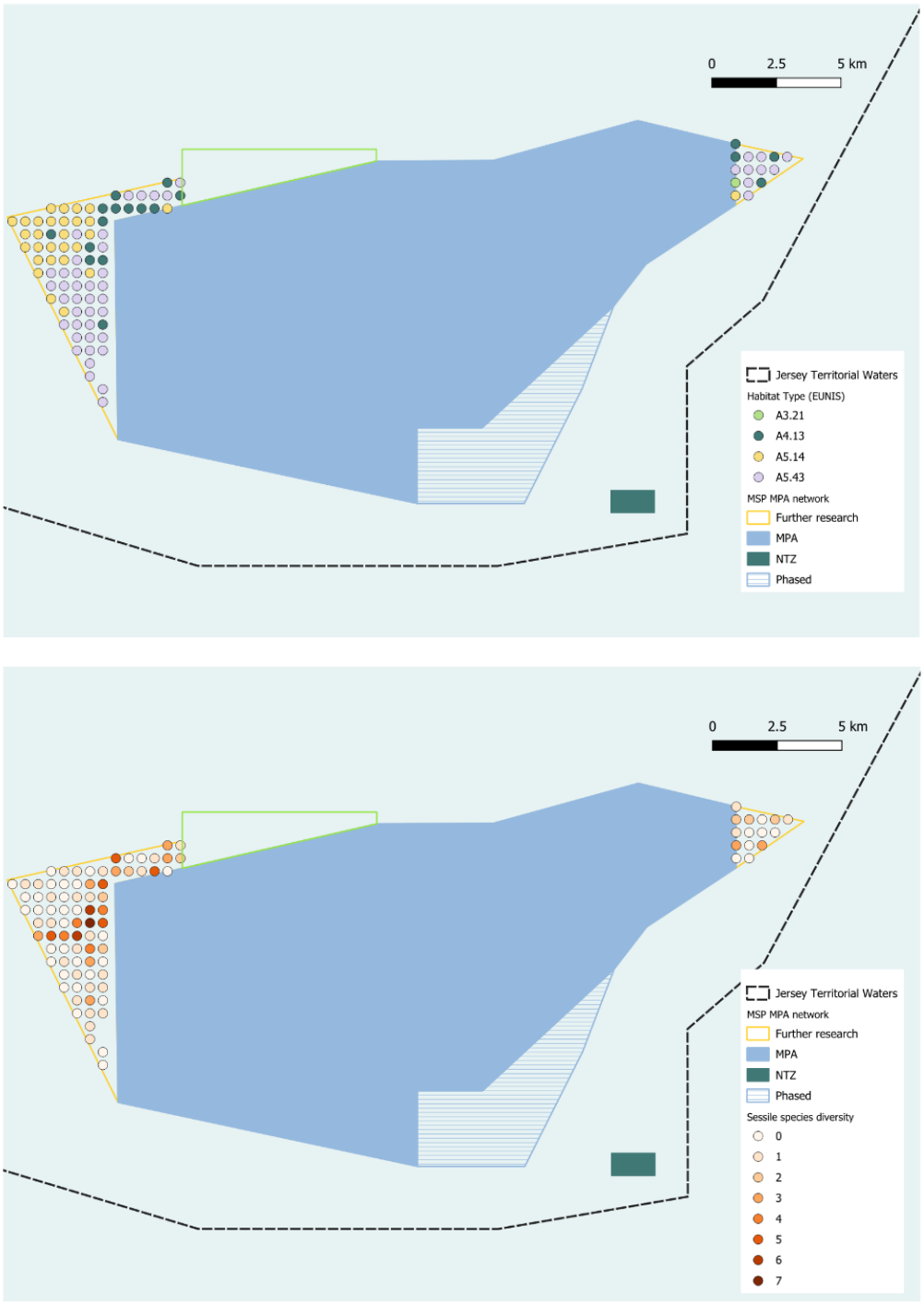


Figure 10. Habitat composition (top) and sessile diversity and seafan counts (bottom) in the Minquiers west further research zone.

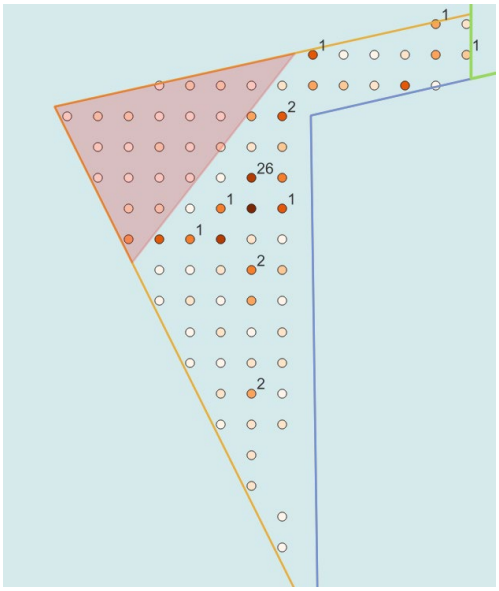


Figure 11. Sessile diversity in the west Minquiers further research area with numbers labels to denote the number of seafans (Eunicella verrucosa) observed.

3.2.2.2. Recommendation

For the west Minquiers research area, the recommendation is to remove the northwest portion only, while including the rest within the MPA boundary. This is based on the presence of rock and mixed sediments that were observed to have relatively high sessile diversity associated with them, and due to the presence of seafans across most of this research area. However, the portion to the northwest was primarily composed of coarse sediments and has relatively low sessile diversity. This, combined with the fishing activity in the northwest of this zone (Figure 3 and Figure 4) is the rational for leaving this part of the research area open to mobile gear fishing.

For the east Minquiers further research area, the recommendation is to leave the whole area open to mobile gear fishing. This is because there was relatively low sessile biodiversity despite the habitat composition being similar to that of the west Minquiers, and because there is considerable use, and therefore economic importance, of the east Minquiers research area by the French mobile fishing fleet (Figure 4). The final MPA boundary for the Minquiers is shown in Figure 12, with the areas to be removed from the MPA boundary are shown in dotted outlines.

