MERC Consultants
environmental and conservation services

Report

Surveys of sensitive subtidal benthic communities in

- Kilkieran Bay & Islands SAC
- Kingstown Bay SAC

Report prepared by:
MERC Consultants Ltd, Galway.

On behalf of:
National Parks and Wildlife,
Department of the Environment, Heritage and Local Government,
Plaza Offices,
Headford Road.
Galway

November 2005

1.Introduction

In furtherance of its policy of developing enhanced tools for managing Irelands marine Special Areas of Conservation (SACs), in 2005 the National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government – commissioned a survey of sensitive subtidal communities in Kilkieran Bay and Islands and Kingstown Bay SACs.

The over-riding purpose of the project was to enhance the conservation of marine wildlife and associated habitats in selected SACs through the investigation of ecological quality indicators.

Within the scope of the project, the following were considered as sensitive subtidal communities:

- beds of seagrass *Zostera marina*
- beds of maerl forming calcareous algae including *Lithothamnion corallioides, Phymatolithon calcareum*[1]
- communities of the polychaetes *Lanice conchilega* (Sand Mason) *, Sabella pavonina* (Peacock Worm) and the reef forming *Serpula vermicularis* (Tube Worm),
- reefs of the Native Oyster *Ostrea edulis* (excluding licensed fisheries/aquaculture sites),
- reefs of the bivalve mollusc *Limaria hians* **(**Gaping File Shell*),*
- communities of *Scolanthus callimorphus (* Burrowing Worm Anemone*)*
- beds of the tubicolous anemone *Pachycerianthus multiplicatus* (Fireworks Anemone),
- communities of *Virgularia mirabilis* and other Sea Pen species,
- beds of *Neopentadactyla mixta* and other burrowing sea cucumbers
- communities of the anemone *Edwardsia delapiae*

The well-documented ecological sensitivity of the selected communities means that they are commonly used in programmes designed to monitor environmental change, as the distribution and abundance of these communities are useful as indicators of habitat quality. A detailed baseline assessment of the distribution, extent and condition of these habitats/communities can facilitate the future management and long-term monitoring of the conservation status of designated conservation sites, as is required under the EU Habitats Directive.

Only *known* significant subtidal stands/populations of these communities constituted the primary target of the survey. However, while the survey was not a search operation *per se*, where additional occurrences of the aforementioned communities were identified as a result of survey effort, these were also surveyed.

[1] Both these species of maërl are listed in Annex V of the EU Habitats Directive (Council Directive 92/43/EEC)

The specific objectives of the 2005 study were to:

- ground-truth data on the distribution of maerl, *Zostera marina* and burrowing mega fauna within Kilkieran Bay and Isalnds SAC that was collected during the broadscale mapping projects conducted during 2001
- map the distribution of seagrass *Zostera marina* beds
- provide estimates of the density of *Zostera marina* beds and of specified megafaunal communities
- map the distribution of maerl communities
- map the distribution of other specific megafaunal communities (see above)

Two SACs were selected for survey during 2005:

- Kilkieran Bay and Islands SAC, Site Code 002111
- Kingstown Bay SAC Site Code 002265

The present report presents the main findings of the study, which was carried out by Marine Environmental and Resource Conservation Consultants Ltd. The textual report compliments the outputs of a more detailed and comprehensive Geographical Information Systems (GIS) project. The entire GIS project is presented electronically however the main outputs in the form of a series of maps are summarised herein.

2. Study Areas

2.1 Kilkieran Bay and Islands SAC

Kilkieran Bay and Islands Special Area of Conservation (SAC) is situated on the west coast of Ireland to the north of Galway Bay. The site is one of the largest and most important marine SAC's in Ireland. Taking in some 21,300 ha, the site encompasses all of the area below MHW mark of Greatmans Bay, Kilkieran Bay and Kiggaul Bay as well as a large area of more open water between Golam Head, Namacken Rocks and Mason Island. Kilkieran Bay itself forms the largest component of the site and is the most significant in terms of conservation value. Kilkieran Bay measures approximately 20km along its northeast-southwest main body. At its widest point it is approximately 8km wide (at the mouth of the bay from Golam Head to Inis Muskerry, however much of the bay is considerably narrower (less than 3km). The entrance to Kilkieran Bay faces the prevailing southwesterly winds, the direction from which the dominant ocean wave patterns also originate.

Kilkieran Bay is a fjard, that is a glacially formed drowned embayment with shallow sloping sides. The numerous islands and islets within the bay lead to a complex hydrography with strong tidal currents forming as the tidal flows are funneled around islands and through the many narrow channels. The mean depth of the area is 12 m Below Chart Datum (BCD) although depths within the bay are as great as 42m BCD. The bay encompasses a very wide range of sublittoral marine sediments. These range from mud and fine sand to duned maerl, gravels, broken shell cobbles and boulders. Exposed granite bedrock is to be seen at numerous locations within the site.

The area surrounding the site is comprised of lowland blanket bog with many hilly rocky outcrops. The SAC designation extends to a number of terrestrial areas, mostly islands.

The site has been designated a SAC because it contains good examples of four habitats listed under Annex I of the Habitats Directive - Large shallow inlets and bays, Reefs, Mudflats and sand flats not covered by seawater at low tide and Coastal lagoons.
The European Otter *Lutra lutra* also occurs within the site and is listed under Annex II of the EU habitats Directive. The Annex I habitats comprise some of the best examples of their type in Ireland, due to the great diversity of biotopes and species found within them.

Kilkieran Bay is connected with Greatmans Bay, lying to the east, by four narrow tide swept channels through which there is considerable exchange of water between the bays. Greatmans Bay facing due south and features a relatively narrow entrance channel approximately 1.5km long at the seaward end which opens up into the main body of the bay to the north. The deepest point of the bay is 18m BCD although most of the inner bay is <5m BCD. Greatman's Bay is of considerable conservation interest and there are examples of at least 3 Annex I habitats within the bay (Large shallow inlets and bays, Reefs, Mudflats and sandflats not covered by seawater at low tide).

Large shallow inlets and bays

Both inner Kilkieran Bay and Greatmans Bay are relatively shallow bays that are generally sheltered from wave action. These bays contain a high diversity of both substrates and sediments that support a very high level of biodiversity. Communities of high conservation importance include maerl beds, eel grass beds and sea pen/burrowing mega fauna communities.

Reefs

Reefs are extensive throughout the site and range from exposed to extremely sheltered. Littoral reefs show excellent examples of community zonation, while some of the sublittoral reefs show a high diversity of encrusting and branching sponges and ascidians. A number of rare sponges are supported in this habitat. The sites also supports several other species and communities of high conservation importance that are rare in Ireland.

Mudflats and sandflats not covered by seawater at low tide

Mudflats occur throughout the site in inter-tidal areas and are often found in association with saltmarsh. Many of the species associated with the mudflats are characteristic of this type of habitat.

Coastal lagoons

The site is extremely important for a number of lagoons that it includes. The lagoons situated to the north of inner Kilkieran Bay are considered to be the best examples of their kind in Ireland.

2.2 Kingstown Bay SAC

Kingstown Bay is a small, narrow tidal inlet located in north-west Connemara, Co Galway. The bay lies between two much larger bays to the north (Streamstown Bay) and south (Clifden Bay). It measures approximately 3 kilometers along the northwest-southeast axis. It is some 600m wide across the mouth of the Bay and the bay gradually narrows along its length, being less than 100 m wide at its easterly end and being less than 200m wide for more than half its length. The total area of the site is approximately 80 hectares.

There is little direct freshwater inflow to the site and hydrographically the site is considered entirely a marine site. There are no islands or other terrestrial components to the site. The north-westerly aspect of the bay and the islands of Omey, Inishturk and Turbot at the mouth afford Kingstown Bay a high degree of shelter from ocean swells. Conditions at the site become progressively more sheltered towards the head of the bay. Depths are at their greatest towards the mouth of the bay where they reach 15m. The bay becomes gradually shallower moving inwards, and there is a sill approximately half way into the bay over which depths are less than 2m BCD and within which there are intertidal areas. The sill extends for over 200m in length. Depths increases once again to

the east of the sill, however are in the main less than 5m BCD. Currents within the bay can be moderately strong and are at their strongest over the sill. Kingstown Bay contains a wide range of sublittoral sediments including medium sand and broken shell at the mouth of the bay to living and dead maerl, gravel and muds in the inner bay. Shorelines vary from bed rock to boulders and cobble at the mouth to dead maerl, gravel, mud and exposed bedrock in the inner bay.).

Kingstown Bay is of high conservation importance and is proposed for designation because it constitutes an important, good quality example of the habitats Annex 1 habitat *Large shallow inlets and bays*.

2.3 Existing Information on the sites

2.3.1 Kilkieran Bay

From the biological perspective, Kilkieran Bay is one of the best known inshore marine sites in the Ireland. The bay has been the focus of much research over the course of the past 50 years or so.

Aspects of the biodiversity of Kilkieran Bay which have been the focus of significant and detailed research include the extensive beds of living and dead maerl and associated in-fauna, the occurrence of large beds of burrowing holothurian sea cucumbers *Neopentadactyla mixta*, sponge communities of Gurraig Sound, *Zostera marina* beds which occur extensively within the Greatmans Bay and in Kilkieran Bay as far west as Mweenish and Ard Bays and the rare tube-dwelling anemone *Pachycerianthus multiplicatus.* A detailed listing of previous research work conducted on aspects of the flora and fauna of Kilkieran Bay is included in the Reference list accompanying this report.

The NPWS site synopses provides an excellent detailed summary of the species and communities encountered and recorded during the BioMar survey of Kilkieran Bay, broken down by Annex I habitat. A copy of the site synopses for Kilkieran Bay is reproduced in Appendix I.

The bay is the focus for significant bivalve shellfish fisheries, including oysters, clams and scallops. The bivalve fisheries are managed by Comharchumann Slioeisc Chonamara – the local shellfish Co-Op. Many small and medium scale studies have been conducted in the context of evaluating the various bivalve resources over the years. While such surveys are normally conducted with a stock assessment perspective in mind, they have added considerably to the existing level of knowledge about the distribution and extent of sedimentary habitats and associated species within the site.

2.3.2 Kingstown Bay

In contrast with Kilkieran Bay, Kingstown Bay has not been the focus of many biological investigations in the past. This may be in part due to its small size and a more normal faunal diversity for an inshore site. The BioMar survey did not visit this site and existing biodiversity information comes from a limited number of diver transects conducted on behalf of NPWS and from some anecdotal records.

Kingstown Bay is nevertheless of very high conservation importance, primarily because of the presence of dense beds of the red coralline algae *Lithophyllum dentatum, Lithophyllum fasciculatum* and *Lithothamnion corallioides,* all of which are maerl-forming species. The main maerl bed is located midway along the bay at its shallowest point and where currents are moderate. The bed is very dense and is formed by unusually

large rounded clusters, some of which may be up to 10cm in diameter. The bed has a very heterogeneous composition in which patches dominated by *Lithophyllum dentatum* and *Lithophyllum fasciculatum* alternate with patches dominated by *Lithothamnion corallioides*. There are further small beds of mixed maerl to the east of the shallow sill. Kingstown Bay has the second largest known population of *Lithophyllum dentatum* in Ireland and the largest population of *Lithophyllum fasciculatum*. Both of these species are known to be rare within Ireland. There are only three known sites where these three maerl species co-occur in Ireland, all of which are located in Co Galway. In terms of plant density and plant size Kingstown Bay contains the best examples of this particular association.

Sea grass (*Zostera marina*) occurs in a number of places in the bay and is dense in areas within the maerl bed. Several epiphytic algae also occur in the area. Of particular interest are *Gelidiella calcicola*, thought to be endemic to maerl, and the common coralline alga, *Corallina officinalis*, which grows in unattached balls at Kingstown Bay. The NPWS site synopses for Kingstown Bay is included in Appendix I and additional References are given in the reference list accompanying this report.

3. Materials and methods

3.1 Maerl and Zostera marina surveys

The methodology used for this study was largely developed in-situ derived after initial assessment of the site, examination of the admiralty charts and previous broad scale mapping of the area and extensive local knowledge.

Initially maps of the areas on a six-inch scale along with aerial images of the regions were examined for the presence of sea grass beds. Aerial photography conducted at a variety of scales and formats including black and white have been used in the past for the purposes of mapping sea grass beds. However aerial imagery available for the study sites was not suitable for the assessment of sub littoral sea grass beds at the study sites and examination of much of the imagery did not suggest the presence of sea grass in areas where the project team was aware of its occurrence. Given these factors, considerable effort was expended in developing appropriate survey techniques in order to maximize the area that could be covered in the available survey time. A further significant consideration was the requirement for data from the 2001-2002 broadscale mapping project to be corroborated or 'ground-truthed'. While that study provided data on the broadscale biological characteristics of seabed communities (habitats) for large tracts of the Kilkieran Bay and Islands SAC, the study in many cases did not define the extent of the various habitats encountered in terms of generating sufficient data in order to allow habitat boundary mapping.

A fundamental consideration therefore in the design of the present study was the requirement to generate data that would allow the extent (boundaries) of particular habitats encountered to be defined. As it was not possible to complete this task effectively using remote observation techniques, the task needed to be approached using data collection techniques that would not require further 'ground-truthing'.

The use of SCUBA is perhaps the most reliable direct seabed observation technique, however its major constraint is the amount of ground that can be covered by a diver swimming underwater. This is limited by air supply, safety and decompression considerations and is further affected by environmental factors such as tidal currents and seabed topography. The use of Diver Propulsion Vehicles (DPV's) in conjunction with SCUBA increases by a factor of 4 or 5, the amount of seabed area that can be covered by a diver. For this reason the use of DPV's during diving transects was identified as appropriate to this study.

In a further effort to obtain as much coverage in the time available to the survey, it was decided to carry out direct surface observations of seabed habitat where this would be possible. Given that much of Kilkieran Bay and Greatmans Bay are relatively shallow, coupled with the clarity of the waters for much of the summer period, it would be possible to conduct direct observations of the seabed from onboard a survey vessel using an underwater viewer. An underwater viewer consists of a water tight cylindrical housing

fitted with a glass or plastic lens at one end, the other end being left open. By submerging the end of the viewer fitted with the lens beneath the surface, excellent underwater observations can be made onboard a survey vessel. The effectiveness of the device is greatly enhanced through the elimination of all background surface light. This is achieved through the use of a hood covering the surface end of the viewer. While underwater viewers are available as off the shelf products, a larger device than was available commercially was required for the present study. A unit was therefore constructed using a 2-meter length of large diameter (200mm) ABS plastic pipe. A lens was made by fitting a piece of clear 8mm Lexan plastic to one end and making this watertight. The specially constructed underwater viewer could be secured outboard on the side of a survey vessel using ratchet straps.

The use of SCUBA and the underwater viewer provided a useful combination which could be combined on individual transects according to conditions of depth and visibility in order to achieve the most efficient coverage of ground.

Two vessels were employed at different times during the study period. A 10.5 meter fully decked shallow draft vessel, fitted with sheltered wheelhouse and an inboard motor was used for the majority of the study. This vessel was highly maneuverable in narrow channels and waterways and was capable of being operated in 2m of water depth. This facilitated the running of transect lines into areas where it would otherwise have been difficult or impossible to conduct in-situ observations. The vessel provided a stable platform from which to deploy and recover divers and from which to conduct direct observations using the underwater viewer. A 7.5 meter rigid inflatable boat fitted with an outboard motor was used for gaining access to the most remote and shallow parts of Kilkieran Bay e.g. Roskeeda and the area north of Camus Bay, as well as for the entire survey of Kingstown Bay. This vessel was further utilized for many of the video and photographic recordings made during the study. The vessel has a draft of less than 50cm with the motor fully raised out of the water. With the motor partially lowered the vessel is capable of being operated in water as shallow as 60cm.

For obtaining underwater imagery, a Fuji D2 digital SLR camera fitted in a SeaCam underwater housing and underwater strobe flash was for the purposes of making underwater photographic recordings. A Panasonic NV38S mini digital video camera fitted in a Seapro underwater video housing and fitted with a dive light was used for making underwater video recordings.

Positional data recordings were made using a Furuno GP-37 dGPS navigator and a Garmin GPS 76 dGPS unit. The Furuno unit provided both satellite and land based differential signal corrections while the Garmin unit provided satellite only derived differential signal corrections. Positional data was recorded using Irish Transverse Mercator grid reference system.

Data on species composition were recorded during dedicated dives and made in conjunction with photographic recordings. Occasional sample specimens were collected for later identification where photographic recordings could not be made.

3.2 Ground truthing of broad scale data

As all broadscale mapping transects had been conducted in water too deep to allow effective use of surface observations for ground-truthing, most of the habitat boundaries shown on the broadscale map were ground-truthed using SCUBA and a DPV. The boundaries of large areas of habitat as indicated on broadscale maps were verified by selecting a number of transect start points appropriate to the size of the broadscale indicated habitat area. Transect start points were generally located within the indicated habitat however occasionally start points were selected outside of the indicated habitat area. Having descended at the selected point, the surveying diver would then swim in a predetermined direction in order to locate the boundary of the particular habitat. Once located this position would be marked using a surface marker buoy towed by the diver. The diver would then surface and positional data would be recorded from the survey vessel.

Smaller areas of broadscale habitat (*c.* < 5 ha) were ground truthed usually by conducting a single SCUBA transect, bisecting the area on its greaest axis.

Spot dives were conducted at sites where broadscale data indicated the presence of very small areas (*c.* < 2 ha), in order to provide point source verification observations. Due to the small area of most of these sites, spot dives were deemed adequate to verify previous mapping.

3.3 Field assessment for Zostera marina and maerl

3.3.1 Shallow field assessment for *Zostera marina* and maerl

Where *Zostera marina* and/or maerl abundance was high and water clarity permitted, the boundaries of beds were mapped from onboard a survey vessel driven at low speed (1-2 knots) along given transect lines. A dGPS position fix was recorded at the start of each transect and the nature of the seabed was recorded (e.g. sand, shell, kelp, maerl, *Zostera marina* etc.). The vessel was steered on a steady course along a given transect bearing, while an observer continuously examined the seabed through an underwater viewer for a change in bottom sediment or cover. At each instance of a change in seabed type a dGPS fix and the type of cover was recorded. Such fixes were as close apart as 10m in some instances and as far apart as 100m or more in others, depending on the variability of the seabed. The vessel continued along the transect until an end point (usually the shore) was reached and a final position fix was made. In some cases, even in areas of shallow water, where the clarity through the underwater viewer was insufficient, a diver was deployed to spot-check any areas of ambiguity.

In all cases where *Zostera marina* was recorded an assessment of its abundance was made on an AFOR scale. In cases where maerl was recorded, its nature (e.g. duned, banded, live or dead) was recorded. Due to difficulties in the positive identification of the two common maerl forming species *Phytomatolithon calcareum* and *Lithothamnion*

coralloides the seabed was recorded as marl only. In some instance, where a sample was taken, and a positive identification was made this identification was included.

3.3.2 Deep field/poor water clarity assessment for *Zostera marina* and maerl

In water deeper than 5 m or if water clarity was poor the area was mapped using a combination of diver transects and spot dives.

A buoy connected to a line with a lead weight at the bottom was dropped over board at the start of a given transect. Having descended the line without pulling on it or causing the weight to move, the diver then followed a given compass bearing, using a compass mounted on a side arm fitted to a DPV. Over the course of a given transect the diver recorded the nature of the seabed and the occurrence and density of *Zostera marina*. Maerl presence/absence and state (i.e. live/dead, dunned, banded etc) was also recorded. At the start of each transect the diver noted the nature of the seabed and then continued along the bearing until a significant change in the seabed habitat occurred. At this point the diver deployed a delayed Surface Marker Buoy with a lead weight attached to the end of it so that the marker buoy remained in position. The boat cover, which continually tracked the diver then moved into position at this buoy and recorded a dGPS position fix, thus allowing the diver to continue along the transect and record further changes. In many cases the depths of the dives were very shallow and this allowed the diver to surface and communicate a change in seabed nature to the recorder on-board the boat. The diver could then re-descend and continue on the transect until an end point was reached. At the end of each transect the diver would detail the changes noted at any point that a Surface Marker Buoy was deployed. All data recordings were geo-referenced using differential GPS positioning.

3.4 Selection of transects for field assessment for Zostera marina and maerl

While the study aimed to provide a high degree of resolution in terms of seabed habitat discrimination over a large area, an important consideration was that transect spacing could be altered to reflect the discontinuity or variability of habitats that would be encountered during the study. The nature of the study and considerations of efficiency and best use of time dictated that the employment of predetermined inflexible transect selection criteria were not suitable.
Accordingly, initial transect spacings were maximized at between 200 and 500 meters apart. Where a significant discontinuity in habitat type was noted between two parallel transects lines, a transect running perpendicular to these would be conducted in order to determine the point of change. Transect lines were generally selected in order to run perpendicular to existing habitat boundaries indicated by the broadscale map or to the general directional lie of the particular body of water e.g. bay, channel or sound, in areas for which there was no broadscale data.

Using these transect selection criteria, transect spacing could be adapted in order to provide coverage as efficiently as possible, while providing an acceptable degree of resolution.

3.5 AFOR Scale

Although the use of an AFOR, or similar abundance scales is largely subjective, it provides a quick method of estimation of the abundance of a species. Abundance scales are frequently used in marine and terrestrial ecological surveys. (Higgins *et al,* 2004). For the purpose of this study an AFOR scale was calibrated to best suit the study site. Initially dives were conducted across varying degrees of density of *Zostera marina* in order to calibrate a scale for this survey. Table 3.1 shows the scale used following calibration by a diver counting the number of individual plants within a 1 m^2 area. In many cases, after the initial calibration, areas of *Zostera marina* were encountered where the number of individuals per m^2 greatly exceeded the state of abundant according to the calibration and in these cases the term Dense Abundant was used. Typically such beds contained greater than 20 individuals per square meter

Table 3.1 Detail of *AFOR* scale used in estimation of *Zostera marina* abundance

Abundant	**F**requent	**O**ccasional	**R**are
> 12 individuals per m^2	6-11 individuals per m^2	2-5 individuals per m^2	<2 individuals per m^2

3.6 Mapping of mega faunal communities

SCUBA techniques were used in order to map selected mega faunal communities (burrowing anemones, holothurians and Sea Pens). The presence of these communities were noted during assessment for maerl and *Zostera marina*, with the aim of returning to these locations later in order to conduct more detailed targeted mapping of the particular communities.

A similar, transect based approach as used to map maerl and *Zostera marina* was employed for mapping mega faunal communities. However SCUBA was exclusively used for this purpose as these communities tended to be beyond the scope of surface observation capabilities. The particular transect technique involved bisecting a known mega faunal community repeatedly, each time swimming in a different direction. The point at which a mega faunal species was first encountered on a given transect was recorded, as was the point on a transect beyond which the species was no longer present to any significant degree.

Density estimates were carried out by using a transect line to cover a known distance across the seabed. For burrowing anemones and Sea pens, all individuals of a species

passing under a diver held 2 meter transect pole were recorded. Thereby an estimate of number of individuals/m^2 could be made.

3.7 Data Recording

Underwater data recordings were made using a dive slate and pencil or marker. Surface data recordings were also logged manually. All data were later transferred onto an Excel spreadsheet database.

4. Results

4.1 General

A total of 29 days of fieldwork was undertaken. During this time 409 individual transects were completed. Of these, 40 were carried out in Kingstown Bay SAC while 369 were conducted in Kilkieran Bay and Islands SAC. Transect data recordings produced some 1800 lines of data in total. Thus the survey was successful in generating a large amount of data in relation to the extent and distribution of sensitive subtidal communities in Kilkieran Bay & Islands SAC and Kingstown Bay SAC. The data supplements that generated during the earlier broadscale mapping exercise and allows for the generation of gross habitat maps for the communities specified.

In addition to transect line surveys, density estimates were successfully obtained for populations of *Virgularia mirabilis* and *Pachycerianthus multiplicatus.* A limited number of photographic and videographic recordings were also made for relevant subtidal communities.

4.2 Survey of sensitive subtidal communities

Data are most appropriately presented in a series of maps depicting the distribution and extent of sensitive subtidal communities. Treating the data in this manner also facilitates interpretation of results. Maps have been generated in a GIS project which utilized ArcView 3.2® GIS software.

The GIS project consisted of plotting transect line data on digitized versions of Admiralty Charts for Kilkieran and Kingstown Bays. Transect lines were color coded so as to indicate the particular community or population recorded along the transect during field survey work. Completion of this task allowed for the drawing of boundary lines, which broadly aimed to indicate the distribution and extent of sensitive subtidal communities. The latter task was completed manually in ArcView 3.2® and boundaries were drawn while paying heed to significant changes in bathymetric and seabed topographic detail, as indicated on the chart. Where it was felt such changes represented a high likelihood of discontinuity in a community, efforts were made to reflect this in the drawing of boundary lines. Table 4.1 summarises the output from the mapping project by sub-area and subtidal community. Appendix II summarises data recorded during individual transects while Appendix III contains species lists for key habitats encountered during fieldwork.

Table 4.1 Summary of Figures detailing area and community depicted

Reference	Area represented	Reference
Figure 4.1	Kilkieran and Greatmans Bays	Data points and transects
Figure4.2	Kingstown Bay	Data points and transects
Figure 4.3	Greatmans Bay	*Zostera marina* boundary
Figure 4.4	Greatmans Bay	Maerl boundary
Figure 4.5	Ard and Meeenish Bays	*Zostera marina* boundary
Figure 4.6	Birmore Island	*Zostera marina* boundary
Figure 4.7	Golam Harbour	*Zostera marina* boundary
Figure 4.8	Kilkieran Bay (mid)	*Zostera marina* boundary
Figure 4.9	Ard Bay	Maerl boundary
Figure 4.10	Kilkieran Bay (outer)	Maerl boundary
Figure 4.11	Kilkieran Bay (mid)	Maerl boundary
Figure 4.12	Kilkieran Bay (inner northern)	Maerl boundary
Figure 4.13	Kilkieran Bay (inner eastern)	Maerl boundary
Figure 4.14	Kingstown Bay	*Zostera marina* boundary
Figure 4.15	Kingstown Bay	Maerl boundary
Figure 4.16	Kilkieran Bay (inner)	*Virgularia mirabilis*
Figure 4.17	Kilkieran Bay, Roskeeda	*Pachycerianthus multiplicatus*
Figure 4.18	Kilkieran Bay (outer)	*Neopentadactyla mixta*

Density estimates were successfully obtained for *Pachycerianthus multiplicatus* and *Virgularia mirabilis* at each location where these populations and communities were encountered during the survey. In the circumstances however, it proved impossible to estimate densities for populations of *Neopentadactyla mixta*. This was due to the onset prior to the completion of field work of the seasonal almost complete torpor that charaterises this species behaviour. During torpor, *Neopentadactyla mixta* retreats into the seabed for an extended period commencing in September and lasting until March/April. During this phase there is no visible indication of the animals presence on the seabed. Density estimates are therefore not obtainable without the use of invasive techniques such as suction dredging. Nevertheless, based on a low number of brief visual assessments, *Neopentadactyla mixta* occurs in Kilkieran Bay in beds amongst dunes of dead maerl, within which densities are thought to reach several hundred per square meter. Table 4.2 Summarises results of density estimates for *Pachycerianthus multiplicatus* and *Virgularia mirabilis* populations at different locations in Kilkieran Bay and Islands SAC.

Photographic recordings are presented in digital format on the CD accompanying this report, while videographic recordings can be accessed by querying the GIS project or by viewing the separate DVD.

