



Killybegs Fishermen's Organisation Stage 2 Appeal to the Designated Areas Appeals Advisory Board (DAAAB) after the Stage 1 rejection of the objection to the Notice of Intention to Designate Porcupine Shelf and Southern Canyons as Special Areas of Conservation.

21/05/2024, 10/03/2025 correction added to P20

1. Summary

- The current delineation of the proposed Porcupine Shelf and Southern Canyons SACs does not reflect the scientific evidence provided and does not align with the designation basis, *Reefs* (1170).
- The evidence indicates that *Reef* habitat is only present in a small fraction of the delineated areas, therefore the spatial scale of the proposed SACs is not supported by the scientific evidence.
- NPWS failed to prove that the proposed SAC sites fulfil the criteria listed in Annex III Stage 1 of the EU Habitats Directive, which is a minimum requirement for designation.
- The original *Notice of Intention to Designate* process was not performed according to the regulations and the data subsequently cited by NPWS was not available for public scrutiny or for verification of its validity as required.
- The KFO objection to the *Notices of Intention to Designate* was dismissed on incorrect "ornithological grounds" at the Stage 1 NPWS review process and the content of the objection report was not considered appropriately.
- Based on the scientific information presented in the current report, NPWS should adjust the boundaries of the proposed SACs and these adjustments should be made following a comprehensive stakeholder engagement process and a new *Notice of Intention to Designate* process.
- The new consultation process should ensure that it '*involves all relevant stakeholders, including sea users, local communities and NGOs in the identification, designation, and management of new protected areas, in a fair and participatory way, in line with the Aarhus Convention and in accordance with national procedures.*'

2. Objection and reason for appeal

On the 15th of February 2023, the Killybegs Fishermen's Organisation (KFO) objected [1], on behalf of its members, to the proposed designation of the Porcupine Shelf (002267) and Southern Canyons (002278) as Special Areas of Conservation (SACs). The scientific bases of the objection were that:

1. The current delineation of the proposed SACs does not reflect the scientific evidence provided and does not align with the designation basis, *Reefs* (1170).
2. The evidence indicates that this habitat type is only present in a small fraction of the defined areas, therefore the spatial scale of the proposed SACs is not supported by the scientific evidence.

On the 12th of February 2024, the KFO were informed by the Site Designations Unit of the National Parks and Wildlife Service (NPWS) that the objection was "*determined to be unsuccessful*" (NPWS Ref: NCDO / 5005 / 002267 / 5006 / 002278), with the stated reason provided being that "*objections can only be considered on scientifically based ornithological grounds*".

This determination was incorrect as the two areas in question were not proposed as Special Protection Areas (SPAs), which are considered under the EU Birds Directive (Directive 2009/147/EC) [2] but were proposed Special Areas of Conservation under the EU Habitats Directive (Council Directive 92/43/EEC) [3]. Therefore, objections did not need to be based on ornithological grounds but on scientific grounds as stated in the original *Notice of Intention to Designate* issued by NPWS on the 18th of November 2022 [4].

The KFO believes that its scientific objection to the proposed delineation of the two SACs was not considered appropriately and that the current delineation of the proposed SACs is not supported by the scientific evidence cited by NPWS. The KFO therefore reiterates its objection and appeals to the Designated Areas Appeals Advisory Board (DAAAB) for the objection to be independently assessed. The current report outlines in more detail the basis of the scientific objection.

Whilst sea fishing is licenced by the Department of Agriculture, Food and the Marine (DAFM) and is not immediately excluded from the proposed SACs or listed as an 'Activity Requiring Consent' (ARC) there is concern that once designated as SACs this may ultimately lead to closure of the areas to fishing or restriction of certain fishing activities and fishing gears. There is precedent for this in the case of other offshore SACs, for example Belgica Mound Province, Hovland Mound Province, Southwest Porcupine Bank and North-West Porcupine Bank. These SACs have the same marine Annex I qualifying interest of *Reefs* (1170) as the two proposed SACs and were first listed as Sites of Community Importance (SICs) in 2008 [5]. In 2016 they were designated as SACs in Irish law (S.I. No. 98/2016 [6], 101/2016 [7], 105/2016 [8], 108/2016 [9]) according to Article 4(4) of the EU Habitats Directive. In 2019 these SACs were closed, under Regulation (EU) 2019/1241 [10], to '*bottom trawls or similar towed nets, bottom set gillnets, entangling nets or trammel nets and bottom set longlines*'. Further restriction on pelagic fishing vessels were also incorporated in the regulation including having to give four hours advance notification to the Irish Fisheries Monitoring Centre (FMC) of their intention to enter the areas.

The KFO, on behalf of its members, is concerned that a similar unilateral approach will be taken with the designation of the proposed SACs, Porcupine Shelf and Southern Canyons, which would have a significant impact on existing fishing activities by Irish vessels in the shallower parts of the currently delineated sites. This expectation is strengthened by the 2023 *EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries* [11] which includes stated targets for prohibiting mobile bottom fishing in MPAs that are Natura 2000 sites designated under the Habitats Directive that protect seabed and marine species.

It is important to clarify that the KFO recognises the need for the conservation and restoration of sensitive habitats and ecosystems and the protection of certain vulnerable species. To this end the KFO does not object to the classification of certain areas as SACs. This is a necessary process and should be based on robust scientific data and analyses, with consideration of other species and other activities in the area. The KFO does object to the lack of transparency around the analyses undertaken by NPWS to determine the delineation of the proposed SACs and objects to the extrapolation of underlying data to increase the spatial area of the proposed SACs. Such practice undermines valid scientifically based conservation measures and inhibits positive and constructive engagement between the fishing industry and policy makers. This is a regrettable precedent to set prior to the Marine Protected Area (MPA) process in Ireland being implemented.

3. *Issues with the Notice of Intention to Designate process*

The KFO has several concerns regarding the process involving the *Notice of the Intention to Designate* the Porcupine Shelf and Southern Canyons as SACs. These concerns were outlined in detail in the original objection submitted to NPWS [1] and are further elaborated in the current report before the

DAAAB. This is relevant to the appeal as the Department of Housing, Local Government and Heritage (DHLGH) and NPWS failed to follow the notification process required as part of the designation process and outlined in Statutory Instrument No. 477 of 2011 - European Communities (Birds and Natural Habitats) Regulations 2011 [12].

The DHLGH published a *Notice of intention to Designate* Porcupine Shelf and Southern Canyons as Special Areas of Conservation in 2022, which was dated the 18th of November 2022. The Notice and associated maps (Figure 1) were published on the gov.ie/publication webpage on the 29th of November 2022 [4] and were publicly announced by the DHLGH on 13th of December 2022 via a press release [13], which coincided with the Minister of State for Nature, Heritage and Electoral Reform, Malcolm Noonan's, attendance at the UN Biodiversity Conference, COP15, in Montréal, Canada. Apart from these announcements, no notice was issued to vessel owners operating previously within the proposed sites nor was any notice issued to the fishing industry representative bodies. This is despite the Notice of Intention to Designate specifying in the Notification Provisions that *'It is important to note that holders of permits or licences including, but not limited to, prospecting licences, exploration licences, foreshore licences, aquaculture licences and finfish licences within the above-mentioned sites, where those are issued by your Department/agency, should be informed of the proposal to designate these sites'*.

The final date for receipt of objections stipulated on the *Notice of Intention to Designate* was the 17th of February 2023 (i.e. three months after the notice was compiled). However, as the notice was not published until the 29th of November and relevant licence holders did not receive any notification, they were not afforded the required time for objection according to Regulation 13 in S.I. No. 477/2011 [12]. Given the delays in publishing the notifications and the complete lack of notification to licence holders the three-month deadline should have been extended and a new and comprehensive round of stakeholder engagement established.

Whilst the Habitats Directive does not have provisions requiring public consultation on the designation of Natura 2000 sites, this is because the Directive was conceived and formulated before such stakeholder engagement was considered a vital step in any such process. The European Commission stated in its 2022 *Staff Working Document on Criteria and Guidance for Protected Areas Designations* [14] that *"it is (therefore) essential that Member States involve all relevant stakeholders, including land owners, managers and users, indigenous peoples, local communities and NGOs in the identification, designation and management of new protected areas, in a fair and participatory way, in line with the Aarhus Convention and in accordance with national procedures"*.

The requirement for such stakeholder participation was also one of the main recommendations of the 2020 MPA Advisory Group Report on Expanding Ireland's MPA Network [15], which concluded that *'Early and sustained stakeholder engagement should be integral to the selection and management processes for MPAs. Engagement should be inclusive and equitable, and the process should be designed to ensure that it is transparent, meaningful, and facilitating.'*

Regrettably, there was no stakeholder engagement or participation as part of the proposed SAC designation processes and no transparency on the site selection and delineation. Since submission of the objection, the KFO has repeatedly attempted to interact with NPWS for further clarity. No meaningful responses were received until the notification that the objection was unsuccessful was provided twelve months after it was submitted. Had NPWS engaged in meaningful discussions with the KFO, then the issues outlined by the KFO may have been resolved in a timely manner with a simple adjustment of the proposed SACs delineations to align with the underlying data.

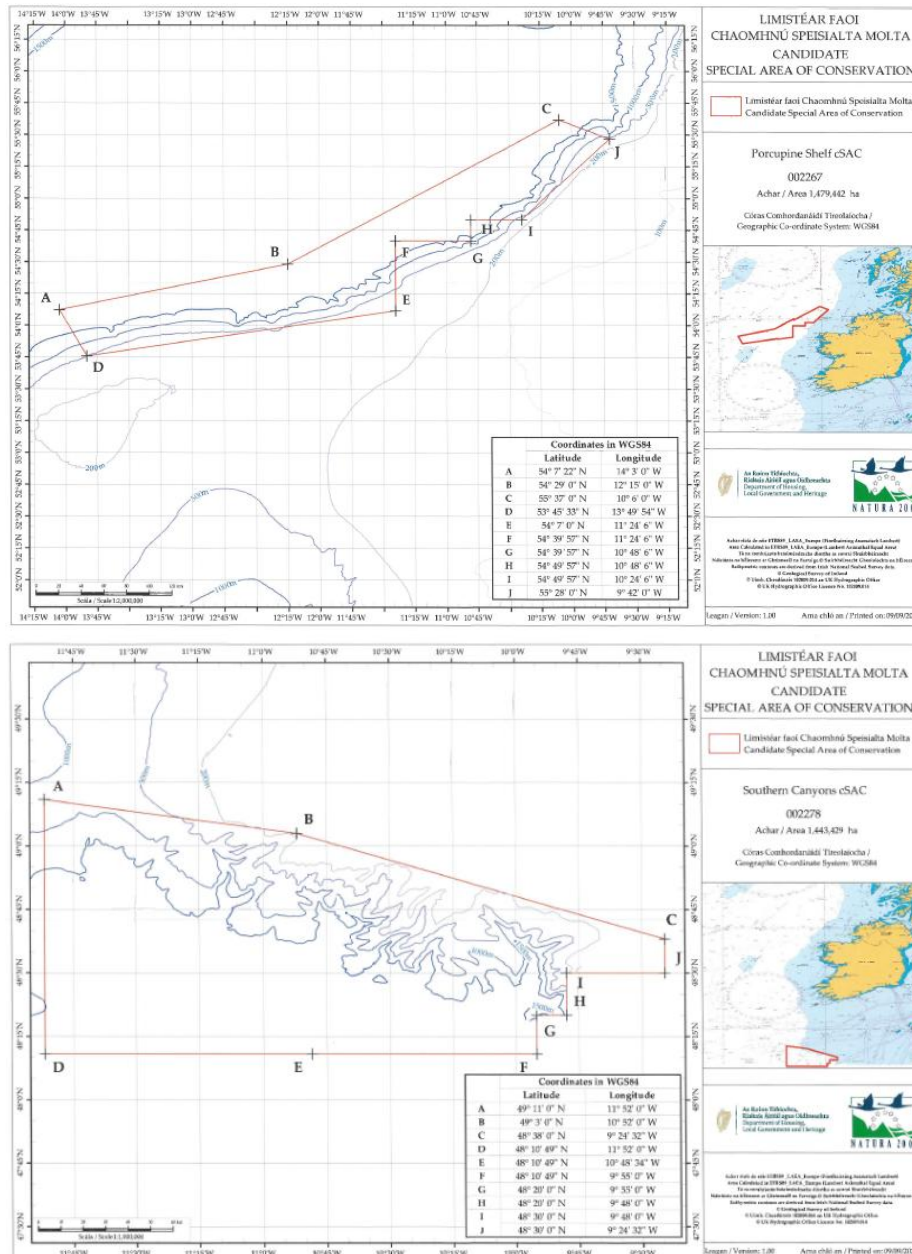


Figure 1: (Top) The proposed site of the Porcupine Shelf SAC (bottom) the proposed site of the Southern Canyons SAC (source = Notice of Intention to Designate).

4. Scientific evidence cited for the proposed designations

The Notices of Intention to Designate for both the Porcupine Shelf and the Southern Canyons SACs stated that the sites were selected as candidate Special Areas of Conservation (cSAC) based on the presence of Reefs (1170), which is a listed habitat in Annex I of the Habitats Directive [3]. The Interpretation Manual of European Union Habitats - EUR28 [16] states that ‘Reefs can be either biogenic concretions or of geogenic origin. They are hard compact substrata on solid and soft bottoms, which arise from the sea floor in the sublittoral and littoral zone. Reefs may support a zonation of benthic communities of algae and animal species as well as concretions and corallogenic concretions’ and that “a variety of subtidal topographic features are included in this habitat complex such as: Hydrothermal vent habitats, sea mounts, vertical rock walls, horizontal ledges, overhangs, pinnacles, gullies, ridges, sloping or flat bed rock, broken rock and boulder and cobble fields”. Reefs are characterised as hard compact rock habitats that are topographically distinct from the surrounding seafloor and may or may not be encrusted with habitat forming accretions of species such as

corallogenic concretions and bivalves which depend on the hard substrate for their habitat. These definitions are important when considering the evidence for *Reef* habitat in the proposed SAC areas.

Part 3 (Conservation of Natural Habitats and Habitats of Species) of S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011 outlines the process for the identification of sites for consideration as sites of Community importance (i.e. Natura 2000 sites) and details the statutory requirement for the information required and the notification processes that must be followed.

S.I. No. 477/2011 Regulation 10. (1) states

*The Minister shall, for the purpose of identifying sites for consideration as sites of Community importance and **based on the criteria set out in Annex III, Stage I, to the Habitats Directive and relevant scientific information**, prepare a list of sites indicating in respect of each such site either or both—*

(a) the natural habitat type or types in Annex I to the Habitats Directive which the site hosts, and

(b) the species in Annex II to the Habitats Directive that are native to the State which the site hosts.

S.I. No. 477/2011 Regulation 11. (1) states

The Minister shall compile information on each candidate site of Community importance including—

(a) an ordnance map of appropriate scale, upon which the boundaries of the site are marked, to identify the land comprising the site and the boundaries thereof,

(b) its name, location, and extent,

*(c) **the data resulting from application of the criteria specified in Annex III, Stage I, to the Habitats Directive, and***

*(d) **the scientific and legal criteria and rationale for the identification of the site as a candidate site of Community importance.***

S.I. No. 477/2011 Regulation 11. (3) states

The information compiled under paragraph (1) shall be made available in a readily accessible format, for inspection by members of the public by appointment during office hours of the Department and in electronic form on the Department's website, as soon as is practicable.

There are therefore specific criteria listed in Annex III Stage 1 of the Habitats Directive (see below) that proposed SACs must fulfil to be considered for designation. The assessment of the proposed sites must include analysis of scientific data that fulfils the criteria and the data resulting from the application of the criteria must be made available as part of the designation process and open to scrutiny by the public and interested parties so that they may lodge a scientific objection if they deem it necessary or appropriate. All data must be available at the *Notice of Intention to Designate* stage which is three months in advance of the closing date for objections and the data presented in the two *Notices of Intention to Designate* should fulfil these requirements.