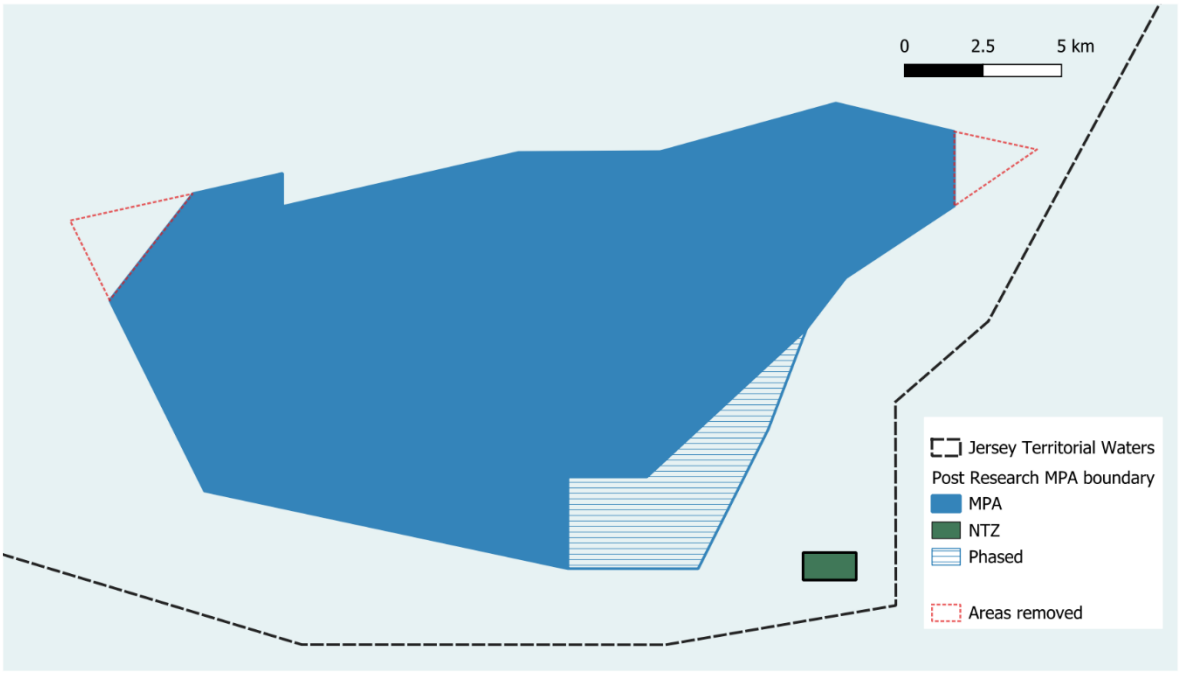
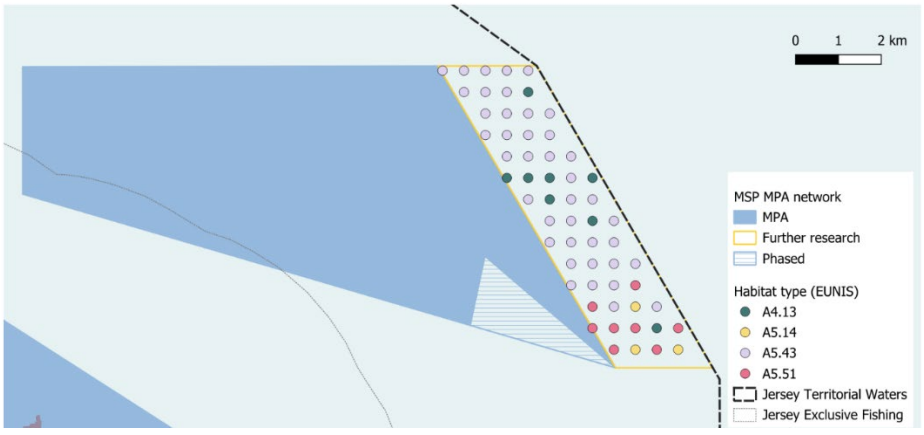


Figure 12. Recommended new boundary to Minquiers MPA. Dotted outlines show the areas that were in the further research areas that did not get included in the final MPA boundary. The central dotted polygon shows the Ramsar area at the Minquiers.

3.2.3. Ecrehous

3.2.3.1. Habitat composition and sessile diversity

The majority of the Ecrehous further research zone was composed of mixed sediments (A5.43), with some areas of circalittoral rock (A4.13). Maerl (A5.51) was found in the southern portion of this zone (Figure) and is further described below in the maerl results. Sessile diversity on the non-maerl substrates (A5.43 and A4.13) was 1.2 ± 1.



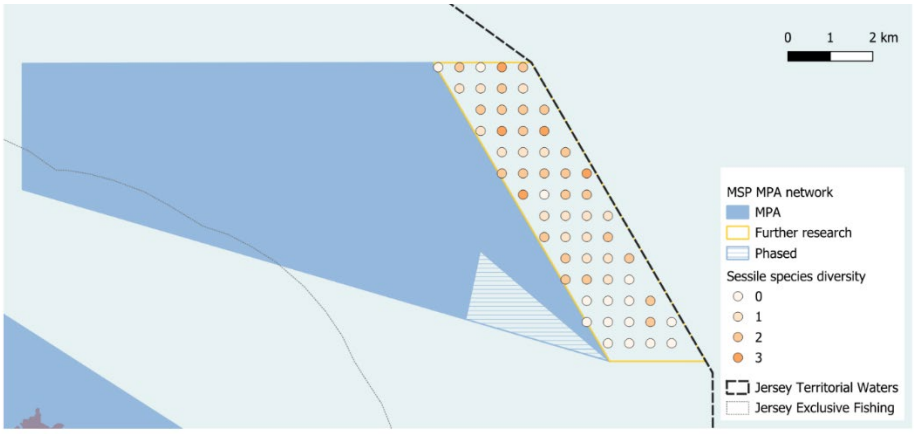


Figure 13. Habitat composition (top) and sessile diversity (bottom) in the Ecrehous further research zone.

3.2.3.2. Maerl coverage (drop cams)

Of the 59 drop cameras in the Ecrehous further research area, 31 had maerl but only 11 had more than 5% maerl. Where maerl occurred, the percentage cover varied strongly, from 1 to 90%, with most of the maerl concentrated in the southern portion of this area. The maerl observed in the top three quarters of the area was very low (<5%) and mostly dead maerl that is likely to have been pushed in with tides and currents. Of the maerl in the bottom quarter of the area, there were five points of high maerl (average 67% ± 21.4), three points of medium maerl (26.6% ± 2.9), and six points of low maerl (3.3% ± 2.5).

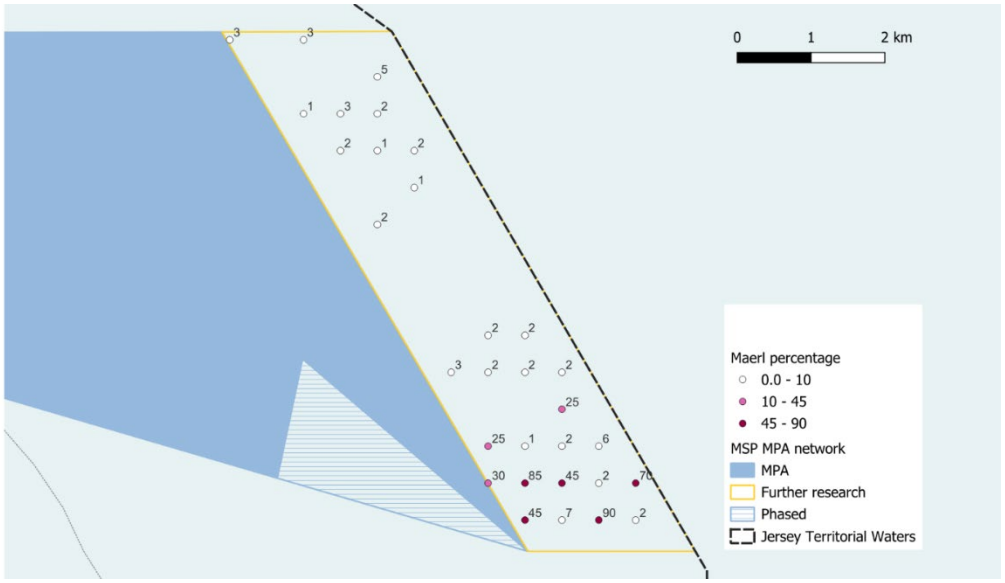


Figure 14. Maerl percentage cover estimated from drop cameras in the Ecrehous further research area.