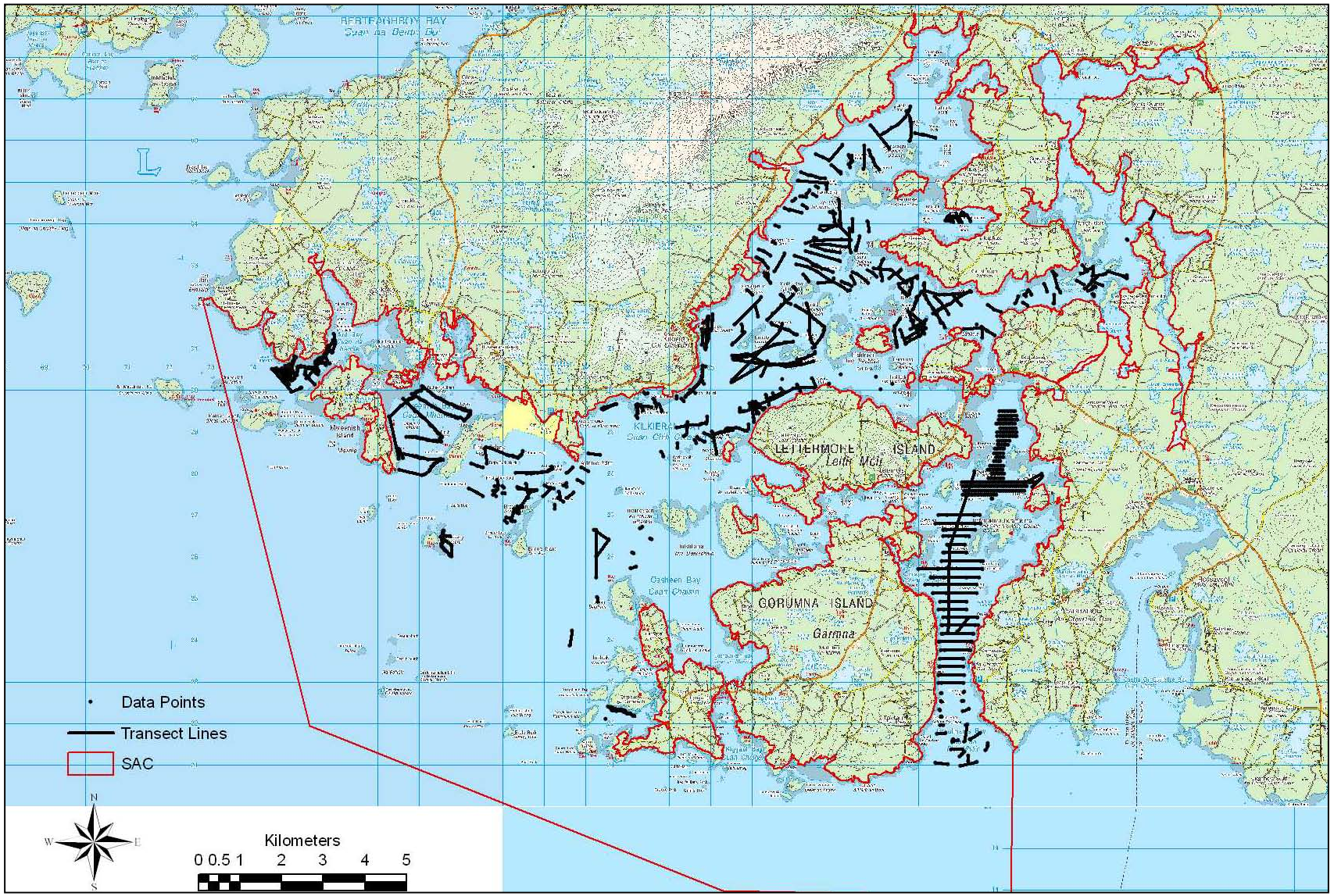

Figure 4.1 Kilkieran and Greatmans Bay. Data points and transects

Figure 4.2 Kingstown Bay. Data points and transects

Figure 4.3 Greatmans Bay. *Zostera marina* Boundary

Figure 4.4 Greatmans Bay. Maerl Boundary

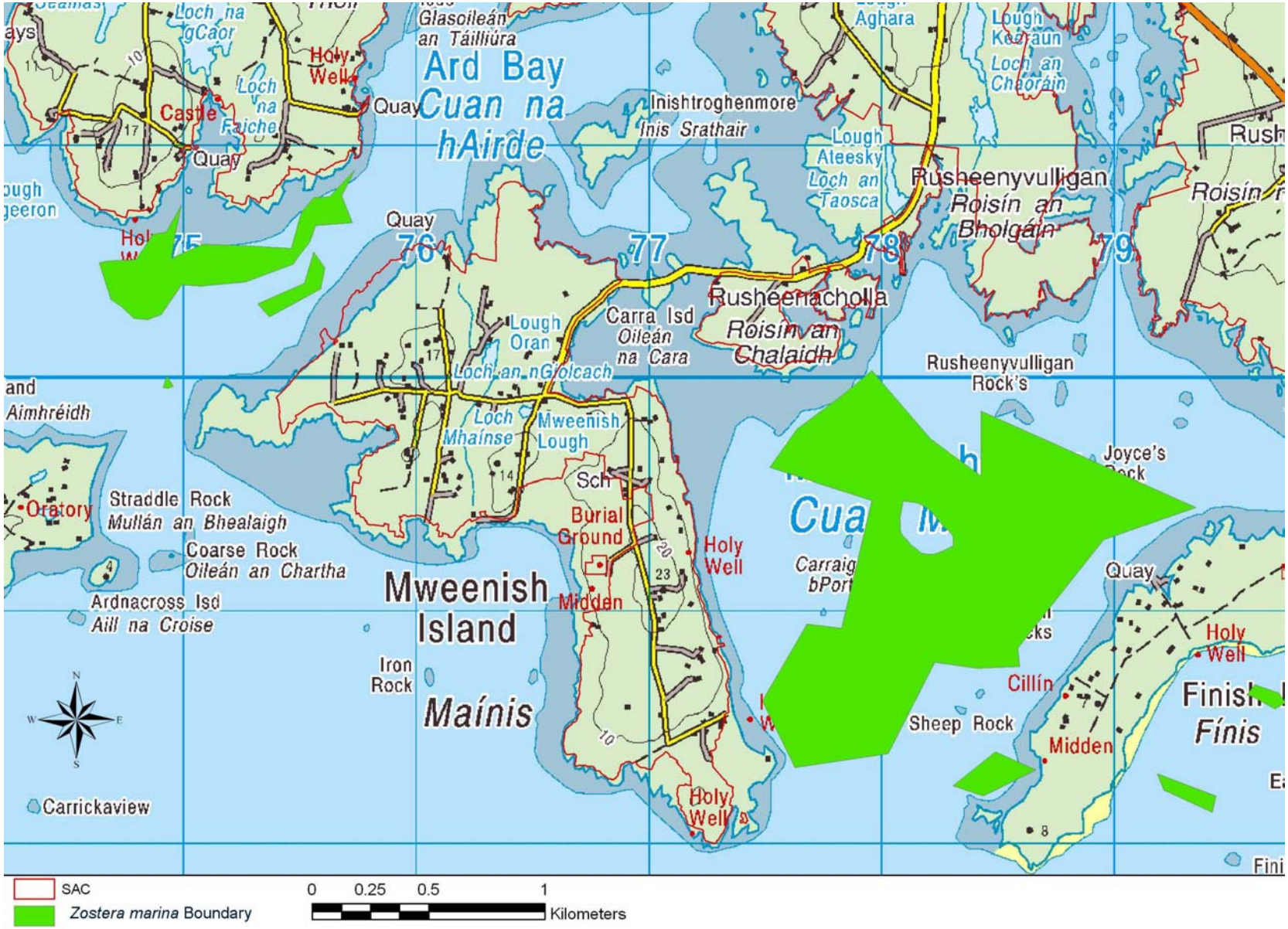

Figure 4.5 Ard and Meeenish Bays. *Zostera marina* Boundary

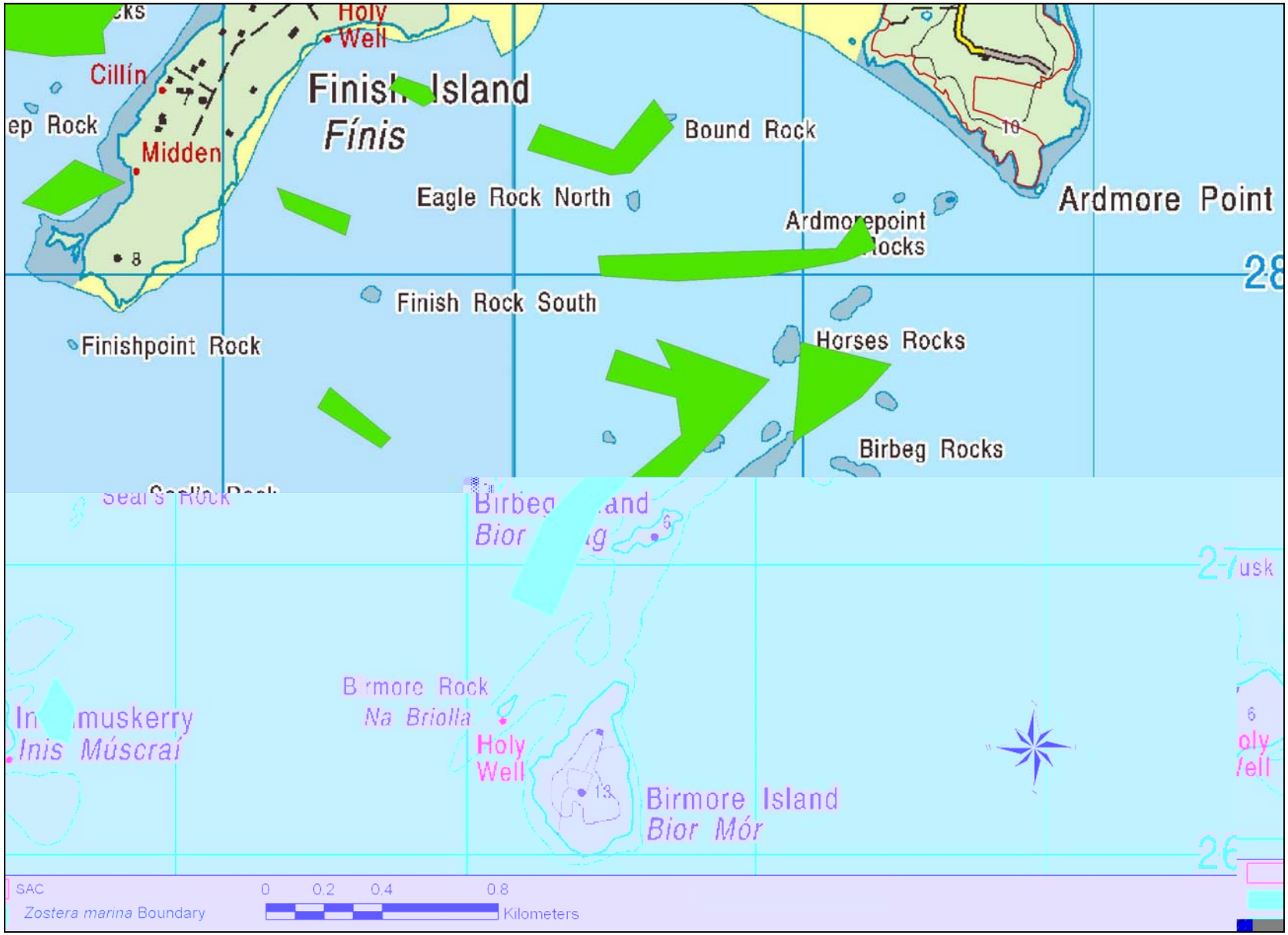

Figure 4.6 Birdmore Island. *Zostera marina* Boundary

Figure 4.7 Golam Harbour. *Zostera marina* Boundary

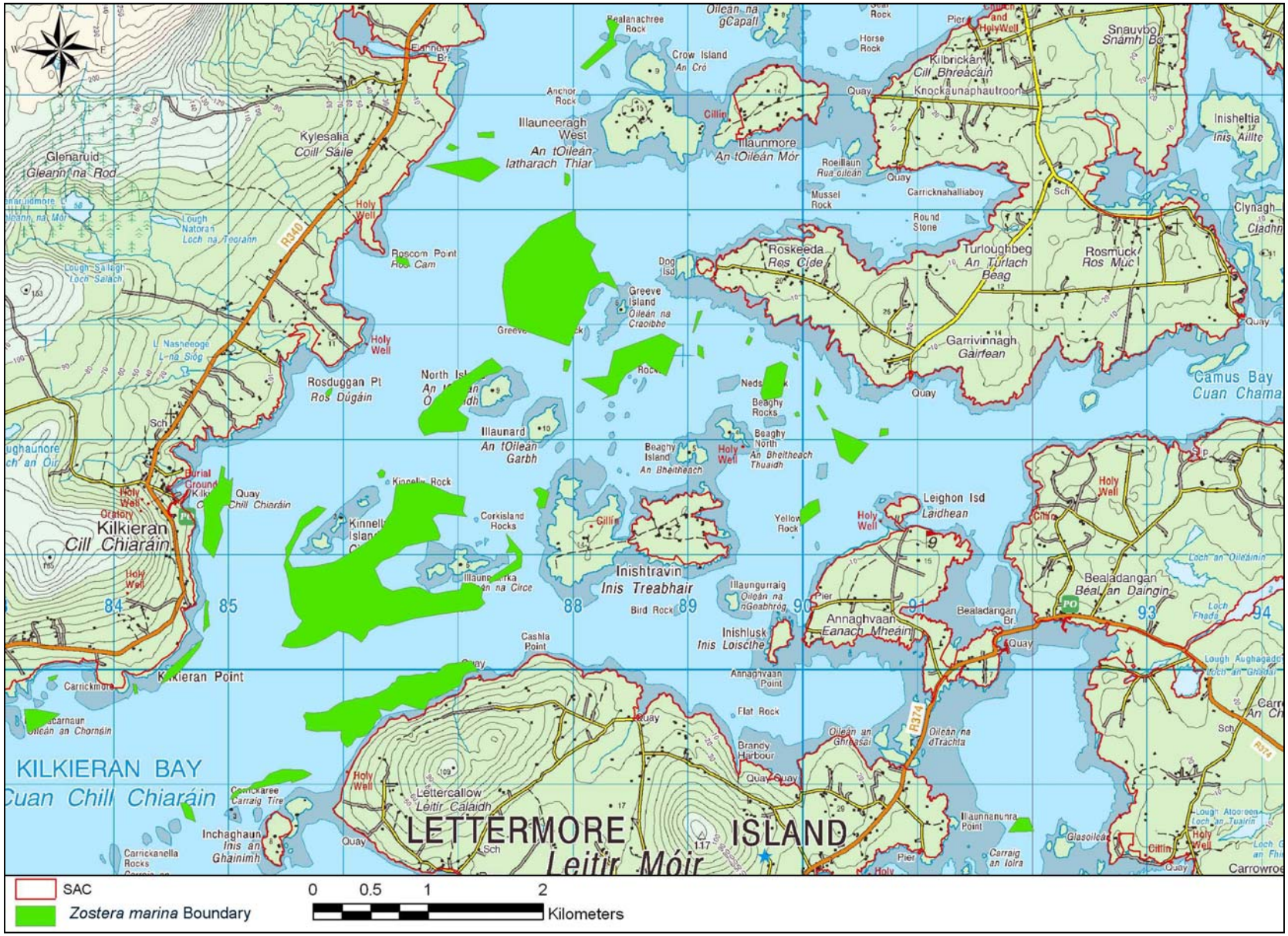

Figure 4.8 Kilkieran (mid). *Zostera marina* Boundary

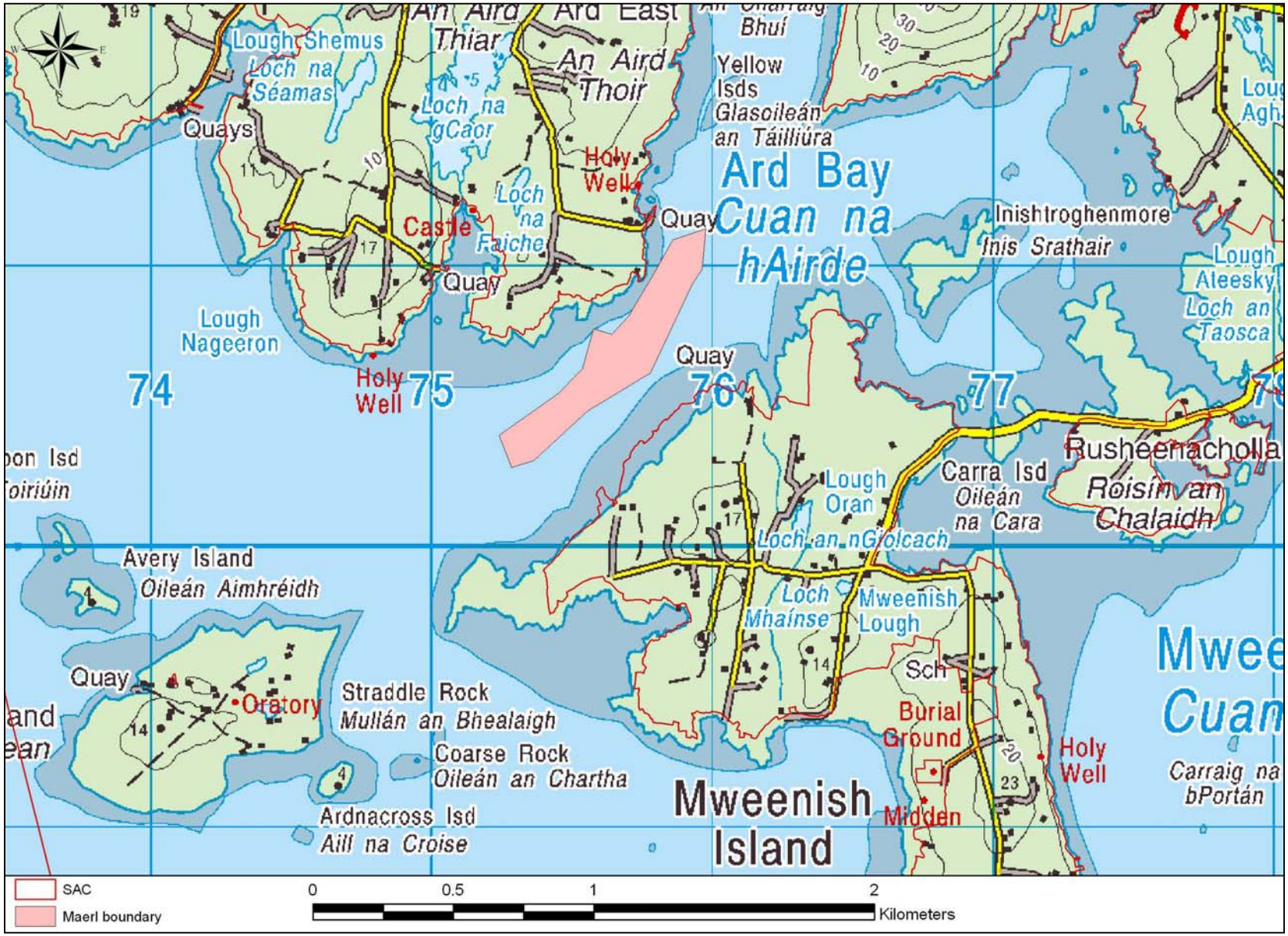

Figure 4.9 Ard Bay. Maerl Boundary

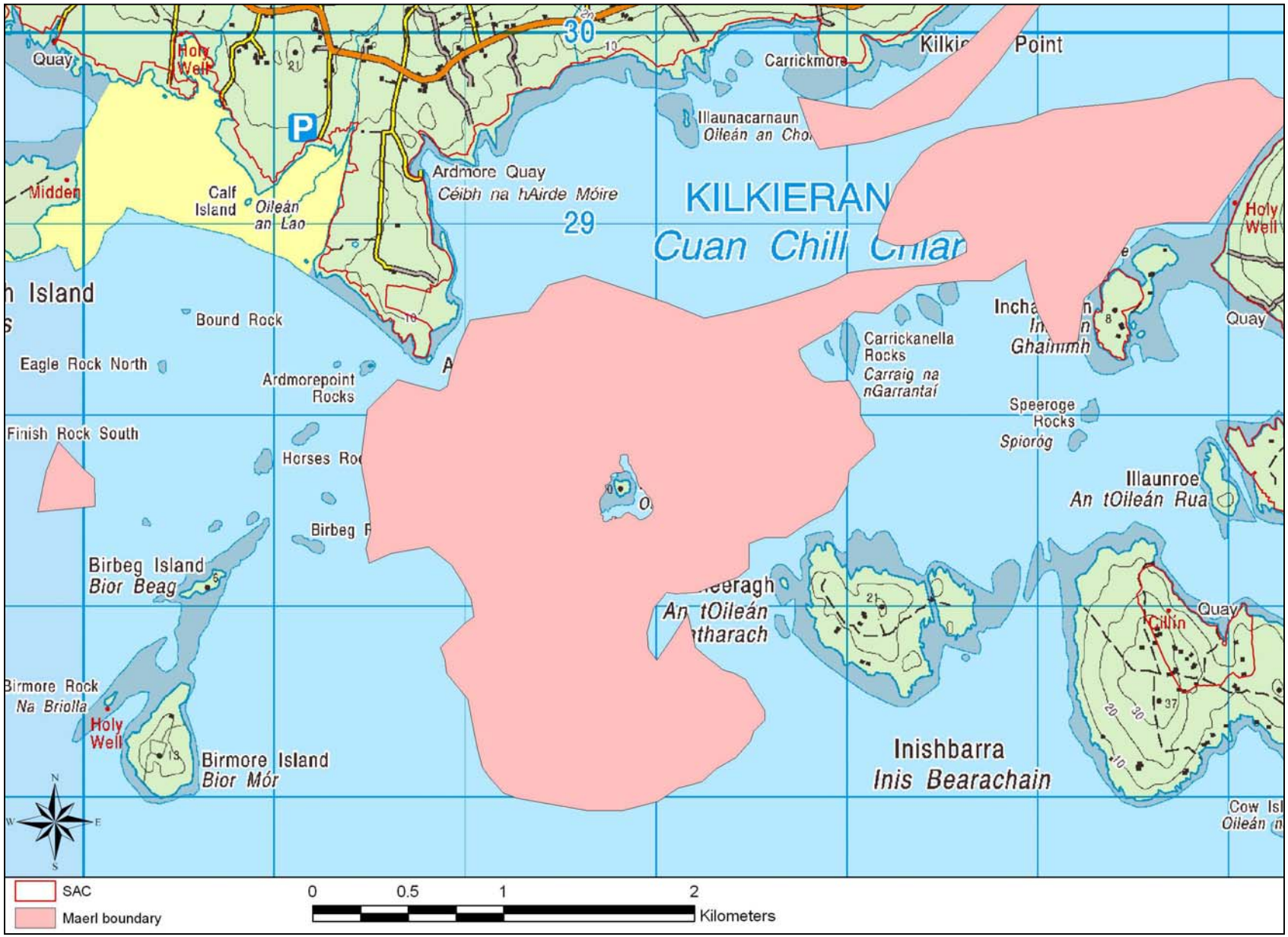

Figure 4.10 Kilkieran (outer). Maerl Boundary

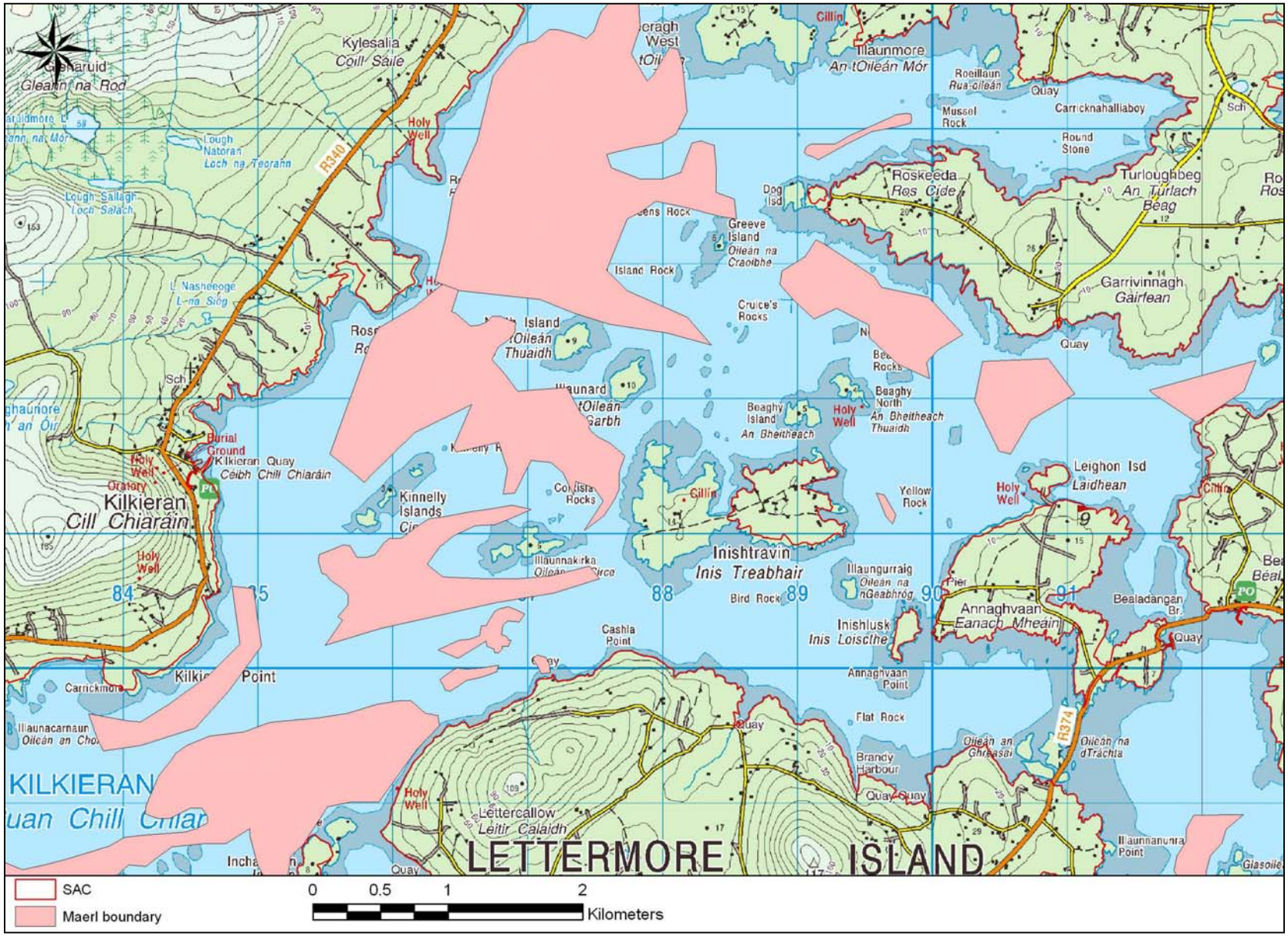

Figure 4.11 Kilkieran (mid). Maerl Boundary

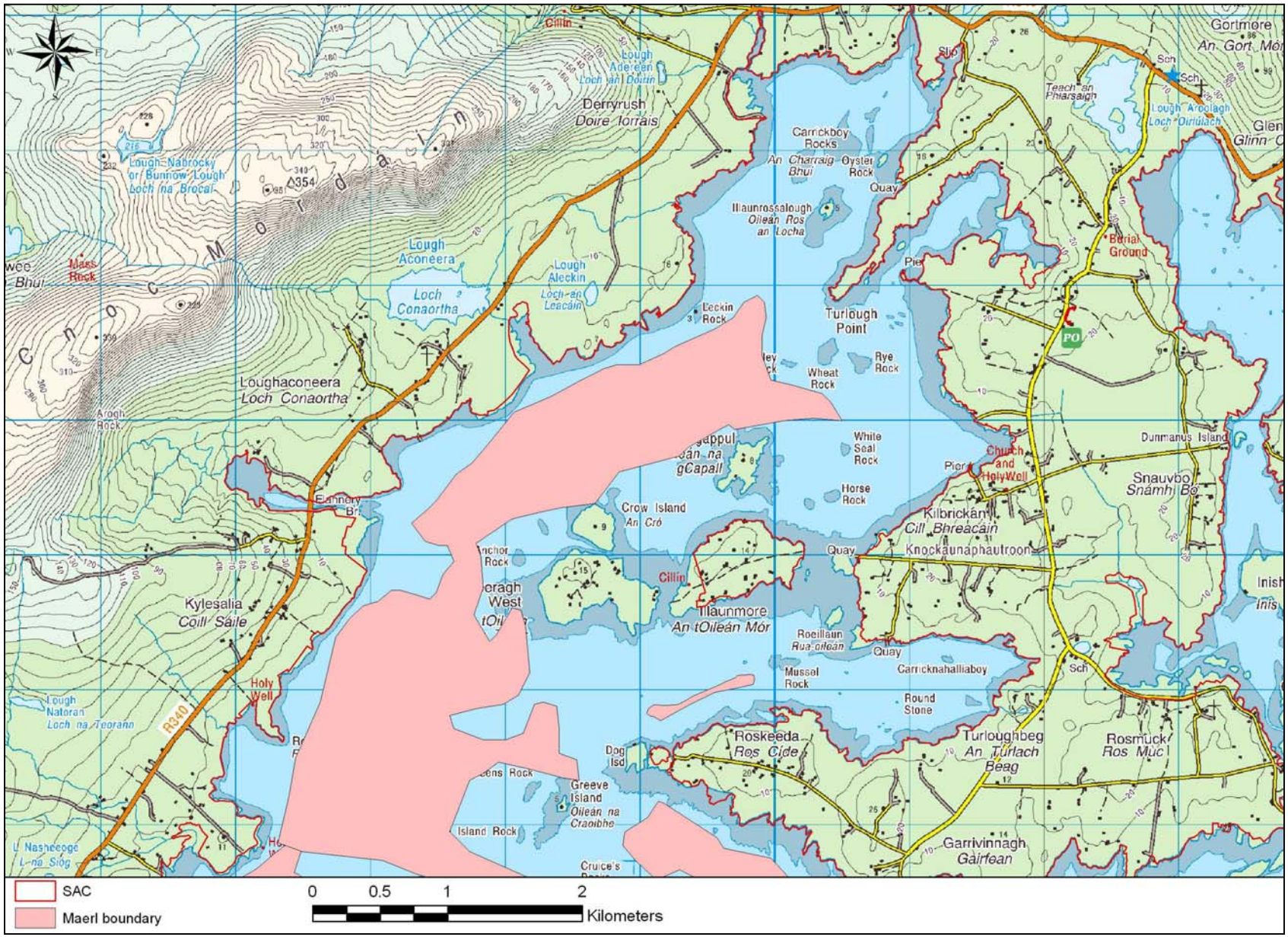

Figure 4.12 Kilkieran (inner northern). Maerl Boundary

Figure 4.13 Kilkerian (inner eastern). Maerl Boundary

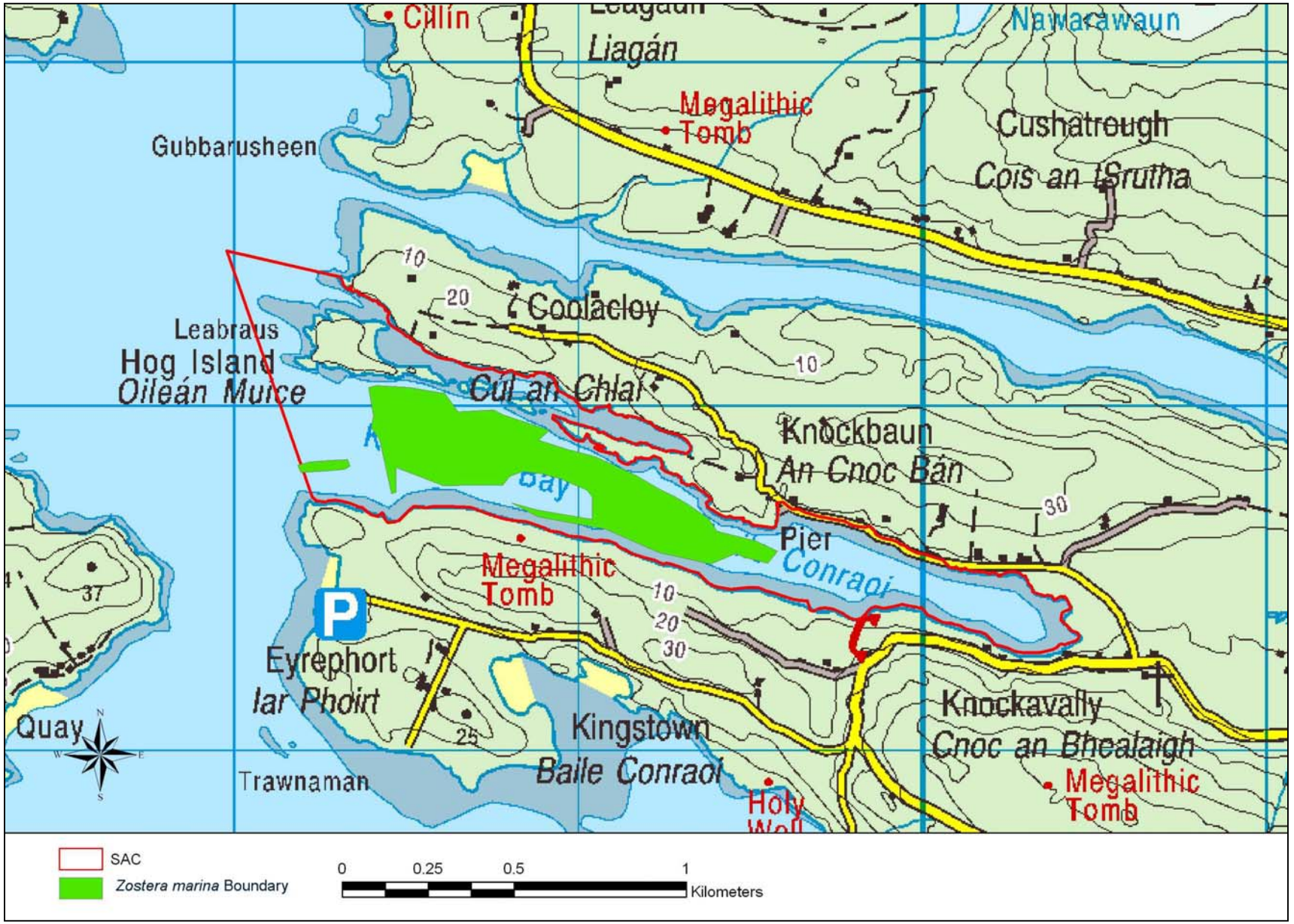

Figure 4.14 Kingstown Bay. *Zostera marina* Boundary

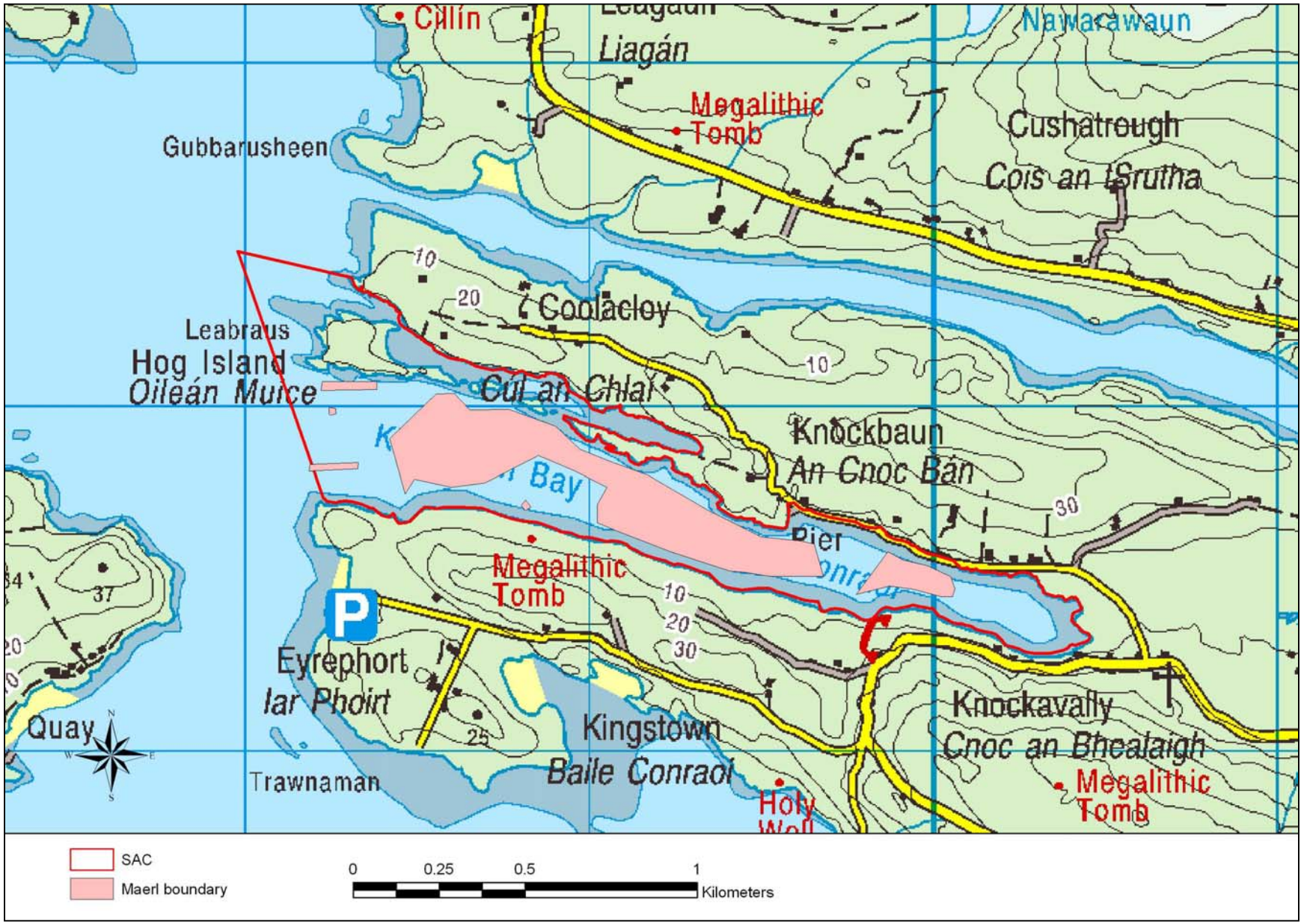

Figure 4.15 Kingstown Bay. Maerl Boundary

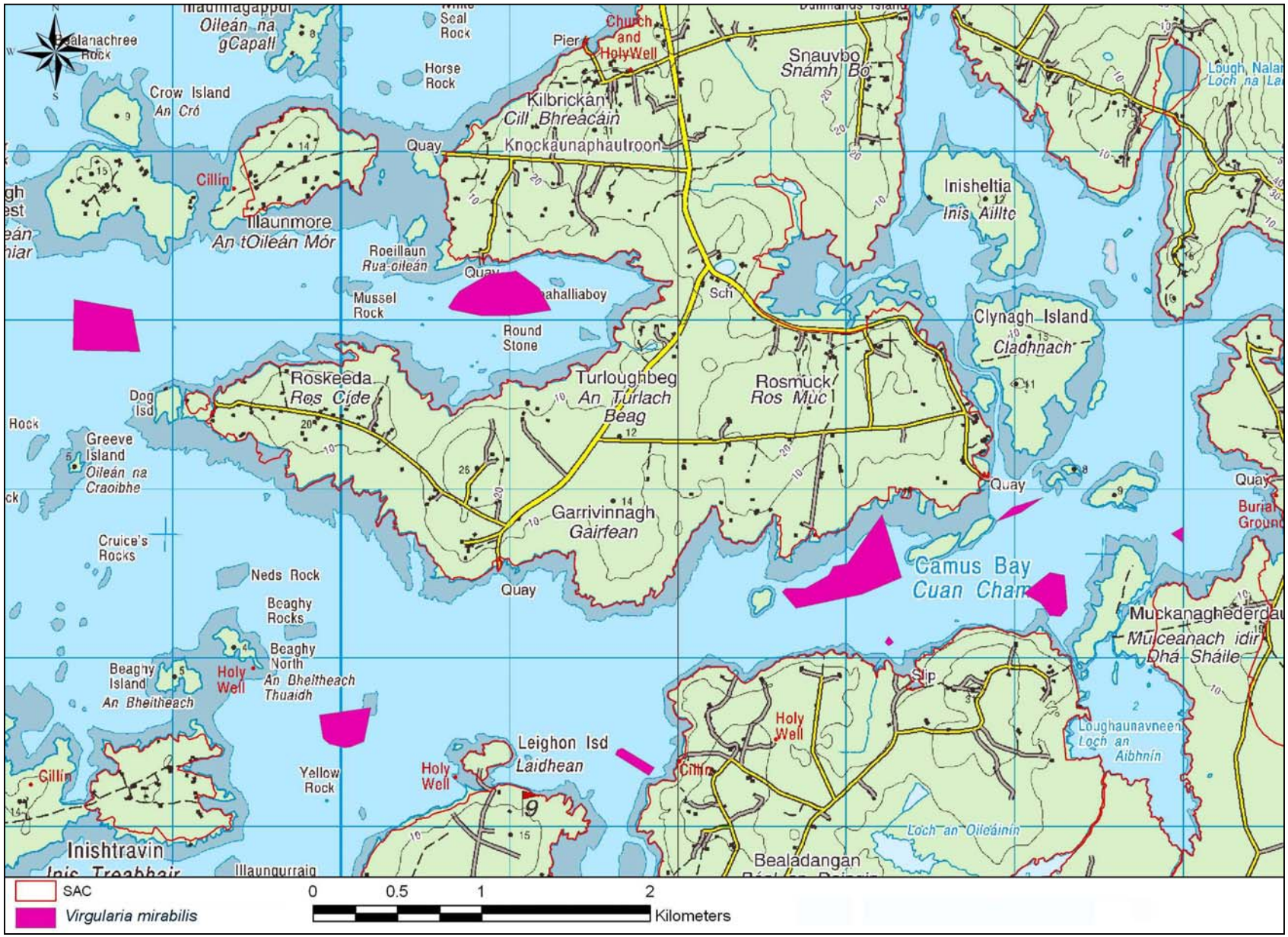

Figure 4.16 Kilkieran. *Virgularia mirabilis* distribution

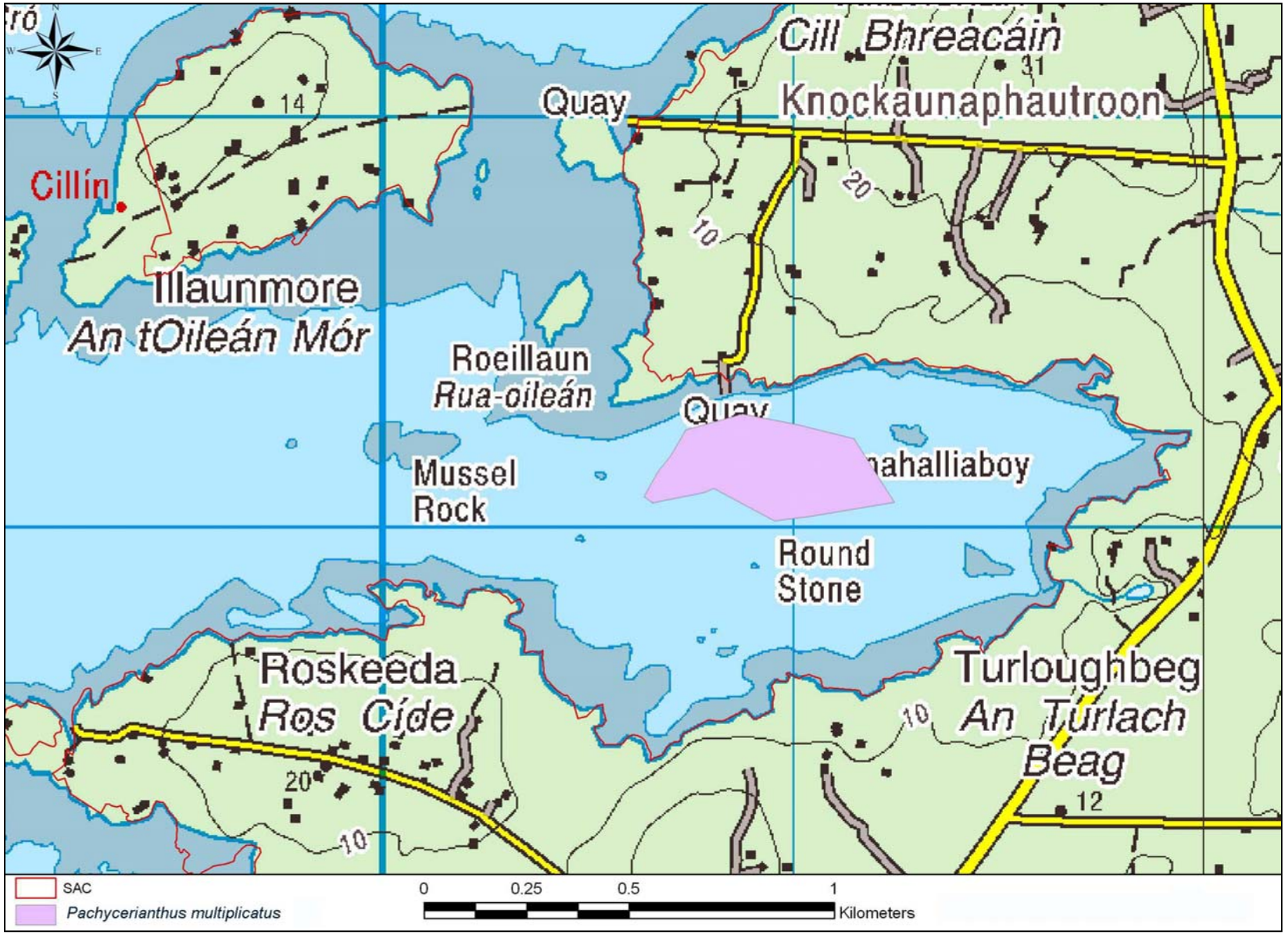

Figure 4.17 Roskeeda. *Pachycerianthus multiplicatus* distribution.

Figure 4.18 Kilkieran (outer) Dives where *Neopentadactyla mixta* was located

Table 4.2 Results for density counts of *Pachycerianthus multiplicities* and *Virgularia mirabilis* communities at different locations in Kilkieran Bay and Islands SAC.

Transect No.	Species	Start Easting	Start Northing	End Easting	End Northing	Description	Count 0-5m	Count 5-10m	Count 10-15m	Count 15-20m	Count 20-25m	Transect Total
D149	*Virgularia mirabilis*	94183	232355	94247	232362	Transect 2m x 25m	-	-	-	-	-	**83**
D150	*Virgularia mirabilis*	94259	232368	94265	232364	Transect 2m X 25m	72	66	126	223	57	**544**
D151	*Virgularia mirabilis*	94288	232304	94300	232307	Transect 2m X 25m	75	88	65	87	80	**395**
D152	*Virgularia mirabilis*	94245	232269	94271	232259	Transect 2m X 25m	3	4	4	1	4	**16**
D153	*Virgularia mirabilis*	94200	232446	94284	232491	Transect 2m X 25m	15	23	47	19	18	**122**
D154	*Virgularia mirabilis*	93043	232470	93065	232511	Transect 2m X 25m	3	3	10	6	4	**26**
D155	*Virgularia mirabilis*	92985	232500	92975	232515	Transect 2m X 25m	7	23	81	97	87	**295**
D156	*Virgularia mirabilis*	92925	232545	92951	232551	Transect 2m X 25m	16	18	31	81	72	**218**
D157	*Virgularia mirabilis*	92758	232418	92768	232429	Transect 2m X 25m	14	23	39	42	78	**196**
D158	*Virgularia mirabilis*	92897	232492	92894	232504	Transect 2m X 25m	107	162	142	98	63	**572**
D173	*Virgularia mirabilis*	90137	231598	90112	231598	Transect 2m X 25m	2	2	3	0	1	**8**
D173	*Virgularia mirabilis*	90024	231521	89999	231521	Transect 2m X 25m	2	0	1	1	0	**4**
D173	*Virgularia mirabilis*	89957	231529	89932	231529	Transect 2m X 25m	1	1	0	2	1	**5**
D173	*Virgularia mirabilis*	90046	231478	90021	231478	Transect 2m X 25m	0	0	0	0	0	**0**
D173	*Virgularia mirabilis*	90124	231510	89999	231510	Transect 2m X 25m	2	1	0	1	1	**5**
D174	*Virgularia mirabilis*	90819	234181	90819	234204	Transect 2m X 25m	26	90	83	86	100	**385**
D174	*Virgularia mirabilis*	90819	234181	90819	234156	Transect 2m X 25m	66	73	43	70	63	**315**
D174	*Virgularia mirabilis*	90819	234181	90794	234181	Transect 2m X 25m	58	83	67	42	84	**334**
D174	*Virgularia mirabilis*	90819	234181	90844	234181	Transect 2m X 25m	56	64	78	118	89	**405**
D174	*Pachycerianthus multiplicatus*	90819	234181	90819	234204	Transect 2m X 25m	3	2	3	1	1	**10**
D174	*Pachycerianthus multiplicatus*	90819	234181	90819	234156	Transect 2m X 25m	0	2	2	2	2	**8**
D174	*Pachycerianthus multiplicatus*	90819	234181	90794	234181	Transect 2m X 25m	2	3	1	1	2	**9**
D174	*Pachycerianthus multiplicatus*	90819	234181	90844	234181	Transect 2m X 25m	1	1	1	2	3	**8**

5. Summary and Conclusion

The present study has provided much new data in relation to gross seabed habitat and subtidal communities for extensive areas of Kilkieran Bay and Islands SAC and for the entire Kingstown Bay SAC. In the case of the Kilkieran Bay SAC, the results of the study compliment those generated by the earlier broad scale mapping project and to a degree provide further validation of that studies findings. Due to operational constraints prevailing during the earlier study, this did not provide coverage for the shallower parts of the area (areas <5m BCD). The present study provides additional data for extensive areas in the western part of the Kilkieran Bay and Islands SAC site including Ard Bay, Mweenish Bay and Feenish, as well as for Golam Harbour, Lettercallow and the north eastern sector of Kilkieran Bay

While this study has been instrumental in providing much new data for these areas, it has also been beneficial in validating and extending the geographical boundaries of known maerl and *Zostera marina* beds in both Kilkieran Bay and Islands and Kingstown Bay SAC's.

The successes of this study have been facilitated in particular by the following factors:

- the use of a stable and shallow draft survey vessel for much of the Kilkieran Bay and Islands work
- the use of a large and ultra shallow draft survey RIB in Kingstown Bay
- the availability of in-house survey vessel resources, ensuring greater control and discretion over transect lines
- the use of diver propulsion vehicles to cover seabed during dive transects
- the use of an underwater viewer in place of SCUBA techniques under appropriate conditions

6. References

6.1 Kilkieran Bay and Islands SAC

Map References:

O.S. Discovery (1:50,000) map: 44, 45

British Admiralty chart No. 2096, 2709

Data Bases :

SAC database, NPWS, Department of Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.

Natura 2000 database, NPWS, Department of Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.

BioMar Biotope Viewer (Picton B.E. and Costello, M.J. 1997)

6.2 Kingstown Bay SAC

Map References:

O.S. Discovery (1:50,000) map: 37

British Admiralty chart: 2707

Data Bases :

NHA database, NPWS, Department of Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.

SAC database, NPWS, Department of Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.

Natura 2000 database, NPWS, Department of Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.

6.3 Bibliography:

Broadscale mapping of Kilkieran Bay and Islands SAC (Site code 2111) Final report. NPWS

Davidson, D.M; and Hughes, D.J. (1998) Zostera biotopes (vol 1) and overview of the dynamics and sensitivity characteristics for conservation management of marine SACs. *Scottish association for Marine Science (UK marine SACs Project).*

De Grave, S; Fazakerley, H; Kelly, L; Guiry, M.D; Ryan, M and Walshe, J (2000) A Study of Selected Maerl Beds in Irish Waters and their Potential for Sustainable Extraction. *Marine Institute, Marine Resource series* **10**, 2000.

Fossitt, J.A. (2000). A Guide to Habitats in Ireland. *The Heritage Council, Kilkenny*

Foster Smith, R.L., Davies, J and Sotheran, I. (2000). Broadscale remote survey and mapping of sublittoral habitats and biota: Technical report to the Broadscale Mapping Project. *Scottish Natural Heritage Research, Survey and Monitoring Report* No. 167.

Picton, B.E. and Costello M.J. eds 1997. BioMar Biotope Viewer: a guide to marine habitats, fauna and flora or Britain and Ireland. (ver. 2.0) *Environmental Sciences Unit, Trinity College Dublin. (Compact Disc).*

Sides, E.M; Picton B.E; Emblow, C.S; Morrow, C.C and Costello M.J. (1994) Marine Communities of Kilkieran Bay, the Aran Islands and the Skerd Rocks and an assessment of their conservation importance. *BioMar/Life Project, Environmental Sciences Unit. Trinity College, University of Dublin, Ireland*

Webb, D.A. (1977) An Irish Flora. *Dundalgan Press Ltd. Dundalk*

Appendix I Site Synopses

Kilkieran Bay & Islands (Site code 002111)

Kilkieran Bay and Islands is located just north of Galway Bay and extends from Keeraun Point, south of Carraroe, westwards to Mace Head, west of Carna. The site contains a large area of open marine water, many islands and rocky islets, and the coastline is much indented with a series of bays (notably the inter-connected Kilkieran Bay and Greatman's Bay), channels and inlets. The entrances of the bays face the prevailing south-westerly winds and they are subject to strong tidal streams as the sea funnels between islands and through channels. A number of streams, lakes and lagoons drain into the bays. The bedrock of the site is igneous, composed of granite, felsite and other intrusive rocks rich in silica. Generally, the site has a rocky shoreline which in most places gives way to mixed sediments and mud in shallow water. The surrounding land is dominated by lowland blanket bog, with rock outcrops and small hills to the north.

The marine habitats found within Kilkieran Bay and Greatman's Bay are of very high conservation value. Both bays have a very wide variety of habitats and Kilkieran Bay a very high species diversity (only Kenmare River is more diverse than Kilkieran Bay). A very high number of species that are rare or considered to be worthy of conservation in Ireland occur in the area. Communities of particular importance are the extensive and varied beds of free-living red calcareous algae or maerl (which may be known locally as 'coral'). Kilkieran Bay is one of three known localities in Ireland where the maerl species *Lithothamnion corallioides*, Lithophyllum dentatum and Lithothamnion fasciculatum co-occur. The range of maerl deposits in Kilkieran Bay, including banks of maerl debris, live maerl and mixtures of maerl, gravel and mud gives rise to a variety of communities. Within these communities are a number of rare anemones, i.e. *Scolanthus callimorphus, Mesacmaea mitchellii* and *Aureliania heterocera*. The last-named species is rare in Ireland, being known only from Donegal Bay and Kilkieran Bay, as well as a number of areas on the north-east coast; the population in the site is the largest on the west coast. Kilkieran Bay is the only known Irish locality for *Mesacmaea mitchellii. Scolanthus callimorphus* is known only from Kilkieran Bay, Valencia Harbour, Co. Kerry and the Dorset coast in the U.K. The best recorded example of the community characterised by the sea cucumber *Neopentadactyla mixta* occurs in the banks of dead maerl of Kilkieran Bay. The very rare anemone *Halcampoides elongatus*, known only from Kilkeran Bay and Ards Bay in Ireland, occurs in a narrow bed of clean dead maerl at the edges of some of the live maerl beds. Greatman's Bay, like Kilkieran Bay, has extensive maerl beds. A population of the large burrowing anemone *Pachycerianthus multiplicatus* occurs at two muddy sites within Kilkieran Bay and is known from only three other localities in Ireland. The seagrass *Zostera marina* occurs in a number of areas in Kilkieran Bay and in some areas co-occurs with maerl. This association is known from a number of areas in Ireland but has not been recorded in the U.K. Beds of the native oyster *Ostrea edulis* occur in Inner Kilkieran Bay. The outer part of the site has sandy bays, e.g. Mweenish Bay, which supports populations of polychaetes, burrowing anemones and bivalves. Sheltered shores have a variety of communities down the shore - the low shore is very

species-rich and supports a variety of polychaetes and bivalves.