Habitats Directive Annex III Stage 1: Assessment at national level of the relative importance of sites for each natural habitat type in Annex I and each species in Annex II (including priority natural habitat types and priority species)

A. Site assessment criteria for a given natural habitat type in Annex I

(a) Degree of representativity of the natural habitat type on the site.

(b) Area of the site covered by the natural habitat type in relation to the total area covered by that natural habitat type within national territory.

(c) Degree of conservation of the structure and functions of the natural habitat type concerned and restoration possibilities.

(d) Global assessment of the value of the site for conservation of the natural habitat type concerned.

The *Notice of Intention to Designate* the Porcupine Shelf SAC stated that “an extensive offshore survey of this site was completed in 2017 using the ILV Granualie and the Holland I ROV” and the *Notice of Intention to Designate* the Southern Canyons SAC stated that “an extensive offshore survey of this site was completed in 2019 using the RV Celtic Explorer and the Holland I ROV”. These surveys were the only source of evidence cited for these proposed SACs to support the presence of Reef habitat. It was stated that 50 dives were completed on each survey. Both notices also contained a brief description of some of the species present and general geology and topography of the areas.

It is assumed that there had been a detailed analysis of the results of these surveys, which included a mapping exercise to delineate the proposed SAC areas transparently, robustly and based on scientific evidence. These are large areas (the Porcupine Shelf SAC is c.14,718 km² and the Southern Canyons SAC 14,448 km²) which have been delineated with simple straight edge polygons (Figure 1). The Southern Canyons polygon extends from less than 200m depth to the abyssal plain at greater than 3,000m. The Porcupine Shelf SAC has a slightly narrower range and extends from the 300-400m depth contours down to 2,900m. However, there appears to have been no attempt to refine the site areas based on bathymetry. Full details of the scientific procedure followed to define the polygons should be included with the *Notice of Intention to Designate* to ensure scientific transparency. In the absence of this information, we have undertaken a simple analysis for the purposes of the appeal and objection.

The *Site Synopsis* documents [17, 18] were published on the 7th of March 2023, i.e. after the closing date for objections, and contained the same text as in the *Notices of Intention to Designate*. The *First Order Site-specific Conservation Objectives* documents [19, 20] were published on the 9th of March 2023 and both comprised generic text on the aims and objectives of the Habitats Directive and did not contain any specific information on the two proposed SACs. As noted in the European Commission’s 2022 Staff Working Document [14] “**The need for clear site-specific conservation objectives and conservation measures for all Natura 2000 sites is a legal requirement that continues to apply**”. This requirement appears not to have been fulfilled in the documentation supporting the proposed SACs.

In summary the only evidence presented by NPWS to support the proposed designation of the two SACs appears to have been the two ROV surveys mentioned in the *Notices of Intention to Designate*. No justification for the delineation of the SACs was provided. There was also **no evidence presented that a Stage I site assessment was conducted** according to the criteria specified in Annex III of the Habitats Directive (see above) and **no clear site-specific conservation objectives** have been defined. The results of application of the four criteria required as part of the assessment were not presented in any of the aforementioned documents, and it is unclear if either of the proposed SACs even fulfil

these criteria. On this basis the KFO reiterates its objection to the current delineation of the two SACs as they are not supported by the data presented and the supporting information was not made available as required by legislation.

5. Additional scientific evidence cited by NPWS after Notification to Designate

In the letter received by the KFO from NPWS (NPWS Ref: NCDO / 5005 / 002267 / 5006 / 002278), in which the rejection of the KFO objection was communicated, NPWS referred to other data sources. It stated that “NPWS used a range of data including the extensive mapping from the Irish National Seabed Survey and INFOMAR and models of habitat generated by those bathymetric surveys which allowed NPWS to predict the occurrence of reef habitat with a high degree of certainty.” Further it stated “NPWS has also collected over 15,000 records of reef habitat, both geogenic and biogenic, from the two sites. These have been collected from a range of scientific surveys over the Irish seabed that used both direct observation and extractive techniques. These data were supplemented by the SeaRover programme from 2017 to 2019 which collected data over 150 stations.”

In the request for an appeal, sent to NPWS on the 13th of February 2024, the KFO queried the new data that was being cited and requested clarity on whether it would be made publicly available and open to scrutiny and appraisal, as required by legislation. The KFO also queried whether NPWS would present the analyses that underly the current delineation of the proposed SACs to the DAAAB and explain how the polygons were derived as so far this has not been made public.

On the 13th of March 2024, a response was received from NPWS, which included a map (Figure 2) and three shape files: *Reef Points*, *Reef Polygon* and *Reef Polyline*. The *Reef Points* data contained individual records of potential Reef habitat and comprised records from a mixture of sources. The *Reef Polyline* data contained simple topographic lines which followed the bathymetric contours of the canyons and the SeaRover ROV transects. One trawl track was also included in this data layer in the Porcupine Shelf area. The *Reef Polygon* shapefile contained several polygons in each proposed SAC, with the metadata containing partial references to the source of the polygons. Whilst the data was not cited in the *Notices of Intention to Designate* and was therefore not made publicly available during the objection period it should not be considered as valid data for supporting the delineation of the proposed SACs. However, for completeness the KFO has included this data in its review of the basis of the current delineations, despite the difficulties in ascertaining the origins of the records.

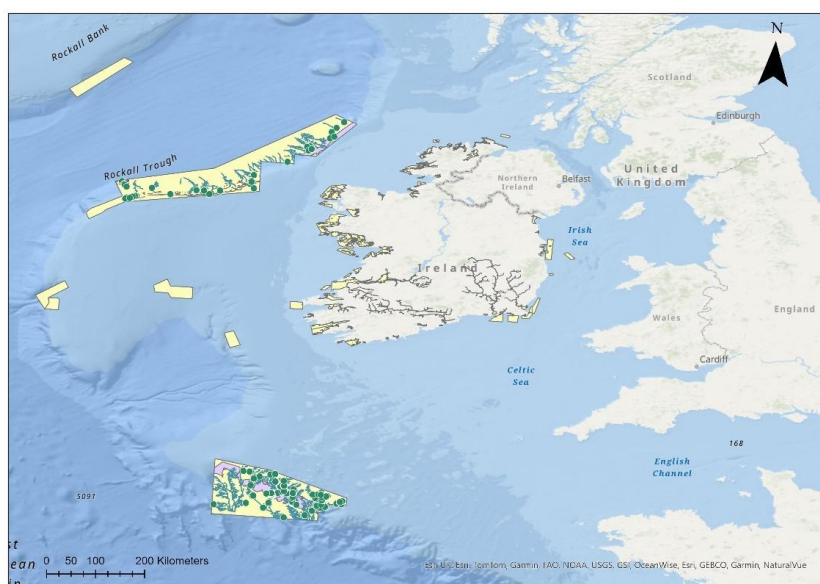


Figure 2. Map received by KFO from NPWS on 13th March 2024, showing the proposed SAC outlines and the additional data not cited in the *Notices of Intention to Designate*. This included the data in the *Reef Points* (green points), *Reef Polygon* (purple polygons) and *Reef polyline* (green lines) shapefiles.

6. **Review of the evidence cited for the proposed designations**

The following sections provide a detailed description and review of the data used by NPWS as the basis for the proposed SAC designations. First, there is a general overview of the surveys and then individual analyses for each of the proposed SACs.

a. **Description of the SeaRover Surveys**

The cited evidence provided for the existence of *Reefs* were the results of two surveys undertaken by the Marine Institute in 2017 in the Porcupine Shelf area and, 2019 in the Southern Canyons area. No specific citations for the surveys were provided in the Notification of Intention to Designate and there were no links to relevant data sources to enable assessment of the evidence base. The KFO were familiar with the surveys that have taken place in these areas and were able to determine that these were the Sensitive Ecosystem Assessment and ROV Exploration of Reef (SeaRover) surveys, which took place annually 2017-2019. The surveys were commissioned by the Marine Institute in partnership with the National Parks and Wildlife Service (NPWS), funded by the European Maritime and Fisheries Fund (EMFF), and coordinated and led by INFOMAR (Integrated Mapping for the Sustainable Development of Ireland's Marine Resources). The cruise reports contain details of the sampling undertaken [21, 22, 23] and a single synthesis report was compiled by MERC Consultants Ltd. on behalf of the Marine Institute [24]. This presented the results of the three surveys along with information and discussion about the wider relevance of the surveys. The 2018 survey was focussed on the southern Porcupine and Rockall Banks and is not relevant to the two proposed designations.

Each survey undertook transects using a Remote Operated Vehicle (ROV) to record high-definition camera footage of the transect, whilst manipulator arms were used to collect samples (physical and sediment). Water sampling apparatus was used to facilitate collection of water samples. Each dive involved the ROV followed a pre-determined transect line 1-2m above the seabed (Figure 3). Transect selection criteria included depth range, areas of highly sloping terrain, geographical spatial discreteness, historically low fishing activity and effort, historically low scientific studies and the presence or absence of certain target geomorphological features identified with reef habitat such as canyons and canyon walls, gullies, escarpments, ridges, carbonate mounds and cobble fields [24].

Therefore, the target transect areas were not randomly distributed but were pre-determined to be undertaken in areas with minimal previous anthropogenic impact and to maximise the encounters with Reef habitats. It is questionable whether there is scientific justification to extrapolate the data collected on these transects to a wider area. Despite this non-random targeted approach, across the entire survey series 89 out of 154 dives or 58% contained evidence of reef habitats, whilst 42% recorded neither biogenic nor geogenic reef [24].

All data were generated after review of HD transect video, which used Ocean Floor Observation Protocol (OFOP) software to facilitate capture of the visual observations with associated positions. Where biogenic or geogenic reef was encountered on transects, *'there was an assumed minimum patch size of 5m x 5m (this is a standard minimum area used for biotope classification)'*. The percentage of reef present per transect was summarised as a proportion of cells marked as reef in the enhanced OFOP file when compared with the length of the dive. ***'This means that the reef presence estimate is based on time, so may be skewed when there have been interruptions for sampling or beauty shots'*** [24].

The SeaRover surveys enabled ground-truthing of published predictive models for coral and sponge distribution. To this end, the models' predicted distribution was assessed relative to where actual observations were made during the SeaRover surveys. However, **the modelling results were poor** and it was concluded that *'If modelling of the type attempted by Howell is to be of any predictive value it*

needs to be much more fine-grained', '.....the modelled distribution of Lophelia is out of scale compared with the real world, where living reef is only in a relatively small patch on the top of carbonate mounds'.

A useful and constructive output of the analyses of the SeaRover series was the Marine Institute's online SeaRover GIS tool [25]. This tool makes accessible a selection of data from the surveys, including the actual ROV footage from each transect. So, if resources were available, an independent assessment of the transects could be conducted. What is evident from watching a subset of the transect footage is that the reef habitats are not homogeneously distributed across the length of the transects. Instead, most of the footage shows soft sediment with little visible biodiversity, occasionally interspersed with rocky outcrops, boulders or cobbles with some organisms that could be Reef habitat. Therefore, it seems highly likely that where reef habitat has been identified on a transect, it represents only a proportion of that transect and not the entire area of the transect.

For the purposes of understanding the evidence on which the proposed SAC designations were based, the coordinates of the dives from the 2017 and 2019 were extracted from the survey reports [21, 23] and plotted in QGIS with the proposed SAC polygons. During this process, several errors were identified in the coordinates supplied in the survey reports. In the 2017 report, the coordinates for two transects (T30, T35) were incorrect as they indicated transect lengths of 17km and 209km, which did not agree with the illustrated transects in the report (Figure 3). The coordinates in the 2019 report all appeared to be incorrect, due to an error in the projection to decimal degrees. The report author in the Marine Institute was contacted and made aware of the errors.

To obtain the correct coordinates, the Marine Institute's online Marine Atlas [26] was accessed and the SeaRover transect positions downloaded as a shapefile. Through this shapefile, it was possible to download the metadata files for the individual surveys from the Marine Institute database [27, 28]. The metadata contained information for each dive including start and end coordinates, depth range, % geogenic reef, % biogenic reef, notes on sampling and notes on species observed. As the start and end coordinates for the transects were available for both surveys it was possible to calculate the length of each transect as a point-to-point, start to end measurement. It was also possible to determine which ROV transects were conducted within the two proposed SACs and the validity of the current delineation. From this point on the two proposed SACs will be analysed separately to provide a clearer understanding of the underlying data.

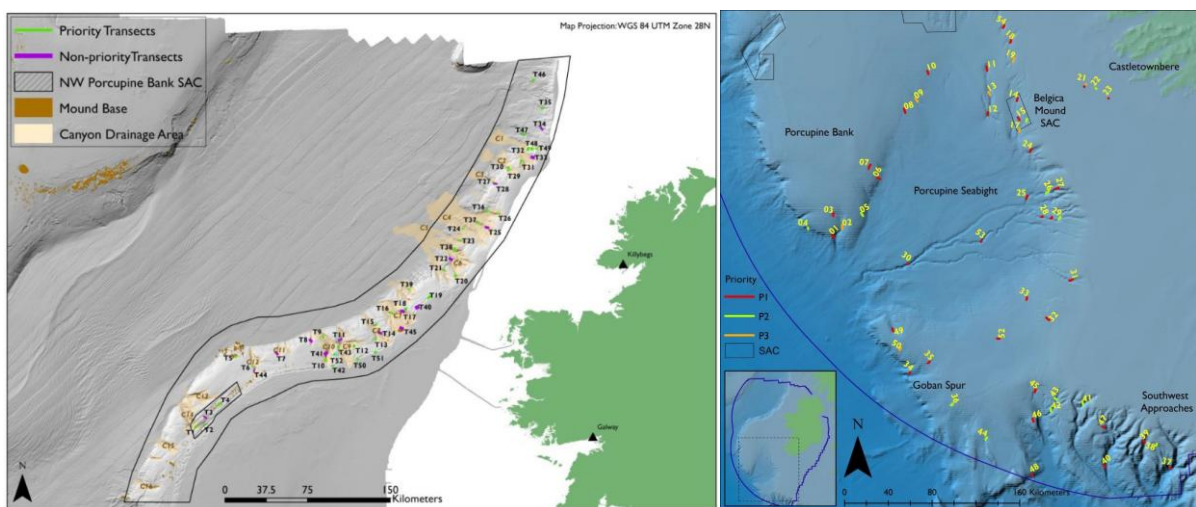


Figure 3. The location of the ROV transects on the (left) 2017 and (right) 2019 SeaRover surveys [21, 23].

b. Proposed Porcupine Shelf SAC

Thirty-four out of 50 dives in the 2017 survey were located within the proposed Porcupine Shelf SAC (Figure 3). The depth range of these dives is shown in Table 1. No dives were initiated at less than 500m depth, though one dive (#492) reached its shallowest depth at 463m and ended at 471m (Figure 4). Only three dives (#457, 492 and 493) took place shallower than 800m, the depth beyond which bottom trawling is prohibited in EU waters under the deep-sea access regulation (Regulation (EU) 2016/2336) [29].