3.2.3.3. Maerl weight (grabs)

The maerl weight in grab samples from the Ecrehous further research zone ranged from 1 to 22 %, with an average of 9 ±7.6 across the samples. The percentage weight of maerl did not match up with the estimated percentage cover by eye and there were no grab samples categorised as high maerl. This may be due to the patchy nature of the maerl here but may also be related the substrate underneath the maerl (some areas of bedrock and cobble) making it harder to get a grab sample. Of the three medium maerl grab samples, the average percentage weight of maerl

was 15% ± 6, and of the three low maerl grabs samples, the average percentage weight of maerl was 3.3% ± 2.5.

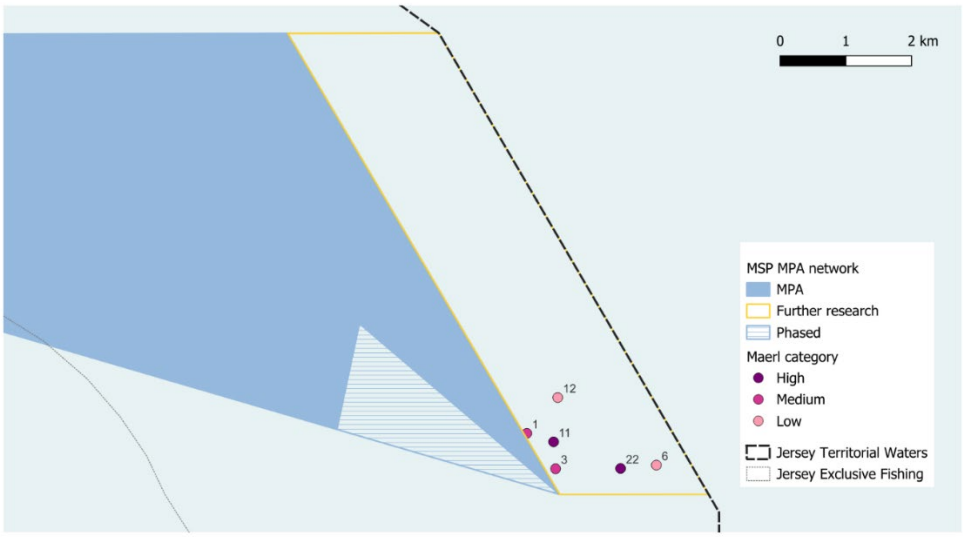


Figure 15. Maerl weight as a percentage of the > 5 mm sediment in the grab samples from the Ecrehous further research zone. Numbers show the exact percentage weight per sample, whereas colours represent the category of maerl as determined by the maerl coverage estimates from the drop cameras.

3.2.3.4. Recommendation

The recommendation is to leave the whole of the research area open to mobile gear due to the low levels of maerl observed in the top three quarters (Figure 16). While higher levels of maerl were observed in the southern quarter of this research area it was very patchy and was primarily dead accumulations of maerl. Further, there is high mobile gear activity here (Figure 3 and Figure 4) and the levels of maerl are deemed insufficient for protection in the face of the economic value this area holds to the scallop industry.

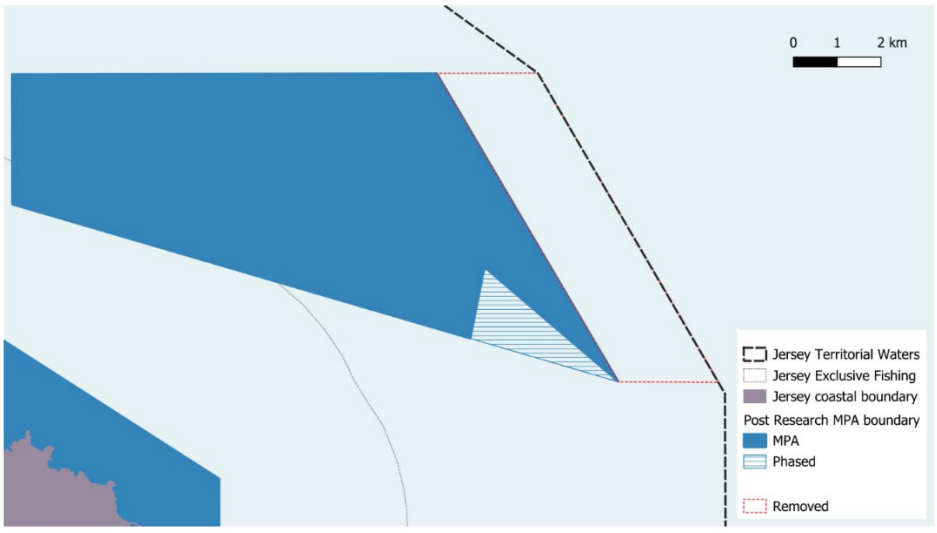


Figure 16. Recommended new boundary to Ecrehous MPA. Dotted outlines show the areas that were in the further research areas that did not get included in the final MPA boundary.

3.2.4. Southeast

3.2.4.1. Habitat composition

The Southeast further research zone was composed of maerl (A5.51) and coarse sediments (A5.14), with maerl being the dominant habitat type. The percentage cover of maerl varied and this is detailed in the maerl section of the results below. As with other locations, sessile species composition was not assessed for maerl habitat as this was not a criteria for this habitat and because maerl biodiversity is typically infaunal and therefor not visible using visual survey techniques.

Figure 17. Habitat composition in the Southeast further research zone.

3.2.4.2. Maerl coverage (drop cams)

Of the 175 drop cameras in the Southeast further research area, 140 had a minimum of 5% maerl (Figure 18). Where maerl occurred, the percentage cover varied strongly, from 1 to 80%. The high maerl (>45%) locations accounted for 16% of the drop cameras, and the medium maerl (10-45%) locations accounted for 50%. The high maerl locations were distributed across the survey area but were more concentrated to the east of the survey area. The most inconsistent area of maerl was to the northeast, around what is locally referred to as the Banc du Chateau. This is a known sand bank and the maerl in this area appeared to be accumulations of dead, fragmented maerl.

Figure 18. Maerl percentage cover estimated from drop cameras in the Southeast further research area. Number labels denote the estimate percentage at each location.

3.2.4.3. Maerl weight (grabs)

The primary habitat type in the Southeast further research zone was maerl but the condition varied across the area. To better understand the condition of maerl, a number of grab samples were taken from areas with low (0-15 %), medium (15-30%), and high (>30%, with one exception of 25% to make up a replicate of four grab samples in an otherwise high maerl area) maerl percentage cover as estimated from the drop cameras. Areas where there were four of these categories (high, medium or low) next to each other were selected to give adequate replication (Figure 19).

Of the four low maerl areas, the average maerl weight was (17 ± 14.3). Of the three medium maerl areas the maerl weight was 43.4 ± 16.8, and of the three high maerl areas the weight was 72.5 ± 15.3.