The rocky shores of the site are comprised of bedrock or a mixture of bedrock, boulders and gravel; they support a very wide variety of shore communities, with the zonation being typical of shores that range from being exposed to wave action through to extremely sheltered shores and some tide-swept shores. Shores exposed to wave action have a zonation of channel wrack *Pelvetia canaliculata* and barnacles in the upper shore, bladder wrack *Fucus vesiculosus* and barnacles in the mid shore, serrated wrack *Fucus serratus* in the low shore and the kelp *Laminaria hyperborea* on the very low shore. Sheltered shores have the mid shore dominated by knotted wrack *Ascophyllum nodosum*. In the inner part of both bays the brown alga *Ascophyllum nodosum* var. mackii, which has very specific habitat requirements, is found. The rapids at Carrickaglegaun Bridge, Lettermore Island, are extremely species-rich (119 species recorded) and includes the rarely-recorded star fish *Asterina phylactica*. This was the highest number of species recorded on any shore in a recent Irish survey. The inner parts of Kilkieran Bay have channels to several extensive lagoons.

Mixed kelp forests of *Laminaria hyperborea* and *Laminaria saccharina* frequently form a canopy in the very sheltered areas. In contrast, in exposed situations there are extensive areas of *Laminaria hyperborea*, in particular to the south of Golam Head. The rare alga *Dermocorymus montagnei* is known only from the very sheltered narrow inlet Coill Saile on the northern shore of Kilkieran Bay and a handful of sites in Brittany. Also in this creek are large plants of the maerl species *Phymatolithon polymorphum* on which the rare, creeping red alga Gelidiella calcicola and the recently described *Gelidium maggsiae* occur. The creek is also unusual for its large population of the red alga *Meredithia microphylla*, which is more characteristic of exposed areas, and for the large form of the sea slug *Akera bullata* var. farrani (which may be a separate species).

In Kilkieran Bay, on subtidal reefs dominated by animals, the sponge/sea squirt community of *Raspailia ramosa* and *Corella parallelogramma* is widespread; the best examples in Ireland of this community occur in Gurraig Sound within the site, where a high diversity of encrusting and branching sponges and ascidians are found. The rare sponges *Plakortis simplex* and *Tricheurypon viride* are found in this community. In more exposed situations such as the Namackan Rocks there are good examples of the Axinellid sponge community with the sea fan *Eunicella verrucosa*. The sponge *Axinella damicornis* occurs here and although it is found at ten locations on the west coast it is never abundant. *Phakellia vermiculata*, a deep-water species, has been recorded in shallow water at only a limited number of locations on the south-west and west coasts of Ireland.

The site is extremely important for the number of lagoons that it includes - it is considered to be the best site in the country for this habitat and is an excellent example of a particularly unusual type of saline lake lagoon situated on peat, which appear to be rare on Europe but characteristic of south Connemara. Examples of lagoons in the site include Lettermullen Pool, Lough Tanai, Mill Lough, Carafinla Lough, the Lough Fhada complex and Loch an Aibhnín. Lettermullen lagoon is a particularly good example of a rock lagoon lying on granite. This habitat is one that is listed on Annex I of the E.U.

Habitats Directive with priority status.

Areas of salt marsh occur frequently throughout the site - a thin fringe salt marsh is found along most stretches of coastline. The habitat occurs most frequently in the many sheltered bays in the eastern half of the site and has developed in the lee of causeways built to connect islands, e.g. Gorumna Island, to the mainland. The area of salt marsh between Costelloe and Kinvara is particularly well-developed and extensive. The salt marshes in the site are of the fringe type and most occur on peat - the large number of discrete areas of the habitat within the site suggests that it contains the largest area of salt marsh on peat in the country. The salt marshes on the site include both the Atlantic and Mediterranean types, habitats that are listed on Annex I of the E.U. Habitats Directive.

Machair occurs most extensively on Mweenish Island, Finish Island and Mason Island, which lie in the west of the site. These machair areas appear to be the remains of formerly more extensive systems; they are some of the most southerly machair systems in the country and are of conservation value from both vegetational and geomorphological perspectives. The habitat is listed on Annex I of the E.U. Habitats Directive with priority status.

Lowland hay meadows are relatively rare within the site, but some good examples are known. The habitat is most commonly found in small, unimproved fields located behind beaches, which are influenced by blown sand. Perhaps the most extensive area of the habitat is to be found at Ardmore Point. The vegetation here is dominated by a species-rich mixture of grasses and low- to medium-sized forbs. A number of relatively rare orchids and other vascular plants have been recorded from this site. This is a threatened habitat that is listed on Annex I of the E.U. Habitats Directive.

Otter, a species listed on Annex II of the E.U. Habitats Directive, occurs commonly throughout the site. The site is used by a small breeding population of Common Seal. Grey Seal is a regular visitor and may breed.

The islands and islets of Kilkieran Bay, mainly those on its western side are important for their colonies of seabirds, particularly breeding terns - Arctic Tern (99 pairs recorded in 1995; 308 pairs, 1984), Common Tern (47 pairs, 1995; 371 pairs, 1984), Little Tern (7-9 pairs, 1995; 11 pairs 1984). All of these tern species are listed on Annex I of the E.U. Birds Directive. Inishmuskerry, and probably other islands, are used by a population of Barnacle Geese in winter (370 in spring 1994) a species that is also listed on Annex I of the Birds Directive. Eagle Rock is of interest for its population of Black Guillemot (30 individuals, 1984). The site also supports colonies of gulls - Herring Gull (310 individuals, 1994), Great Black-backed Gull (6 individuals, 1984) and Black-headed Gull.

Kilkieran Bay and Islands is an extensive coastal complex site that is of high conservation value, particularly for the fine examples of marine and terrestrial E.U. Habitats Directive Annex I habitats that it supports and for its important Otter and seabird populations.

Kingstown Bay (002265)

Kingstown Bay is a small, narrow bay situated approximately 7 km north-west of Clifden and south of Streamstown Bay, Co. Galway. It is an unusually shallow bay that is about 3 km long and 500 m wide at the mouth. The north-westerly aspect of the bay and the offshore islands of Omey, Inishturk and Turbot at the mouth afford shelter from Atlantic swells. Conditions become even more sheltered towards the head of the bay where the sediment is muddy. Currents within the bay can be moderately strong.

The bay is of conservation importance because there are excellent populations of the free-living, red coralline algae (maerl-forming species*) Lithophyllum dentatum, Lithophyllum fasciculatum* and *Lithothamnion corallioides* (which may be locally known as 'coral'). These occur midway along the bay at 0-2 m in depth. The bed is very dense and is formed by unusually large individuals. It has a very heterogeneous composition in which patches dominated by *Lithophyllum dentatum* and *Lithophyllum fasciculatum* alternate with patches dominated by *Lithothamnion corallioides*. Kingstown Bay has the second largest known population of *Lithophyllum dentatum* in Ireland and the largest population of *Lithophyllum fasciculatum*, but species being rare nationally. There are only three known sites where these three species co-occur (the others being Kilkieran slip and Kinvarra Bay, both also in Galway), and this is by far the best example of this association, in terms of plant density and plant size.

Seagrass (*Zostera marina*) occurs in a number of places in the bay and is dense in areas within the maerl bed. The algal community is characterized by several species of filamentous and foliose red algae (e.g. *Antithamnion* spp., *Ceramium* spp., *Polysiphonia* spp. and *Cryptopleura ramosa*), brown algae (e.g. *Mesogloia vermiculata* and *Dictyota dichotoma*) and green algae (e.g. *Derbesia marina* and *Ulva lactuca*). Several epiphytic algae also occur in the area. Of particular interest are *Gelidiella calcicola*, thought to be endemic to maerl, and the common coralline alga, *Corallina officinalis*, which grows in unattached balls at Kingstown Bay. Sheltered rocky shores are dominated by the brown alga *Ascophyllum nodosum*. The faunal community of the bay includes sponges, anemones, crustaceans, bivalve and gastropod molluscs, and fish. The oyster (*Ostrea edulis*) occurs.

Broken coralline algae accumulates between rocky outcrops on the shore, forming shallow beaches that are approximately 20 - 30 m wide. A small grassy island, Hog Island, occurs at the

mouth of the bay.

Kingstown Bay is of high conservation importance owing to the presence of an excellent example of a sheltered bay, a habitat that is listed on Annex I of the EU Habitats Directive.