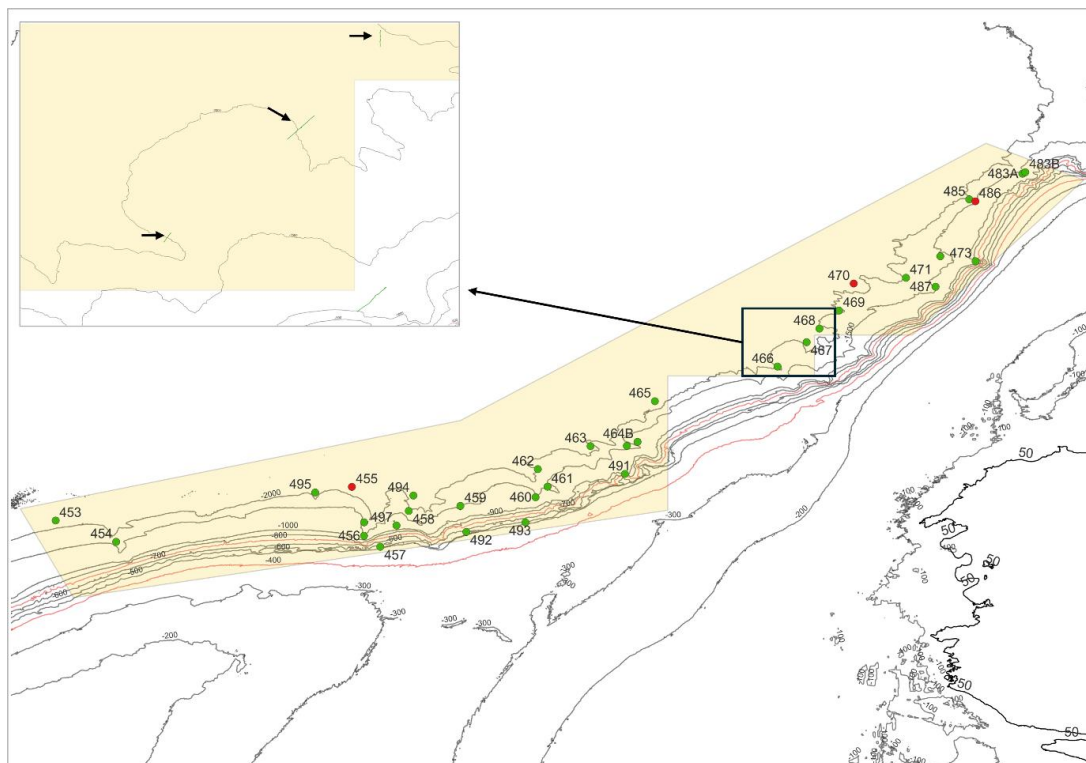


Figure 4. The 2017 SeaRover dive locations in relation to the proposed Porcupine Shelf SAC. The green points represent transects with >0% reef presence and the red points represent transects with 0% reef presence. Note that the points are not to scale. The inset is zoomed to the area on the main figure and shows the length of the transects to scale. Note the width of the transects is not to scale to enable visibility.

Table 1. The depth range of SeaRover transects undertaken within the proposed Porcupine Shelf SAC in 2017.

Start Depth Range (m)	Number of ROV Transects
0-400	0
400-500	0
500-600	1
600-700	2
700-800	0
800-900	0
900-1000	1
1000-2000	18
2000-3000	12

Finer scale analysis of the three dives shallower than 800m was possible as the dive summaries and dive logs were available through the shapefile metadata [30-32]. The dive logs contain a second-by-second log of the entire dives including position, depth, temperature, substrate type, species, biotope, habitat type, listed habitat etc. Therefore, it was possible to review the dive logs and determine the depths at which the listed habitats were encountered.

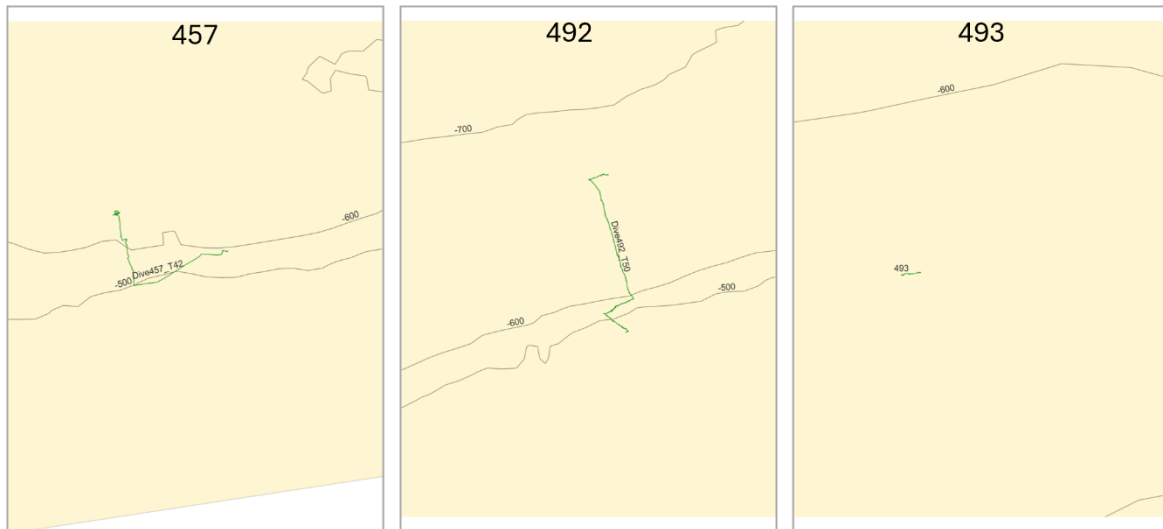


Figure 5. The three ROV transects in the proposed Porcupine Shelf SAC conducted shallower than 800m.

The majority of Dive 457 was conducted deeper than 500 m. However, coral gardens were noted in the Dive log along the 500m bathymetric contour up to 472 m water depth. During the two-hour dive, the ROV spent 38 minutes at depths less than 500m, of which all except 33 seconds was at greater than 480 m. On review of the footage, of the 33 seconds where the Dive log recorded depth between 472 m and 479 m, it is evident that the ROV left the seabed and rose in the water column due to some unlogged reason (Figure 6). Prior to leaving the seabed the dive log recorded the habitat as being a “Coral Garden” and this categorisation was continued during the time when the seabed was not visible due to the ROV rising in the water column (i.e., the habitat logged did not match that observed). This calls in question the reliability of the data scrutinization and the habitat classification employed and indicates that the shallowest evidence for the “Coral Garden” on this dive was at 480 m.



Figure 6. Footage of Dive 457 on the 2017 SeaRover survey where the ROV left the seabed, but it was not noted in the dive log. All images were categorised as “Coral Garden” despite the ROV leaving the seabed and there being no record of seabed habitat during that period.

Dive 492 lasted 2 hours 41 minutes, of which 50 minutes were at depths deeper than 600m and 1 hour and 18 minutes at depths deeper than 500 m. During the 33 minutes spent at depths between 463 m and 499 m, the shallowest “Coral Gardens” were observed at 467 m. Dive 493 lasted c. 2 hours and 4 minutes and was conducted between 502 m and 570 m. “Coral Gardens” were observed in patches

along the length of the transect. As a result of the distribution of the survey transects, **the SeaRover based evidence for the presence of Reefs within the proposed SAC areas is only applicable to depths greater than 463 m in the Porcupine Shelf SAC.**

The length from the start position to end position of the 34 transects within the proposed Porcupine Shelf SAC ranged from 397 m to 2,485 m with an average point to point length of 1,435 m (Table 2). The percentage occurrence of reef habitat observed within each transect was provided in the metadata. Therefore, it was possible to calculate an estimated area of observed reef habitat within each transect, though as previously noted this is an overestimate as the ***reef presence estimate is based on time, so may be skewed when there have been lots of stops for sampling or beauty shots.*** From the viewing the footage of a subset of transects [25] it is evident that the ROV followed the transect and did not deviate significantly from the pre-determined track, though it did stop and start depending on the habitat encountered and as noted spent additional time recording features of particular interest. Though the field of view was not specified in the reports it could be estimated to be approximately 1m², given that the ROV was 1-2m above the seabed.

Table 2. The transit length (m), total % reef, estimated reef area, % geogenic reef (e.g. rocky outcrops, boulders, cobbles,) and % biogenic reef (hard matter created by living organisms) within the dives conducted in the proposed Porcupine Shelf SAC.

Area	Dive	Length (m)	% Reef	Estimated reef area km ²	% Geogenic Reef	% Biogenic Reef
Porcupine Shelf SAC	453	1614	75	1.21	75	0
Porcupine Shelf SAC	454	1599	58	0.93	58	0
Porcupine Shelf SAC	455	581	0	0.00	0	0
Porcupine Shelf SAC	456	1422	35	0.50	35	0
Porcupine Shelf SAC	457	627	88	0.55	88	0
Porcupine Shelf SAC	458	1745	100	1.75	82	18
Porcupine Shelf SAC	459	1756	55	0.97	55	10
Porcupine Shelf SAC	460	1496	58	0.87	58	0
Porcupine Shelf SAC	461	1516	65	0.99	42	31
Porcupine Shelf SAC	462	1274	37	0.47	37	0
Porcupine Shelf SAC	463	1373	41	0.56	41	0
Porcupine Shelf SAC	464A	1445	40	0.58	40	0
Porcupine Shelf SAC	464B	1622	73	1.18	51	22
Porcupine Shelf SAC	465	1116	12	0.13	12	0
Porcupine Shelf SAC	466	878	20	0.18	20	0
Porcupine Shelf SAC	467	2446	12	0.29	12	0
Porcupine Shelf SAC	468	1416	7	0.10	7	0
Porcupine Shelf SAC	469	1957	9	0.18	9	0
Porcupine Shelf SAC	470	1182	0	0.00	0	0
Porcupine Shelf SAC	471	2485	6	0.15	6	0
Porcupine Shelf SAC	472	2435	35	0.85	16	19
Porcupine Shelf SAC	473	1711	6	0.10	6	0
Porcupine Shelf SAC	483A	1181	72	0.85	72	0
Porcupine Shelf SAC	483B	2262	12	0.27	12	0
Porcupine Shelf SAC	485	979	19	0.19	19	0
Porcupine Shelf SAC	486	904	0	0.00	0	0
Porcupine Shelf SAC	487	1562	40	0.62	21	18
Porcupine Shelf SAC	491	1180	87	1.03	81	5
Porcupine Shelf SAC	492	1454	63	0.92	63	0
Porcupine Shelf SAC	493	397	88	0.35	88	0
Porcupine Shelf SAC	494	1285	20	0.26	20	0
Porcupine Shelf SAC	495	822	60	0.49	60	0
Porcupine Shelf SAC	496	1060	58	0.61	53	5
Porcupine Shelf SAC	497	2020	38	0.77	21	32

The total surveyed area of the transects within the proposed Porcupine Shelf SAC was estimated to be 48.8km² of seabed. Once this was corrected for the occurrence of observed reef habitat, the total estimated observed reef habitat was 18.89km² (Table 2). Three transects observed no biogenic or geogenic habitat (Figure 4 and Table 2) and twenty-five transects (74%) observed no biogenic reef (i.e. living reef forming organisms). The majority of reef habitat observed was bare rock (outcrops, rocks, boulders, and cobbles). Whilst these fall within the Habitats Directive definition of *Reefs* (see section

3), it is at odds with the common perception that proposed designation is to protect deep sea reef biodiversity rather than bare rock.

Given that the total area of the proposed Porcupine Shelf SACs is 14,718km², then **the % observed reef habitat within this area based on the evidence presented was 0.0013%**. Even if the assumed minimum patch size of 5m x 5m as indicated in the survey synthesis report [24] was used and the transects were assumed to be 5m wide, then the observed reef habitat within these areas based on the **evidence presented would be 0.006% of the total area proposed as an SAC**. Whilst it is prudent to apply the precautionary principal, the scale of extrapolation of the evidence base cited in the notification of intention to designate the SACs is extraordinary. To put it into context it is akin to designating the entire combined area of Counties Dublin, Wicklow, Wexford, Kildare, and Louth based on the presence of a habitat the size of the Phoenix Park.

Given the mismatch between the scale of the proposed Porcupine Shelf SAC and the limited evidence of Annex I Reef habitat observed on the 2017 SeaRover survey, it is prudent to examine the other data sources and additional scientific evidence cited by NPWS after the *Notice of Intention to Designate* period (see section 4). It should be noted that these data sources were not made available to the public by NPWS, and their existence only became known after queries by the KFO. Further, despite repeated requests for the source reports and origin of the data that makes up the three layers, the NPWS failed to provide all of these to the KFO.

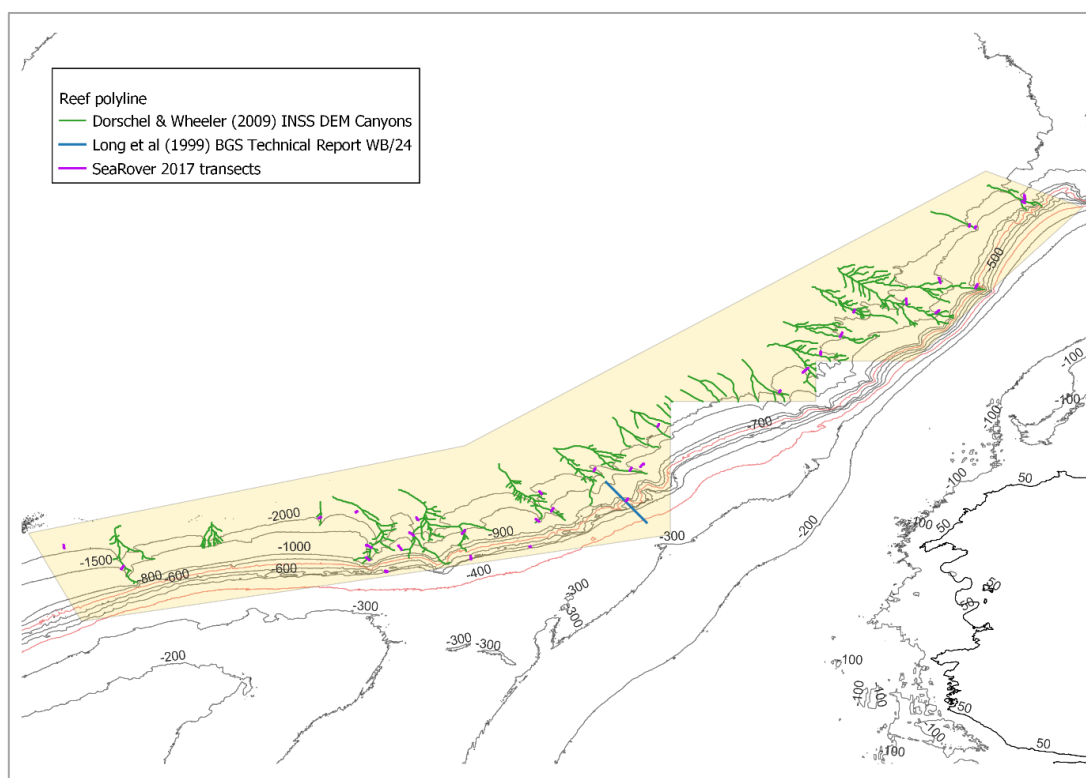


Figure 7. The Reef Polyline shapefile showing the SeaRover transects in purple, the Dorschel & Wheeler (2009) canyons in green and the Long et al (1999) line in blue.

The Reef Polyline layer comprised three data sources (Figure 7). The first was the 2017 SeaRover transects, which were already the primary basis for the proposed SAC designation. It is assumed that these have not been double counted in the “15,000 records of reef habitat”. Regardless, they have already been analysed and discussed above and will not be analysed further here.

The second data source was cited as *Dorschel & Wheeler (2009) INSS DEM Canyons* and appears to show topographic lines of depressions in the seafloor that run perpendicular to the bathymetry. The

abbreviation DEM was determined to mean Digital elevation models. These are presumed to be the modelled outline of the canyons in the seabed derived from sonar mapping data, though the specific information was not made available by NPWS for scrutiny. The data may be included in the *Atlas of the Deep-Water Seabed – Ireland* [33], though this book was not available open source. It is important to note that the presence of canyons does not confirm the presence of Reef habitat and the seabed in canyons may be comprised of soft sediment without any biogenic or geogenic Reef being present. More rigorous analyses would be required to determine the presence of Reef habitat in these areas.

The final data source in the Reef Polyline layer was a single 21.5 km straight line track that was cited as Long et al (1999) BGS Technical Report WB/24. The full citation was determined to be a British Geological Survey Report [34], which compiled data on the occurrences of *Lophelia pertusa* on the Atlantic margin based on old records and reports. The report noted that “the accuracy of positioning will be suspect in older records. This is evident in the “round numbers” given for location e.g. 61°00.00’N or 10° 10.00’W particularly for data gathered prior to about 1975”. The single track in the Reef Polyline layer was attributed to work described in a French book called *Les Profondeurs de la Mer*, published in 1948 [35]. The start and end positions (rounded latitude and longitude) and the depth range, 400 m to 1000 m, were noted. It did not note where along the 21.5 km track that the specimens were collected. When the positions were plotted (Figure 7) the track ran from just shallower than the 400 m contour to just deeper than the 1500 m contour. Though the equipment used was not described [34], given that the track was perpendicular to the bathymetry it is likely that this was not a single trawl, and it is more likely that this was a sampling transect along which several sampling events were conducted. Regardless there is disagreement between the recorded depth and position of the transect.