Figure 19. Maerl weight as a percentage of the > 5 mm sediment in the grab samples from the Southeast further research zone. Numbers show the exact percentage weight per sample, whereas colours represent the category of maerl as determined by the maerl coverage estimates from the drop cameras.

The distribution of maerl in the grab samples typically reflected that of the drop cameras, but with a higher overall percentage in the grabs. This higher percentage will in part be due to a number of factors. Firstly, only sediment >5mm in size was used to obtain maerl percentages from grab samples. Secondly, it was not possible to take the grab sample and drop camera images from the exact same spot. Thirdly, there is more maerl than that which is visible on the surface as it accumulates in a layer that is multiple centimetres thick, whereas the grab takes samples up to 20 cm deep. Finally, drop camera surveys do not provide high enough resolution photos to see all of the maerl and therefore the estimates are conservative and not absolute (i.e. only the obvious nodules of maerl are included in the percentage estimate).

3.2.4.4. Maerl extent (towed videos)

Transects were carried out in the Southeast further research area on areas of previously identified high, medium and low maerl (see drop camera results).

Of the 475m of high maerl transects and 313m of medium maerl transects, there was a 100% continuation of maerl habitat, with the exception of small patches of bedrock (A4.13/A3.12) at one high maerl site (HM2). Transects on low maerl were patchy. Of the 355m of low maerl transects, 179m had sparse maerl present.

Figure 20. Maerl transect locations categorised by high (red), medium (medium pink) and low (light pink) as based on initial drop camera assessments.

3.2.4.5. Recommendation

The recommendation for the southern part of this area has been discussed with consideration for the mobile gear requested survey area to the south of the Anquettes. Please see section 3.3.4 for the results relating to the south Anquettes survey area.

The area to the south of the Southeast further research area is recommended to be removed from the final MPA boundary. This area links up with the requested survey area to the west (South Anquettes), within which little sensitive habitat or sessile diversity was observed but where there is high mobile gear use by the Jersey fleet (Figure 3). It is also recommended to remove the very northern triangle of the Southeast further research area from the MPA boundary. This is because little maerl was observed in this area, and where maerl was present it was primarily dead

accumulations of maerl in close proximity to the sand bank called the Banc du Chateau. This sand bank is also a hotspot for mobile gear activity (Figure 3) and is a relatively sheltered spot from westerly winds. By removing these areas from the MPA boundary, it allows for two areas with high mobile gear activity area to remain open, reducing the impact of the MPAs on this industry.

Figure 21. Recommended new boundary to the Southeast MPA. Red dotted outlines show the areas that were in the further research area that did not get included in the final MPA boundary. The shaded grey outlines the South Anquettes research area which is also recommended to be removed from the MPA boundary.

3.3. Mobile gear industry requested survey area results

3.3.1. Jument Bank (south Corbiere, Zone A)

3.3.1.1. Habitat composition and sessile diversity

The additional research zone to the south of Corbiere, over Jument bank, was primarily coarse sediment (A5.14) with some areas of mixed sediments (A5.43) to the north and south of this zone. There was one occurrence of sediment affected kelp and seaweed communities on rock (A3.12) in the north of this zone (Figure 22). Sessile diversity to the south of Corbiere was very low (0.4 ± 0.7) and was composed of keel worm and red algae (Figure 22).

Figure 22. Habitat composition (left) and sessile diversity (right) in the Jument bank requested research zone.

3.3.1.2. Recommendation

It is recommended that the majority of this area is open for trawling in the winter months (December, January and February), and to classify it as seasonal access instead of MPA. The northern boundary of this seasonal access area has been straightened and angled so as to exclude the kelp dominated rock and the mixed sediments in the northern portion of this area.

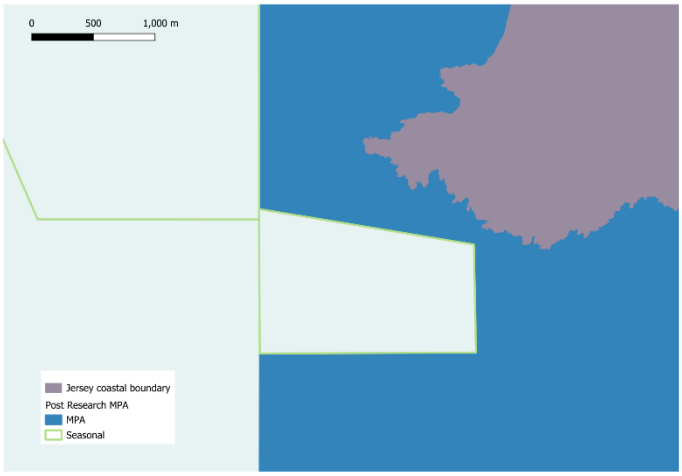


Figure 23. Recommended new boundary to the MPA on the southwest coast (Jument Bank).

3.3.2. St. Aubins Bay (Zone B)

3.3.2.1. Habitat composition and sessile diversity

The habitat composition in St. Aubins (zone B, Figure 3) bay was a combination of coarse sediment (A5.13), mixed sediments (A5.43) and fine sand (A5.23) dominated by sand mason worms (*Lanice conchilega*) and peacock worms (*Sabella* sp.). Sessile diversity was low on the whole (0.9 ± 0.8) but variable due to some areas of mixed sediments having relatively high sessile diversity (1.1±1), particularly to the east. The coarse sediment sessile diversity (0.7 ± 0.8) was slightly higher in St. Aubins than any of the other locations surveyed which may be due to the occurrence of two sessile worm species (*Lanice conchilega* and *Sabella* sp.) in the west of St. Aubins research area. These species create structure on the seafloor and also help to stabilise sediments, allowing more diverse communities to establish.

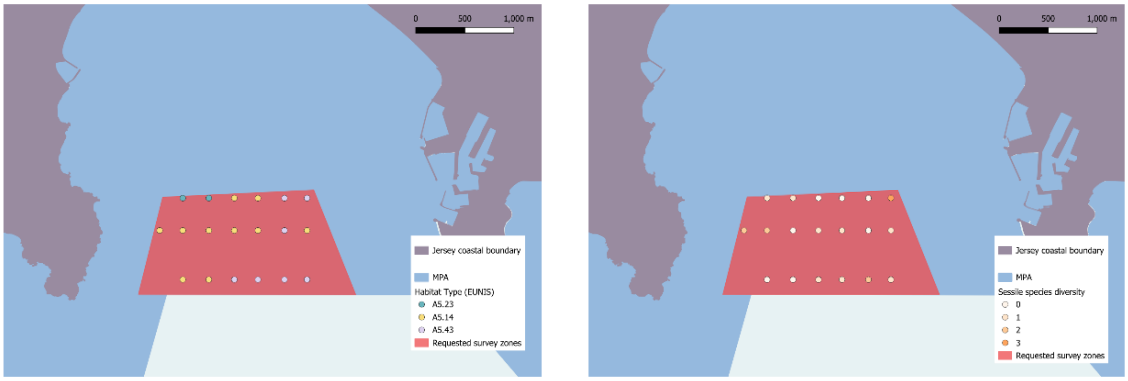


Figure 24. Habitat composition (left) and sessile diversity (right) in the St Aubins requested research zone.