Appendix II Summary data for survey transects

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD1.1	81259	227161	81266	227250	Bed rock and Kelp for entire transect.
KilkD1.2	81266	227250	End Point	End Point	Bed rock and kelp entire transect.
KilkD2.1	81382	227391	81354	227577	Hard sand changing to bed rock and kelp.
KilkD2.2	81354	227577	End Point	End Point	Hard sand changing to bed rock and kelp.
KilkD3.1	81336	227420	81461	227332	Kelp, bedrock and shelly sand.
KilkD3.2	81461	227332	End Point	End Point	Kelp bedrock, shelly sand.
KilkD4.1	81700	227550	81541	227430	This transect started in duned maerl and continued until it ended at a boundary with sand at the end point. There was very little live maerl on this transect.
KilkD4.2	81541	227430	End Point	End Point	Transect started on duned maerl and continued west to the boundary of maerl with sand at end point, very little living maerl.
KilkD5.1	81115	227668	81010	227728	*Zostera marina* (abundant) or Frequent all of this transect.
KilkD5.2	81010	227728	End Point	End Point	*Zostera marina* abundant or Frequent) for entire transect.
KilkD6.1	81138	227659	81235	227654	*Zostera marina*(abundant) to end point. Then kelp occurs.
KilkD6.2	81235	227654	End Point	End Point	*Zostera marina (*abundant) to end point. Kelp at end point.
KilkD7.1	81162	227649	81158	227672	*Zostera marina* (frequent). *Zostera marina* ends at end point.
KilkD7.2	81158	227672	End Point	End Point	*Zostera marina* (frequent). *Zostera marina* ends at end point.
KilkD8.1	81688	228149	81538	228031	Thin layer of live/dead maerl in bands, start point was already in maerl.
KilkD8.2	81538	228031	End Point	End Point	Thin layer live/dead maerl in bands, start point was already in maerl.
KilkD9.1	81473	227717	81531	227770	Maerl living and dead duned starts at start point and ends at end point.
KilkD9.2	81531	227770	End Point	End Point	Maerl living and dead duned begins at start pt, ends at end point
KilkD10.1	81531	227700	81534	227687	Maerl living and dead duned, transect ends in reef at end point.
KilkD10.2	81534	227687	End Point	End Point	Maerl living and dead duned , ends in reef at end point.
KilkD11.1	81796	227853	81942	227779	Maerl entire length of transect, duned living and dead. *Neopentadactyla mixta* was found abundant.
KilkD11.2	81942	227779	End Point	End Point	Maerl entire length of transect, duned living and dead maerl. *Neopentadactyla mixta* (abundant) recorded on this transect.
KilkD12.1	82060	228061	81894	228150	Transect starts in duned living and dead maerl with *Neopentadactyla mixta*, maerl ends in reef.
KilkD12.2	81894	228150	End Point	End Point	Transect starts in duned living and dead maerl with *Neopentadactyla mixta*, maerl ends in reef.
KilkD13.1	82066	228485	82355	228457	Transect starts in dead maerl with shell and *Neopentadactyla mixta*, maerl flat and uniform for entire transect.
KilkD13.2	82355	228457	End Point	End Point	Transect starts in dead maerl with shell and *Neopentadactyla mixta,* maerl flat and uniform for entire transect.
KilkD14.1	82549	226433	82247	226016	Duned dead maerl start 5m south-west of start point. Maerl stops at end point with fragments of shell and sand at end point.
KilkD14.2	82247	226016	End Point	End Point	Maerl start 5m south-west from start point, duned dead maerl. Maerl stops at end point with fragments of shell and sand at end point.
KilkD15.1	82550	226401	82197	226649	Maerl all the way from start point, large areas of duned maerl & also areas of maerl over mud & shell, maerl ends in bedrock at end point.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD15.2	82197	226649	End Point	End Point	Maerl all the way from start point, large areas of duned maerl & also areas of maerl over mud & shell, ends in bedrock at end point.
KilkD16.1	82250	225508	82250	226654	Broken shell.
KilkD16.2	82250	226654	End Point	End Point	Broken shell.
KilkD17.1	83218	225772	83082	225725	Flat sand with very occasional maerl fragments.
KilkD17.2	83082	225725	End Point	End Point	Flat sand, very occasional maerl fragments.
KilkD18.1	83589	226425	83545	226441	Sand and dead maerl gravel, no living maerl.
KilkD18.2	83545	226441	End Point	End Point	Sand and dead maerl gravel, no living maerl.
KilkD19.1	83366	226721	83310	226698	Transect started on course sand, end point is start of maerl heading west.
KilkD19.2	83310	226698	End Point	End Point	Transect started in course sand, end point is start of maerl bed heading west.
KilkD20.1	83111	226109	83161	226090	Duned maerl, living and dead from start point. End point is interface of maerl with kelp/rock.
KilkD20.2	83161	226090	End Point	End Point	Duned maerl, living and dead from start point. End point is interface of maerl with kelp/rock.
KilkD21.1	75921	231211	75861	231079	Maerl starts at end point.
KilkD21.2	75861	231079	75774	230900	Maerl living and dead becomes mixed with weed as transect continues.
KilkD21.3	75774	230900	75291	230295	Maerl still occurs at end point 50% living. *Zostera marina* starts at end point.
KilkD21.4	75291	230295	End Point	End Point	Maerl still at end point 50% living, *Zostera marina* also starts at end point.
KilkD22	75943	231360	75983	231122	Mud at start point, sand/shell occur at end point.
KilkD22.1	75983	231122	End Point	End Point	Mud at start point sand/shell at end point.
KilkD22.1	75983	231122	75976	231105	Mud at start point, sand/shell at end point.
KilkD22.2	75976	231105	75964	231110	Live maerl starts at end point in small patches among an area of mostly sand and shell.
KilkD22.3	75964	231110	75920	230909	Transect ends in reef.
KilkD22.4	75920	230909	End Point	End Point	Ends in reef.
KilkD23	75568	230767	75610	230707	*Zostera marina* (abundant) mixed with live maerl at start point.
KilkD23.1	75610	230707	75717	230666	*Zostera marina* ends.
KilkD23.2	75717	230666	75765	230615	Live maerl ends
KilkD23.3	75765	230615	End Point	End Point	Sand.
KilkD24.1	79868	227629	79769	227505	Maerl at start point, maerl ends at end point. Entire transect is living/dead maerl 50/50.
KilkD24.2	79769	227505	End Point	End Point	Maerl at start point, maerl ends at end point. Entire transect is living/dead maerl 50/50.
KilkD25.1	79860	227460	End Point	End Point	Sand only.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD26.1	79890	227629	79869	227845	Maerl at start point, living/dead 50/50, maerl ends at end point.
KilkD26.2	79869	227845	End Point	End Point	Maerl at start point, living/dead 50/50, maerl ends at end point.
KilkD27.1	80008	227699	80046	227672	Maerl at start point, living/dead 50/50 banded, maerl ends at end point.
KilkD27.2	80046	227672	End Point	End Point	Maerl at start point, living/dead 50/50 banded, maerl ends at end pt
KilkD28.1	79900	227723	79812	227700	Maerl at start point, Maerl ends at end point, living/dead 50/50 banded then runs into fine sand.
KilkD28.2	79812	227700	End Point	End Point	Maerl at start point, maerl ends at end point, living/dead 50/50 banded then goes into fine sand.
KilkD29.1	80008	227540	80052	227526	Duned maerl at start point, ends in rocks/kelp at end point.
KilkD29.2	80052	227526	End Point	End Point	Duned maerl at start point, ends in rocks/kelp at end point.
KilkD30.1.1	79808	227590	79783	227583	Duned maerl at start point, ends at end point swim 1
KilkD30.1.2	79783	227583	End Point	End Point	Duned maerl at start pt, ends at end point swim 1
KilkD30.2.1	81174	228179	81206	228121	*Zostera marina* (abundant) at start point. *Zostera marina* ends at end point swim 2
KilkD30.2.2	81206	228121	End Point	End Point	*Zostera marina* (abundant) at start point. *Zostera marina* ends at end point.
KilkD31.1	80599	227614	80359	227678	Dense *Zostera marina* (abundant) at start point continues to end point and turns into maerl bed (Sample taken) Good maerl bed living/dead bands.
KilkD31.2	80359	227678	End Point	End Point	*Zostera marina* (dense abundant) at start point continues to end point and goes into maerl bed (Sample taken) Good maerl bed living/dead bands
KilkD32.1	80309	226850	80244	226865	*Zostera marina* abundant at start point, then bands of kelp/*Zostera marina*, kelp at end point, *Zostera marina* gone at end point.
KilkD32.2	80244	226865	End Point	End Point	*Zostera marina* at start point, then bands of kelp/*Zostera marina*, kelp at end point, *Zostera marina g*one at end point.
KilkD33.1	80480	227197	80405	227202	Kelp with small patches of *Zostera marina* (frequent).
KilkD33.2	80405	227202	End Point	End Point	Kelp with small patches of Zostera *marina* (frequent).
KilkD34.1	80405	227202	80366	227214	*Zostera marina* bed starts at start point, *Zostera marina* ends at end point in shelly sand.
KilkD34.2	80366	227214	End Point	End Point	*Zostera marina* bed true starts at start pt, ends at end point in shelly sand
KilkD35.1	82938	222299	82907	222281	*Zostera marina* (abundant) at start point, ends at end point.
KilkD35.2	82907	222281	End Point	End Point	*Zostera marina* (abundant) at start point, ends at end point.
KilkD36.1	82737	222327	82749	222305	*Zostera marina* (abundant) at start point, *Zostera marina* ends at end point in sand and kelp.
KilkD36.2	82749	222305	End Point	End Point	*Zostera marina* at start point, ends at end point in sand and kelp.
KilkD37.1	82612	222389	82594	222369	*Zostera marina* (abundant) at start point, *Zostera marina* ends at end point. *Zostera marina* (occasional) for last 20m.
KilkD37.2	82594	222369	End Point	End Point	*Zostera marina* (abundant) at start point, *Zostera marina* ends at end point. *Zostera marina* (occasional) for last 20m.
KilkD38	82486	222113	End Point	End Point	Sand no maerl here.
KilkD39.1	81624	223872	81675	224225	Sand and broken shell for entire transect.
KilkD39.2	81675	224225	End Point	End Point	Sand and broken shell for entire transect.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD40.1	82270	225034	82297	224922	Sand for entire transect, flat with occasional ripples, no broken shell.
KilkD40.2	82297	224922	End Point	End Point	Sand entire transect, flat occasional ripples, no broken shell.
KilkD41.1	86387	232791	86358	232703	Transect started in maerl. Mostly dead, but 10% living.
KilkD41.2	86358	232703	End Point	End Point	Transect started in maerl. Mostly dead, about 10% living.
KilkD42.1	86777	233301	86538	232859	Transect started in maerl, mixed living /dead to end point (on reef). Small patches of sand with thin layer dead maerl but good living maerl with large nodules & anemones. Ended at isolated reef.
KilkD42.2	86538	232859	End Point	End Point	Transect started mixed living /dead maerl to end point in reef. Small patches of sand covered in thin layer of dead maerl but good living maerl with large nodules and anemones. Ended at isolated reef.
KilkD43.1	86204	232237	85564	231596	Started in duned maerl gravel, quickly turning to mud with sprinkling of maerl gravel for 1/5th of transect. Mud had *Pecten maximus*. Rocky reef on west side 1/5th distance. Remainder duned dead maerl
KilkD43.2	85564	231596	End Point	End Point	Started in duned maerl gravel quickly turning to mud with sprinkling of maerl gravel for 1/5th total distance of transect. Mud with *Pecten maximus*. Reef on west side 1/5th distance. Duned dead maerl 50% with dead clam shells.
KilkD44.1	86444	232580	86309	232749	Maerl for entire transect, living/dead dunes about 2 foot deep. Rocky reef and sand at end i.e. at shoreline
KilkD44.2	86309	232749	End Point	End Point	Maerl for entire transect, living/dead dunes about 2 foot deep. Rocky reef and sand at end i.e. shoreline.
KilkD45.1	86000	232306	85875	232417	Living & dead maerl all of this transect to the end point. *Zostera marina* starts at end point on sand. Maerl ends where *Zostera marina* starts at end point.
KilkD45.2	85875	232417	End Point	End Point	Maerl all the way to end point. *Zostera marina (abundant)* starts at end point on sand. Maerl ends where *Zostera marina* starts.
KilkD46.1	86284	232824	86354	232809	Transect starts in Mud. Maerl starts at end point. Dead flat maerl gravel.
KilkD46.2	86354	232809	End Point	End Point	Transect started on Mud, maerl starts at end point. Dead flat maerl gravel.
KilkD47.1	86250	233116	86132	233174	Transect started in rock/mud, rock & mud all the way to end point.
KilkD47.2	86132	233174	End Point	End Point	Transect started on rock/mud, rock & mud all the way to end point.
KilkD48.1	86102	233201	86243	233107	Rock & mud all of this transect.
KilkD48.2	86243	233107	End Point	End Point	Rock & mud for entire transect.
KilkD49.1	86243	233107	86383	232946	Rock & mud at start point. Dead maerl bed starts at end point.
KilkD49.2	86383	232946	End Point	End Point	Rock & mud at start point. Dead maerl bed starts at end point.
KilkD50.1	86156	233387	86267	233353	Transect started in mud. Mud for entire length of this transect.
KilkD50.2	86267	233353	End Point	End Point	Mud for entire transect.
KilkD51.1	86267	233353	86434	233238	Maerl bands live & dead start at end point.
KilkD51.2	86434	233238	End Point	End Point	Maerl bands live & dead start at end point.
KilkD52.1	86487	233572	86549	233529	Mud at start of this transect, *Zostera marina* starts about 20m along this transect, *Zostera marina* also ends 20 m before end point. Dense bed of maerl starts where *Zostera marina* ends.
KilkD52.2	86549	233529	End Point	End Point	Mud, *Zostera marina* starts after about 20m, *Zostera marina* also ends 20 m before end point. Dense bed of maerl starts where *Zostera marina* ends.
KilkD53.1	86558	233971	86649	233926	Mud & rock at start point. Maerl starts at end point mostly dead.
KilkD53.2	86649	233926	End Point	End Point	Mud & rock at start point, maerl starts at end point mostly dead.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD54.2	86890	234335	End Point	End Point	Transect started on mud and went straight into living and dead maerl, *Zostera marina* starts at end point in patches.
KilkD55.1	86901	234343	87185	234272	Mixture of *Zostera marina* on maerl all the way from start to end point. *Zostera marina* stops at end point and maerl continues. Good bed of Living and dead maerl in bands.
KilkD55.2	87185	234272	End Point	End Point	Mixture of *Zostera marina* on maerl all the way from start to end point. *Zostera marina* stops at end point maerl continues. Living and dead good bed banded.
KilkD56.1	87041	234610	86954	234556	Thin scattering of live maerl on mud at start point. *Zostera marina* stats at end point. Dense bed of *Zostera marina* on thick live maerl.
KilkD56.2	86954	234556	End Point	End Point	Thin scattering of live maerl on mud at start point. *Zostera marina* stats at end point. Dense bed of *Zostera marina* on thick live maerl.
KilkD57.1	87202	234452	87309	234375	*Zostera marina* at start point, *Zostera marina* ends at end point.
KilkD57.2	87309	234375	End Point	End Point	*Zostera marina* at start point, ends at end point.
KilkD58.1	87156	234663	87199	234659	Mud with a thin scattering of living maerl at start point. *Zostera marina* starts at end point.
KilkD58.2	87199	234659	End Point	End Point	Mud, thin scattering of living maerl at start point. *Zostera marina* starts at end point.
KilkD59.1	87199	234659	87291	234654	*Zostera marina* on maerl at start point, *Zostera marina* ends at end point. Maerl continues.
KilkD59.2	87291	234654	End Point	End Point	*Zostera marina* at start point, ends at end point. Maerl continues.
KilkD60.1	87367	234822	87308	234715	Kelp all the way from start to end. Maerl starts at end point living/dead 50/50.
KilkD60.2	87308	234715	End Point	End Point	Kelp all the way from start to end. Maerl starts at end point living/dead 50/50.
KilkD61.1	87444	234712	87540	234661	Transect started on kelp & living and dead maerl all the way from start to end points.
KilkD61.2	87540	234661	End Point	End Point	Transect started on kelp & living and dead maerl all the way start to end point.
KilkD62.1	87520	234909	87583	234872	Transect started in kelp and course sand. Kelp and living and dead maerl at end point.
KilkD62.2	87583	234872	End Point	End Point	Kelp and course sand at start point. Kelp and living and dead maerl at end point.
KilkD63.1	87530	235668	87700	235600	*Corallina officinalis* on mud for the first half of this transect, second half of transect consists of living and dead maerl with rock to end point.
KilkD63.1.1	87700	235600	87851	235527	*Corallina officinalis* on mud for the first half of this transect, second half of transect consists of living and dead maerl with rock to end point.
KilkD63.2	87851	235527	88167	235902	*Corallina officinalis* on mud for the first half of this transect, second half of transect consists of living and dead maerl with rock to end point.
KilkD63.2	87851	235527	End Point	End Point	*Corallina officinalis* on mud for first half of this transect, second half living and dead maerl and rock to end point.
KilkD64.2	88167	235902	End Point	End Point	Maerl with *Corallina officinalis* at start point, then becomes live maerl to end point.
KilkD65.1	88662	235326	88692	235888	Live maerl all the way from start to end point.
KilkD65.2	88692	235888	End Point	End Point	Live maerl all the way start to end point.
KilkD66.1	87085	235043	87121	235037	Kelp at start point, mud at end point.
KilkD66.2	87121	235037	End Point	End Point	Kelp at start point, mud at end point.
KilkD67.1	87121	235037	87798	234990	Kelp at start point, transect ends in the center of the channel in rock.
KilkD67.2	87798	234990	End Point	End Point	Kelp at start point, end point in center of channel is rock.
KilkD68.1	89291	235799	88838	236379	Transect starts on maerl, maerl continues for the entire length of this transect. 95% living.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD68.2	88838	236379	End Point	End Point	Transect started on maerl, maerl for entire transect 95% living.
KilkD69.1	87789	234831	87767	234942	This transect consisted mostly of rock and kelp with maerl in between
KilkD69.2	87767	234942	End Point	End Point	Mostly rock and kelp with maerl in between.
KilkD70.1	88798	233827	88756	234060	Mud, *Virgularia mirabilis* and *Cerianthus loydii* occur at 9m depth all along this transect. The transect ended at the start of an oyster bed.
KilkD70.2	88756	234060	End Point	End Point	Mud, *Virgularia mirabilis* & *Cerianthus loydii* at 9m depth in mud all the way, transect ended in oyster bed.
KilkD71.1	88397	233827	88413	234118	Mud, *Virgularia mirabilis* and *Cerianthus loydii* occur for the entire length of this transect.
KilkD71.2	88413	234118	End Point	End Point	Mud *Virgularia mirabilis* & *Cerianthus loydii* for entire transect.
KilkD72.1	88134	233943	88100	234043	Mud occurs to within 40m of the end point at about 8m depth, then living maerl and sand bands start. (sample)
KilkD72.1.1	88100	234043	88089	234076	Mud occurs to within 40m of the end point at about 8m depth, then living maerl and sand bands start. (sample)
KilkD72.2	88089	234076	End Point	End Point	Mud to about 40m before end point at about 8m depth then living maerl and sand bands (sample)
KilkD73.1	87973	234037	87929	234253	Transect started on live maerl. Maerl continues to end point. Good bed banded with sand.
KilkD73.2	87929	234253	End Point	End Point	Transect started on maerl. Maerl to end point, good bed banded with sand.
KilkD74.1	87940	234262	87945	234310	Transect starts with a number of small patches of *Zostera marina* (frequent) at start point. The remainder of the transect consists of sand with fragments of maerl gravel.
KilkD74.2	87945	234310	End Point	End Point	A few small patches of *Zostera marina* at start point. Mostly sand with fragments of maerl gravel.
KilkD75.1	88063	234581	88104	234093	Transect starts in living maerl, which continues all the way to end point. Transect ends in mud.
KilkD75.2	88104	234093	End Point	End Point	Maerl living for entire transect. Transect ends in mud.
KilkD76.1	87856	234296	87996	234256	Transect starts in sand and weed. Maerl starts at end point
KilkD76.2	87996	234256	End Point	End Point	Sand and weed at start point. Maerl starts at end point
KilkD77.1	88582	233703	88496	233441	Transect starts in mud. Maerl starts at end point, very dense live maerl with shell.
KilkD77.2	88496	233441	End Point	End Point	Mud at start point. Maerl starts at end point. Very dense live bed with shell.
KilkD78.1	88496	233441	88479	233367	Transect consists of live maerl from start to end point. Maerl ends at end point.
KilkD78.2	88479	233367	End Point	End Point	Live maerl from start and ends at end point.
KilkD79.1	88329	233885	88311	233463	Live maerl and oyster shell at start point. *Zostera marina* starts at end point.
KilkD79.2	88311	233463	End Point	End Point	Live maerl and oyster shell at start point. *Zostera marina* starts at end point.
KilkD80.1	88311	233463	88372	233309	*Zostera marina* (abundant) occurs from start point to end point. *Zostera marina* ends at end point.
KilkD80.2	88372	233309	End Point	End Point	*Zostera marina* (abundant)from start to end point. *Zostera marina* ends at end point.
KilkD81.1	87644	233946	88030	233955	Maerl gravel on mud, maerl ends in mud at end point.
KilkD81.2	88030	233955	End Point	End Point	Maerl gravel on mud, mud at end point.
KilkD82.1	87282	233537	87536	233654	Maerl living/dead 50/50, *Zostera marina* (abundant) starts at end point.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD82.2	87536	233654	End Point	End Point	Maerl living/dead 50/50, *Zostera marina* (abundant) starts at end point.
KilkD83.1	87223	232788	87299	232691	Transect starts in dead maerl, *Zostera marina* (abundant) starts at end point, maerl continues.
KilkD83.2	87299	232691	End Point	End Point	Transect started on dead maerl, *Zostera marina* (abundant) starts at end point maerl continues.
KilkD84.1	87299	232691	87359	232616	*Zostera marina* (abundant) to shore
KilkD84.2	87359	232616	End Point	End Point	*Zostera marina* (abundant) to shore.
KilkD85.1	86986	232491	86991	232478	Transect started on sand with *Zostera marina* (rare). Dense *Zostera marina* bed starts at end point.
KilkD85.2	86991	232478	End Point	End Point	Transect started on sand with *Zostera marina* (rare) , Dense *Zostera marina* bed starts at end point.
KilkD86.1	86991	232478	87060	232413	*Zostera marina* (abundant) ends here at shore.
KilkD86.2	87060	232413	End Point	End Point	*Zostera marina* ends here at shore.
KilkD87.1	86675	232293	86734	232257	Transect started on living and dead maerl, *Zostera marina* starts at end point.
KilkD87.2	86734	232257	End Point	End Point	Transect started on maerl, *Zostera marina* starts at end point.
KilkD88.1	86734	232257	86791	232124	*Zostera marina* (abundant) Living and dead maerl continues.
KilkD88.2	86791	232124	End Point	End Point	*Zostera marina* (abundant), living and dead maerl continues.
KilkD89.1	86791	232124	86916	232073	*Zostera marina* (abundant). Edge of bed.
KilkD89.2	86916	232073	End Point	End Point	*Zostera marina* (abundant), edge of bed.
KilkD90.1	86497	231844	86356	231707	Mud at start point, Zostera *marina* starts at end point.
KilkD90.2	86356	231707	End Point	End Point	Mud at start point, *Zostera marina* (abundant) starts at end point.
KilkD91.1	86059	232032	86137	231771	Maerl at start point, mostly dead. Kelp and rock at end point.
KilkD91.2	86137	231771	End Point	End Point	Maerl at start point, mostly dead. Kelp and rock at end point.
KilkD92.1	85750	231594	85768	231412	Landed on maerl, mostly dead. *Zostera marina* (abundant) starts at end point
KilkD92.2	85768	231412	End Point	End Point	Transect started on maerl, mostly dead. *Zostera marina* (abundant) starts at end point.
KilkD93.1	85813	231407	85543	231144	*Zostera marina* at start point. Course sand to end point
KilkD93.2	85543	231144	End Point	End Point	*Zostera marina* at start point. Course sand to end point.
KilkD94.1	85514	231095	End Point	End Point	*Zostera marina* (abundant) starts at this point.
KilkD95.1	83436	229920	83499	229940	*Zostera marina* (dense abundant) all of this transect, sand at end point.
KilkD95.2	83499	229940	End Point	End Point	*Zostera marina (*dense abundant) at start, sand at end.
KilkD96	83396	229946	End Point	End Point	Sand (bounce).
KilkD97.1	83857	228417	83807	228526	Course sand and bed rock, small sprinkling dead maerl for entire transect. Not a maerl bed.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD97.2	83807	228526	End Point	End Point	Course sand and bed rock, small sprinkling dead maerl for entire transect, not a true bed.
KilkD98.1	84203	228618	84198	228729	Transect started on live maerl, became duned at end point.
KilkD98.2	84198	228729	End Point	End Point	Transect started on live maerl, became duned at end point.
KilkD99.1	84657	228737	84612	228802	Transect started on live maerl with *Zostera marina* (rare). Became duned live/dead maerl at end point.
KilkD99.2	84612	228802	End Point	End Point	Transect started on live maerl with *Zostera marina* (rare) . Became duned live/dead maerl at end point.
KilkD100.1	85136	228473	85020	229013	Live & dead maerl at start of transect with maerl & sand at end point.
KilkD100.2	85020	229013	End Point	End Point	Live / Dead maerl at start with maerl/sand at end point.
KilkD101.1	84810	230595	84830	230590	*Zostera marina (*patchy abundant),shell & sand, 20m along transect seabed becomes live/dead maerl.
KilkD101.1.1	84830	230590	84883	230580	*Zostera marina (*patchy abundant), shell & sand, 20m along transect seabed becomes live/dead maerl.
KilkD101.2	84883	230580	End Point	End Point	*Zostera marina* (patchy abundant) with shell sand. 20m along transect the seabed becomes live/dead maerl.
KilkD102.1	84792	230215	84850	230165	Kelp/sand/gravel at start point, maerl (95% dead) starts at end point.
KilkD102.2	84850	230165	End Point	End Point	Kelp/sand/gravel at start point. Maerl 95% dead starts at end point.
KilkD103.1	84498	230005	84565	229987	*Zostera marina* (abundant) at start point, *Zostera marina* ends at end point.
KilkD103.2	84565	229987	End Point	End Point	*Zostera marina* (abundant) at start point, *Zostera marina* ends at end point.
KilkD104.1	84565	229987	84627	229945	Shell/sand/mud at start point. Maerl (dead gravel) starts at end point.
KilkD104.2	84627	229945	End Point	End Point	Shell/sand/mud at start point, dead maerl gravel starts at end point.
KilkD105.1	84297	229810	84348	229740	Kelp/ bed rock at start point. Maerl (dead gravel) starts at end point.
KilkD105.2	84348	229740	End Point	End Point	Kelp/ bed rock at start point. Maerl, dead gravel starts at end point.
KilkD106.1	83745	229666	83832	229509	Living/dead maerl all the way from start point, maerl gravel at end point
KilkD106.2	83832	229509	End Point	End Point	Living/dead maerl all the way from start, maerl gravel at end point.
KilkD107.1	83205	229396	83242	229334	Kelp/mud for all of this transect.
KilkD107.2	83242	229334	End Point	End Point	Kelp/mud for entire transect.
KilkD108.1	85537	229057	85253	228989	*Zostera marina* (abundant) at start point. *Zostera marina* ends at end point.
KilkD108.2	85253	228989	End Point	End Point	*Zostera marina* at start point. *Zostera marina* ends at end point.
KilkD109.1	86157	229445	86018	229614	*Zostera marina* (abundant) at start point. *Zostera marina* still occurs at end point.
KilkD109.2	86018	229614	End Point	End Point	*Zostera marina (abundant) at start point. Zostera marina still occurs at end point.*
KilkD110.1	87837	230164	87837	230164	Mud all this transect.
KilkD110.2	87837	230164	End Point	End Point	Mud for entire transect.
KilkD111.1	89788	231477	89896	231528	Mud and kelp at start point, mud and *Virgularia mirabilis* at end point.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD111.2	89896	231528	End Point	End Point	Mud and kelp at start point, mud and *Virgularia mirabilis* at end point.
KilkD112.1	89896	231528	90167	231704	Mud with *Virgularia mirabilis* and anemones, transect ends in reef.
KilkD112.2	90167	231704	End Point	End Point	Mud with *Virgularia mirabilis* and anemones, transect ends in reef.
KilkD113.1	93890	232810	94033	232869	*Virgularia mirabilis* on mud at start point, continues to end point where it stops. Dense *Virgularia mirabilis* about 20-30 individuals per meter sq.
KilkD113.2	94033	232869	End Point	End Point	*Virgularia mirabilis on mud at start point and continues to end point where Virgularia mirabilis ends. Dense Virgularia mirabilis about 20-30 individuals per meter sq.*
KilkD114.1	94036	232897	94162	232954	Mud, *Virgularia mirabilis* (rare) from start to end point. Rock and kelp at end point.
KilkD114.2	94162	232954	End Point	End Point	Mud, *Virgularia mirabilis* (rare) from start to end point. Rock and kelp at end point.
KilkD115.1	94182	232514	94209	232505	Transect started in mud at a depth of 12m, *Virgularia mirabilis* (rare) started to occur at 7.6 m depth and continued to end point. End point consisted of rock and boulders.
KilkD115.1.1	94209	232505	94245	232488	Transect started in mud at a depth of 12m. *Virgularia mirabilis* (rare) started at 7.6 m and continued rare to end point. End point consisted of rock and boulders.
KilkD115.2	94245	232488	End Point	End Point	Transect started in mud at a depth of 12m. *Virgularia mirabilis* started to occur at 7.6 m depth and continued rare to end point. End point rock and boulders.
KilkD116.1	94277	232735	94150	232620	Transect started on 80% dead, 20% live maerl. Mud started mid way between start and end points, No *Virgularia mirabilis* noted. Mud at end point.
KilkD116.1.1	94150	232620	94417	232516	Transect started on 80% dead, 20% live maerl. Mud started mid way between start and end points, No *Virgularia mirabilis* noted. Mud at end point.
KilkD116.2	94417	232516	End Point	End Point	Transect started on 80% dead, 20% live maerl. No *Virgularia mirabilis*. Mud at end point. Mud started mid way between start and end points.
KilkD117.1	94168	232459	94245	232479	Mud with *Virgularia mirabilis* for all of this transect. *Virgularia mirabilis* ends at end point in mud.
KilkD117.2	94245	232479	End Point	End Point	Mud with *Virgularia mirabilis* all the way from start to end point. *Virgularia mirabilis* ends at end point in mud.
KilkD118.1	91652	232054	91800	231940	Maerl 100% live at start point, duned gravel starts 2/3rds of the way along the transect at 7m depth, dredge marks noted on the seabed. Rock at end point.
KilkD118.1.1	91800	231940	91966	231890	Maerl 100% live at start point, duned gravel starts 2/3rds of the way along the transect at 7m depth, dredge marks noted on the seabed. Rock at end point.
KilkD118.2	91966	231890	End Point	End Point	Maerl 100% live at start point, duned gravel starts 2/3rds way across at 7m depth, dredge marks obvious on bottom. Rock at end point.
KilkD119.1	92634	232414	92695	232301	*Virgularia mirabilis* on mud at start point (4-5 individuals per meter sq.) Mud with oyster shell at end point.
KilkD119.2	92695	232301	End Point	End Point	*Virgularia mirabilis* in mud at start point (4-5 per meter sq.) mud with oyster shell at end point.
KilkD120.1	93004	232561	93084	232380	Mud with *Virgularia mirabilis* for all of this transect. *Virgularia mirabilis* becomes denser closer to shore. Boulders and rock at end point.
KilkD120.2	93084	232380	End Point	End Point	Mud with *Virgularia mirabilis* for entire transect. *Virgularia mirabilis* is denser closer to shore. Boulders and rock at end point.
KilkD121.1	93302	232766	93206	232856	Mud at start point, *Virgularia mirabilis* starts at end point
KilkD121.2	93206	232856	End Point	End Point	Mud at start point *Virgularia mirabilis* starts at end point.