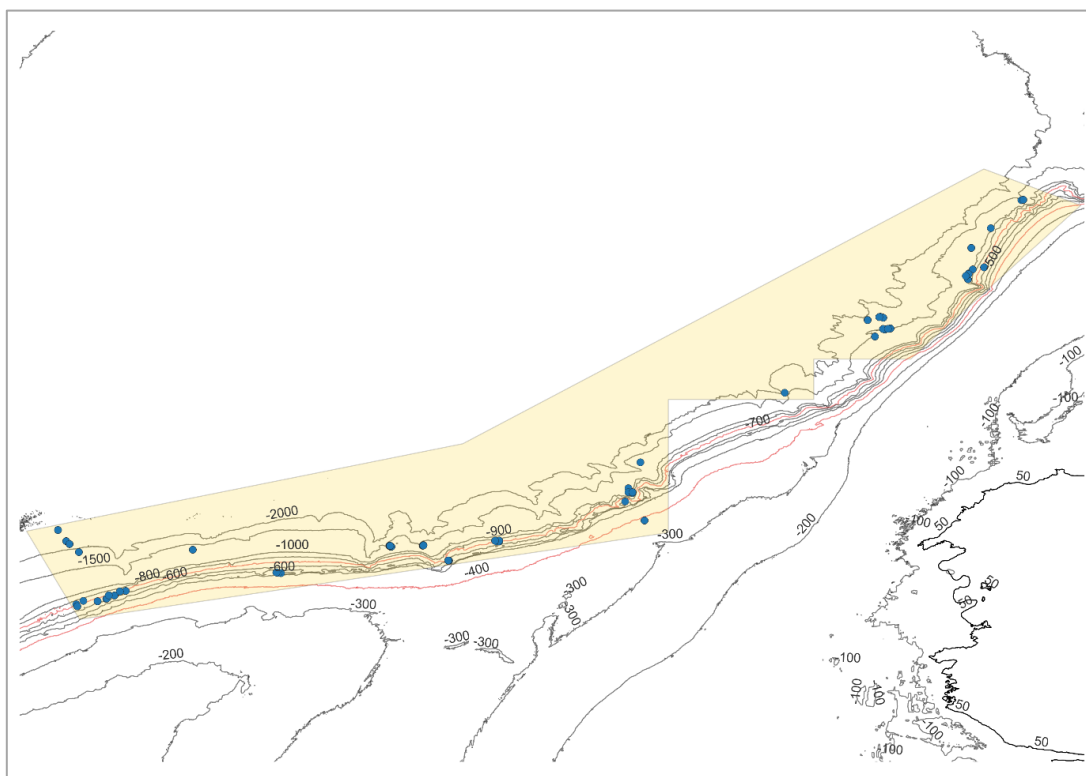


Figure 8. The Reef Points shapefile showing the data points in blue.

The Reef Points shapefile comprised data points from twenty-nine sources of varying age and quality, from personal communications to published scientific papers. Most records were deeper than 800 m (Figure 8). Only four records were in the 600-700 m range; 1 record in the 500-600 m range; and two records shallower than 400 m. Within the current report it was not possible to review each record. However, some key records have been reviewed to highlight the uncertainty of the data and the need

for review of all the data. It should be noted that the metadata for the records only contain partial references, some of which were from inaccessible databases or unverifiable personal communications. Further, several of the points was duplicate even though the metadata cites various sources.

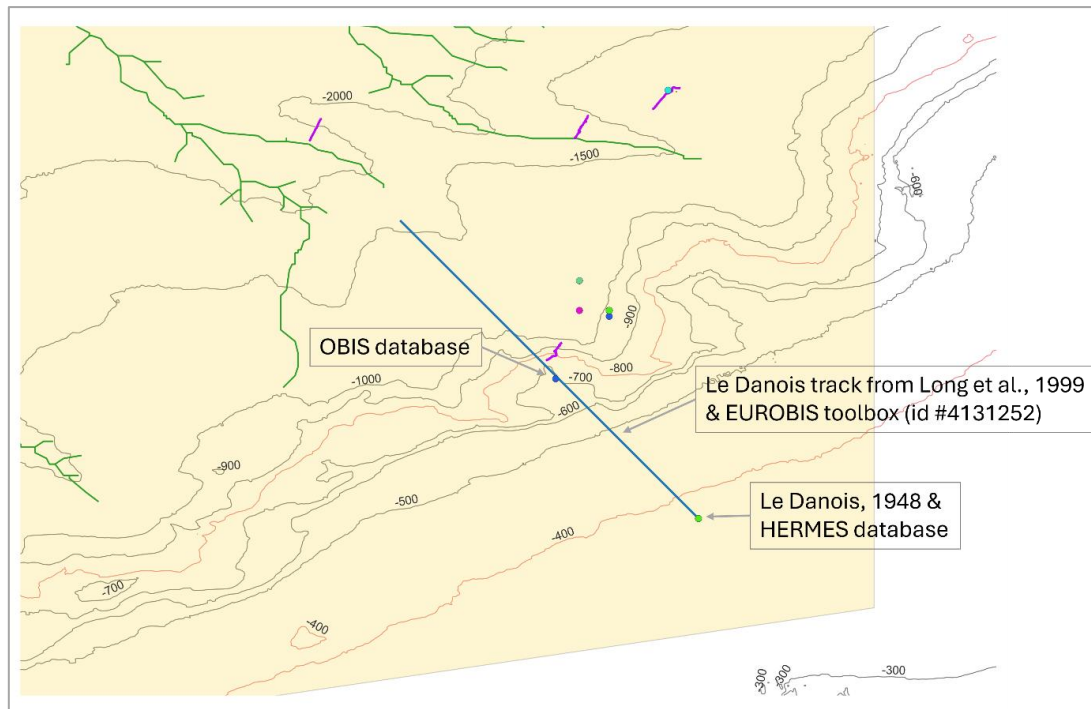


Figure 9. The *Reef Polyline* and *Reef Point* shapefile zoomed in to the Long *et al.* (1999) in in blue and the Le Danois (1948) point in green.

The metadata of the two records, shallower than 400 m, in the *Reef Points* layer indicated that the records were c.3 m apart. One record was noted as “coral rubble” and cited as the HERMES database. The second record was noted as being *Lophelia* and cited as Le Danois (1948). When the *Reef Polyline* layer was overlaid, it was apparent the “coral rubble” point was at the start of the track in Long *et al.* (1999). The Le Danois (1948) *Lophelia* record should have been located at the start of this track if the Long *et al.* (1999) positions are taken as correct, but it appeared to have been slightly offset by c. 3 m possibly because of being manually added to the GIS layer. As previously noted, this start position was noted to be at 400 m and the latitude and longitude were likely to have been rounded and therefore inaccurate. Regardless these two records appear to be duplicates. An attempt was made to locate the HERMES database, which was developed into a GIS tool [36] and archived on Pangaea [37]. However, the archived database only contained records from the Mediterranean Sea with no information for the northeast Atlantic.

At the midpoint of the transect there was an additional point near the transect at c. 700 m (Figure 9). This was noted as being a stony coral and cited as being from the Ocean Biodiversity Information System (OBIS) database. An independent search was conducted on the OBIS database through the mapper tool [38] and the record located (Figure 10). The record was listed as being at a depth of 388 m, which according to the latitude and longitude is incorrect but matches with the two records at the start of the Le Danois track from Long *et al.* [34]. No date was given for the OBIS record but when the metadata was downloaded from the EUROBIS toolbox database [39] (record id #4131252) it noted that the “coordinate uncertainty in meters” was 10,778 m, the depth range was 400-1000 m and it provided start and end coordinates which matched exactly the Le Danois transect coordinates [34]. This may be independently verified by following the links to the databases and searching for the relevant records.

In summary and in this case, there were multiple duplicate records in the NPWS *Reef Points* shapefile, and the records listed shallower than 400 m were not correct and should be deleted. Only the record at 700 m should be retained. Therefore the extension of the SAC polygon shallower than 400 m in this area is not supported by scientific evidence and should be revised.

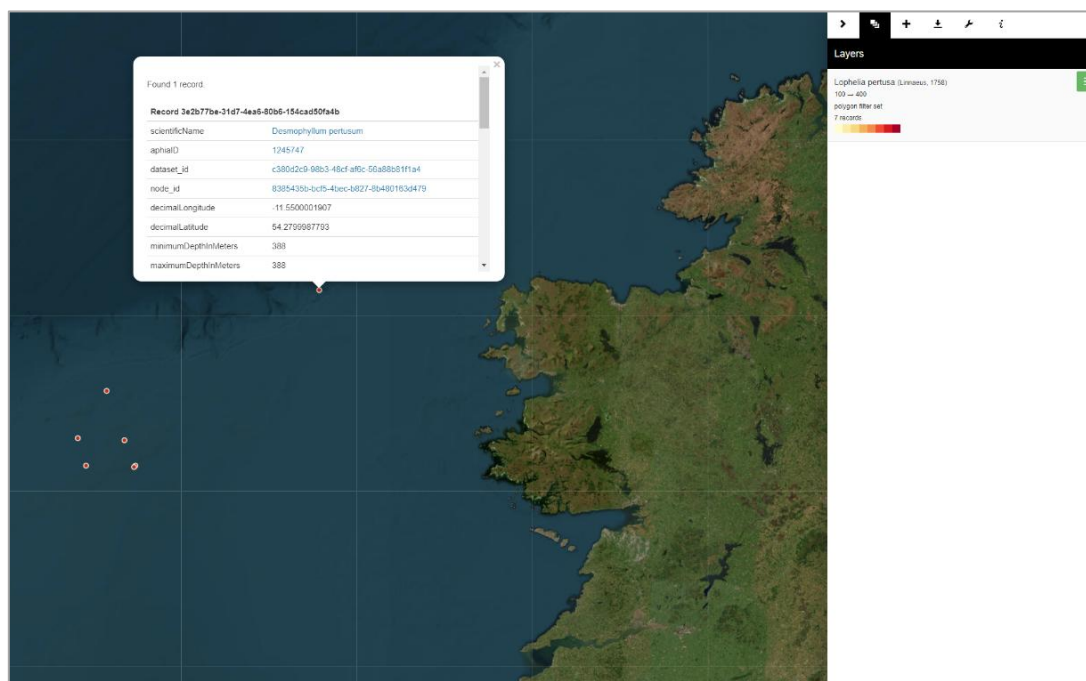


Figure 10. The OBIS database mapper tool with the duplicated record incorrectly noted as being at 380 m depth.

In the northern part of the proposed Porcupine Shelf SAC most of the *Reef Points* appear to be from the Marine Scotland Science's (MSS) West Scotland Deepwater Trawl Survey. Most of these data points are included in the ICES (International Council for the Exploration of the Sea) Vulnerable Marine Ecosystem Database and were extensively reviewed by the KFO in its report on errors in that data submitted to ICES in June 2023 [40].

In short there were several errors in the reported end positions of some of the hauls conducted by MSS during the 2013 Deepwater survey. When the data was incorporated into the ICES VME database the midpoint of the trawls were used in the ICES VME assessment as the position of the indicator species observed. NPWS have included this erroneous data in the *Reef Points* layer, with the metadata citing the source of each of these records as "GB_WGDEC_2013_001". ICES is currently conducting a review of this data and MSS have confirmed the errors, which will be corrected in the ICES database.

The result of the errors is that the midpoint of the trawls, which were used as a proxy for the position of the *Reef* habitat, were in the wrong positions in some of the records in the NPWS *Reef Points* shapefile (Figure 11). If corrected the points would be moved to deeper than 1000 m, which would have an impact on the delineation of the proposed SAC. NPWS may refer to the KFO report for a list of all the incorrect data points in ICES division 6.a.

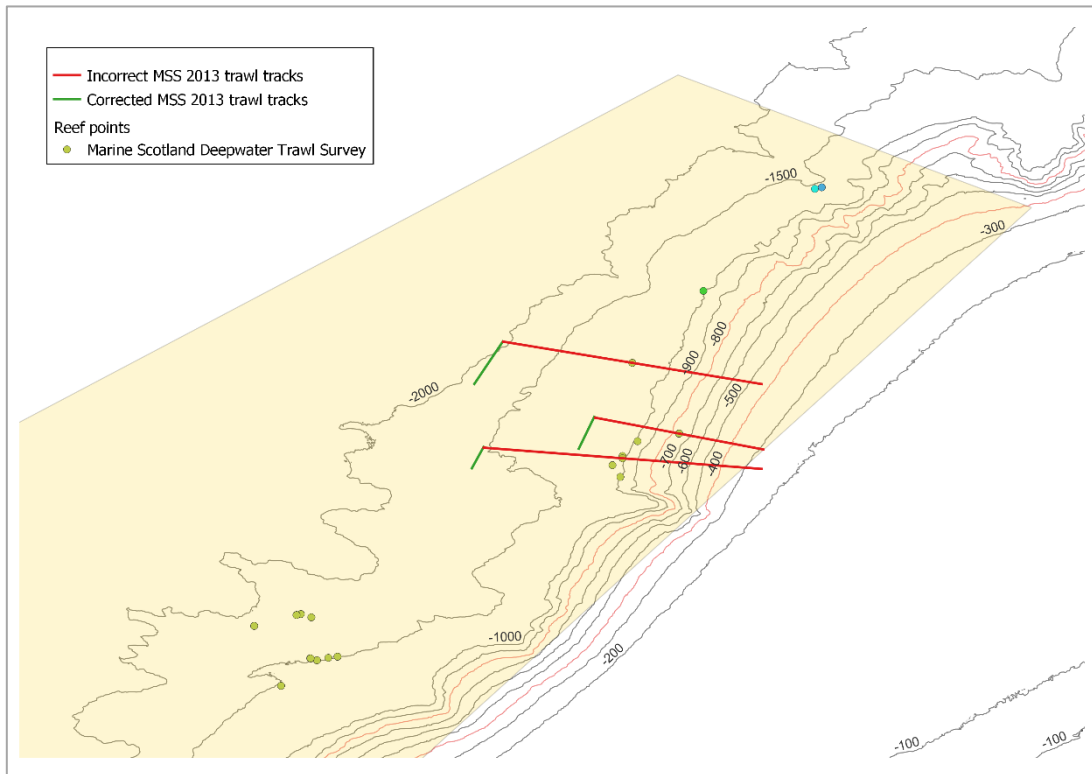


Figure 11. The *Reef Point* shapefile zoomed in to the northern part of the proposed Porcupine Shelf SAC. The GB_WGDEC_2013_001 *Reef Points*, the incorrect MSS trawl tracks (red) and the corrected MSS trawl tracks (green) are illustrated.

In the southern part of the proposed Porcupine Shelf SAC there appeared to be a considerable number of duplicated records in the *Reef Points* shapefile (Figure 12). The NPWS (2010) *Offshore SAC Project* record was in the same position as the UNESCO TTR Cruises 1997-2003 record and the metadata was the same for each. Similarly, eight of the nine Croker (2002) PAD Exploration Meta Data records in the area were duplicates of the Unnithan (2002) GSI/INSS Multibeam Data records. It is unclear if NPWS was aware of the duplicated records and if they were accounted for in the assessment of the data. There may be more duplicates in the remaining records, which have not been reviewed.

The examples above highlight the uncertainty and issues with the data that was used to delineate the proposed SAC. When compiling many data sources into such a layer it is critical that the full original sources of the records are available and open to scrutiny. Secondary sources should not be used as the basis for inclusion of a record as this leads to compounding of errors and undermines the valid records included. This appears to be what has occurred in the current situation and the layer should not be used in its current form. A full review of the *Reef Points* shapefile should be conducted, errors corrected, and duplicate records removed, and non-verifiable records deleted.