3.3.2.2. Recommendation

It is recommended that the majority of this area is open for trawling in the winter months (December, January and February), and to classify it as seasonal access instead of MPA. The east and west boundaries of this seasonal access area have been tapered in on the landward side so as to ensure the more sensitive and diverse habitats are included within the MPA. By opening this area to mobile gear fishing in the winter, it will allow vessels to continue fishing during winter storms as this is a relatively sheltered location close to port.

Figure 25. Recommended new boundary to the MPA on the south coast (St. Aubins bay).

3.3.3. Gorey (Zone C)

3.3.3.1. Habitat composition and sessile diversity

Habitats to the east of Gorey (zone C, Figure 26) within the originally proposed MPA boundary were a mix of maerl (A5.51) and coarse sediment (A5.13/A5.14). There was one area of circalittoral rock (A4.13) which had the highest sessile diversity in this area (3), and two areas of slipper limpet beds (A5.422) which had a sessile diversity of 0. Additional drop cameras were carried out to determine the coverage of maerl; sessile diversity was not assessed for maerl drop cameras as was the case with other maerl areas.

Of the 29 drop cameras in the requested further survey zone to the east of Gorey, 18 had maerl. The maerl coverage varied (1-80%) and was more sparse along the eastern edge of this zone which overlaps with the western edge of the Banc du Chateau (Figure 27).

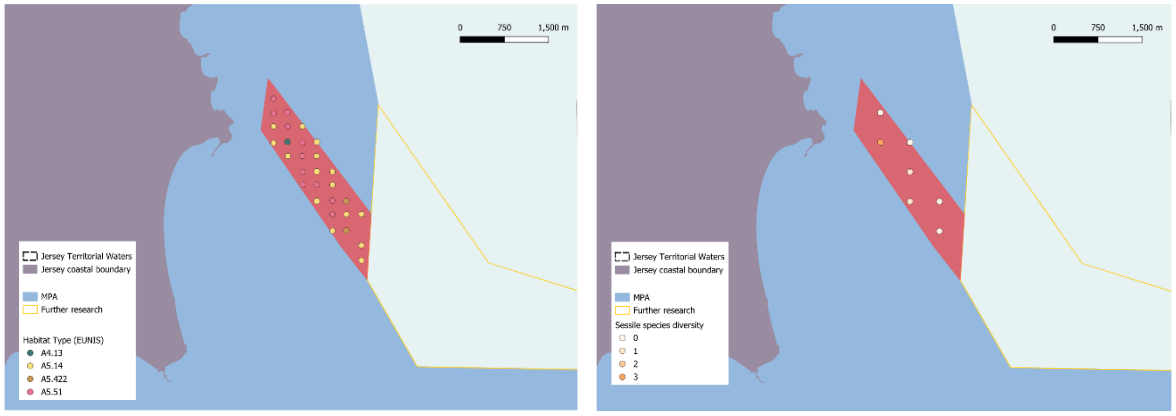


Figure 26. Habitat composition (left) and sessile diversity (right) in the Gorey requested research zone (red shading).

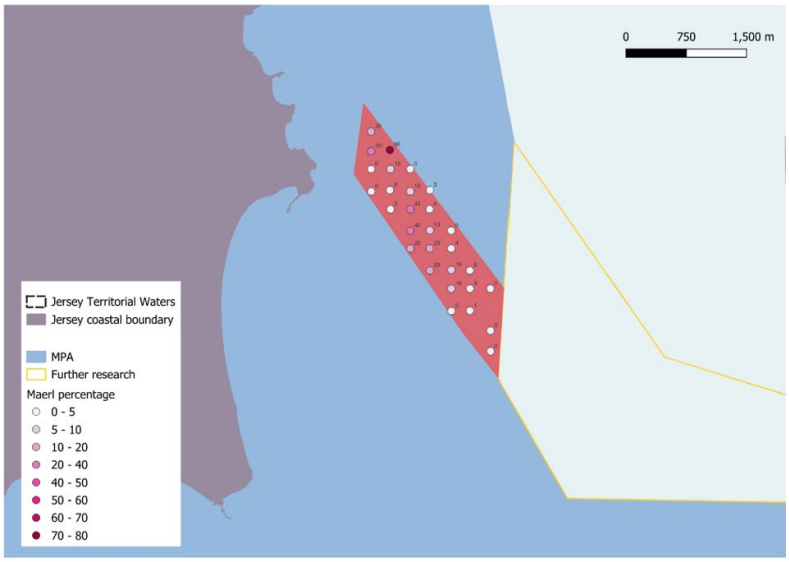


Figure 27. Maerl percentage cover estimated from drop cameras in the Gorey survey area. Number labels denote the estimated percentage of maerl at each location.

3.3.3.2. Recommendation

The recommendation is to retain this whole area within the MPA boundary, as it was originally proposed. This is because of the presence of maerl. However, the boundary line has been straightened along the eastern edge to improve navigation of the MPA and this has opened another small section of seabed in this area to mobile fishing (Figure 28).

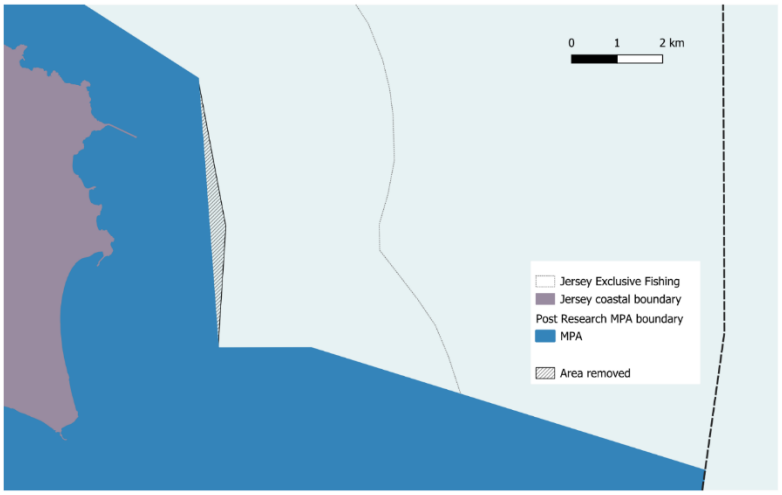


Figure 28. Recommended new boundary to the MPA on the east coast.

3.3.4. South Anquettes (Zone D)

3.3.4.1. Habitat composition and sessile diversity

The area to the south of the Anquettes (zone D, Figure) that was within the originally proposed MPA boundary had no maerl and was instead a mix of coarse sediment (A5.14), mixed sediments (A5.43) and circalittoral rock (A4.13). Sessile diversity was relatively low (0.7 ± 0.9) despite the presence of circalittoral rock (A4.13). The circalittoral rock sessile diversity was 1.5 ± 1, which was the lowest sessile diversity observed on this habitat type across the locations surveyed (Table 55).