KilkD122.1	93206	232856	93325	232484	Mud with *Virgularia mirabilis* at start point, transect ends in rocky reef at end point.
KilkD122.2	93325	232484	End Point	End Point	*Virgularia mirabilis* starts at start pt and ends at end point in rocky reef.
KilkD123.1	93324	232477	93397	232349	Sandy mud from start point to end point. Transect ends at boulder slope.
KilkD123.2	93397	232349	End Point	End Point	Sandy mud at start pt to end pt ends in boulder slope.
KilkD124.1	93964	232538	93784	232639	Sponges on rock at start of transect, course sandy mud at end point.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD124.2	93784	232639	End Point	End Point	sponges on rock at start course sandy mud at end.
KilkD125.1	93917	233020	93988	232899	Mud at start point and for entire length of transect. *Virgularia mirabilis* starts to occur at end point.
KilkD125.2	93988	232899	End Point	End Point	Mud at start *Virgularia mirabilis* starts at end point.
KilkD126.1	93988	232899	94025	232895	*Virgularia mirabilis* ends 25m before end point of transect.
KilkD126.1.1	94025	232895	94050	232887	*Virgularia mirabilis* ends 25m before end point of transect.
KilkD126.2	94050	232887	End Point	End Point	*Virgularia mirabilis* ends 25m before end point
KilkD127.1	94177	232971	94191	232818	Large rocks at start point, decreasing to pebbles, no mud or *Virgularia mirabilis*.
KilkD127.2	94191	232818	End Point	End Point	Large rocks at start point decreasing to pebbles, no mud or *Virgularia mirabilis.*
KilkD128.1	94139	232436	94062	232390	*Virgularia mirabilis* for all of this transect, dive stopped just short of fish cages.
KilkD128.2	94062	232390	End Point	End Point	*Virgularia mirabilis* for entire transect, dive stopped short of fish cages
KilkD129.1	94206	232262	94199	232291	*Virgularia mirabilis* on mud for all of this transect.
KilkD129.2	94199	232291	End Point	End Point	*Virgularia mirabilis* for entire transect.
KilkD130.1	94199	232291	94159	232326	*Virgularia mirabilis* on mud for all of this transect. *Virgularia mirabilis* stops at end point.
KilkD130.2	94159	232326	End Point	End Point	*Virgularia mirabilis* on mud at start point, *Virgularia mirabilis* gone at end point.
KilkD131.1	93977	232456	94100	232550	Mud, sprinkling of dead maerl at start, half way across transect maerl is 100 living good bed, still good live maerl at end point. No *Virgularia mirabilis* recorded on this transect
KilkD131.1.1	94100	232550	94175	232663	Mud, sprinkling dead maerl at start, half way across transect maerl is 100 living good bed, still good live maerl at end point. No *Virgularia mirabilis* recorded on this transect.
KilkD131.2	94175	232663	End Point	End Point	Mud, sprinkling dead maerl at start, half way across transect maerl is a 100% living good bed, still good live maerl at end point. No *Virgularia mirabilis* anywhere this transect
KilkD132.1	94480	232799	94430	232795	Live maerl at start point, transect continues down steep boulder slope, stone and gravel at bottom with *Ophiocomina nigra* and *Antedon bifida.*
KilkD132.1.1	94430	232795	94163	232755	Live maerl at start point, transect continues down steep boulder slope, stone and gravel at bottom with *Ophiocomina nigra* and *Antedon bifida.*
KilkD132.2	94163	232755	End Point	End Point	Live maerl at start then transect continued down steep boulder slope with stone and gravel at bottom with *Ophiocomina nigra* and *Antedon bifida.*
KilkD133.1	93242	232297	93225	232084	Mud from start to end point end point, boulders at end point/
KilkD133.2	93225	232084	End Point	End Point	Mud from start to end point, boulders occur at end point.
KilkD134	93251	232094	End Point	End Point	Patch of *Virgularia mirabilis* for about 20 m.
KilkD135.1	92497	232118	92612	232029	Scallop bed (*Pecten maximus*) and mud from start point. Transect ends in rocks and boulders at end point.
KilkD135.2	92612	232029	End Point	End Point	Scallop bed (*Pecten maximus*) and mud at start, rocks and boulders at end point
KilkD136.1	92304	232084	92383	232264	Bedrock and dead maerl at start point, Oysters (*Ostrea edulis*) and mud at end point.
KilkD136.2	92383	232264	End Point	End Point	Bed rock and dead maerl at start point, Oysters and mud at end point.
KilkD137.1	92564	232261	92539	232292	Rock/mud all of this transect.
KilkD137.2	92539	232292	End Point	End Point	Rock/mud all of this transect.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KilkD138.1	92539	232292	92616	232393	*Virgularia mirabilis* starts at end point
KilkD138.2	92616	232393	End Point	End Point	*Virgularia mirabilis* starts at end point.
KilkD139.1	91504	231536	91640	231446	Mud, *Virgularia mirabilis* starts at end point with peacock worms (*Sabella pavonina*) in clusters of approximately 10 individuals.
KilkD139.2	91640	231446	End Point	End Point	Mud, *Virgularia mirabilis* starts at end point with *Sabella pavonina* in clusters of about 10 individuals.
KilkD140.1	91640	231446	91830	231331	*Virgularia mirabilis* ends at end point.
KilkD140.2	91830	231331	End Point	End Point	*Virgularia mirabilis* ends at end point.
KilkD141.1	91502	231486	91514	231268	Mud, all the way, no obvious epifauna.
KilkD141.2	91514	231268	End Point	End Point	Mud, all the way, no epifauna.
KilkD142.1	91516	231513	91076	231477	Mud with rocks/reef, 3 individuals of *Virgularia mirabilis* recorded for the entire transect.
KilkD142.2	91076	231477	End Point	End Point	Mud with rocks and reef, 3 individuals of *Virgularia mirabilis* recorded for the entire transect.
KilkD143.1	94994	232772	94988	232695	*Virgularia mirabilis* at start point and occurs all the way to end point. Transect ends in reef.
KilkD143.2	94988	232695	End Point	End Point	*Virgularia mirabilis* at start point all the way to end, ends in reef.
KilkD144.1	94989	232701	94929	232735	*Virgularia mirabilis* at start point and occur all the way to end point. Transect ends in reef.
KilkD144.2	94929	232735	End Point	End Point	*Virgularia mirabilis* at start point all the way to end, ends in reef.
KilkD145.1	94990	232741	94990	232707	Muddy sediment with rocks covered in sponges, ascidians and *Sabella pavonina*
KilkD145.2	94990	232707	End Point	End Point	Muddy sediment with rocks covered in sponges, ascidians and *Sabella pavonina*
KilkD146.1	94890	232746	94532	232871	Very fast drift through channel, Rocks and boulders covered in sponges, ascidians and *Sabella pavonina*.
KilkD146.2	94532	232871	End Point	End Point	Very fast drift through channel, Rocks and boulders covered in sponges, ascidians and *Sabella pavonina*
KilkD147.1	95004	233619	94993	233627	6m hole off Mac Kanagh point with dead maerl at bottom.
KilkD147.2	94993	233627	End Point	End Point	6m hole off Mac Kanagh point, dead maerl at bottom
KilkD148.1	95651	234302	95553	234126	Rocks and boulders covered in sponges and ascidians.
KilkD148.2	95553	234126	End Point	End Point	Rocks and boulders covered in sponges, ascidians.
KS1	80640	227550	80828	227616	*Zostera marina* (abundant) at start point, western boundary of *Zostera marina* bed identified.
KS1.1	80828	227616	80685	227615	Kelp.
KS1.2	80685	227615	80584	227628	*Zostera marina* (patchy abundant), becoming Occasional.
KS1.3	80584	227628	80566	227631	*Zostera marina* (abundant). Edge of bed.
KS1.4	80566	227631	80550	227634	Kelp
KS1.5	80550	227634	80385	227649	*Zostera marina* (abundant).
KS1.6	80385	227649	End Point	End Point	Sand (*Zostera marina* gone).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS2	80621	227430	80580	227644	*Zostera marina* (abundant).
KS2.1	80580	227644	80560	227753	Sand, *Zostera marina* gone briefly, then becomes abundant or frequent.
KS2.2	80560	227753	End Point	End Point	*Zostera marina* (abundant / Frequent) to this point.
KS3	80975	227454	81162	227649	*Zostera marina* (patchy/abundant)
KS3.1	81162	227649	End Point	End Point	*Zostera marina* (patchy abundant).
KS4	80643	227527	80451	227228	*Zostera marina* (abundant/frequent alternating).
KS4.1	80451	227228	80439	227201	*Zostera marina* (patchy abundant).
KS4.2	80439	227201	80407	227190	*Zostera marina* (rare).
KS4.3	80407	227190	80390	227150	*Zostera marina* (patchy Frequent).
KS4.4	80390	227150	80350	227060	Sand (*Zostera marina* gone).
KS4.5	80350	227060	80334	227122	Loose sand and *Chorda filum*.
KS4.6	80334	227122	80303	227132	*Zostera marina* (abundant patchy).
KS4.7	80303	227132	80275	227100	*Zostera marina* (abundant patchy).
KS4.8	80275	227100	80257	227061	*Zostera marina (*occasional patchy).
KS4.9	80257	227061	80212	226942	Sand (*Zostera marina* gone).
KS4.10	80212	226942	80211	226880	Patchy kelp, *Zostera marina* (occasional), sand patches.
KS4.11	80211	226880	End Point	End Point	Sand, shell, Kelp (*Zostera marina* gone).
KS5	80110	226814	80062	226881	Sand and Kelp.
KS5.1	80062	226881	End Point	End Point	Sand and kelp.
KS6	80097	226957	80202	226934	Sand.
KS6.1	80202	226934	80232	226931	Kelp.
KS6.2	80232	226931	End Point	End Point	*Zostera marina*, small patch then back to sand and Kelp.
KS7	80391	227051	80359	227070	Kelp.
KS7.1	80359	227070	80350	227103	Kelp, With *Zostera marina (*abundant) mixed with kelp.
KS7.2	80350	227103	80285	227154	*Zostera marina (*patchy abundant) in sand.
KS7.3	80285	227154	End Point	End Point	Vision gone at 10m depth.
KS8	79528	227459	79387	227558	*Zostera marina (*patchy Frequent) in shell and sand.
KS8.1	79387	227558	79189	227640	Sand (*Zostera marina* gone).
KS8.2	79189	227640	End Point	End Point	Kelp.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS9	79243	228250	79393	228187	*Zostera marina (*abundant, patchy).
KS9.1	79393	228187	79541	228150	Sand.
KS9.2	79541	228150	End Point	End Point	Sand.
KS10	79626	228252	79569	228605	Sand.
KS10.1	79569	228605	End Point	End Point	Sand.
KS11	79610	228648	79700	228614	Kelp & patches of *Zostera marina* (abundant).
KS11.1	79700	228614	80105	228460	Kelp and sand.
KS11.2	80105	228460	80179	228441	Kelp & patches of *Zostera marina* (abundant).
KS11.3	80179	228441	80244	228428	Sand/kelp small patches of *Zostera marina* (occasional) in kelp.
KS11.4	80244	228428	80266	228424	*Zostera marina* (abundant).
KS11.5	80266	228424	80288	228415	Kelp.
KS11.6	80288	228415	80338	228398	*Zostera marina* (abundant).
KS11.7	80338	228398	80373	228386	*Zostera marina* (abundant).
KS11.8	80373	228386	End Point	End Point	Sand/shell.
KS12	80413	228423	80425	228432	*Zostera marina* (abundant).
KS12.1	80425	228432	80436	228438	Sand.
KS12.2	80436	228438	80450	228462	*Zostera marina* (abundant).
KS12.3	80450	228462	80498	228554	*Zostera marina* (patchy abundant).
KS12.4	80498	228554	End Point	End Point	Kelp.
KS13	80591	228001	80703	228011	Shell/sand.
KS13.1	80703	228011	80751	228015	*Zostera marina* (abundant).
KS13.2	80751	228015	80773	228017	Sand
KS13.3	80773	228017	80328	228026	*Zostera marina* (patchy abundant).
KS13.4	80328	228026	80851	228031	Kelp
KS13.5	80851	228031	80942	228049	*Zostera marina* (abundant).
KS13.6	80942	228049	80974	228050	*Zostera marina* (patchy abundant).
KS13.7	80974	228050	81081	228069	*Zostera marina*(abundant).
KS13.8	81081	228069	81104	228078	Kelp/sand/shell
KS13.9	81104	228078	81126	228086	*Zostera marina* (patchy abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS13.10	81126	228086	81137	228090	Shell/sand.
KS13.11	81137	228090	End Point	End Point	*Zostera marina* (patchy abundant).
KS14	74586	230529	74580	230505	Kelp.
KS14.1	74580	230505	74586	230493	Sand.
KS14.2	74586	230493	74595	230466	Kelp.
KS14.3	74595	230466	74600	230431	Sand.
KS14.4	74600	230431	End Point	End Point	Sand.
KS15	74686	230384	74712	230540	Sand.
KS15.1	74712	230540	End Point	End Point	Kelp.
KS16	74784	230588	74790	230506	Kelp.
KS16.1	74790	230506	74787	230476	*Zostera marina* (patchy abundant) on sand.
KS16.2	74787	230476	74781	230417	Sand.
KS16.3	74781	230417	74777	230333	*Zostera marina* (patchy abundant).
KS16.4	74777	230333	74792	230287	*Zostera marina* (patchy abundant).
KS16.5	74792	230287	74782	230262	Sand, *Zostera marina* (rare).
KS16.6	74782	230262	End Point	End Point	Sand.
KS17	74792	230236	74871	230282	Sand.
KS17.1	74871	230282	74871	230282	Sand.
KS17.1	74871	230282	End Point	End Point	Sand.
KS18	74871	230282	74874	230307	Sand.
KS18.1	74874	230307	74870	230330	*Zostera marina* (frequent).
KS18.2	74870	230330	74850	230426	*Zostera marina* (patchy abundant).
KS18.3	74850	230426	74838	230486	Sand.
KS18.4	74838	230486	74838	230497	*Zostera marina* (patchy frequent).
KS18.5	74838	230497	74835	230546	Kelp.
KS18.6	74835	230546	74834	230566	Kelp with *Zostera marina* (patchy occasional).
KS18.7	74834	230566	End Point	End Point	*Zostera marina* (patchy abundant) and kelp.
KS19	74834	230566	74863	230606	Sand/kelp small patches of *Zostera marina* (occasional) in kelp.
KS19.1	74863	230606	74880	230617	Kelp.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS19.2	74880	230617	End Point	End Point	Sand.
KS20	74880	230617	74901	230611	Sand.
KS20.1	74901	230611	74899	230580	*Zostera marina* (abundant).
KS20.2	74899	230580	74904	230542	Kelp.
KS20.3	74904	230542	74908	230518	*Zostera marina* (abundant).
KS20.4	74908	230518	74910	230506	Kelp.
KS20.5	74910	230506	74911	230495	Sand.
KS20.6	74911	230495	74903	230401	Kelp.
KS20.7	74903	230401	74902	230389	Sand.
KS20.8	74902	230389	74901	230372	*Zostera marina* (patchy abundant).
KS20.9	74901	230372	74900	230336	Kelp.
KS20.10	74900	230336	74900	230320	*Zostera marina* (patchy abundant).
KS20.11	74900	230320	74902	230282	*Zostera marina (*rare).
KS20.12	74902	230282	74910	230257	Sand.
KS20.13	74910	230257	End Point	End Point	Sand.
KS21	74939	230241	75009	230299	Sand.
KS21.1	75009	230299	End Point	End Point	Sand.
KS22	75009	230299	74985	230409	Sand.
KS22.1	74985	230409	74966	230454	*Zostera marina* (patchy abundant)
KS22.2	74966	230454	74938	230510	Kelp.
KS22.3	74938	230510	74928	230528	*Zostera marina* (patchy abundant)
KS22.4	74928	230528	74920	230549	Kelp.
KS22.5	74920	230549	74913	230568	Sand, *Zostera marina* (occasional).
KS22.6	74913	230568	74911	230580	*Zostera marina* (patchy abundant).
KS22.7	74911	230580	74909	230594	Kelp.
KS22.8	74909	230594	74905	230624	*Zostera marina* (patchy abundant).
KS22.9	74905	230624	74906	230627	*Zostera marina* (patchy abundant).
KS22.10	74906	230627	End Point	End Point	Kelp.
KS23	74912	230607	74923	230618	*Zostera marina* (abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS23.1	74923	230618	74944	230634	Kelp.
KS23.2	74944	230634	74966	230671	Sand.
KS23.3	74966	230671	74981	230710	*Zostera marina* (abundant).
KS23.4	74981	230710	75003	230809	Sand.
KS23.5	75003	230809	End Point	End Point	Sand.
KS24	75003	230809	75044	230799	Sand.
KS24.1	75044	230799	End Point	End Point	Sand.
KS25	75044	230799	75028	230782	Sand.
KS25.1	75028	230782	75011	230756	Kelp.
KS25.2	75011	230756	74990	230722	Sand.
KS25.3	74990	230722	74983	230711	*Zostera marina* (occasional).
KS25.4	74983	230711	74979	230702	*Zostera marina* (patchy abundant).
KS25.5	74979	230702	74964	230656	*Zostera marina* (abundant).
KS25.6	74964	230656	74961	230627	Sand.
KS25.7	74961	230627	74956	230600	*Zostera marina* (abundant).
KS25.8	74956	230600	74934	230531	Kelp.
KS25.9	74934	230531	74925	230514	Sand.
KS25.10	74925	230514	74898	230406	Kelp.
KS25.11	74898	230406	74900	230386	Sand, *Zostera marina* (patchy abundant).
KS25.12	74900	230386	74909	230347	Kelp.
KS25.13	74909	230347	74916	230328	*Zostera marina* (patchy abundant).
KS25.14	74916	230328	74929	230285	Sand.
KS25.15	74929	230285	End Point	End Point	Sand.
KS26	75070	230363	75071	230394	Sand.
KS26.1	75071	230394	75073	230439	*Zostera marina* (abundant).
KS26.2	75073	230439	75082	230515	*Zostera marina* (patchy abundant).
KS26.3	75082	230515	75088	230549	Sand.
KS26.4	75088	230549	End Point	End Point	Rock/sand.
KS27	75094	230568	75145	230567	Kelp/*Zostera marina* mixed.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS27.1	75145	230567	75162	230567	*Zostera marina* (abundant).
KS27.2	75162	230567	End Point	End Point	Kelp.
KS28	75165	230585	75187	230583	Sand.
KS28.1	75187	230583	75250	230566	Kelp.
KS28.2	75250	230566	75263	230563	*Zostera marina* (occasional).
KS28.3	75263	230563	75338	230542	*Zostera marina* (abundant).
KS28.4	75338	230542	75352	230538	*Zostera marina* (occasional).
KS28.5	75352	230538	75368	230532	Sand.
KS28.6	75368	230532	75475	230500	*Zostera marina* (patchy abundant) in sand.
KS28.7	75475	230500	End Point	End Point	Vision gone, diver needed.
KS29	75526	230415	75554	230403	*Zostera marina* (abundant).
KS29.1	75554	230403	75571	230395	Kelp.
KS29.2	75571	230395	End Point	End Point	Sand.
KS30	75579	230396	75571	230426	Sand/kelp small patches of *Zostera marina* (occasional) in kelp.
KS30.1	75571	230426	75565	230462	*Zostera marina* (abundant) and kelp mixed.
KS30.2	75565	230462	75563	230485	Sand.
KS30.3	75563	230485	75554	230527	*Zostera marina (*patchy occasional).
KS30.4	75554	230527	End Point	End Point	Vision gone, diver needed.
KS31	75537	230577	75530	230603	Sand/shell.
KS31.1	75530	230603	75522	230631	*Zostera marina* (abundant).
KS31.2	75522	230631	75517	230648	*Zostera marina (*patchy abundant).
KS31.3	75517	230648	75517	230657	*Zostera marina* (abundant).
KS31.4	75517	230657	75517	230663	Kelp
KS31.5	75517	230663	75516	230681	*Zostera marina* (abundant).
KS31.6	75516	230681	75514	230685	Sand.
KS31.7	75514	230685	75518	230702	Patches of *Zostera marina* (abundant).
KS31.8	75518	230702	End Point	End Point	Sand.
KS32	75518	230653	75528	230658	Kelp.
KS32.1	75528	230658	75565	230663	*Zostera marina* (abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS32.2	75565	230663	75602	230661	Sand.
KS32.3	75602	230661	75653	230663	Vision gone.
KS32.4	75653	230663	75847	230646	Sand/shell.
KS32.5	75847	230646	End Point	End Point	Sand.
KS33	75808	230697	75770	230774	Sand.
KS33.1	75770	230774	75758	230798	Kelp.
KS33.2	75758	230798	75734	230869	Vision gone.
KS33.3	75734	230869	75731	230879	Kelp.
KS33.4	75731	230879	End Point	End Point	*Zostera marina* (abundant).
KS34	75748	230868	75780	230934	No vision.
KS34.1	75780	230934	75797	230980	Kelp.
KS34.2	75797	230980	75799	231000	Vision gone.
KS34.3	75799	231000	75822	231086	Sand & kelp.
KS34.4	75822	231086	End Point	End Point	Sand.
KS35	75188	230063	75168	230061	Kelp.
KS35.1	75168	230061	75135	230047	Shell/sand/kelp.
KS35.2	75135	230047	74938	229977	Kelp.
KS35.3	74938	229977	74934	229973	*Zostera marina* (abundant), small patch.
KS35.4	74934	229973	74930	229969	Sand.
KS35.5	74930	229969	End Point	End Point	Sand.
KS36	74930	229969	74468	230510	Sand.
KS36.1	74468	230510	End Point	End Point	Kelp.
KS37	74526	230508	74618	230500	Kelp.
KS37.1	74618	230500	74653	230499	Sand.
KS37.2	74653	230499	74678	230497	Kelp.
KS37.3	74678	230497	End Point	End Point	*Zostera marina* (occasional).
KS38	74694	230491	74796	230319	*Zostera marina* (patchy abundant) in sand.
KS38.1	74796	230319	74826	230278	*Zostera marina* (abundant).
KS38.2	74826	230278	74842	230270	*Zostera marina* (patchy abundant) /kelp.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS38.3	74842	230270	74851	230264	*Zostera marina* (abundant).
KS38.4	74851	230264	End Point	End Point	Sand (*Zostera marina* gone).
KS39	74888	230139	74727	230311	Sand.
KS39.1	74727	230311	74708	230340	*Zostera marina* (patchy abundant).
KS39.2	74708	230340	74685	230370	*Zostera marina (*patchy frequent).
KS39.3	74685	230370	74650	230484	*Zostera marina* (patchy frequent).
KS39.4	74650	230484	End Point	End Point	Kelp.
KS40	75920	230909	75872	230960	Living maerl.
KS40.1	75872	230960	75927	230937	Living maerl.
KS40.2	75927	230937	75797	230958	Maerl bed ends here.
KS40.3	75797	230958	End Point	End Point	Maerl at this point fades into kelp and rock.
KS41	75730	230837	75675	230792	Kelp.
KS41.1	75675	230792	75639	230755	*Zostera marina* (abundant).
KS41.2	75639	230755	75629	230741	Kelp.
KS41.3	75629	230741	75619	230730	*Zostera marina* (frequent).
KS41.4	75619	230730	75617	230777	Kelp.
KS41.5	75617	230777	75589	230705	*Zostera marina* (abundant).
KS41.6	75589	230705	End Point	End Point	Kelp.
KS42	75389	230555	75449	230491	*Zostera marina* (abundant).
KS42.1	75449	230491	75477	230530	Maerl/*Zostera marina* (abundant) mixed
KS42.2	75477	230530	75558	230486	*Zostera marina* ends, maerl continues.
KS42.3	75558	230486	75568	230473	Maerl ends, *Zostera marina* starts again.
KS42.4	75568	230473	End Point	End Point	*Zostera marina* ends then sand to shore.
KS43	75348	230550	75466	230550	Sand/*Zostera marina* (abundant) patches
KS43.1	75466	230550	75558	230508	*Zostera marina* ends, living maerl starts.
KS43.2	75558	230508	75592	230470	Maerl ends on sand.
KS43.3	75592	230470	End Point	End Point	Reef/Zostera marina (abundant).
KS44	75491	230143	75361	230280	Sand.
KS44.1	75361	230280	75341	230318	*Zostera marina* (abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS44.2	75341	230318	75251	230393	Maerl (dead) starts/*Zostera marina* stops
KS44.3	75251	230393	75266	230422	Sand.
KS44.4	75266	230422	75271	230452	*Zostera marina* (patchy occasional).
KS44.5	75271	230452	End Point	End Point	Sand.
KS45	77619	228385	77605	228403	Sand, *Zostera marina* (patchy abundant).
KS45.1	77605	228403	77596	228434	Sand.
KS45.2	77596	228434	77511	228605	*Zostera marina* (patchy abundant) on sand.
KS45.3	77511	228605	77500	228361	Sand.
KS45.4	77500	228361	77283	229370	Sand.
KS45.5	77283	229370	End Point	End Point	Sand.
KS46	77283	229370	77564	229627	Sand.
KS46.1	77564	229627	77709	229752	*Zostera marina* (abundant).
KS46.2	77709	229752	77723	229759	Kelp and *Zostera marina* (patchy abundant) mixed.
KS46.3	77723	229759	77749	229783	*Zostera marina* (abundant).
KS46.4	77749	229783	77761	229790	Zostera marina and kelp mixed.
KS46.5	77761	229790	77777	229797	*Zostera marina* (abundant).
KS46.6	77777	229797	77799	229803	Kelp.
KS46.7	77799	229803	77832	229810	*Zostera marina* (abundant).
KS46.8	77832	229810	77850	229818	Kelp.
KS46.9	77850	229818	77861	229826	*Zostera marina* (abundant).
KS46.10	77861	229826	77871	229834	Kelp.
KS46.11	77871	229834	77897	229912	*Zostera marina* (abundant).
KS46.12	77897	229912	77897	229923	Kelp.
KS46.13	77897	229923	77900	229934	*Zostera marina* (abundant).
KS46.14	77900	229934	77907	229924	Kelp.
KS46.15	77907	229924	77939	229974	Sand.
KS46.16	77939	229974	77968	229981	Rock & kelp.
KS46.17	77968	229981	77989	229989	*Zostera marina* (abundant).
KS46.18	77989	229989	78043	229996	Kelp.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS46.19	78043	229996	78049	230004	Kelp.
KS46.20	78049	230004	78100	230092	Sand.
KS46.21	78100	230092	End Point	End Point	Kelp.
KS47	78064	230097	78083	230086	Kelp.
KS47.1	78083	230086	78216	229989	Sand.
KS47.2	78216	229989	78293	229934	Kelp.
KS47.3	78293	229934	78329	229902	vision gone
KS47.4	78329	229902	78412	229848	Kelp.
KS47.5	78412	229848	78460	229830	Sand.
KS47.6	78460	229830	78500	229800	*Zostera marina* (abundant).
KS47.7	78500	229800	78512	229796	Kelp.
KS47.8	78512	229796	78547	229777	*Zostera marina* (abundant).
KS47.9	78547	229777	78576	229760	Kelp.
KS47.10	78576	229760	78587	229752	*Zostera marina* (abundant).
KS47.11	78587	229752	78645	229719	Kelp.
KS47.12	78645	229719	78660	229713	Sand.
KS47.13	78660	229713	78696	229688	Kelp.
KS47.14	78696	229688	78726	229675	Kelp.
KS47.15	78726	229675	78775	229667	Vision gone.
KS47.16	78775	229667	78841	229641	Kelp.
KS47.17	78841	229641	78858	229628	*Zostera marina* (patchy abundant).
KS47.18	78858	229628	78871	229620	Kelp.
KS47.19	78871	229620	78899	229607	*Zostera marina* (patchy abundant).
KS47.20	78899	229607	78919	229600	Kelp.
KS47.21	78919	229600	78936	229593	Sand/kelp/*Zostera marina* (patchy abundant).
KS47.22	78936	229593	78953	229584	Vision gone
KS47.23	78953	229584	78990	229574	Kelp.
KS47.24	78990	229574	79002	229570	vision gone
KS47.25	79002	229570	79017	229563	Kelp.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS47.26	79017	229563	79030	229555	*Zostera marina* (patchy abundant).
KS47.27	79030	229555	79042	229551	*Zostera marina* (patchy abundant).
KS47.28	79042	229551	79052	229547	Kelp.
KS47.29	79052	229547	79090	229534	*Zostera marina* (patchy abundant).
KS47.30	79090	229534	79098	229531	Kelp.
KS47.31	79098	229531	79108	229527	*Zostera marina* (patchy abundant).
KS47.32	79108	229527	79118	229523	Kelp.
KS47.33	79118	229523	79137	229520	Sand.
KS47.34	79137	229520	79167	229513	Kelp/sand
KS47.35	79167	229513	79210	229509	Kelp/sand
KS47.36	79210	229509	79232	229503	Sand.
KS47.37	79232	229503	79235	229497	Kelp.
KS47.38	79235	229497	End Point	End Point	Kelp.
KS48	79229	229438	79210	229410	*Zostera marina* (occasional) on sand
KS48.1	79210	229410	79203	229410	Sand.
KS48.2	79203	229410	79168	229371	Kelp.
KS48.3	79168	229371	79126	229310	Kelp.
KS48.4	79126	229310	79090	229273	Sand.
KS48.5	79090	229273	End Point	End Point	Sand.
KS49	79090	229273	78992	229347	Sand.
KS49.1	78992	229347	78929	229344	Kelp.
KS49.2	78929	229344	78906	229349	Sand/kelp.
KS49.3	78906	229349	78892	229352	*Zostera marina* (patchy abundant)/kelp.
KS49.4	78892	229352	78880	229354	Sand.
KS49.5	78880	229354	78848	229371	*Zostera marina* (abundant).
KS49.6	78848	229371	78790	229399	Kelp/*Zostera marina* (abundant) alternating.
KS49.7	78790	229399	78772	229403	Vision gone.
KS49.8	78772	229403	78686	229430	Sand.
KS49.9	78686	229430	78637	229456	Patches of *Zostera marina* (abundant) in sand.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS49.10	78637	229456	78526	229505	*Zostera marina* (abundant).
KS49.11	78526	229505	78491	229525	Kelp.
KS49.12	78491	229525	78468	229538	*Zostera marina* (abundant).
KS49.13	78468	229538	78455	229545	*Zostera marina* (patchy abundant) in sand.
KS49.14	78455	229545	78432	229560	*Zostera marina* (abundant).
KS49.15	78432	229560	78333	229610	Kelp.
KS49.16	78333	229610	78303	229630	*Zostera marina* (abundant).
KS49.17	78303	229630	78203	229700	kelp/*Zostera marina* (abundant) alternating.
KS49.18	78203	229700	78160	229730	Sand.
KS49.19	78160	229730	78134	229742	Kelp/sand.
KS49.20	78134	229742	78080	229767	Vision gone.
KS49.21	78080	229767	78038	229788	Sand.
KS49.22	78038	229788	78007	229803	Rock.
KS49.23	78007	229803	77987	229815	Kelp.
KS49.24	77987	229815	77921	229859	*Zostera marina* (abundant).
KS49.25	77921	229859	77906	229867	Kelp/*Zostera marina* (abundant).
KS49.26	77906	229867	77840	229917	Kelp/*Zostera marina* (abundant) alternating.
KS49.27	77840	229917	77832	229915	Kelp.
KS49.28	77832	229915	End Point	End Point	Kelp.
KS50	77612	229808	77653	229766	Sand.
KS50.1	77653	229766	77704	229710	*Zostera marina* (abundant).
KS50.2	77704	229710	77726	229688	*Zostera marina* (patchy abundant) /kelp.
KS50.3	77726	229688	77847	229571	*Zostera marina* (abundant).
KS50.4	77847	229571	77888	229533	Sand/*Zostera marina* (patchy abundant).
KS50.5	77888	229533	77909	229507	*Zostera marina*(occasional).
KS50.6	77909	229507	77927	229495	*Zostera marina* (abundant).
KS50.7	77927	229495	78029	229410	*Zostera marina* (occasional).
KS50.8	78029	229410	78037	229396	sand
KS50.9	78037	229396	78061	229377	*Zostera marina* (occasional).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS50.10	78061	229377	78090	229360	Sand.
KS50.11	78090	229360	78122	229328	Vision gone.
KS50.12	78122	229328	78252	229193	Sand.
KS50.13	78252	229193	78272	229173	*Zostera marina* (patchy abundant).
KS50.14	78272	229173	78291	229155	*Zostera marina* (patchy abundant).
KS50.15	78291	229155	78307	229141	Kelp.
KS50.16	78307	229141	78385	229056	Sand.
KS50.17	78385	229056	78411	229027	*Zostera marina* (patchy occasional).
KS50.18	78411	229027	78451	228986	*Zostera marina* (patchy abundant).
KS50.19	78451	228986	78460	228975	Shelly sand.
KS50.20	78460	228975	78484	228953	Kelp.
KS50.21	78484	228953	78505	228934	Sand.
KS50.22	78505	228934	78544	228896	*Zostera marina* (patchy abundant).
KS50.23	78544	228896	78557	228882	*Zostera marina* (dense abundant) .
KS50.24	78557	228882	78505	228842	Sand
KS50.25	78505	228842	End Point	End Point	Sand.
KS51	78545	228767	78526	228771	Kelp.
KS51.1	78526	228771	78450	228780	Sand.
KS51.2	78450	228780	78430	228784	*Zostera marina* (patchy abundant).
KS51.3	78430	228784	78415	228787	Kelp.
KS51.4	78415	228787	78392	228789	*Zostera marina* (occasional).
KS51.5	78392	228789	78368	228789	Kelp.
KS51.6	78368	228789	78344	228784	Sand.
KS51.7	78344	228784	78327	228786	Kelp.
KS51.8	78327	228786	78237	228804	Sand.
KS51.9	78237	228804	78194	228814	*Zostera marina* (patchy abundant).
KS51.10	78194	228814	78158	228822	*Zostera marina* (occasional).
KS51.11	78158	228822	78093	228839	Sand.
KS51.12	78093	228839	78030	228857	*Zostera marina* (patchy occasional).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS51.13	78030	228857	77990	228866	*Zostera marina* (patchy abundant).
KS51.14	77990	228866	77957	228874	*Zostera marina* (rare) on sand
KS51.15	77957	228874	77939	228877	Sand/kelp
KS51.16	77939	228877	77920	228882	*Zostera marina* (patchy abundant).
KS51.17	77920	228882	77854	228892	*Zostera marina* and kelp alternating.
KS51.18	77854	228892	77818	228885	*Zostera marina* (patchy abundant).
KS51.19	77818	228885	77777	228884	*Zostera marina (*abundant).
KS51.20	77777	228884	77688	228881	*Zostera marina* (patchy abundant).
KS51.21	77688	228881	End Point	End Point	Sand.
KS52	77541	228501	77558	228492	Kelp.
KS52.1	77558	228492	77845	228438	*Zostera marina* (patchy abundant).
KS52.2	77845	228438	77900	228416	*Zostera marina* (patchy abundant).
KS52.3	77900	228416	77913	228412	*Zostera marina* (patchy abundant/kelp.
KS52.4	77913	228412	77925	228410	Sand.
KS52.5	77925	228410	77933	228410	*Zostera marina* (patchy abundant).
KS52.6	77933	228410	77944	228409	Kelp.
KS52.7	77944	228409	77959	228407	*Zostera marina* (patchy abundant).
KS52.8	77959	228407	77966	228406	Kelp.
KS52.9	77966	228406	77972	228405	*Zostera marina* (patchy abundant).
KS52.10	77972	228405	78016	228387	Sand.
KS52.11	78016	228387	78028	228386	Sand.
KS52.12	78028	228386	78035	228386	Kelp.
KS52.13	78035	228386	78045	228385	Kelp.
KS52.14	78045	228385	78113	228381	Sand.
KS52.15	78113	228381	78214	228348	Sand.
KS52.16	78214	228348	78466	228335	Sand.
KS52.17	78466	228335	78496	228336	Kelp/*Zostera marina* (abundant).
KS52.18	78496	228336	78512	228330	Sand.
KS52.19	78512	228330	78515	228326	*Zostera marina* (occasional).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS52.20	78515	228326	78584	228333	*Zostera marina* (patchy abundant).
KS52.21	78584	228333	End Point	End Point	*Zostera marina* (patchy abundant).
KS53	78518	228363	78401	228260	*Zostera marina* (patchy abundant).
KS53.1	78401	228260	78375	228241	*Zostera marina* (patchy frequent).
KS53.2	78375	228241	78357	228227	Kelp on sand.
KS53.3	78357	228227	78342	228216	Sand.
KS53.4	78342	228216	78298	228167	Kelp.
KS53.5	78298	228167	78255	228101	Sand/kelp.
KS53.6	78255	228101	78252	228080	Sand.
KS53.7	78252	228080	78133	227977	Kelp.
KS53.8	78133	227977	78072	227961	Sand.
KS53.9	78072	227961	77521	228097	course sand/shell
KS53.10	77521	228097	End Point	End Point	Course sand/shell.
KS55	78590	226642	78585	226635	Kelp.
KS55.1	78585	226635	78583	226616	Sand.
KS55.2	78583	226616	78583	226596	*Zostera marina* (abundant).
KS55.3	78583	226596	78582	226572	*Zostera marina* (abundant).
KS55.4	78582	226572	78579	226560	Sand.
KS55.5	78579	226560	78577	226549	*Zostera marina* (abundant).
KS55.6	78577	226549	78574	226526	Kelp.
KS55.7	78574	226526	78571	226501	*Zostera marina* (abundant).
KS55.8	78571	226501	78570	226491	Sand.
KS55.9	78570	226491	78558	226431	*Zostera marina* (abundant).
KS55.10	78558	226431	78566	226421	*Zostera marina* and kelp.
KS55.11	78566	226421	78554	226405	*Zostera marina (*abundant).
KS55.12	78554	226405	78554	226385	Kelp.
KS55.13	78554	226385	78550	226340	Sand.
KS55.14	78550	226340	78543	226320	Kelp.
KS55.15	78543	226320	78533	226300	Sand/kelp