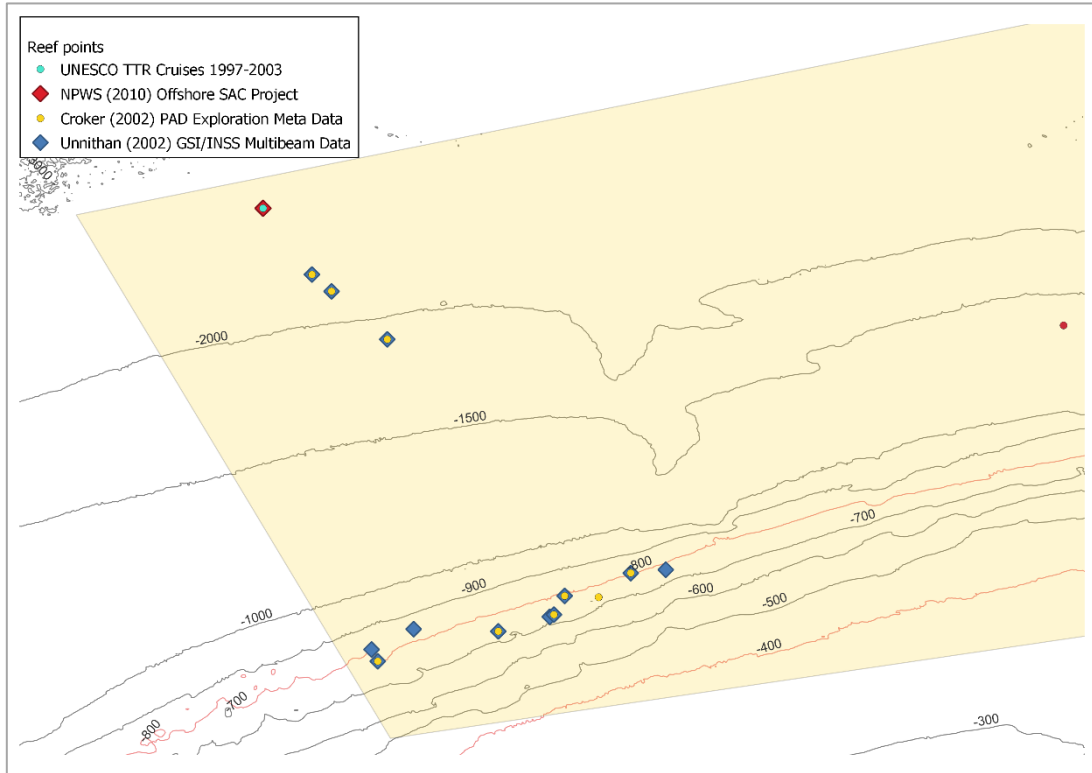


Figure 12. The Reef Point shapefile zoomed in to the southern part of the proposed Porcupine Shelf SAC. The duplicate records are illustrated and are described in the legend.

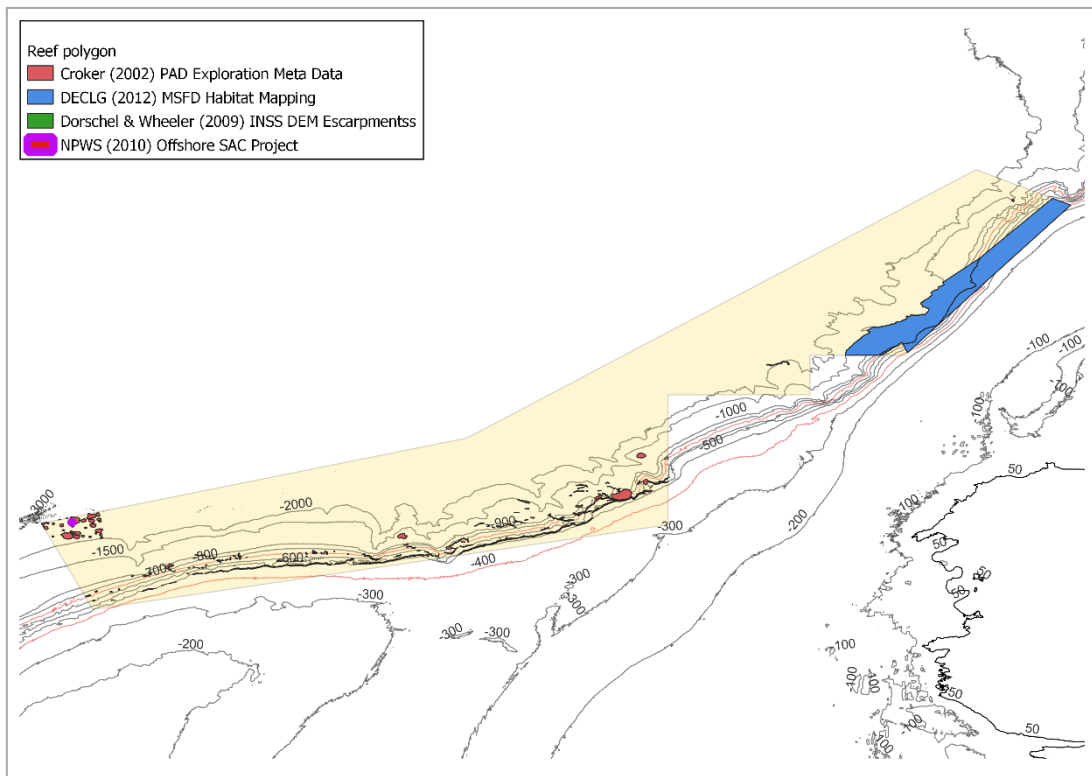


Figure 13. The Reef Polygon shapefile with the data sources coloured according to the legend.

The final additional data presented by NPWS was the *Reef Polygon* shapefile (Figure 13). This data layer comprised four cited sources, none of which were accessible or provided by NPWS despite repeated requests. The basis of these polygons and the data used to derive them is unknown. The *NPWS (2010) Offshore SAC project* layer had only one polygon in the southern end of the proposed SAC, which overlapped completely with the *Croker (2002) PAD Exploration Meta Data* records in that

area (Figure 13). Further the NPWS (2010) *Offshore SAC project* polygon was identical to the NPWS (2010) *Offshore SAC project* point, which was already shown to be a duplicate of the UNESCO TTR Cruises 1997-2003 record (Figures 12 & 14). Similarly, the Croker (2002) *PAD Exploration Meta Data* points overlapped with some of the Croker (2002) *PAD Exploration Meta Data* polygons. These polygons were primarily deeper than 800 m (Figures 8 & 13).

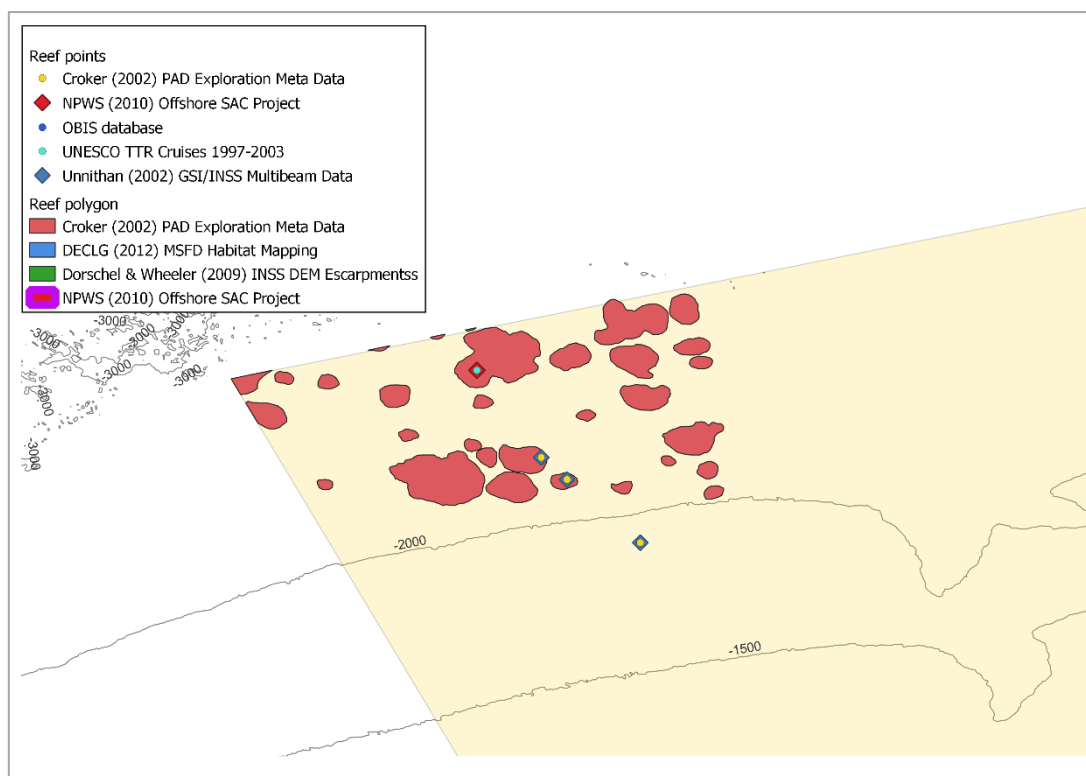


Figure 14. The *Reef Polygon* shapefile zoomed to the southern part of the proposed Porcupine Shelf SAC with the data sources coloured according to the legend.

The Dorschel & Wheeler (2009) *INSS DEM Escarpments* layer appeared to mark out digital elevation models of escarpments (Figure 13), which in geological terms are defined as a long cliff or steep slope that has resulted from erosional processes or faulting. Like the *Reef Polyline* layer these are topographic features and cannot necessarily be defined as *Reef* habitats. These polygons were primarily found along the 500 m bathymetric contour in the southern half of the proposed SAC.

The final layer in the *Reef Polygon* shapefile comprised two *DECLG (2012) MSFD Habitat Mapping* polygons in the northern part of the proposed SAC (Figure 13). The source report for this layer was requested from NPWS, who responded that the work was carried out by the Marine Institute. It is unclear if there is a report which details the analysis that resulted in the polygons and no report was provided by NPWS. The metadata indicated that both polygons were classified as geogenic reef (i.e. rock). To assess the validity of the polygons, the MSFD Broad Benthic Habitat shapefile was downloaded from the Marine Institute's Marine Atlas [26] and the data interrogated. The area within the polygons is clearly classified as upper and lower bathyal sediment comprising muddy sand and sandy mud (Figure 15). It was not classified as any form of rock or biogenic reef. However, two SeaRover dive stations located in the deeper of the two polygons, were bounded by the 750 m and 1500 m bathymetric contours. Dive #487, which ranged from 1211-1491 m, did note *Reef* habitat (Table 2) and Dive #473, which ranged from 800-1100 m, also noted a small percentage of *Reef* habitat (Table 2).

The shallower of the two polygons ranged from less than 300 m to c. 750m where it bordered the deeper polygon. This polygon contained no SeaRover dives, no *Reef Points* or *Reef Polyline*s. There

appears to be no basis for it other than to enable a straight-line edge to be added to the proposed SAC delineation (Figure 13).

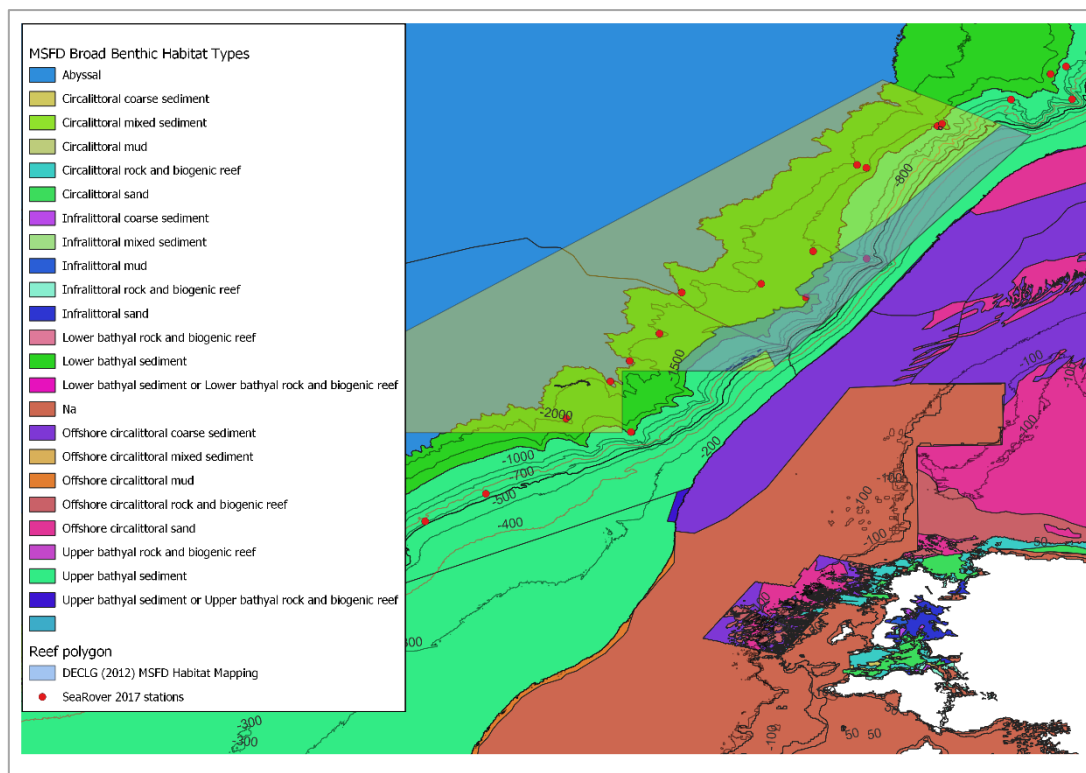


Figure 15. The MSFD Broad Benthic Habitat shapfile from the Marine Institute’s Marine Atlas overlaid with the DECLG (2012) MSFD Habitat Mapping polygons and the 2017 Sea Rover stations.

Whilst exploring the delineation of the proposed Porcupine Shelf SAC the unusual shape of the polygon west of Mayo was noted (Figure 1), where the proposed SAC was almost divided into northern and southern parts by a large cut-out. There was a lack of supporting evidence for Reef habitat in the cut-out areas but there was also a conspicuous absence of SeaRover stations within the cut-out areas (Figure 4). This area was not targeted for exploration by the NPWS commissioned survey and additional data for this area was not compiled in the new data sources. In fact, the additional data sources appear to have been cut off at the border of this area e.g. Reef Polyline layer. The questions therefore arose as to why the cut-out area was not surveyed and why was it not included in the proposed delineation.

Correction (10/03/2025) – There were three SeaRover stations in the cut-out area all of which contained Reef habitat. No other data sources for these areas were included in the additional data provided by NPWS. This error was explained to the DAAAB on the 14/03/2025.

The answer appears to lie in the licences for non-renewable energy production and exploration issued by the Department of the Environment, Climate and Communications (DECC). The DECC publishes and Acreage Report each quarter which sets out the position of each authorisation in offshore Irish waters [41]. Shapefiles of the authorisations are supposed to be available on the DECC website too, however at the time of writing the links were not working. Therefore, the KFO downloaded the relevant shapefile from the Marine Institute’s Marine Atlas [26] and overlaid it on the proposed SAC (Figure 16). It was quite clear that the delineation of the SAC was tailored to avoid the EL3/19 and EL4/19 areas. As far as the KFO is aware the criteria for selecting sites for designation as SACs does not include a provision to avoid areas with existing licences (see section 3). Therefore, clarity is sought on why the NPWS have accounted for these oil and gas exploration licences in the delineation of the proposed SAC?

It should be noted that this is not without precedent as outlined in the KFO and IS&EFPO submission to DHLGH on the *Ecological Sensitivity Analysis of the western Irish Sea a to inform future designation of Marine Protected Areas (MPAs) Report* [42], where it was highlighted that NPWS avoided designating the majority of sandbanks in the Irish Sea as SACs. Those Annex I listed habitats are now the proposed sites of massive development of offshore windfarms, which will completely alter the natural habitats there. It begs the question, is the designation process being influenced or led by the energy industry? Regardless of the answer it further points to the lack of scientific integrity and the bias in the process for delineating the proposed SAC.