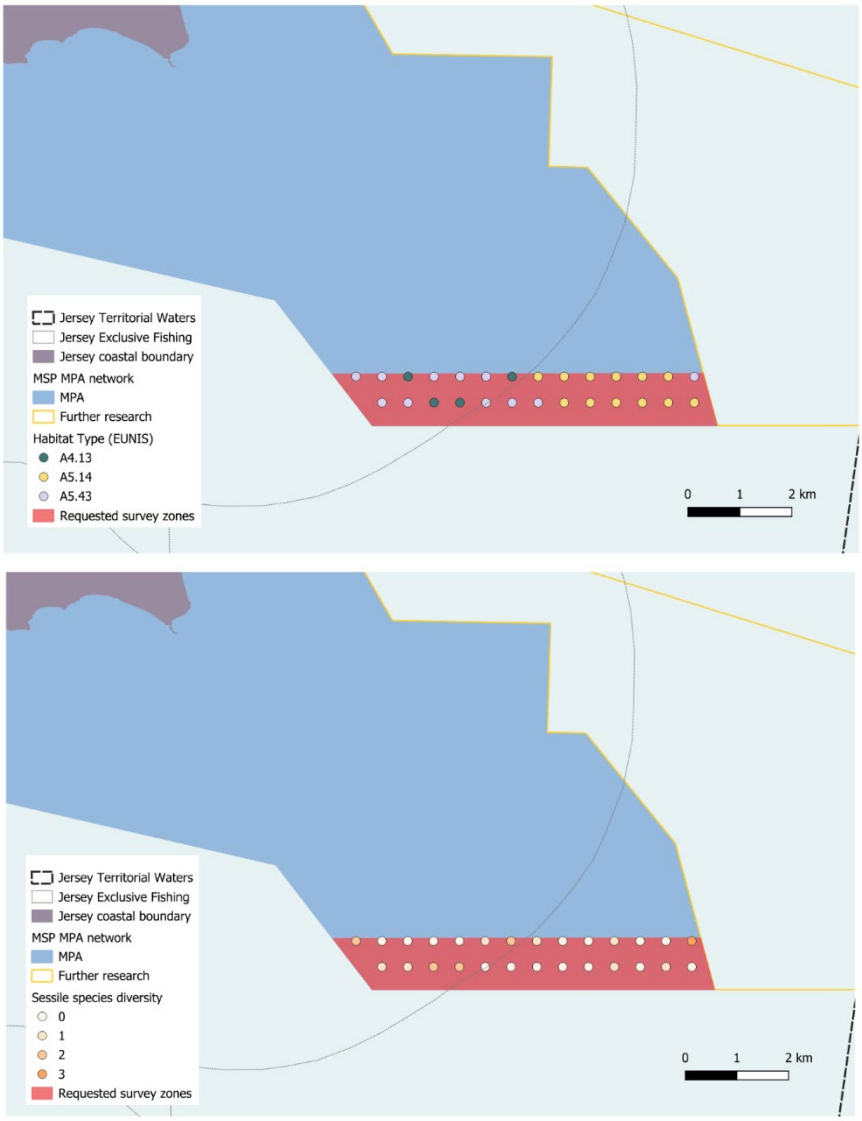


Figure 29. Habitat composition (top) and sessile diversity (bottom) in the south Anquettes requested research zone.

3.3.4.2. Recommendation

This recommendation for this area also takes into consideration the Southeast further research area (Figure 30). It is recommended that the whole of this requested area is left open to mobile gear fishing year-round as it is predominantly coarse sediments. Where rock habitat occurred, it was relatively low diversity compared to other further research areas. A small section to the northeast of this requested survey area has been opened to improve connectivity with the Southeast further research area that is also recommended to be left open. There is high mobile gear fishing activity here for a number of vessels and by connecting these two areas together, it will allow mobile vessels to compete their full run and be able to turn within this space without encroaching on any hotspots of maerl habitat.

Figure 30. Recommended new boundary to the South Anquettes MPA. Red dotted outlines show the areas that were in the survey areas that did not get included in the final MPA boundary.

3.4. Maerl model accuracy

The accuracy of the modelled maerl was assessed by plotting all of the drop camera positions that had more than 5% maerl coverage (Figure 31). If a drop camera was on the boundary of the modelled maerl, it was included as a modelled maerl drop.

In the Southeast further research area, there were 107 drop cameras on modelled maerl habitat, and of these, 97 had a minimum of 5% maerl coverage. This equates to a 91% accuracy of the model. However, there were also multiple occurrences of maerl outside of the modelled maerl boundary, with 43 out of 68 drops showing maerl was present, primarily to the south of the current modelled extent. This highlights that model underestimates maerl coverage on the southeast coast.

In the Ecrehous further research area, there were 23 drop cameras on modelled maerl, and of these, only 6 had a minimum of 5% maerl coverage. This equates to a 26% accuracy of the model. However, similarly to the Southeast, there were some areas of maerl outside of the modelled maerl extent. Five out of the 36 drop cameras outside of the modelled maerl had maerl present, again, this was primarily to the south of the modelled extent.

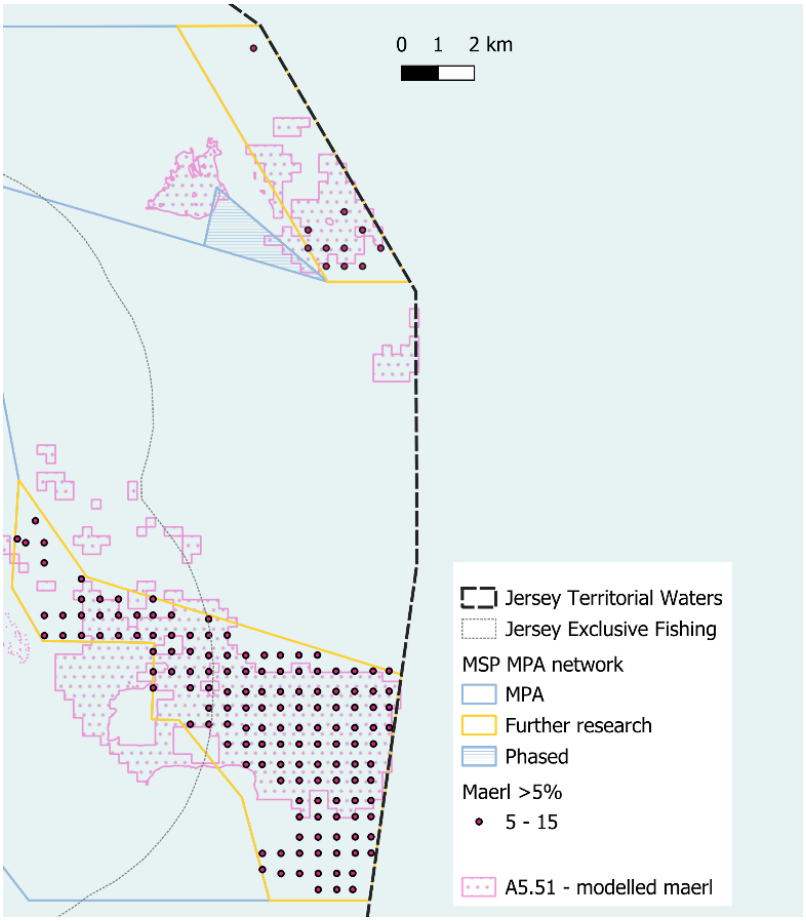


Figure 31. Modelled maerl extent in a) Southeast further research area and b) Ecrehous further research area, is shown as polygons filled with small pink dots. The further research areas are outlined in yellow. Pink points show where maerl was observed on drop cameras.