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS55.16	78533	226300	End Point	End Point	Sand.
KS56	78530	226259	78554	226234	Sand.
KS56.1	78554	226234	78570	226220	Kelp.
KS56.2	78570	226220	78596	226193	Sand.
KS56.3	78596	226193	78620	226172	Kelp.
KS56.4	78620	226172	78635	226160	Sand.
KS56.5	78635	226160	78676	226119	Patchy kelp/sand.
KS56.6	78676	226119	78732	226057	Kelp.
KS56.7	78732	226057	78749	226039	Sand.
KS56.8	78749	226039	78777	226011	Kelp.
KS56.9	78777	226011	78777	226272	Kelp.
KS56.10	78777	226272	End Point	End Point	Kelp.
KS57	78777	226272	78628	226387	Kelp.
KS57.1	78628	226387	78608	226405	*Zostera marina* (patchy abundant) on sand.
KS57.2	78608	226405	78570	226436	Sand.
KS57.3	78570	226436	78546	226459	*Zostera marina* (abundant).
KS57.4	78546	226459	78530	226474	*Zostera marina* (patchy abundant)/kelp.
KS57.5	78530	226474	78522	226484	*Zostera marina* (patchy abundant)/kelp.
KS57.6	78522	226484	End Point	End Point	*Zostera marina* (patchy abundant) and kelp.
KS58	78535	226508	78560	226510	*Zostera marina* (abundant).
KS58.1	78560	226510	78568	226511	Sand.
KS58.2	78568	226511	78565	226507	*Zostera marina* (abundant).
KS58.3	78565	226507	78659	226505	*Zostera marina* (abundant) on sand.
KS58.4	78659	226505	78741	226496	Sand.
KS58.5	78741	226496	End Point	End Point	Sand.
KS59	82529	222419	82599	222388	Sand.
KS59.1	82599	222388	82639	222373	*Zostera marina* (abundant dense).
KS59.2	82639	222373	82655	222366	Kelp
KS59.3	82655	222366	82767	222331	*Zostera marina* (abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS59.4	82767	222331	82799	222344	*Zostera marina* (occasional).
KS59.5	82799	222344	82825	222346	Kelp
KS59.6	82825	222346	82841	222341	*Zostera marina* (occasional).
KS59.7	82841	222341	82855	222337	Sand.
KS59.8	82855	222337	82872	222333	Vision gone
KS59.9	82872	222333	82897	222327	Sand.
KS59.10	82897	222327	82925	222318	Kelp.
KS59.11	82925	222318	82631	222314	*Zostera marina* (abundant).
KS59.12	82631	222314	82948	222300	Kelp.
KS59.13	82948	222300	82955	222293	*Zostera marina* (abundant).
KS59.14	82955	222293	82962	222285	Kelp.
KS59.15	82962	222285	82973	222264	Sand.
KS59.16	82973	222264	82987	222250	Kelp/sand
KS59.17	82987	222250	83005	222245	Kelp.
KS59.18	83005	222245	83028	222247	Sand.
KS59.19	83028	222247	83065	222239	Kelp.
KS59.20	83065	222239	83087	222235	Sand.
KS59.21	83087	222235	83119	222214	Kelp.
KS59.22	83119	222214	83135	222195	Sand.
KS59.23	83135	222195	83174	222181	Kelp.
KS59.24	83174	222181	End Point	End Point	Mud vision gone, Verified by dive as mud.
KS200	84790	231092	84807	231326	*Zostera marina* (abundant dense) all the way from S200 to S200.1
KS200.1	84807	231326	End Point	End Point	Sand.
KS201	84796	231395	84789	231476	*Zostera marina* (abundant dense).
KS201.1	84789	231476	End Point	End Point	Sand.
KS202	84931	231511	84861	231464	Sand
KS202.1	84861	231464	84882	231353	*Zostera marina* (abundant dense).
KS202.2	84882	231353	84901	231280	Sand.
KS202.3	84901	231280	84860	231029	*Zostera marina* (abundant dense).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS202.4	84860	231029	84870	230988	Sand, *Zostera marina* (patchy abundant)
KS202.5	84870	230988	End Point	End Point	Sand.
KS203	84894	231037	84864	231070	Sand.
KS203.1	84864	231070	84940	231208	*Zostera marina* (abundant dense).
KS203.2	84940	231208	84961	231363	Sand.
KS203.3	84961	231363	End Point	End Point	Sand.
KS204	84830	231622	84933	231749	Sand and kelp patches.
KS204.1	84933	231749	84934	231770	*Zostera marina* (patchy abundant).
KS204.2	84934	231770	84962	231765	Kelp
KS204.3	84962	231765	End Point	End Point	*Zostera marina* (dense abundant).
KS205	84962	231765	84925	231633	*Zostera marina* (abundant dense).
KS205.1	84925	231633	84926	231613	Sand and *Zostera marina* (patchy abundant).
KS205.2	84926	231613	84924	231585	Sand.
KS205.3	84924	231585	84959	231440	*Zostera marina* (dense abundant).
KS205.4	84959	231440	End Point	End Point	Sand.
KS206	85050	231830	85045	231708	Sand and kelp patches.
KS206.1	85045	231708	85023	231668	Sand.
KS206.2	85023	231668	85006	231445	*Zostera marina* (dense abundant).
KS206.3	85006	231445	End Point	End Point	End point *Zostera marina* (abundant).
KS207	87176	235241	87360	235179	Mud with brown weed.
KS207.1	87360	235179	87407	235167	Mud with living maerl.
KS207.2	87407	235167	87523	235135	Maerl living 100%.
KS207.3	87523	235135	87643	235100	Maerl living 100%.
KS207.4	87643	235100	87747	235090	Dead maerl with rock.
KS207.5	87747	235090	End Point	End Point	Rock with kelp with live maerl in patches.
KS208	89039	236118	89154	236180	Maerl living good deep bed.
KS208.1	89154	236180	89349	236323	Maerl living good deep bed.
KS208.2	89349	236323	89490	236398	Maerl getting thinner on mud.
KS208.3	89490	236398	89671	236559	Maerl living good dense bed.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS208.4	89671	236559	89797	236824	Maerl living good dense bed.
KS208.5	89797	236824	89750	236726	Mud/oysters no maerl.
KS208.6	89750	236726	89718	236678	Mud/oysters no maerl.
KS208.7	89718	236678	End Point	End Point	Maerl boundary, northern limit of bed.
KS209	89710	236700	89787	236516	Dense living maerl bed.
KS209.1	89787	236516	89797	236474	Dense living maerl bed.
KS209.2	89797	236474	89810	236442	Dense living maerl bed (sample).
KS209.3	89810	236442	89813	236397	Dense living maerl bed.
KS209.4	89813	236397	89821	236325	Living maerl, mussel shell spread here.
KS209.5	89821	236325	89810	236121	Living maerl. mussel shell spread here.
KS209.6	89810	236121	89779	235993	Maerl good living bed.
KS209.7	89779	235993	End Point	End Point	Maerl, close to shore as boat could go.
KS210	89915	236188	90068	236154	Maerl good living bed.
KS210.1	90068	236154	90122	236139	Maerl good living bed.
KS210.2	90122	236139	90396	236063	Maerl and shell still good living bed.
KS210.3	90396	236063	End Point	End Point	Oysters (*Ostrea edulis*) (abundant) shell & mud, thin scattering of maerl very little living.
KS211	89036	235303	88956	235410	Mud, no maerl.
KS211.1	88956	235410	88915	235482	Mud.
KS211.2	88915	235482	88891	235565	Mud.
KS211.3	88891	235565	88833	235638	Mud.
KS211.4	88833	235638	88803	235767	Live maerl.
KS211.5	88803	235767	End Point	End Point	End of maerl bed.
KS212	88415	235516	88356	235583	Live maerl and shell.
KS212.1	88356	235583	88326	235627	*Zostera marina* (abundant)
KS212.2	88326	235627	88311	235649	Live maerl.
KS212.3	88311	235649	End Point	End Point	Maerl ends.
KS213	88392	235645	88373	235586	*Zostera marina* (abundant)
KS213.1	88373	235586	88362	235485	*Zostera marina* ends, living maerl starts.
KS213.2	88362	235485	88361	235475	Kelp.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS213.3	88361	235475	88306	235440	*Zostera marina* (abundant)
KS213.4	88306	235440	88343	235367	Living maerl.
KS213.5	88343	235367	End Point	End Point	Kelp.
KS214	88128	235199	88117	235236	Kelp.
KS214.1	88117	235236	88091	235267	*Zostera marina* (abundant)
KS214.2	88091	235267	88072	235271	Kelp.
KS214.3	88072	235271	87895	235405	Living maerl.
KS214.4	87895	235405	End Point	End Point	Kelp.
KS215	87486	233597	87496	233675	*Zostera marina* ends, maerl starts, good bed living maerl.
KS215.1	87496	233675	End Point	End Point	Living maerl ends.
KS216	87041	232037	87138	231975	Dead maerl on mud, thin covering.
KS216.1	87138	231975	87318	231868	Mud.
KS216.2	87318	231868	87491	231718	Mud.
KS216.3	87491	231718	87577	231643	Maerl, living and weed and *Corallina officinalis*.
KS216.4	87577	231643	87678	231564	Living Maerl.
KS216.5	87678	231564	87731	231533	*Zostera marina* (patchy abundant).
KS216.6	87731	231533	End Point	End Point	Kelp.
KS217	87623	233880	87711	233842	Mud.
KS217.1	87711	233842	88027	233981	*Zostera marina* (continuous abundant) starts, very dense.
KS217.2	88027	233981	88301	233742	*Zostera marina* ends.
KS217.3	88301	233742	End Point	End Point	Mud, rock and shell.
KS218	88360	233617	88140	233626	Shell/mud.
KS218.1	88140	233626	87730	233621	*Zostera marina* (abundant)
KS218.2	87730	233621	87690	233602	Dead maerl, some live, oyster shell.
KS218.3	87690	233602	87486	233597	*Zostera marina* (abundant dense).
KS218.4	87486	233597	87496	233675	Maerl living, *Zostera marina* gone.
KS218.5	87496	233675	End Point	End Point	Maerl ends.
KS219	87486	233502	87887	233497	*Zostera marina* (abundant).
KS219.1	87887	233497	88240	233450	*Zostera marina* (abundant dense) on living maerl.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS219.2	88240	233450	End Point	End Point	*Zostera marina* (abundant) still here (end of transect).
KS220	88115	233309	87758	233370	*Zostera marina* (abundant).
KS220.1	87758	233370	87412	233491	*Zostera marina* (abundant) on live/dead maerl.
KS220.2	87412	233491	End Point	End Point	*Zostera marina* and maerl end.
KS221	87272	233359	87415	233320	Maerl live and dead.
KS221.1	87415	233320	88060	233119	*Zostera marina* (abundant).
KS221.2	88060	233119	88115	233098	*Zostera marina (*frequent) on oyster shell.
KS221.3	88115	233098	End Point	End Point	Shell/rock/kelp.
KS222	87935	232849	87743	232915	*Zostera marina* (patchy)/ oyster shell.
KS222.1	87743	232915	87679	232926	*Zostera marina* (dense abundant).
KS222.2	87679	232926	87606	232972	*Zostera marina* (less dense frequent) with shell.
KS222.3	87606	232972	87553	232976	*Zostera marina* (dense abundant).
KS222.4	87553	232976	87500	232993	*Zostera marina* (patchy abundant).
KS222.5	87500	232993	87450	233016	*Zostera marina* (abundant).
KS222.6	87450	233016	87543	233010	Vision gone.
KS222.7	87543	233010	87461	233028	Live/dead maerl and 10% patchy *Zostera marina*.
KS222.8	87461	233028	87305	233144	Living Maerl, *Zostera marina* gone (8m deep).
KS222.9	87305	233144	87010	233233	Maerl live/dead 50/50.
KS222.10	87010	233233	End Point	End Point	Maerl live and dead.
KS223	87058	233026	87313	232979	Maerl living/dead 50/50.
KS223.1	87313	232979	87385	232935	Mud with weed on top.
KS223.2	87385	232935	87550	232867	Live/dead maerl bands.
KS223.3	87550	232867	87852	232648	80% live maerl.
KS223.4	87852	232648	88109	232516	Mostly dead maerl.
KS223.5	88109	232516	88296	232401	*Zostera marina* (dense abundant).
KS223.6	88296	232401	88359	232408	*Zostera marina* (dense abundant).
KS223.7	88359	232408	End Point	End Point	*Zostera marina* ends here, live maerl continues.
KS224	87950	232691	87926	232611	*Zostera marina* (abundant).
KS224.1	87926	232611	87577	232586	Living Maerl, *Zostera marina* gone