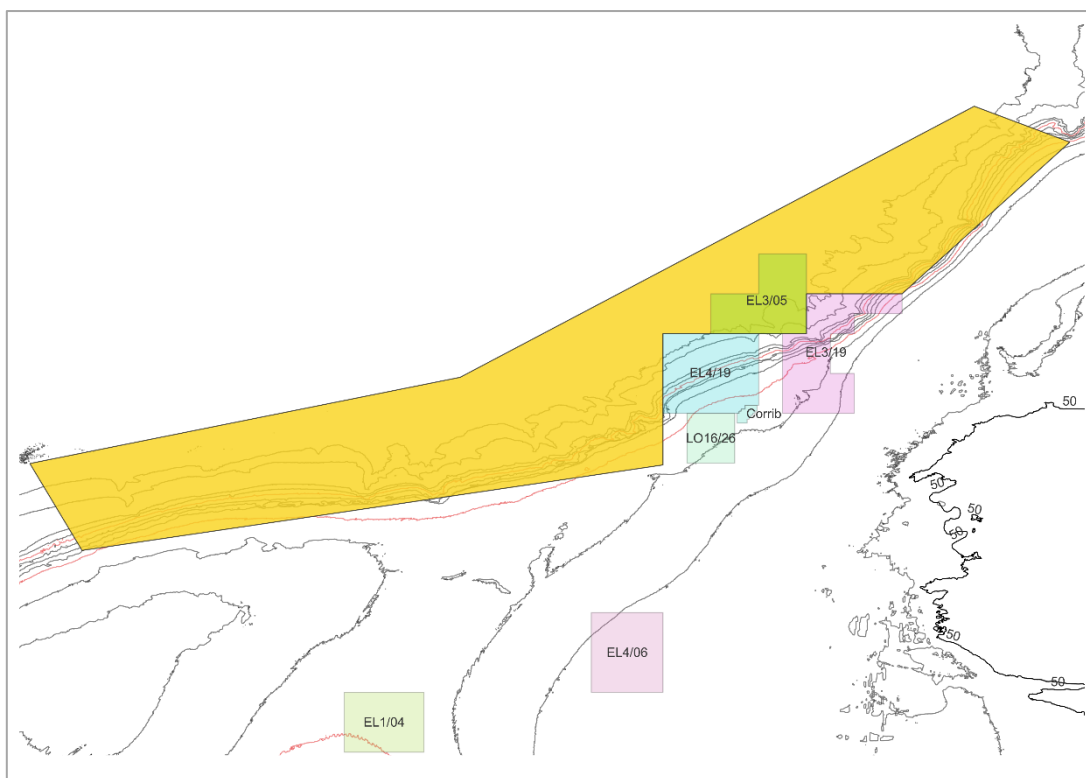


Figure 16. The proposed Porcupine Shelf SAC with the oil and gas exploration licences, licencing options, and petroleum leases.

In summary, NPWS has failed to prove that the Annex III Stage I Habitats Directive criteria have been applied or fulfilled in the development of the proposed Porcupine Shelf SAC. The proposed delineation is not supported by the cited data. There is no evidence of Reef habitat shallower than 463 m within the current proposed area. There is also no evidence of Reef habitat over significant parts of the proposed area deeper than 2000 m. The evidence cited has significant errors and inconsistencies and only represents a tiny proportion of the proposed area.

c. Proposed Southern Canyons SAC

Eleven out of 52 transects in the 2019 SeaRover survey were located within the proposed Southern Canyons SAC (Figure 17). The depth range of these dives is shown in Table 3 and none of the dives were initiated or ended at less than 900m. As a result, any reported evidence related to the occurrence of Reef habitat within the proposed SAC areas is only applicable to depths greater than 900 m in the Southern Canyons SAC. Seven of the eleven transects (64%) had no evidence of either geogenic or biogenic reef despite being targeted to survey areas with a high likelihood of having this habitat. Further nine out of eleven (82%) of the transects had no evidence of biogenic reef. The two transects that were positive for biogenic reef habitat had less than 10% occurrence. Similarly, only one transect had greater than 10% geogenic reef (i.e. rock). This underlines the general conclusion that the proposed SAC area is dominated by soft sediment habitat and not Reef.

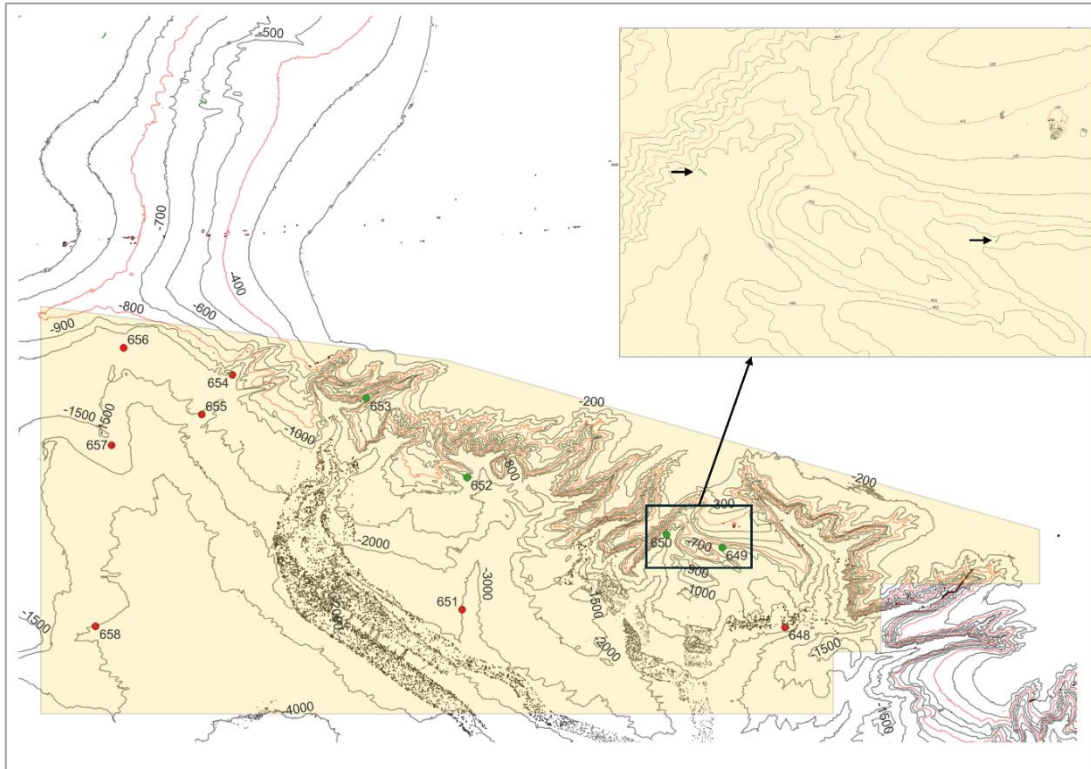


Figure 17. The 2019 SeaRover dive locations in the proposed Southern Canyons SAC. The green points represent transects with >0% reef presence and the red points represent transects with 0% reef presence. Note that the points are not to scale. The inset is zoomed to the area on the main figure and shows the length of the transects to scale. Note the width of the transects is not to scale to increase visibility.

Table 3. The depth range of SeaRover ROV transects undertaken within the proposed Southern Canyons SAC in 2019.

Start Depth Range (m)	Number of ROV Transects
0-400	0
400-500	0
500-600	0
600-700	0
700-800	0
800-900	0
900-1000	1
1000-2000	7
2000-3000	3

The length of the 11 transects within the proposed Southern Canyons SAC ranged from 331 m to 1036 m with an average length of 607 m (Table 4). As with the proposed Porcupine Shelf SAC data it was possible to calculate an estimated area of reef habitat within each transect, though as previously noted this is an overestimate as the ***'reef presence estimate is based on time, so may be skewed when there have been lots of stops for sampling or beauty shots'***. The total surveyed area of the transects within the proposed Southern Canyons SAC was estimated to 6.7km² of seabed. Once corrected for the occurrence of observed *Reef* habitat then the total estimated observed *Reef* habitat was 0.24km² (Table 4).

Table 4. The transit length (m), total % reef, estimated reef area, % geogenic reef (e.g. rocky outcrops, boulders, cobbles,) and % biogenic reef (hard matter created by living organisms) within the dives conducted in the proposed Southern Canyons SAC.

Area	Dive	Length (m)	% Reef	Estimated reef area km ²	% Geogenic Reef	% Biogenic Reef
Southern Canyons SAC	648	627	0	0.00	0	0
Southern Canyons SAC	649	331	10	0.03	6	4
Southern Canyons SAC	650	357	18	0.06	18	0
Southern Canyons SAC	651	423	0	0.00	0	0
Southern Canyons SAC	652	1036	10	0.10	2	8
Southern Canyons SAC	653	417	9	0.04	9	0
Southern Canyons SAC	654	1003	0	0.00	0	0
Southern Canyons SAC	655	733	0	0.00	0	0
Southern Canyons SAC	656	528	0	0.00	0	0
Southern Canyons SAC	657	777	0	0.00	0	0
Southern Canyons SAC	658	441	0	0.00	0	0

Given that the total area of the proposed Southern Canyons SAC is 14,448km², then **the % observed Reef habitat within the areas based on the evidence presented was 0.000017%**. Even if the assumed minimum patch size of 5 m x 5 m as indicated in the survey synthesis report [24] was used and the transects were assumed to be 5 m wide then the observed Reef habitat within the area based on the evidence presented would be **0.00008% of the total area proposed as an SAC**. Whilst it is prudent to apply the precautionary principal, the scale of extrapolation of the evidence base cited in the *Notice of Intention to Designate* the SACs is extraordinary. To put it into context in the case of the proposed Porcupine Shelf SAC it is akin to designating the entire combined area of counties Dublin, Wicklow, Wexford, Kildare, and Louth based on the presence of habitat the size of St Stephens Green.

Given the mismatch between the scale of the proposed Southern Canyons SAC and the limited evidence of Annex I Reef habitat observed on the 2019 SeaRover survey, it is prudent to examine the other data sources and additional scientific evidence cited by NPWS after the *Notice of Intention to Designate* period (see section 4). It should be noted that these data sources were not made available to the public by NPWS, and their existence only emerged after repeated queries from the KFO. Further, despite requests for the source reports and origin of the data that makes up the three layers, the NPWS failed to provide these to the KFO. Where possible the KFO have examined the original reports and sources.

The *Reef Polyline* layer comprised three data sources in the Southern Canyons area (Figure 18). Unlike in the proposed Porcupine Shelf SAC, the SeaRover transects were not part of the *Reef Polyline* shapefile. The first data source was again cited as *Dorschel & Wheeler (2009) INSS DEM Canyons* and appeared to show topographic lines of depressions in the seafloor that run perpendicular to the bathymetry. This data layer was already discussed in relation to the Porcupine Shelf SAC and it is again important to note that the presence of canyons does not confirm the presence of Reef habitat and the seabed in canyons may be comprised of soft sediment without any biogenic or geogenic reef being present. More rigorous analyses are required to determine the presence of Reef habitat in these areas.

The second data source in the *Reef Polyline* layer was cited as *Davies et al (2009) SW Approaches Canyons*. The metadata indicated the four records were from the *MESH Canyon Survey 2007* and that all four records comprised geogenic reef (i.e. rock). The only similar reference that could be found online was a report from a Joint Nature Conservation Committee (JNCC) Geophysical, Multibeam, Photo and Video Survey [43]. As part of that survey four camera tows were conducted just inside the Irish EEZ and the four tows appear to align with the records in the *Reef Polyline* layer (Figure 19). The deepest tow, C1_1, was a 1.4 km tow at 800-880 m and “the dominant seabed type encountered was muddy sand with varying amounts of shell debris. Bedrock was encountered and appeared to comprise chalk.” The bedrock was noted to have some isolated bamboo corals attached. The second deepest

tow (C1_4), was at 530-700 m depth and the seabed was primarily muddy sand with shells and pebbles though a rocky outcrop was observed. Therefore, both deepest tows could technically be considered to have comprised some *Reef* habitat.

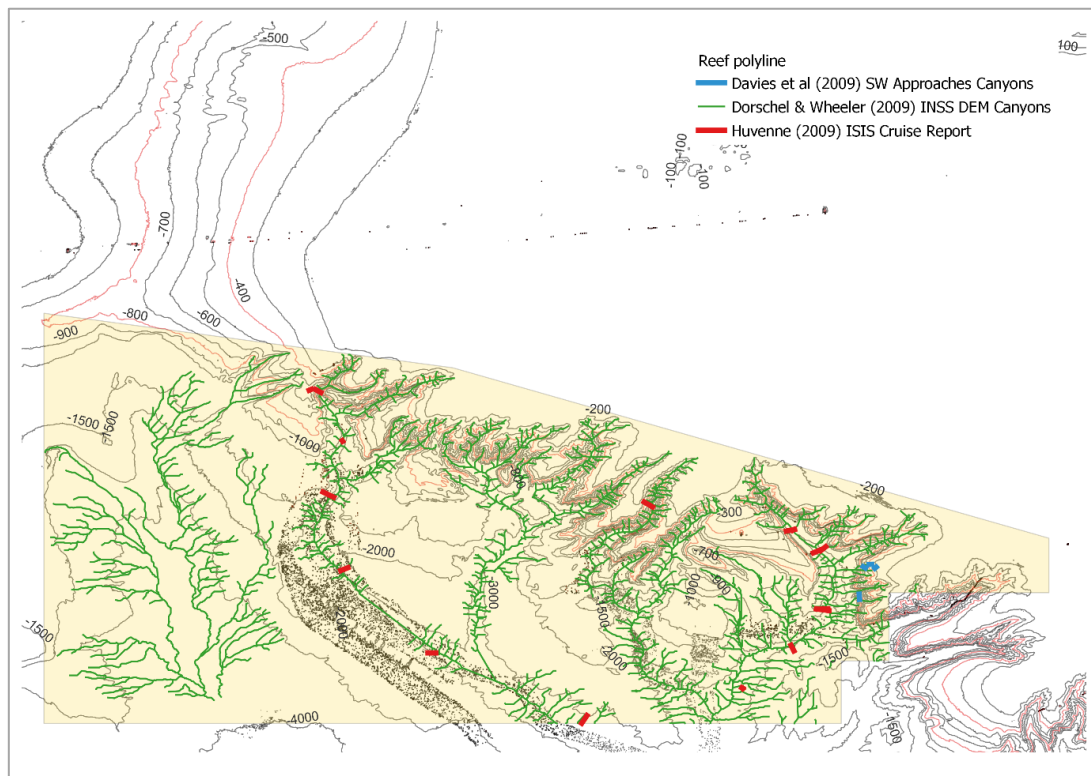


Figure 18. The *Reef Polyline* shapefile of showing the proposed Southern Canyons SAC with the three data sources noted in the legend.

Two shallower tows were also conducted - tow (C1_3) was at 350-440 m depth and the seabed was composed of muddy sand with varying amounts of shells and pebbles. Though a ledge of bedrock was noted later in the tow, no reef fauna was noted to be associated with it. The shallowest tow, C1_2, was at 280-300 m depth and encountered “rippled muddy sand”. Little epifauna were visible, apart from squat lobsters, *Munida rugosa*. There was therefore no evidence of *Reef* noted in this tow.

The final data source in the *Reef Polyline* layer was cited as *Huvenne (2009) ISIS Cruise report* (Figure 18). There were seventeen tracks in the shapefile, each labelled in the metadata as geogenic reef. The source of this data appears to be an ROV survey undertaken in 2009 onboard the RSS James Cook [44]. Most of the dives occurred at greater than 3000 m and all except two were at greater than 1000 m [45]. The shallowest dive was at 547 m. The cruise report did not give a detailed breakdown of each dive and it is therefore unclear how NPWS concluded that there was *Reef* habitat in each dive site. In fact, the word “reef” was not mentioned in the cruise report. NPWS should make clear what data was used to conclude that each of the dives identified *Reef* habitat.