4. Recommended MPA network

Figure 32 shows the MPA network as proposed in the final version of the MSP but with dotted outlines showing areas that are recommended to be left open to bottom towed fishing following the results from the 2025 surveys in the further research areas.

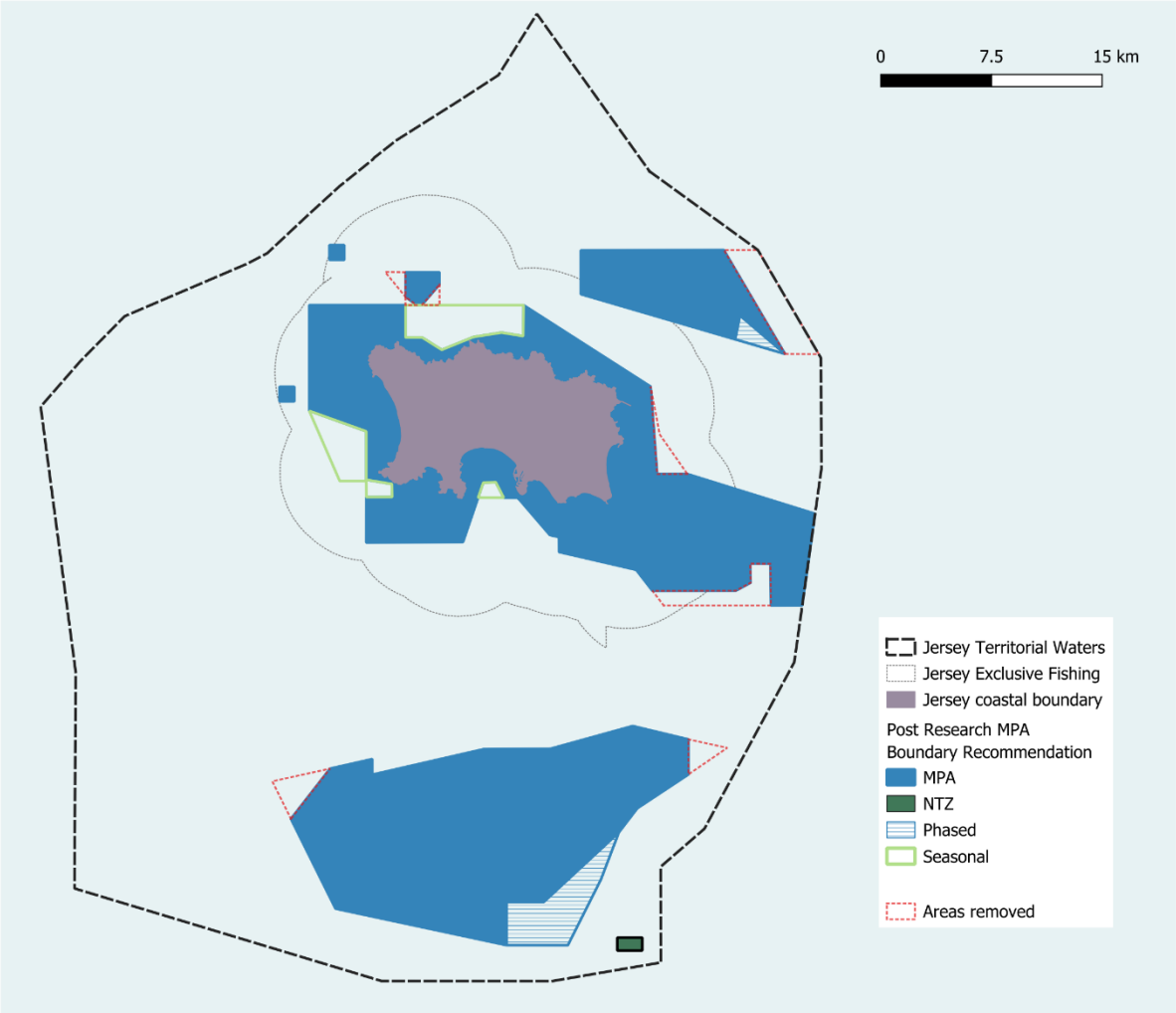


Figure 32. The recommended MPA boundary based on most recent evidence as detailed in this report.

The orginal MPA proposal in the JMSP equated to 22.3% of Jersey's teritorial waters, with a further 1% of phased MPAs in 2030. The new recommended MPA boundary following the research carried out in 2025 is 23.2%, with another 1% of phased MPA to be desingated by 2030 (Table 3). The main changes are the addition of the southeast offshore area and the additoin of the area west of the Minquiers, the removal of the seasonal area north of the Minquiers, and the change from MPA to seasonal of two areas inshore on the south coast of Jersey.

Table 3. Percentage area of protection categories in the original MSP proposal and in the post research recommendation.

MPA category	Original proposal	Post research recommendation
MPA and NTZ	22.3	23.2

No Take Zone (included above)	0.06	0.06
Phased	1	1
Seasonal	1.7	1.4
Total by 2030		**24.2**

Some small alterations are recommended to improve the navigability of the MPA network. Figure 33 shows a boundary of the MPA which has been simplified in order to improve its navigability. Where possible the lines have been straightened out to decrease the number of base points that define the MPA boundary, making it simpler to input into vessel plotters, minimising risk of errors navigating at sea and therefore improving compliance. The lines have been straightened where a balance between MPA and open fishing ground can be found without altering the final MPA coverage, resulting in an MPA that covers 24% of Jerseys territorial waters by 2030.