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS224.2	87577	232586	End Point	End Point	Weed, (*Chorda filum*).
KS225	87727	231477	87712	231428	*Zostera marina* (abundant).
KS225.1	87712	231428	87670	231326	Sand/shell.
KS225.2	87670	231326	87444	231033	*Corallina officinalis* and some live maerl.
KS225.3	87444	231033	End Point	End Point	*Zostera marina* (patchy abundant) and rocks.
KS226	87499	231038	87439	231154	*Zostera marina* (patchy abundant).
KS226.1	87439	231154	87402	231222	Mud, *Zostera marina* gone.
KS226.2	87402	231222	87362	231428	Mud.
KS226.3	87362	231428	87375	231827	Mud, small amount live maerl.
KS226.4	87375	231827	87301	232085	Mud and weed.
KS226.5	87301	232085	End Point	End Point	Live/dead maerl.
KS227	86972	232306	86705	232048	*Zostera marina* (abundant).
KS227.1	86705	232048	86616	231966	Maerl live and dead.
KS227.2	86616	231966	86497	231844	Mud.
KS227.3	86497	231844	86356	231707	Diver in, see D90
KS227.4	86356	231707	End Point	End Point	Diver out, see D90.
KS228	83371	229526	83321	229648	*Zostera marina* (dense abundant).
KS228.1	83321	229648	End Point	End Point	*Zostera marina* ends.
KS229	83263	229620	83512	229609	*Zostera marina* (dense abundant).
KS229.1	83512	229609	83584	229599	Sand/kelp.
KS229.2	83584	229599	End Point	End Point	Sand.
KS230	83691	229620	83678	229689	Sand.
KS230.1	83678	229689	83674	229702	Sand.
KS230.2	83674	229702	83657	229715	Kelp.
KS230.3	83657	229715	83636	229778	Sand.
KS230.4	83636	229778	83615	229810	Kelp.
KS230.5	83615	229810	End Point	End Point	Sand/vision gone.
KS231	84194	229796	84181	229867	*Zostera marina* (abundant).
KS231.1	84181	229867	End Point	End Point	*Zostera marina* ends at shore.

TRANS	Start E'		End E'	End N'	SEABED
KS232	84399	229849	84409	229879	Kelp.
KS232.1	84409	229879	84762	230258	*Zostera marina (*dense abundant).
KS232.2	84762	230258	End Point	End Point	End transect *Zostera marina* (abundant) still here.
KS233	84762	230258	84796	230362	Boat turned = Kelp immediately
KS233.1	84796	230362	84800	230521	*Zostera marina* (abundant).
KS233.1	84800	230521	End Point	End Point	Kelp.
KS234	84804	230502	84803	230440	Kelp, *Zostera marina* (occasional).
KS234.1	84803	230440	84776	230353	Sand.
KS234.2	84776	230353	84778	230337	*Zostera marina*, (dense abundant).
KS234.2	84778	230337	End Point	End Point	Kelp.
KS235	84797	230245	84738	230198	Kelp.
KS235.1	84738	230198	84466	229918	*Zostera marina* (dense abundant).
KS235.2	84466	229918	End Point	End Point	*Zostera marina* ends here.
KS236	82733	229675	82612	229639	Kelp on sand with occasional patchy *Zostera marina.*
KS236.1	82612	229639	82424	229549	Sand.
KS236.2	82424	229549	End Point	End Point	Sand
KS237	82392	229556	82444	229605	Sand.
KS237.1	82444	229605	82709	229674	Kelp on sand.
KS237.2	82709	229674	End Point	End Point	Patchy *Zostera marina* and kelp.
KS238	83239	229666	83225	229655	Kelp.
KS238.1	83225	229655	83216	229646	*Zostera marina* (abundant).
KS238.2	83216	229646	83219	229636	Kelp.
KS238.3	83219	229636	83223	229625	*Zostera marina* (abundant).
KS238.4	83223	229625	83227	229607	Kelp.
KS238.5	83227	229607	83253	229523	*Zostera marina* (abundant).
KS238.6	83253	229523	83252	229511	Sand.
KS238.7	83252	229511	83256	229472	*Zostera marina* (abundant).
KS238.8	83256	229472	83256	229457	Sand.
KS238.9	83256	229457	End Point	End Point	Sand.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS239	86090	229448	85996	229726	*Zostera marina* (dense abundant)
KS239.1	85996	229726	End Point	End Point	*Zostera marina* ends (8m).
KS240	86319	229896	86349	229814	Sand.
KS240.1	86349	229814	86401	229649	*Zostera marina* (abundant).
KS240.2	86401	229649	End Point	End Point	Kelp.
KS241	86684	230047	86759	229969	14m
KS241.1	86759	229969	86356	229813	*Zostera marina* (abundant).
KS241.2	86356	229813	End Point	End Point	*Zostera marina* ends.
KS242	87066	230149	87104	230064	13m
KS242.1	87104	230064	87146	229983	*Zostera marina* (abundant).
KS242.2	87146	229983	End Point	End Point	Sand and dead maerl.
KS243	87438	230292	87531	230087	18m
KS243.1	87531	230087	End Point	End Point	Sand
KS244	87490	230067	87066	230063	No *Zostera marina.*
KS244.1	87066	230063	End Point	End Point	*Zostera marina* (abundant) starts here.
KS245	84351	228913	84403	228946	No vision.
KS245.1	84403	228946	84453	229241	Mud/ dead maerl.
KS245.2	84453	229241	End Point	End Point	Maerl live/dead.
KS246	84189	229114	84436	229174	No vision.
KS246.1	84436	229174	84755	229190	Living Maerl.
KS246.2	84755	229190	84776	229196	Living Maerl.
KS246.3	84776	229196	84892	229247	Living Maerl.
KS246.4	84892	229247	84925	229378	Living Maerl.
KS246.5	84925	229378	End Point	End Point	Living Maerl.
KS247	84678	228882	84729	228820	No vision.
KS247.1	84729	228820	84850	228772	Maerl living/dead 50/50 bands.
KS247.2	84850	228772	84864	228767	Maerl mixed with shell sand.
KS247.3	84864	228767	End Point	End Point	Kelp.
KS248	84843	228972	84967	228927	Live/dead maerl and shelly sand.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS248.1	84967	228927	85007	228905	Vision gone.
KS248.2	85007	228905	85030	228892	Sand.
KS248.3	85030	228892	End Point	End Point	*Zostera marina (*patchy abundant)
KS249	85049	228910	85072	228931	Sand.
KS249.1	85072	228931	85083	228943	kelp/*Zostera marina* (rare)
KS249.2	85083	228943	85090	228948	Kelp.
KS249.3	85090	228948	85127	228959	Sand.
KS249.4	85127	228959	85180	228986	Kelp.
KS249.5	85180	228986	85229	229001	Sand.
KS249.6	85229	229001	85255	229006	Sand, scattered maerl and *Zostera marina* (rare).
KS249.7	85255	229006	85278	229004	Live maerl patches on sand.
KS249.8	85278	229004	85358	229067	Patches of *Zostera marina* (rare/frequent), on 80% dead maerl.
KS249.9	85358	229067	85410	229092	*Zostera marina* (frequent) and living maerl.
KS249.10	85410	229092	85431	229100	*Zostera marina* (patchy abundant) on Live & dead maerl.
KS249.11	85431	229100	85609	229103	*Zostera marina (*dense abundant) and live maerl.
KS249.12	85609	229103	85689	229093	*Zostera marina* (dense abundant) and live maerl.
KS249.13	85689	229093	85825	229040	Sand with maerl, *Zostera marina* gone.
KS249.14	85825	229040	85875	229027	Live & dead maerl/weed.
KS249.15	85875	229027	End Point	End Point	Maerl gravel/mud.
KS250	85916	229079	85917	229180	Mud/weed.
KS250.1	85917	229180	End Point	End Point	Vision gone.
KS251	86047	229250	86034	229264	Dead maerl/mud.
KS251.1	86034	229264	86026	229350	Maerl gravel on sand, some live.
KS251.2	86026	229350	85968	229615	*Zostera marina* (abundant).
KS251.3	85968	229615	85951	229652	*Zostera marina* (patchy abundant) on sand.
KS251.4	85951	229652	85927	229694	*Zostera marina (*abundant)
KS251.5	85927	229694	End Point	End Point	Sand.
KS252	86074	229726	86240	229549	*Zostera marina* (dense abundant) starts here on live/dead maerl.
KS252.1	86240	229549	86260	229542	*Zostera marina* (patchy abundant) on live dead maerl/sand.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS252.2	86260	229542	End Point	End Point	*Zostera marina* (patchy abundant) on live dead maerl/sand.
KS253	86308	229584	86123	229589	*Zostera marina* (abundant) on live/dead maerl.
KS253.1	86123	229589	86100	229589	*Zostera marina* (rare) on sand/maerl gravel.
KS253.2	86100	229589	85813	229508	*Zostera marina* (patchy abundant).
KS253.3	85813	229508	85787	229506	*Zostera marina* (rare) on maerl/sand 50/50 live/dead maerl.
KS253.4	85787	229506	85707	229494	*Zostera marina* (frequent) on maerl/sand 50/50 live/dead.
KS253.5	85707	229494	End Point	End Point	*Zostera marina* gone maerl/sand 50/50 live/dead.
KS254	85699	229513	85704	229550	*Zostera marina* (patchy frequent).
KS254.1	85704	229550	85698	229585	*Zostera marina* (patchy abundant).
KS254.2	85698	229585	End Point	End Point	Sand/maerl gravel and shell *Zostera marina* gone.
KS255	85949	229591	86164	229678	*Zostera marina* (dense abundant).
KS255.1	86164	229678	86518	229806	*Zostera marina* (patchy abundant).
KS255.2	86518	229806	86988	230039	*Zostera marina* (dense abundant).
KS255.3	86988	230039	87084	230070	Sand (*Zostera marina* gone).
KS255.4	87084	230070	End Point	End Point	Maerl live/dead
KS256	86208	230355	86350	230625	*Zostera marina* (dense abundant).
KS256.1	86350	230625	86372	230665	*Zostera marina* (dense abundant).
KS256.2	86372	230665	End Point	End Point	*Zostera marina* (dense abundant).
KS257	86352	230700	85970	230468	*Zostera marina* (dense abundant), some sand patches.
KS257.1	85970	230468	85504	230197	*Zostera marina* (dense abundant) on living maerl.
KS257.2	85504	230197	End Point	End Point	Live/dead maerl banded *Zostera marina* gone.
KS258	85510	230262	86654	231435	*Zostera marina* (dense abundant).
KS258.1	86654	231435	86667	231464	Stones/oyster shell very shallow, *Zostera marina* gone.
KS258.2	86667	231464	86723	231612	*Zostera marina (*dense abundant).
KS258.3	86723	231612	End Point	End Point	*Zostera marina* (dense abundant).
KS259	86463	231631	86468	231611	Sand/maerl gravel.
KS259.1	86468	231611	86475	231595	*Zostera marina* (patchy abundant).
KS259.2	86475	231595	86788	231478	*Zostera marina* (dense abundant).
KS259.3	86788	231478	86843	231461	*Zostera marina* (patchy abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS259.4	86843	231461	86865	231451	*Zostera marina* gone, sand/maerl gravel.
KS259.5	86865	231451	87007	231355	*Zostera marina* (dense abundant).
KS259.6	87007	231355	87046	231351	*Zostera marina* (patchy abundant).
KS259.7	87046	231351	87067	231341	*Zostera marina* (rare).
KS259.8	87067	231341	End Point	End Point	Sand/dead maerl and shell.
KS260	86984	231174	86835	231148	Maerl live and dead.
KS260.1	86835	231148	86773	231148	*Zostera marina* (rare).
KS260.2	86773	231148	86657	231125	*Zostera marina* (dense abundant) on live maerl.
KS260.3	86657	231125	86600	231113	Living maerl, *Zostera marina* (rare).
KS260.4	86600	231113	86555	231106	Maerl (*Zostera marina* gone)
KS260.5	86555	231106	86526	231093	Maerl live/dead with shell.
KS260.6	86526	231093	86508	231090	*Zostera marina* (frequent).
KS260.7	86508	231090	86383	231039	*Zostera marina* (abundant patchy) on live maerl
KS260.8	86383	231039	86274	231008	*Zostera marina* (abundant dense) on live maerl.
KS260.9	86274	231008	85880	230826	*Zostera marina* (abundant patchy) on live maerl.
KS260.10	85880	230826	85540	230760	*Zostera marina* (abundant dense).
KS260.11	85540	230760	End Point	End Point	*Zostera marina* gone. Maerl live.
KS261	85524	230828	85570	230831	Maerl live/dead 50/50.
KS261.1	85570	230831	85837	230872	*Zostera marina* (dense abundant).
KS261.2	85837	230872	End Point	End Point	*Zostera marina (*dense abundant).
KS262	85891	230872	86054	230783	*Zostera marina (*patchy abundant).
KS262.1	86054	230783	86407	230619	*Zostera marina* (dense abundant).
KS262.2	86407	230619	86447	230609	*Zostera marina* (dense abundant).
KS262.3	86447	230609	86639	230621	*Zostera marina* (dense abundant).
KS262.4	86639	230621	86743	230626	*Zostera marina* (dense abundant).
KS262.5	86743	230626	86897	230654	*Zostera marina* (dense abundant).
KS262.6	86897	230654	86973	230666	*Zostera marina* (dense abundant).
KS262.7	86973	230666	87016	230670	*Zostera marina (*patchy abundant).
KS262.8	87016	230670	87159	230711	*Zostera marina* (dense abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS262.9	87159	230711	87068	230748	*Zostera marina* (dense abundant).
KS262.10	87068	230748	87268	230779	Sand, *Zostera marina* gone.
KS262.11	87268	230779	87335	230826	*Zostera marina* (dense abundant).
KS262.12	87335	230826	87362	230833	Sand, *Zostera marina* gone.
KS262.13	87362	230833	87506	230895	*Zostera marina* (dense abundant).
KS262.14	87506	230895	87509	230921	*Zostera marina* (dense abundant).
KS262.15	87509	230921	End Point	End Point	*Zostera marina* gone, sand/oyster shell.
KS263	87469	230701	87181	230623	Sand/maerl gravel.
KS263.1	87181	230623	86813	230575	*Zostera marina* (dense abundant) on living maerl.
KS263.2	86813	230575	86677	230603	*Zostera marina (*dense abundant) on living maerl.
KS263.3	86677	230603	86550	230622	*Zostera marina* (frequent) on maerl.
KS263.4	86550	230622	86251	230646	*Zostera marina* (dense abundant) on living maerl.
KS263.5	86251	230646	86101	230669	*Zostera marina (*dense abundant) on living maerl.
KS263.6	86101	230669	86057	230671	*Zostera marina* (patchy abundant) on LD maerl
KS263.7	86057	230671	85550	230736	*Zostera marina* (dense abundant) on living maerl
KS263.8	85550	230736	End Point	End Point	Sand, *Zostera marina* gone.
KS264	90718	231831	90617	231990	Maerl Mostly living on mud, 100% cover.
KS264.1	90617	231990	90484	232145	Maerl Mostly living on mud, 100% cover.
KS264.2	90484	232145	90381	232270	Maerl Mostly living on mud, 100% cover.
KS264.3	90381	232270	End Point	End Point	Maerl mostly living on mud, 100% cover.
KS265	90842	232268	90875	232183	Maerl Mostly living on mud, uniform 100% cover.
KS265.1	90875	232183	90919	232145	Mud.
KS265.2	90919	232145	91022	232047	Living Maerl.
KS265.3	91022	232047	End Point	End Point	Mud/weed.
KS266	90128	231599	89971	231711	Boulders/stones.
KS266.1	89971	231711	89800	231860	Mud.
KS266.1	89800	231860	End Point	End Point	Mud.
KS267	89731	231898	89817	231680	Mud and weed.
KS267.1	89817	231680	89874	231572	Boulders/rock.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS267.2	89874	231572	89987	231374	Mud.
KS267.3	89987	231374	90037	231323	*Zostera marina* (dense abundant).
KS267.4	90037	231323	End Point	End Point	Mud.
KS268	90132	231354	90110	231394	Mud.
KS268.1	90110	231394	90060	231454	*Zostera marina* (dense abundant) on mud.
KS268.2	90060	231454	End Point	End Point	Mud (*Zostera marina* gone).
KS269	90105	231461	89998	231297	*Zostera marina* (dense abundant).
KS269.1	89998	231297	End Point	End Point	Kelp /boulders (*Zostera marina* gone).
KS270	89985	231305	89803	231212	Mud.
KS270.	89803	231212	89691	231129	Boulders/kelp.
KS270.2	89691	231129	End Point	End Point	Boulders/mud.
KS271	89674	231126	89612	231292	Dead maerl (~10% living).
KS271.1	89612	231292	89543	231458	Sand/mud.
KS271.2	89543	231458	End Point	End Point	Mud.
KS272	90344	231847	90466	231940	*Zostera marina* starts here. Mud before the *Zostera marina* started.
KS272.1	90466	231940	End Point	End Point	*Zostera marina* ends here.
KS273	90430	231842	90396	231846	Mud/shell.
KS273.1	90396	231846	90429	231904	*Zostera marina* (dense abundant).
KS273.2	90429	231904	90522	231958	Mud.
KS273.3	90522	231958	90550	231976	*Zostera marina* (dense abundant).
KS273.4	90550	231976	90681	232047	Mud.
KS273.5	90681	232047	90738	232079	*Zostera marina* (dense abundant).
KS273.6	90738	232079	90873	232183	Mud.
KS273.7	90873	232183	91218	232385	Vision gone (mud/shell).
KS273.8	91218	232385	End Point	End Point	Mud/shell.
KS274	91253	232369	90951	232320	Mud/shell.
KS274.1	90951	232320	90938	232316	Kelp.
KS274.2	90938	232316	90803	232314	Mud.
KS274.3	90803	232314	90622	232296	Kelp.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS274.4	90622	232296	90487	232291	Mud.
KS274.5	90487	232291	90159	232395	Mud/shell.
KS274.6	90159	232395	End Point	End Point	Mud/shell.
KS275	90129	232291	90147	232275	*Zostera marina* (dense abundant).
KS275	90129	232291	End Point	End Point	*Zostera marina* (dense abundant)
KS275.1	90147	232275	90165	232217	*Zostera marina* (patchy abundant).
KS275.2	90165	232217	90189	232189	*Zostera marina* (dense abundant).
KS275.3	90189	232189	90248	232098	Mud (*Zostera marina* gone).
KS275.4	90248	232098	90347	231961	*Zostera marina* (dense abundant).
KS275.5	90347	231961	90332	231961	*Zostera marina* (rare), maerl, live/dead.
KS275.6	90332	231961	90348	231938	*Zostera marina* (dense abundant).
KS275.7	90348	231938	90387	231906	*Zostera marina* (patchy abundant) on Live/dead maerl.
KS275.8	90387	231906	90410	231838	*Zostera marina* (dense abundant) on living maerl.
KS275.9	90410	231838	90424	231804	*Zostera marina (*patchy abundant) on Live/dead maerl.
KS275.10	90424	231804	90499	231681	Maerl/shell (*Zostera marina* gone). Maerl Live/dead 50/50.
KS275.11	90499	231681	90563	231616	Maerl Live/dead 50/50.
KS275.12	90563	231616	90624	231510	Maerl/sand edge of bed.
KS275.13	90624	231510	End Point	End Point	Kelp/rock to shore.
KS276	88148	232622	88227	232585	Rock/kelp.
KS276.1	88227	232585	88287	232555	Sand.
KS276.2	88287	232555	88396	232507	*Zostera marina* (dense abundant).
KS276.3	88396	232507	End Point	End Point	Mud/shell.
KS277	88465	232567	88384	232720	*Zostera marina* (dense abundant).
KS277.1	88384	232720	88369	232744	*Zostera marina* (dense abundant).
KS277.2	88369	232744	End Point	End Point	Sand (*Zostera marina* gone).
KS278	88407	232838	88494	232811	Sand
KS278.1	88494	232811	88718	232629	*Zostera marina* (dense abundant).
KS278.2	88718	232629	88790	232590	*Zostera marina* (patchy abundant).
KS278.3	88790	232590	End Point	End Point	Sand/shell.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS279	88984	232737	88899	232828	Dead maerl, some live.
KS279.1	88899	232828	End Point	End Point	*Zostera marina (*dense abundant)
KS279.1	88899	232828	88750	232894	*Zostera marina* (dense abundant).
KS280	89467	231039	89453	231111	mud/shell.
KS280.1	89453	231111	89448	231149	Kelp.
KS280.2	89448	231149	89437	231208	Mud.
KS280.3	89437	231208	89396	231423	Mud.
KS280.4	89396	231423	End Point	End Point	Mud.
KS281	89399	231430	89415	231506	Mud.
KS281.1	89415	231506	89421	231540	Kelp/mud.
KS281.2	89421	231540	End Point	End Point	Kelp/mud.
KS282	89421	231540	89542	231744	Kelp/mud.
KS282.1	89542	231744	End Point	End Point	Kelp/mud.
KS283	89848	231939	89910	232095	Mud.
KS283.1	89910	232095	89933	232122	Rock/kelp.
KS283.2	89933	232122	89945	232159	Mud.
KS283.3	89945	232159	89969	232179	Mud.
KS283.4	89969	232179	89949	232224	Maerl (living) and *Corallina officinalis*.
KS283.5	89949	232224	89953	232241	*Zostera marina* (frequent) small patch on maerl.
KS283.6	89953	232241	89977	232256	Maerl living/dead.
KS283.7	89977	232256	90062	232374	Mud and oysters.
KS283.8	90062	232374	90124	232406	Maerl living/dead.
KS283.9	90124	232406	90121	232518	Living maerl, *Zostera marina* (frequent patchy)
KS283.10	90121	232518	90124	232578	Mud (*Zostera marina* gone).
KS283.11	90124	232578	End Point	End Point	Mud, sprinkling live maerl.
KS284.	89966	232687	89928	232726	Live & dead maerl.
KS284.1	89928	232726	End Point	End Point	*Zostera marina* on live/dead maerl.
KS285	89831	232642	89828	232606	*Zostera marina* (frequent patchy).
KS285.1	89828	232606	89827	232577	Living maerl.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS285.2	89827	232577	89813	232471	*Zostera marina* (frequent patchy) on maerl live.
KS285.3	89813	232471	89783	232389	Living maerl, shell, *Zostera marina* (dense abundant).
KS285.4	89783	232389	89770	232336	Maerl (*Zostera marina* gone).
KS285.5	89770	232336	89757	232307	Mud, small amount live maerl.
KS285.6	89757	232307	End Point	End Point	Mud, oyster shell
KS286	89714	232286	89705	232301	Mud/kelp.
KS286.1	89705	232301	89675	232338	Maerl, live/dead 50/50.
KS286.2	89675	232338	89655	232359	Maerl 100% live.
KS286.3	89655	232359	89633	232380	*Zostera marina* (abundant) on sand and living maerl.
KS286.4	89633	232380	89560	232451	Maerl 50/50 live/dead (*Zostera marina* gone),
KS286.5	89560	232451	89537	232478	Mud with living maerl and shell.
KS286.6	89537	232478	End Point	End Point	Mud with small amount of shell . Live maerl.
KS287	89706	232583	89323	232894	Maerl live/dead with shell.
KS287.1	89323	232894	End Point	End Point	Maerl live/dead with shell.
KS288	89316	232893	88907	232934	Maerl live/dead with shell.
KS288.1	88907	232934	End Point	End Point	Maerl live/dead with shell.
KS289	89516	232566	89704	232618	Maerl living 90%.
KS289.1	89704	232618	89724	232633	*Zostera marina* (patchy frequent) on maerl Live/dead.
KS289.2	89724	232633	89738	232644	*Zostera marina* (abundant) on maerl live/dead.
KS289.3	89738	232644	89786	232659	*Zostera marina* (patchy frequent) on maerl Live/dead.
KS289.4	89786	232659	89794	232666	*Zostera marina* (dense abundant)
KS289.5	89794	232666	89972	232745	Maerl, live/dead (*Zostera marina* gone).
KS289.6	89972	232745	End Point	End Point	Sand/shell.
KS290	89280	232696	89404	232807	Sand, small amount live maerl.
KS290.1	89404	232807	89518	232850	Maerl 80% living, banded with sand.
KS290.2	89518	232850	89546	232888	Maerl live, *Zostera marina* (patchy frequent).
KS290.3	89546	232888	89562	232896	Maerl 50/50 live/dead (*Zostera marina* gone),
KS290.4	89562	232896	End Point	End Point	Kelp.
KS291	89165	233154	89115	233128	Maerl 50/50 live/dead (*Zostera marina* gone),