The *Reef Points* shapefile comprised individual records from fifteen, partially referenced and unreferenced data sources (Figure 20). Most records were deeper than 800 m and twelve records were shallower than 400 m. As with *Reef Points* in the proposed Porcupine Shelf SAC, it was not possible to review each record. However, some key records have been reviewed to highlight the uncertainty of the data and the need for a full review.

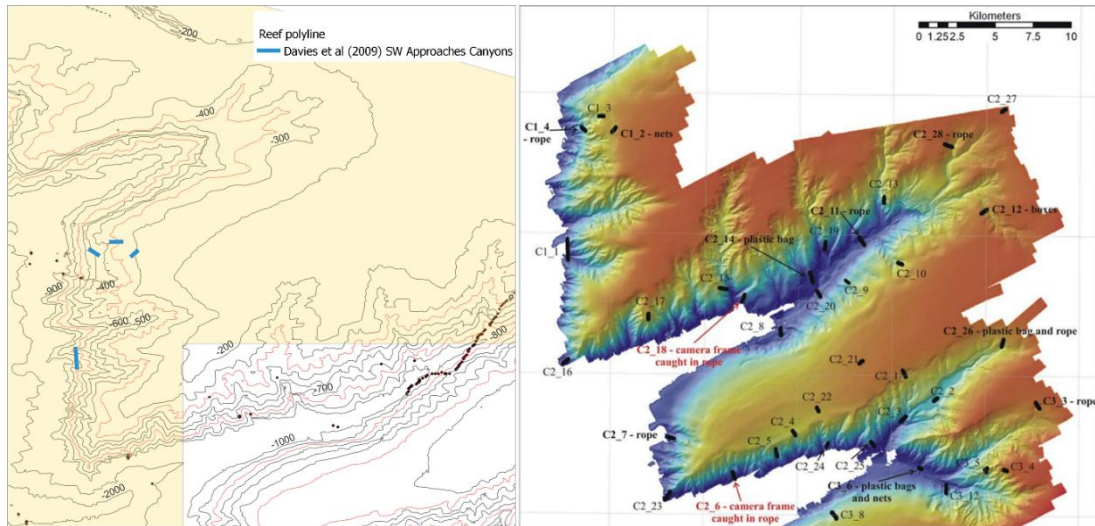


Figure 19. (left) The *Davies et al (2009) SW Approaches Canyons* records from the *Reef Polyline* shapefile. (right) Figure 18 from the *MESH Canyon Survey 2007* report.

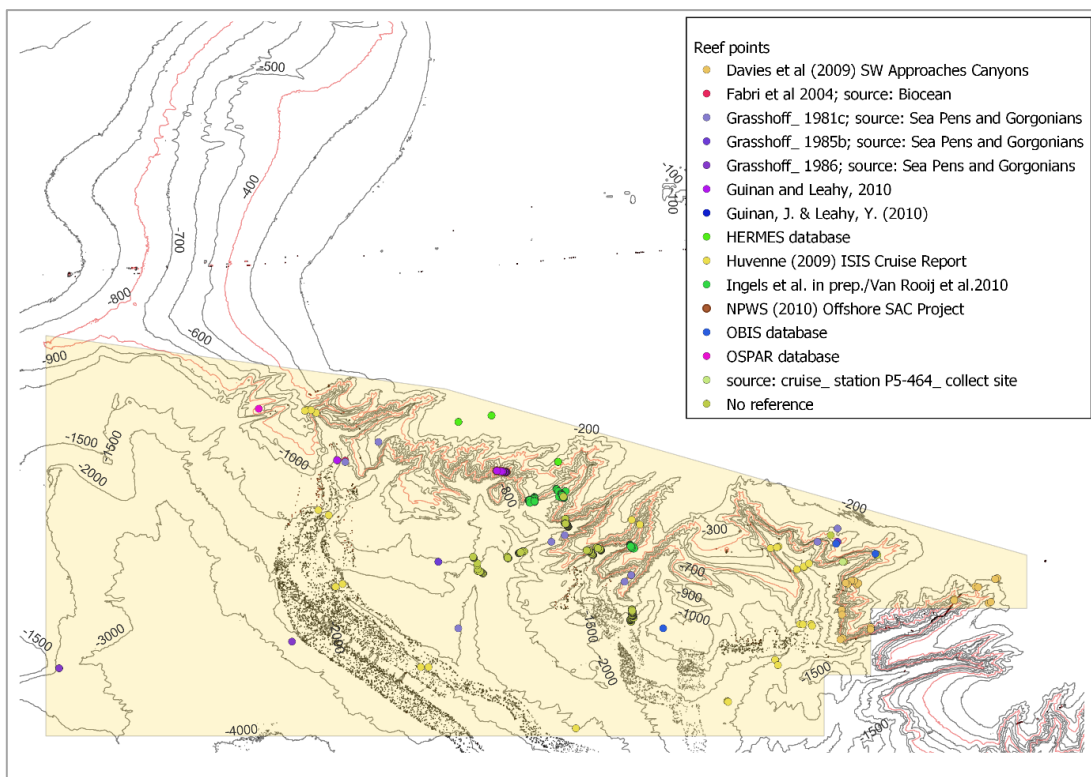


Figure 20. The *Reef Points* shapefile showing the data points with the sources coloured according to the legend.

There again appeared to be a considerable number of duplicated records. In the first instance, the *Huvenne (2009) ISIS Cruise Report* records have been included in the *Reef Points* shapefile as start and end positions for each dive transect and as previously described in the *Reef Polyline* shapefile as transects. Therefore, both this data layer and the individual points for each of these records are duplicated. Similarly, some of the *Davies et al (2009) SW Approaches Canyons* records have already been included in the *Reef Polyline* shapefile and are duplicated in the *Reef Points* shapefile as start and end positions, rather than transects.

Additional *Davies et al (2009) SW Approaches Canyons* records were also included in the *Reef Points* shapefile in the eastern part of the proposed SAC, which have been omitted from the *Reef Polyline* shapefile (Figures 19 and 20). It is not clear why the same datasets were used in diverse ways in the

different shapefiles in the same analyses. This is a disjointed approach and points to a lack of scientific rigour in the methods for compiling and reviewing the data.

The NPWS (2010) *Offshore SAC Project* records completely overlap with the *Guinan and Leahy, 2010* records, which is interesting as the later were from an unpublished NPWS report entitled “*Habitat Mapping of Geogenic Reef Offshore Ireland*”. The KFO requested a copy of the report from NPWS but were refused access. Therefore, it was not possible to verify the validity of the records.

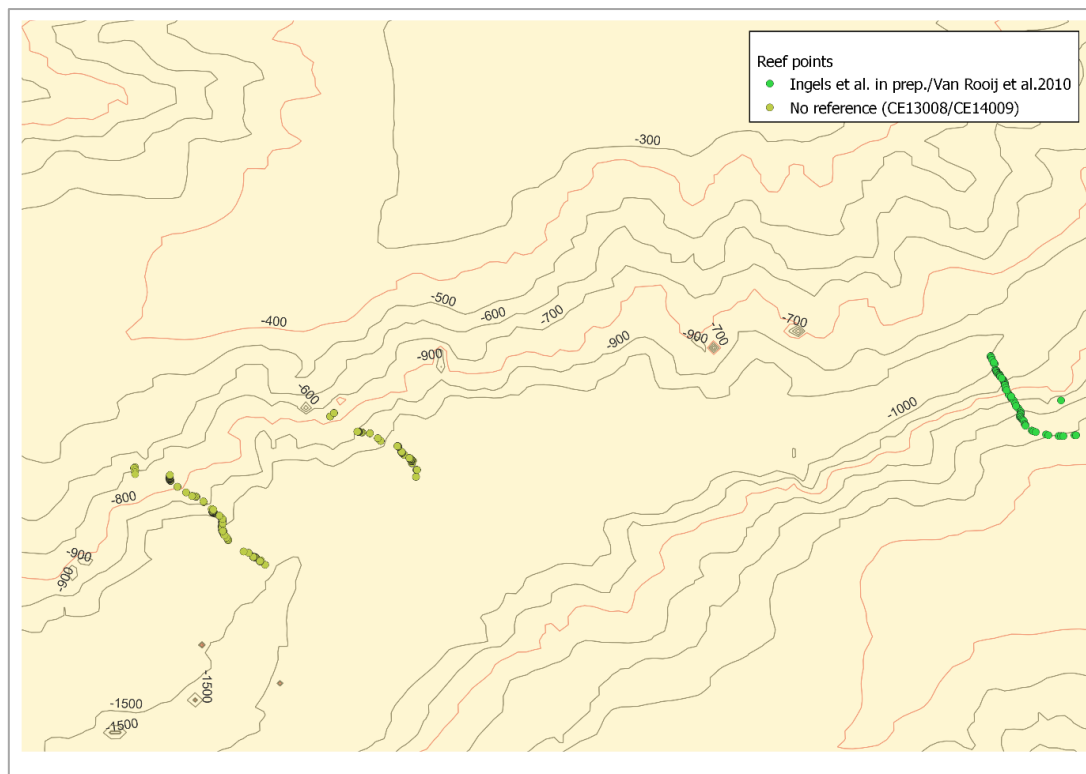


Figure 21. The *Reef Points* shapefile showing the duplicated data points from transects.

Whilst trying to understand where the “15,000 records of reef habitat” stated by NPWS came from it was noticed that in several cases in the *Reef Points* shapefile in the proposed Southern Canyons SAC, there were lines of closely aligned points, which was in the form of a transect (Figure 21). These were from multiple records some with partial references and some with no reference. Those with no reference did have a cruise codes (CE13008 and CE14009) in the associated metadata, which indicates they were from ROV surveys conducted on the Celtic Explorer. Though the individuals cruise reports could not be located, CE13008 was determined to be the *Biodiscovery and Ecosystem Function of Canyons Survey* [46] and CE14009 to be the *Whittard Canyon ROV Survey* [47]. Both surveys conducted ROV transects, and NPWS has included multiple positions along each transect as single *Reef Points* rather than a single transect as they did with the other ROV surveys. These are not individual independent records but rather the position of the ROV as it conducted the transect. The change in practice was not explained but it is not appropriate as it results in duplication of data points and a significant increase in the number of data points in the layer, which explains where the vast majority of the “15,000 records of reef habitat” originated from.

The same issue was also confirmed to affect another data source, *Ingels et al. in prep/van Rooij et al. 2010*, which was confirmed by comparing the NPWS *Reef Points* data with the map from the relevant cruise report [48]. It was clear that the multiple points in the *Reef Points* layer matched with the transects in the cruise report (Figure 22). That report showed that on Dive B10-05 (Figure 22) “only soft sediment was observed with nearly no living fauna”. Despite this, the *Reef Points* metadata indicates that the records in this transect were classified as “geogenic reef” and “seapen fields.” The

data pertaining to the individual records do not seem to have been adequately scrutinised. Therefore, the *Reef Points* shapefile should be thoroughly reviewed and revised as there are questions about the validity of many of the records currently in the dataset.

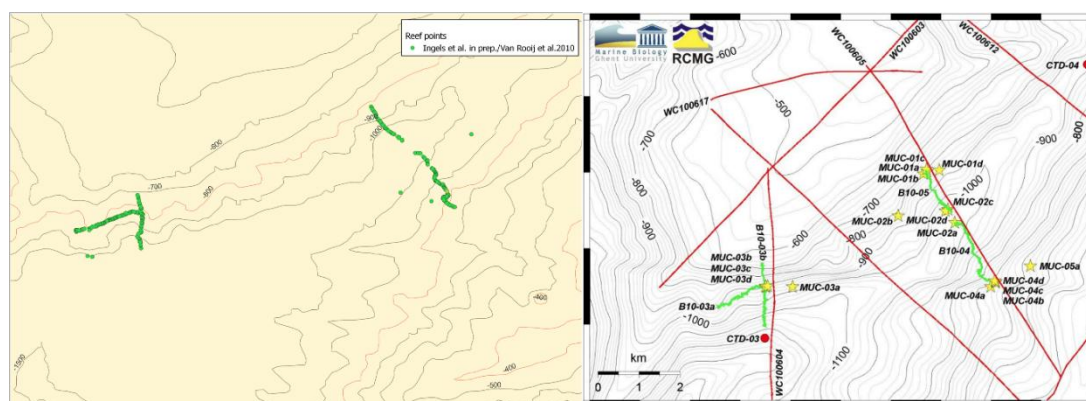


Figure 22. The *Reef Points* shapefile showing (left) the duplicated data points along a transect (right) the transects as shown in the 2010 cruise report [48].

The sources of the *Reef Points* records attributed to Grasshoff (1981c, 1985b, 1986) were unclear. The metadata states that these are all geogenic reef communities and notes gorgonians (sea fans). The source is listed as *Octocoral_2012*. It was unclear if these records were from a particular survey and to uncover the origin of these records the KFO queried the ICES VME database. It was clear that there were matching records in the ICES VME database and that these were the probable source of the *Reef Points* records. The metadata associated with these records confirmed that the records were archive records of gorgonians of the species *Iciligorgia schrammi* and with the observation date noted as January 1st, 1900. This appears as the default date for an archive record when the real date is not known. The original source of these records is not listed and as they are archive records it is likely that their position is not reliably known. It should also be noted that the ICES VME database has already been shown to contain significant errors and need a thorough review. This further adds to the uncertainty around these records of unknown origin.

A search for the records in question was conducted on the OBIS database through the mapper tool [38] and the records located. The records were noted as being from the ICES VME database and had the same metadata associated with them. There was no depth or original source noted. The EUROBIS toolbox database [39] was then interrogated. However, no additional data to that available in the OBIS or ICES VME databases was found. It was noted on the OBIS database, that *Iciligorgia schrammi* is primarily known to occur in the western Atlantic and primarily at depths shallower than 100 m, though it has been recorded to 500 m. All records of this species in the *Reef Points* shapefile exceed this depth and are obviously in the northeast Atlantic. Therefore, the species identification is questionable.

The records listed as *Iciligorgia schrammi*, were in the deepest part (western) of the proposed Southern Canyons SAC (Figure 23) and were cited as from Grasshoff 1986. A literature search was conducted to try to find the Grasshoff reference and a 1986 paper was located [49]. Manfred Grasshoff is renowned as a scientific authority for gorgonians and in his 1986 paper entitled “*Die Gorgonaria der Expeditionen von « Travailleur » 1880-1882 und « Talisman » 1883 (Cnidaria, Anthozoa)*” he described specimens collected during surveys conducted from 1880-1882. There was no mention of *I. schrammi* specimens, but the paper clearly described the confusion surrounding the location of the sampling positions and the fact that they have been incorrectly interpreted multiple times over the years. It highlights the uncertainty of using archive records with poorly documented sampling locations for spatial conservation measures without validating the records through modern approaches such as ROV surveys.

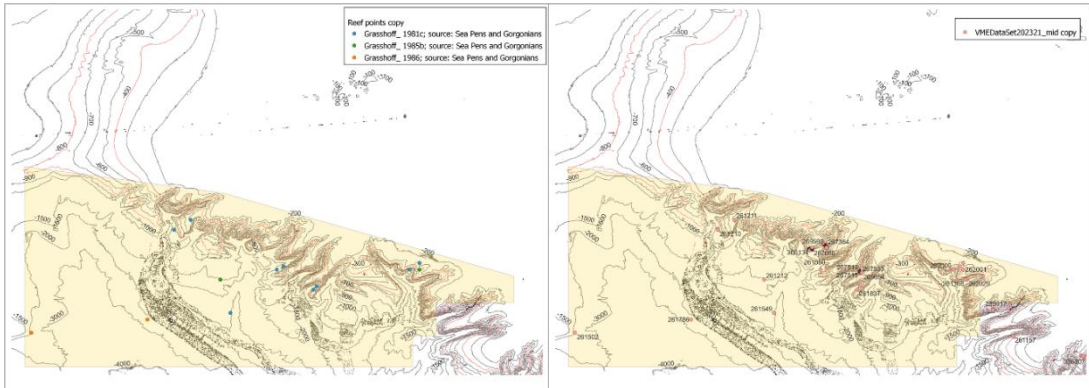


Figure 23. (left) the *Reef Points* shapefile with selected “Grasshoff” records shown (right) the ICS VME database records.