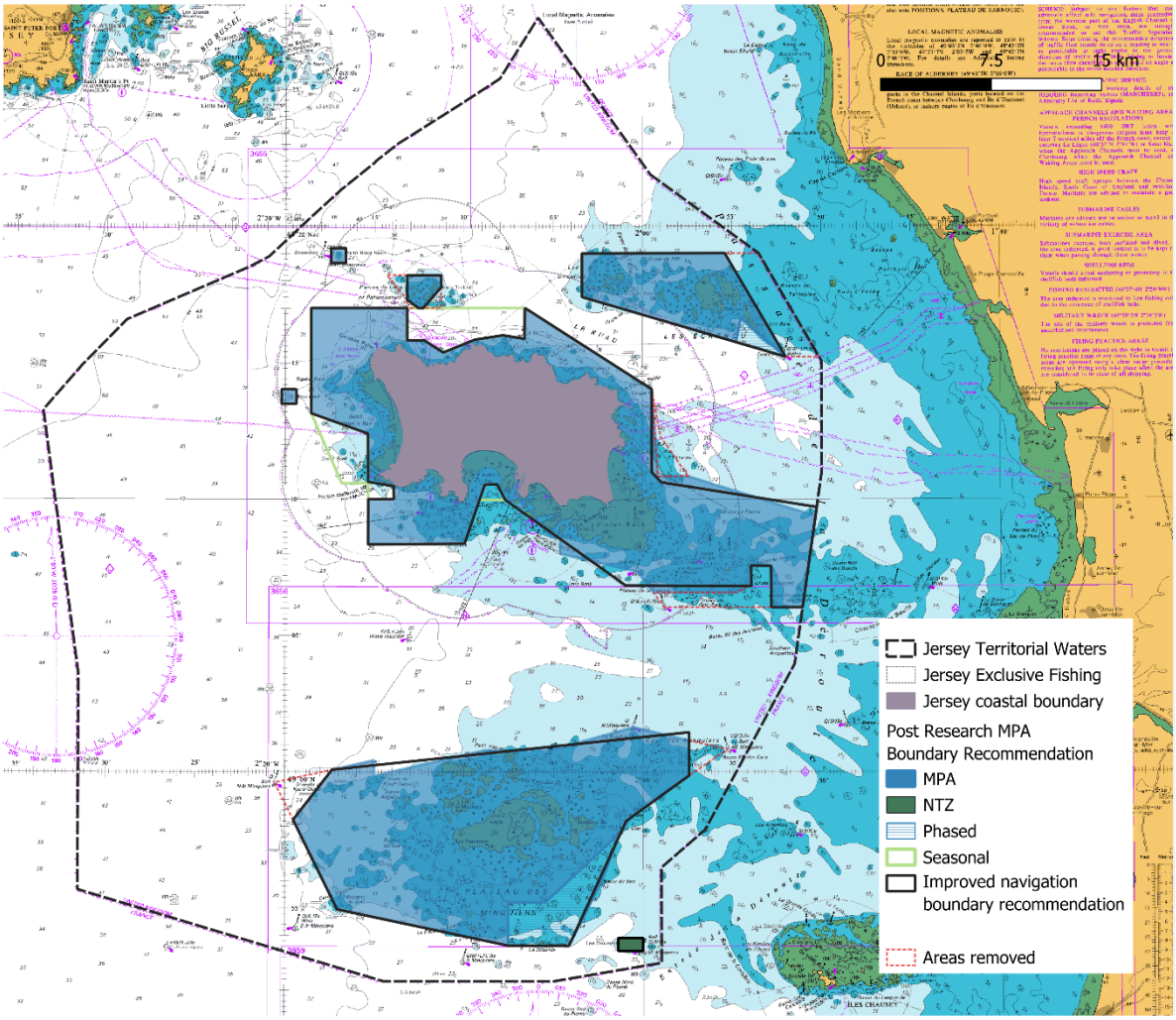


Figure 33. Final evidence-based MPA boundary recommendation with refined navigable boundary for MPA and phased areas overlaid. Displayed on a plain background (top) and on an admiralty chart (bottom).

5. Conclusion

Striking a balance between the protection of OSPAR listed habitats and the continued use of mobile fishing gear is essential for both ecological integrity, the future of sustainable fisheries and socio-economics of the local fishery. Robust scientific research has been undertaken in the further research areas in Jersey territorial waters. A mix of habitats have been found including areas with high percentages of maerl which were previously not modelled and also areas of coarse, mobile sand which do not warrant protecting. Areas which have been proven to show high levels of OSPAR listed habitats have all been recommended for closure from mobile gear fishing due to their irreplaceable ecological functions and slow recovery rates. Areas of high biodiversity or where sensitive and slow growing species occurred have also been considered in the MPA network. However, exceptions are made throughout the territory where evidence of sensitive habitat or species were not abundant enough.

In inshore areas which were closed for conflict issues, further exceptions are made to ensure access over winter months when conflict is less likely. Crucially, consultation with industry stakeholders has played a central role in this review with areas A, B, C & D being re-surveyed, all

of which have subsequently been partially or wholly removed from the MPA recommendation. This process establishes the mandatory protection of OSPAR listed habitats and biodiverse areas while ensuring continued use of mobile fishing gear around Jersey territorial waters encompassing the views and fishing patterns of all who access these areas.

6. Appendix

Table 4. The sessile species associated with the key habitat types at each location. Blank cells mean that the species was not noted on any habitat type at that location. Note that this is not a comprehensive list of species associated with these habitat types, just those that were readily identifiable from the drop cameras.

Species	Corbiere	Ecrehous	Gorey	Minquiers E	Minquiers W	Paternosters	South Anquettes	St Aubins
Red algae	A5.43	A4.13, A5.43	A4.13	A3.21, A4.13, A5.43	A4.13, A5.43	A4.13	A4.13,A5.14,A5.43	A5.14,A5.43
Keel worm	A5.43	A4.13, A5.43		A4.13, A5.43				
Encrusting sponge		A4.13, A5.43	A4.13	A3.21, A4.13,A5.43	A4.13, A5.43	A4.13,A5.43	A4.13,A5.43	
Botryllus schlosseri		A4.13						
Dendrodoa grossularia		A4.13,A5.43	A5.14	A4.13	A4.13, A5.14, A5.43	A4.13		
Anemone sp.		A4.13,A5.43					A5.43	
Cereus pedunculatus		A5.14						
Actinothoe sphyrodeta		A5.14,A5.43						
Branching sponge		A5.43	A4.13		A4.13, A5.14, A5.43	A4.13		
Massive spong		A5.43		A3.21				
Hydroids		A5.43		A5.43	A4.13, A5.14, A5.43	A5.43	A5.43	
Ciocalypta penicillus		A5.43	A5.14					
Anemonia viridis		A5.43						
Styela clava		A5.43						
Halidrys siliquosa			A4.13					A5.43
Lanice conchilega			A5.14,A5.43		A5.43			A5.14
Pecten maximus				A5.43	A5.14			A5.14
Eunicella verrucosa					A4.13, A5.43	A4.13		
Flustra foliacea					A4.13, A5.14, A5.43	A4.13	A4.13	
Alcyonium digitatum					A4.13, A5.43			
Echinus esculentus					A4.13,A5.14,A5.43			
Bispiral worms					A4.13			
Axinella dissimilis					A4.13,A5.14,A5.43	A4.13		
Cup coral					A4.13			

Marthasterias glacialis					A4.13			
Adreus fasciculari s					A4.13,A5.14,A5.43			
Pentapora foliacea					A4.13,A5.14,A5.43			
Tethya citrina					A5.43			
Crepidula fornicata							A5.14	A5.43
Sabella sp.								A5.14,A5.23
Dictyota dichotoma								A5.43

Table 5. Average sessile species diversity, and standard deviation, of the three main habitat categories across the further research areas. A Standard deviation of NA meant that the habitat did not occur in that location.

Location	A5.14 – coarse sediment	SD	A5.43 – Mixed sediments	SD	A4.13 – circalittoral rock	SD
Corbiere	0	0	1.5	0.58	NA	NA
Ecrehous	0	0	1.4	0.9	1.63	0.92
Gorey	0.67	0.47	NA	NA	3	NA
Minquiers west	0.5	0.84	1.4	1.64	3.36	2.1
Minquiers east	0	NA	0.44	0.73	2	0.82
Paternosters	0	0	0.6	0.55	3.4	1.14
South Anquettes	0.33	0.5	0.73	1	1.5	1
St Aubins	0.7	0.82	1.14	1.07	NA	NA