The final additional data presented by NPWS was the *Reef Polygon* shapefile (Figure 24), which in the case of the proposed Southern Canyons SAC comprised two data sources. As with the proposed Porcupine Shelf SAC, the basis of the *Reef Polygons* and the data used to derive them was unknown. There was a single small polygon attributed to the *Croker (2002) PAD Exploration Meta Data*, which overlapped completely with part of one of the *DECLG (2012) MSFD Habitat Mapping* polygons. The later comprised the majority this data layer and at its deeper side appeared to be aligned with the 1500 m bathymetric contour. The shallower side of the polygons is a straight line, with no obvious basis. There appears to be no agreement between the *Reef Points* and *Reef Polygon* layers. As NPWS have not made available the underlying data or the method for delineating the outlines of the polygons, it is not possible to determine their validity.

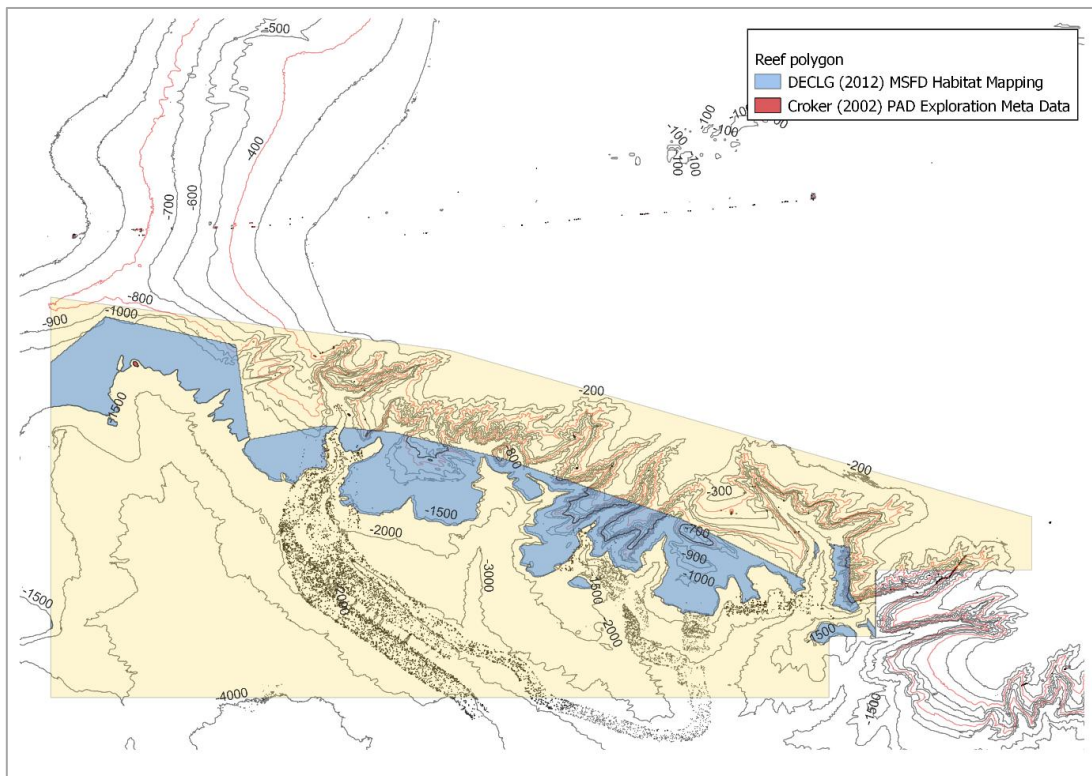


Figure 24. The *Reef Polygon* shapefile with the data sources coloured according to the legend.

In summary NPWS have failed to prove that the Annex III Stage I Habitats Directive criteria have been applied or fulfilled in the delineation of the proposed designation of the Sothern Canyons SAC. The delineation of the proposed Porcupine Shelf SAC is not supported by the data. There is no evidence of *Reef* habitat in many parts of the proposed SAC and where evidence has been cited it is in many cases poorly documented, unverifiable, and likely to be unreliable.

7. ***Suggested approach with the available evidence***

Despite the illustrated lack of evidence to support the proposed designations in their current form, it should be clarified that the KFO is not opposed to such designations provided that due process is followed and that such designations are based on robust scientific evidence which is applied at the finest spatial scale possible.

Further, as SACs will form part of Ireland's 30x30 MPA network, the process should include implementation of the recommendations of the *2020 MPA Advisory Group Report on Expanding Ireland's MPA Network* [15] in that '**Early and sustained stakeholder engagement should be integral to the selection and management processes for MPAs. Engagement should be inclusive and equitable and the process should be designed to ensure that it is transparent, meaningful and facilitating.**', and also the recommendation of the European Commission's *2022 Staff Working Document on Criteria and Guidance for Protected Areas Designations* [14], which advised that **Member States should involve all relevant stakeholders, including sea users, local communities and NGOs in the identification, designation and management of new protected areas, in a fair and participatory way, in line with the Aarhus Convention and in accordance with national procedures.** Had these recommendations been followed then the current situation could have been avoided prior to the *Notices of Intention to Designate* being issued. The KFO would be happy to be involved in and make a meaningful contribution to any such process.

The KFO recommend that the data should be reanalysed, and the proposed SAC polygons re-drawn to reflect the available supporting evidence. As it stands, during the *Notice of Intention to Designate* process, the only evidence cited were the SeaRover surveys (see Sections 3 & 4). Therefore, if the Regulations defined in S.I. No. 477/2011 are adhered to then the additional evidence proposed by NPWS after that period should be considered inadmissible. Ignoring these regulations would set an inappropriate precedent for other such initiatives and would undermine the future MPA process. Regardless, the additional data, which was not available for public scrutiny, has been shown to be replete with errors, inconsistencies, duplication, and presented with a lack of transparency. If it were to be used in any form, it would require a thorough review.

The question arises, what form would the proposed SACs take if only the SeaRover data were used in the delineation? To this end, the KFO plotted the SeaRover data and constructed polygons in areas where there was no evidence of *Reef* habitat. In the case of the proposed Porcupine Shelf SAC, in the shallower zone a 1 km buffer was applied to the 500 m contour to and the "*No evidence*" polygons bordered by this at the deeper side and bordered by the current straight lines of the proposed SAC at the shallower side (Figure 25). In the deeper zone of the proposed SAC the polygon was constructed to encompass the area without any scientific support and to follow the contours between 2,000 and 2,500 m, whilst leaving a significant buffer (Figure 25). There are further large areas that are not supported by the data and this example is simplified for illustration. The result was the inclusion of several areas in the shallower zone without any evidential support or justification in the proposed SAC (Figure 25). Removing them would mean the SAC would better reflect the bathymetry and align with the existing regulations on bottom contact fishing deeper than 400m [29]. This would entail removing c. 915 km² of the proposed SAC. Most of the SAC deeper than 2,000 m is also not supported by any evidence. If the delineation of the SAC were refined in this area, it would entail removing 6,268 km² of the proposed SAC (Figure 25). Therefore, in total c. 7,183 km² of the proposed 14,718 km² SAC or 49% are not supported by the data presented.

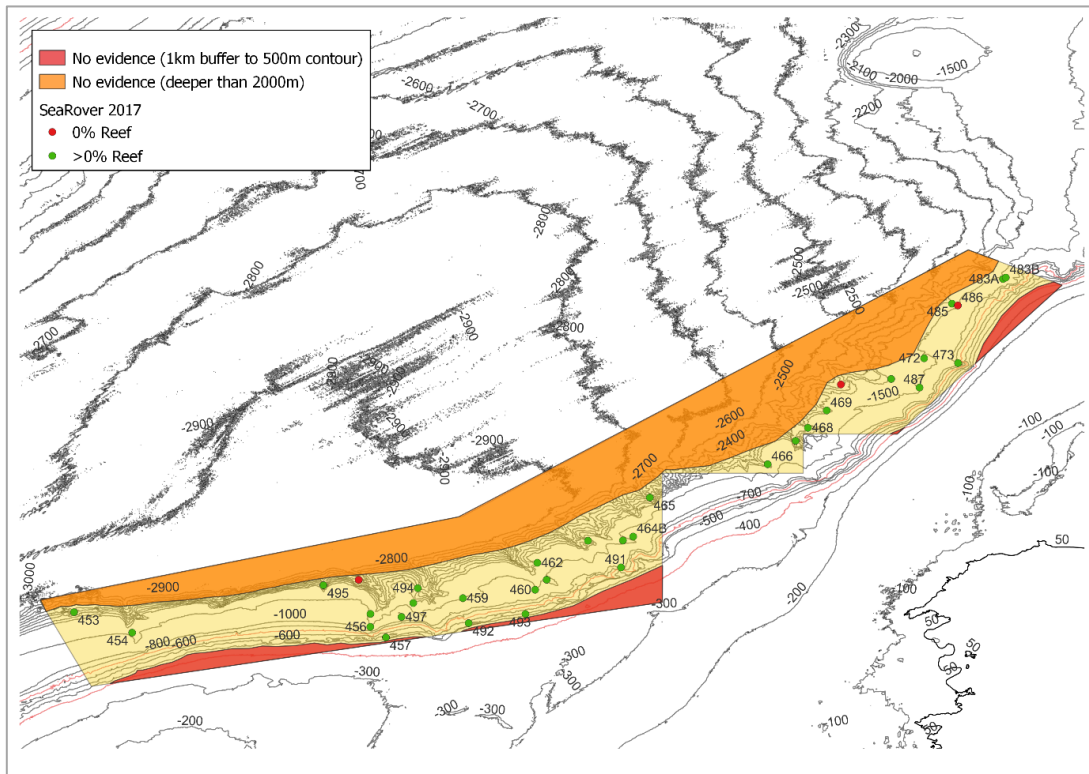


Figure 25. The proposed Porcupine Shelf SAC with the unsupported areas highlighted in red and orange according to the legend.

Similarly in the case of the proposed Southern Canyons SAC and the SeaRover data there was no support for *Reef* habitat shallower than 400 m and a polygon of 2,121 km² was constructed along this contour (Figure 26). There was no evidence of deepwater *Reef* habitat and in fact, the seven SeaRover dives proved that *Reef* habitat was not present in those locations sampled (Figure 26). If a polygon were constructed around those dives, it would amount to 10,068 km² (Figure 26). In total c. 12,189 km² of the proposed 14,448 km² SAC or 84% were not supported by the data presented.

The two examples presented above are deliberately extreme, as the current proposed SACs are, and provided to highlight the significant issues with the current delineation of the proposed SACs. The KFO is acutely aware that the precautionary principle should apply, where appropriate, and that Ireland has ambitious MPA targets to reach. It would be prudent to keep the proposed areas as large as possible whilst minimising the uncertainty due to lack of evidence. Rather than using straight lines, the polygons should follow bathymetric contours the shallower sides, which should be aligned with existing EU regulation on Deep Sea fishing (i.e. fishing with bottom trawls deeper than 800 m is not permitted). Numerous VME closures to fishing with bottom contact gears have been implemented in the 400-800 m zone [29] and it would be more sensible to align the SACs with these regulations, given the absence of evidence of *Reef* habitat in the shallower parts of the proposed SACs. This would also minimise impact on fishing and food production which as it stands will be significantly impacted if the current delineation of the SACs is accepted, whilst conferring no protection on *Reef* habitats.

The proposed SAC areas removed in the shallow zone could be gained by extending the SACs into deeper water where there is already no fishing with bottom trawls taking place and where any future exploitation with negative impacts on the seabed and potential *Reef* habitats could thus be prevented. Many of these areas remain unexplored. There may also be additional benefits such as protection of ecosystem services such as carbon sequestration, which in Irish waters is known to be highest and most stable in the muddy sediments of the abyssal plain [50].

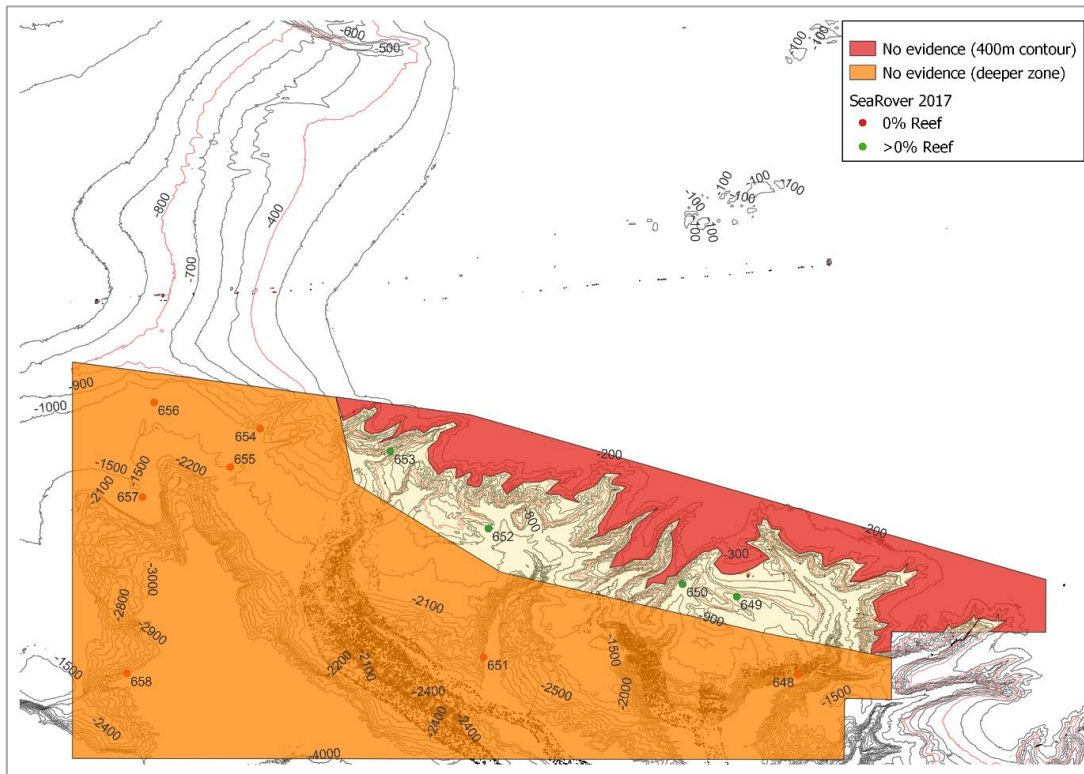


Figure 26. The proposed Southern Canyons SAC with the unsupported areas highlighted in red and orange according to the legend.

The previously unrecognised issue of NPWS adapting the outline of the proposed Porcupine Shelf SAC to avoid areas with non-renewable energy production and exploration licences issued by the DECC should be openly and transparently discussed (see Section 5b). As far as the KFO is aware, the criteria for selecting sites for designation as SACs does not include a provision to avoid areas with existing licences. The justification for this needs to be clearly explained. If there is justification and precedent for such an undertaking, then consideration should also be given to avoiding key fishing grounds, which are essential for food production.

It is important to also highlight pelagic fishing grounds. Pelagic fishing does not impact on bottom habitats. However, in the case of the other offshore SACs where closures have been implemented [10], pelagic vessels must adhere to additional regulations including having to give advanced notice of entering and leaving these areas and only having specific sized fishing gear on board. This creates unnecessary additional administrative obligations for the vessels, particularly given the enormous size of the proposed SACs (c.14,718km² and 14,448km²), that can interrupt fishing activities. The proposed SAC areas are important pelagic fishing grounds for Irish and international vessels and given the scale of these areas, such measures within them would cause widespread issues for pelagic fisheries. It is important that a sensible and informed approach is taken when it comes to implementing the SACs.

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