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KS291.1	89115	233128	89052	232954	*Zostera marina* (dense abundant) on live maerl.
KS291.2	89052	232954	89090	232810	Maerl 50/50 live/dead (*Zostera marina* gone),
KS291.3	89090	232810	89100	232745	*Zostera marina* (dense abundant) on living maerl.
KS291.4	89100	232745	89111	232634	Maerl 100% live (*Zostera marina* gone).
KS291.5	89111	232634	End Point	End Point	Maerl live 100%
KingD1.1	60283	253420	60100	253457	Mud.
KingD1.2	60100	253457	60050	253456	Mud.
KingD1.3	60050	253456	60022	253457	Start of dead maerl Gravel.
KingD1.4	60022	253457	60039	253502	Dead maerl Gravel ends on south side.
KingD1.5	60039	253502	End Point	End Point	Dead maerl gravel continues to shore on North side of bay.
KingD2.1	59641	253586	59673	253520	Maerl gravel.
KingD2.2	59673	253520	59665	253516	Mud with sprinkling of maerl gravel.
KingD2.3	59665	253516	59735	253560	Mud.
KingD2.4	59735	253560	59784	253586	Mud.
KingD2.5	59784	253586	End Point	End Point	Mud.
KingD3.1	58387	254051	58395	254041	*Zostera marina* (abundant).
KingD3.2	58395	254041	58461	253757	Zostera marina (abundant).
KingD3.3	58461	253757	End Point	End Point	*Zostera marina* (abundant) on maerl gravel with some live maerl - for entire transect.
KingD4.1	58485	253877	58421	253907	*Zostera marina* (abundant) on maerl gravel with some live maerl - across entire transect.
KingD4.2	58421	253907	58249	253992	*Zostera marina* ends.
KingD4.3	58249	253992	End Point	End Point	Maerl continued westward for 10-20m after and of *Zostera marina* seabed then becomes sand/mud.
KingD5.1	58370	254062	58228	254061	Maerl gravel - *no Zostera marina*
KingD5.2	58228	254061	End Point	End Point	Broken shell.
KingD6.1	58190	253825	58316	253834	
KingD6.2	58316	253834	End Point	End Point	*Zostera marina* on maerl gravel starts.
KingS1.1	59843	253528	60057	253468	Flat maerl gravel/sand with patches of living maerl - 80% dead.
KingS1.2	60057	253468	End Point	End Point	Mud Flocs.
KingS10.1	59587	253594	59564	253578	Dead maerl gravel.
KingS10.2	59564	253578	59560	253569	*Zostera marina* (dense abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KingS10.3	59560	253569	59554	253552	*Zostera marina* (abundant).
KingS10.4	59554	253552	59545	253542	Dead maerl gravel.
KingS10.5	59545	253542	59538	253533	Live maerl.
KingS10.6	59538	253533	59536	253530	Dead maerl gravel.
KingS10.7	59536	253530	59523	253515	Live maerl (*Phytomatolithon calcareum*) with Patches of *Lithophyllum dentatum.*
KingS10.8	59523	253515	End Point	End Point	Live maerl (*Phytomatolithon calcareum*) with patches of *Lithophyllum dentatum.*- continues to shore.
KingS11.1	59500	253612	59495	253600	*Zostera marina* (patchy abundant) on maerl gravel with *Lithophyllum dentatum.* - also some live *Liththamnion coralloides* and *Phytomatolithon calcareum.*
KingS11.2	59495	253600	59479	253575	*Zostera marina* (patchy frequent).
KingS11.3	59479	253575	59466	253554	Living Maerl.
KingS11.4	59466	253554	End Point	End Point	Fine maerl gravel - continues to shore
KingS12.1	59490	253618	59482	253587	Maerl Gravel.
KingS12.2	59482	253587	59480	253568	Dense *Zostera marina* on maerl Gravel.
KingS12.3	59480	253568	59472	253549	Live maerl (*Phytomatolithon calcareum*).
KingS12.4	59472	253549	59451	253531	Maerl gravel with patches of live maerl (P*hytomatolithon calcareum*).
KingS12.5	59451	253531	End Point	End Point	Maerl gravel with patches of live maerl (*Phytomatolithon calcareum*) - continues to shore
KingS13.1	59381	253548	59387	253586	*Zostera marina* (frequent)
KingS13.2	59387	253586	59390	253599	Live maerl (*Liththamnion coralloides*)
KingS13.3	59390	253599	59394	253633	Live maerl (*Liththamnion coralloides and Phytomatolithon calcareum*).
KingS13.4	59394	253633	End Point	End Point	*Zostera marina* (frequent) - continues to shore.
KingS14.1	59378	253662	59351	253682	*Zostera marina* (frequent) on maerl gravel.
KingS14.2	59351	253682	59340	253692	Maerl gravel.
KingS14.3	59340	253692	59304	253715	*Zostera marina* (frequent).
KingS14.4	59304	253715	59272	253678	*Zostera marina* (frequent).
KingS14.5	59272	253678	59264	253654	*Zostera marina* (frequent) on maerl gravel.
KingS14.6	59264	253654	59260	253646	Maerl gravel.
KingS14.7	59260	253646	59253	253623	*Zostera marina* (abundant) on maerl gravel.
KingS14.8	59253	253623	59239	253595	*Zostera marina* (occasional) on *Lithophyllum dentatum*.
KingS14.9	59239	253595	59292	253708	*Zostera marina* (abundant) on maerl gravel.
KingS14.10	59234	253588	End Point	End Point	*Zostera marina* on maerl gravel - continues to shore.

TRANS	Start E'	Start N'		End N'	SEABED
KingS15.1	59292	253708	End Point	End Point	*Zostera marina* (frequent) on live maerl.
KingS16.1	59231	253591	59206	253600	*Zostera marina* (abundant) on live maerl.
KingS16.2	59206	253600	59201	253602	Maerl Gravel.
KingS16.3	59201	253602	59187	253614	*Zostera marina* (occasional) on live maerl.
KingS16.4	59187	253614	59182	253618	*Zostera marina* (occasional) on live maerl.
KingS16.5	59182	253618	59232	253746	*Zostera marina* (abundant) on Living maerl.
KingS16.6	59232	253746	59239	253751	*Zostera marina* (abundant) on *Lithophyllum dentatum.*
KingS16.7	59239	253751	End Point	End Point	Dense living *Lithophyllum dentatum.*
KingS17.1	59218	253765	59162	253790	*Zostera marina* (abundant) on *Lithophyllum dentatum.*
KingS17.2	59162	253790	End Point	End Point	Maerl gravel.
KingS18.1	59131	253792	59101	253742	Maerl gravel.
KingS18.2	59101	253742	59072	253653	*Zostera marina* (abundant) on Living maerl (*Phytomatolithon calcareum*).
KingS18.3	59072	253653	59042	253671	Zostera marina (abundant) on Living maerl (Phytomatolithon calcareum) - continues to shore.
KingS18.4	59042	253671	End Point	End Point	*Zostera marina* (abundant) on live maerl (*Phytomatolithon calcareum*) - continues to shore
KingS19.1	59024	253666	59026	253717	Dead *Zostera marina* on dead maerl gravel.
KingS19.2	59026	253717	59044	253749	Dead maerl gravel.
KingS19.3	59044	253749	59053	253767	*Zostera marina* (frequent).
KingS19.4	59053	253767	59077	253805	Live maerl.
KingS19.5	59077	253805	End Point	End Point	Live maerl - continues to shore.
KingS2.1	60023	253451	60021	253514	Mud over dead maerl gravel.
KingS2.2	60021	253514	End Point	End Point	Mud over dead maerl gravel - continues to shore.
KingS20.1	59064	253833	59042	253844	Dead maerl gravel.
KingS20.2	59042	253844	59000	253856	Small patch live maerl - then back to dead gravel.
KingS20.3	59000	253856	End Point	End Point	Maerl gravel/sand.
KingS21.1	58976	253866	58941	253828	Dead maerl gravel.
KingS21.2	58941	253828	58886	253727	*Zostera marina* (abundant).
KingS21.3	58928	253794	58874	253700	No Vision - 10m depth.
KingS21.4	58874	253700	End Point	End Point	*Zostera marina* (rare).
KingS22.1	58854	253712	58815	253720	Mud.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KingS22.2	58815	253720	End Point	End Point	*Zostera marina* (abundant) on dead maerl gravel.
KingS23.1	58792	253731	58832	253824	No vision.
KingS23.2	58832	253824	58847	253866	*Zostera marina* (abundant).
KingS23.3	58847	253866	58873	253915	Maerl gravel some *Zostera marina* (occasional).
KingS23.4	58873	253915	End Point	End Point	*Zostera marina* (occasional) continues to shore.
KingS24.1	58900	253931	58833	253927	*Zostera marina* (abundant) on dead maerl gravel.
KingS24.2	58833	253927	58810	253940	Dead maerl gravel.
KingS24.3	58810	253940	58772	253976	*Zostera marina* (abundant) on dead maerl gravel.
KingS24.4	58772	253976	End Point	End Point	*Zostera marina* (abundant) on Living maerl
KingS25.1	58761	253983	58731	253962	*Zostera marina* (abundant) on Living maerl.
KingS25.2	58731	253962	58724	253946	*Zostera marina* (abundant) on dead maerl gravel.
KingS25.3	58724	253946	58718	253929	Dead Maerl gravel.
KingS25.4	58718	253929	58692	253807	*Zostera marina* (abundant) on dead maerl gravel.
KingS25.5	58692	253807	58689	253788	Dead maerl gravel.
KingS25.6	58689	253788	End Point	End Point	*Zostera marina* (abundant) on dead maerl gravel
KingS26.1	58604	253775	58613	253814	*Zostera marina* (abundant) on dead maerl gravel.
KingS26.2	58613	253814	58624	253861	Dead Maerl gravel.
KingS26.3	58624	253861	58651	253984	*Zostera marina* (abundant) on dead maerl gravel.
KingS26.4	58651	253984	End Point	End Point	*Zostera marina* on dead maerl gravel - continues to shore
KingS27.1	58604	254031	58557	254035	*Zostera marina* (abundant) on dead maerl gravel.
KingS27.2	58557	254035	58468	253835	*Zostera marina* (abundant) on dead maerl gravel.
KingS27.3	58468	253835	58455	253783	Dead Maerl gravel.
KingS27.4	58455	253783	End Point	End Point	*Zostera marina* on dead maerl gravel - continues to shore
KingS28.1	58334	253764	58341	253805	Kelp.
KingS28.2	58341	253805	58389	254046	No vision.
KingS28.3	58389	254046	End Point	End Point	Kelp.
KingS3.1	59978	253540	59939	253479	Dead maerl gravel.
KingS3.2	59939	253479	59920	253502	Patches of *Lithophyllum dentatum.*
KingS3.3	59920	253502	End Point	End Point	Patches of *Lithophyllum dentatum*.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
KingS4.1	59875	253487	59885	253515	Large nodules *Lithophyllum dentatum.*
KingS4.2	59885	253515	59904	253552	Dead maerl gravel.
KingS4.3	59904	253552	End Point	End Point	Dead maerl gravel to shore.
KingS5.1	59867	253584	59837	253513	Dead maerl gravel.
KingS5.2	59837	253513	59830	253496	*Lithophyllum dentatum* on dead maerl gravel.
KingS5.3	59830	253496	59778	253461	Mud with maerl gravel - continues to shore.
KingS5.4	59778	253461	59811	253600	Mud.
KingS5.5	59811	253600	End Point	End Point	Mud.
KingS6.1	59933	253488	59891	253506	*Lithophyllum dentatum* on dead maerl gravel.
KingS6.2	59891	253506	59873	253518	*Lithophyllum dentatum* on dead maerl gravel.
KingS6.3	59873	253518	End Point	End Point	*Lithophyllum dentatum* on dead maerl gravel
KingS7.1	59437	253535	59452	253573	*Lithophyllum dentatum* on *Liththamnion coralloides* and *Phytomatolithon calcareum.*
KingS7.2	59452	253573	59462	253591	Live maerl *Phytomatolithon calcareum* and *Lithophyllum dentatum.*
KingS7.3	59462	253591	End Point	End Point	*Zostera marina* (patchy abundant).
KingS8.1	59420	253528	59409	253533	Live maerl (*Phytomatolithon calcareum*)
KingS8.2	59409	253533	End Point	End Point	Maerl gravel with patches of live maerl (*Phytomatolithon calcareum*).
KingS9.1	59625	253506	59616	253538	Dead maerl gravel with some living patches.
KingS9.2	59616	253538	59611	253563	Patch of *Lithophyllum dentatum.*
KingS9.3	59611	253563	59609	253606	Dead maerl gravel.
KingS9.4	59609	253606	End Point	End Point	Dead maerl gravel - continues to pier.
GTD1.1	91659	221466	91601	221365	All sand with small reefs covered in Kelp.
GTD1.2	91601	221365	End Point	End Point	All sand with small reefs covered in Kelp.
GTD2.1	90970	221210	91040	221276	Sand for first 100m then thin cover flat dead maerl.
GTD2.1.1	91040	221276	91088	221330	Sand for first 100m then thin cover flat dead maerl.
GTD2.2	91088	221330	End Point	End Point	Sand for first 100m then thin cover of flat dead maerl.
GTD3.1	90800	221569	90848	221580	Sand for first 50m then continuous dense bed of duned dead maerl.
GTD3.1.1	90848	221580	90930	221599	Sand for first 50m then continuous dense bed of duned dead maerl.
GTD3.2	90930	221599	End Point	End Point	Sand for first 50m then continuous dense bed of duned dead maerl.
GTD4.1	90389	221056	90696	221032	Sand occasional rocks/kelp.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTD4.2	90696	221032	End Point	End Point	Sand and occasional rock/kelp.
GTD5.1	90988	220982	91380	221072	Sand occasional rocks/kelp.
GTD5.2	91380	221072	End Point	End Point	Sand and occasional rock/kelp.
GTD6.1	90773	221375	91043	221379	Sand, dead maerl bed perimeter found at end point of transect appeared extensive.
GTD6.2	91043	221379	End Point	End Point	Maerl bed perimeter found at end point of transect appeared extensive.
GTD7.1	91178	221103	91189	221229	Sand at start point, duned dead maerl starts at end point.
GTD7.2	91189	221229	End Point	End Point	Sand at start point, duned dead maerl starts at end point.
GTD8.1	90800	221570	90811	221604	Transect starts in sand/rock/kelp, end point 20m along transect on dead duned maerl.
GTD8.1.1	90811	221604	90825	221625	Transect starts in sand/rock/kelp, end point 20m along transect on dead duned maerl
GTD8.2	90825	221625	End Point	End Point	Transect starts on sand/rock/kelp, end point 20m along transect on dead duned maerl.
GTD9.1	91659	221466	91659	221540	Sand all along transect from start to finish.
GTD9.2	91659	221540	End Point	End Point	Sand for entire transect.
GTD10.1	91469	221766	91229	221617	Sand for entire transect.
GTD10.2	91229	221617	End Point	End Point	All sand.
GTD11.1	91166	221980	91119	221961	Sand at start point, Thin covering of maerl at end point with sand.
GTD11.2	91119	221961	End Point	End Point	Sand at start point, Thin covering of dead maerl at end point with sand.
GTD13.1	91200	222349	91058	222302	End point on edge of live maerl bed, flat maerl and shell.
GTD13.2	91058	222302	End Point	End Point	End point on edge of live maerl bed, flat maerl and shell.
GTD14.1	91074	222551	91030	222538	Live maerl bed starts at end point, dead maerl bed.
GTD14.2	91030	222538	End Point	End Point	Live maerl bed starts at end point, dead maerl bed.
GTD15.1	91075	222755	91098	222767	Transect heading east, end point is sand which is the eastern limit of living maerl.
GTD15.2	91098	222767	End Point	End Point	Transect heading east end point is sand which is the eastern limit of living maerl.
GTD16.1	90423	221759	90648	221780	Sand, maerl bed (duned maerl) starts at end point.
GTD16.2	90648	221780	End Point	End Point	Sand, maerl bed (duned maerl) starts at end point.
GTD17.1	90513	221962	90591	221957	Western edge of dead maerl bed at end point.
GTD17.2	90591	221957	End Point	End Point	Western edge of dead maerl bed at end point.
GTD18.1	90538	222160	90527	222161	Sand, maerl starts at end point (duned maerl).
GTD18.2	90527	222161	End Point	End Point	Sand, maerl starts at end point (duned maerl).
GTD19.1	90514	222315	90497	222330	Starts point is on dead maerl so transect heading continued west over maerl to rock/kelp at end point.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTD19.2	90497	222330	End Point	End Point	Starts point is on maerl, transect heading west over maerl to rock/kelp at end point.
GTD20.1	90536	222522	90528	222539	Transect started on flat maerl bed and ended in gravel at end point.
GTD20.2	90528	222539	End Point	End Point	Transect started on flat maerl bed and became gravel at end point.
GTD21.1	90529	222732	90548	222731	Transect started on sand at, and ended on living and dead maerl at end point.
GTD21.2	90548	222731	End Point	End Point	Transect started on sand, transect continued west with seabed turning to living and dead maerl at end point.
GTD22.1	91080	221564	91139	221968	Transect started on sand and continued into a thin cover of dead maerl/shell at end point.
GTD22.2	91139	221968	End Point	End Point	Transect started on sand, leading into thin cover of dead maerl/shell at end point.
GTD23.1	90700	224200	90714	225769	Maerl to end point, mostly dead, last 500m about 20% living, 80% dead. Diver descended again at end point
GTD23.1.1	90714	225769	90724	226257	Maerl to end point, mostly dead, last 500m about 20% living, 80% dead. Diver descended again at end point
GTD23.2	90724	226257	End Point	End Point	Maerl to end point, mostly dead, last 500m about 20% living, 80% dead. Diver descended again at end point.
GTD24.1	90724	226257	91339	228052	From this start point 40-90% living maerl. Sand at end point but still with small pieces of living maerl in sand and scattered thin cover of dead maerl.
GTD24.2	91339	228052	End Point	End Point	From this start point 40-90% living Maerl. Sand at end point but still with small pieces of living maerl in sand and scattered thin cover of dead maerl.
GTD25.1	90925	224223	91184	224556	Maerl all the way to fish cages then sand.
GTS1.1	92316	229500	92266	229500	Mud (including mud/rock).
GTS1.2	92266	229500	92216	229500	Mud (including mud/rock).
GTS1.3	92216	229500	92166	229500	Mud (including mud/rock).
GTS1.4	92166	229500	92116	229500	Mud (including mud/rock).
GTS1.5	92116	229500	92066	229500	Mud (including mud/rock).
GTS1.6	92066	229500	92016	229500	Mud (including mud/rock).
GTS1.7	92016	229500	91940	229500	Mud (including mud/rock).
GTS1.8	91940	229500	End Point	End Point	Mud (including mud/rock).
GTS2.1	91940	229400	91990	229400	Mud (including mud/rock).
GTS2.2	91990	229400	92040	229400	Mud (including mud/rock).
GTS2.3	92040	229400	92090	229400	Mud/Kelp.
GTS2.4	92090	229400	92140	229400	Mud (including mud/rock).
GTS2.5	92140	229400	92190	229400	Mud (including mud/rock).
GTS2.6	92190	229400	92240	229400	Mud/Kelp.
GTS2.7	92240	229400	92340	229400	Mud/Kelp.
GTS2.8	92340	229400	End Point	End Point	Mud/Kelp

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS3.1	92360	229300	92310	229300	Mud (including mud/rock).
GTS3.2	92310	229300	92260	229300	Mud (including mud/rock).
GTS3.3	92260	229300	92210	229300	Mud/Kelp.
GTS3.4	92210	229300	92160	229300	Mud (including mud/rock).
GTS3.5	92160	229300	92110	229300	Mud/Kelp.
GTS3.6	92110	229300	92060	229300	Mud (including mud/rock).
GTS3.7	92060	229300	92010	229300	Mud (including mud/rock).
GTS3.8	92010	229300	91960	229300	Mud (including mud/rock).
GTS3.9	91960	229300	91910	229300	Mud/Kelp.
GTS3.10	91910	229300	End Point	End Point	Mud/Kelp
GTS4.1	91850	229200	91900	229200	Mud (including mud/rock).
GTS4.2	91900	229200	91950	229200	Kelp (including kelp/rock).
GTS4.3	91950	229200	92000	229200	Kelp (including kelp/rock).
GTS4.4	92000	229200	92050	229200	Kelp (including kelp/rock).
GTS4.5	92050	229200	92100	229200	Kelp (including kelp/rock)
GTS4.6	92100	229200	92150	229200	Kelp (including kelp/rock)
GTS4.7	92150	229200	92200	229200	Kelp (including kelp/rock)
GTS4.8	92200	229200	92250	229200	Kelp (including kelp/rock)
GTS4.9	92250	229200	92300	229200	Mud (including mud/rock).
GTS4.10	92300	229200	End Point	End Point	Kelp (including kelp/rock).
GTS5.1	92330	229100	92280	229100	Kelp (including kelp/rock)
GTS5.2	92280	229100	92230	229100	Kelp (including kelp/rock)
GTS5.3	92230	229100	92180	229100	Kelp (including kelp/rock)
GTS5.4	92180	229100	92130	229100	Mud (including mud/rock).
GTS5.5	92130	229100	92080	229100	Mud (including mud/rock).
GTS5.6	92080	229100	92030	229100	Mud (including mud/rock).
GTS5.7	92030	229100	91980	229100	Kelp (including kelp/rock)
GTS5.8	91980	229100	91950	229100	Mud (including mud/rock).
GTS5.9	91950	229100	End Point	End Point	Kelp (including kelp/rock).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS6.1	92350	229000	92300	229000	Kelp (including kelp/rock)
GTS6.2	92300	229000	92250	229000	Mud (including mud/rock).
GTS6.3	92250	229000	92200	229000	Mud (including mud/rock).
GTS6.4	92200	229000	92150	229000	Kelp (including kelp/rock)
GTS6.5	92150	229000	92100	229000	Kelp (including kelp/rock)
GTS6.6	92100	229000	92050	229000	Kelp (including kelp/rock)
GTS6.7	92050	229000	92000	229000	Mud (including mud/rock).
GTS6.8	92000	229000	91950	229000	Kelp (including kelp/rock)
GTS6.9	91950	229000	91870	229000	Kelp (including kelp/rock)
GTS6.10	91870	229000	End Point	End Point	Kelp (including kelp/rock).
GTS7.1	92350	228900	92300	228900	Kelp (including kelp/rock)
GTS7.2	92300	228900	92250	228900	Living maerl.
GTS7.3	92250	228900	92200	228900	Living maerl.
GTS7.4	92200	228900	92150	228900	Living maerl.
GTS7.5	92150	228900	92100	228900	Rock.
GTS7.6	92100	228900	92050	228900	Rock.
GTS7.7	92050	228900	92000	228900	Living maerl.
GTS7.8	92000	228900	91950	228900	Living maerl.
GTS7.9	91950	228900	91880	228900	Rock.
GTS7.10	91880	228900	End Point	End Point	Rock
GTS8.1	91890	228800	91940	228800	Living maerl/sand/mud.
GTS8.2	91940	228800	91990	228800	Living maerl/kelp.
GTS8.3	91990	228800	92040	228800	Living maerl/kelp.
GTS8.4	92040	228800	92090	228800	Patchy living & dead maerl on mixed bottom.
GTS8.5	92090	228800	92180	228800	Patchy living & dead maerl on mixed bottom.
GTS8.6	92180	228800	End Point	End Point	Patchy living & dead Maerl on mixed bottom.
GTS9.1	92140	228700	92090	228700	Living maerl.
GTS9.2	92090	228700	92040	228700	Kelp (including kelp/rock)
GTS9.3	92040	228700	91990	228700	Living maerl.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS9.4	91990	228700	91940	228700	Living maerl.
GTS9.5	91940	228700	91890	228700	*Zostera marina* (patchy) and Living maerl
GTS9.6	91890	228700	End Point	End Point	Rock.
GTS10.1	92050	228600	92000	228600	Living maerl.
GTS10.2	92000	228600	91950	228600	*Zostera marina* (abundant) and live maerl
GTS10.3	91950	228600	91900	228600	Living maerl.
GTS10.4	91900	228600	91850	228600	*Zostera marina* (patchy abundant)/living & dead maerl/kelp/rock.
GTS10.5	91850	228600	91815	228600	*Zostera marina*/living & dead maerl/kelp/rock
GTS10.6	91815	228600	End Point	End Point	*Zostera marina*/living & dead maerl/kelp/rock.
GTS11.1	91800	228500	91850	228500	Living maerl.
GTS11.2	91850	228500	91900	228500	Living maerl.
GTS11.3	91900	228500	91950	228500	Living maerl.
GTS11.4	91950	228500	92020	228500	Living maerl.
GTS11.5	92020	228500	End Point	End Point	Living maerl.
GTS12.1	92020	228400	91970	228400	Living maerl.
GTS12.2	91970	228400	91920	228400	Living maerl.
GTS12.3	91920	228400	91850	228400	Living maerl.
GTS12.4	91850	228400	End Point	End Point	Living maerl.
GTS13.1	91810	228300	91860	228300	Living maerl.
GTS13.2	91860	228300	91910	228300	Living maerl.
GTS13.3	91910	228300	91960	228300	Living maerl.
GTS13.4	91960	228300	91910	228300	Living maerl.
GTS13.5	91910	228300	End Point	End Point	Living maerl.
GTS14.1	92020	228200	91970	228200	Living maerl.
GTS14.2	91970	228200	91920	228200	Living maerl.
GTS14.3	91920	228200	91870	228200	Living maerl.
GTS14.4	91870	228200	91820	228200	Living maerl.
GTS14.5	91820	228200	91770	228200	Living maerl.
GTS14.6	91770	228200	91700	228200	Living maerl.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS14.7	91700	228200	End Point	End Point	Kelp (including kelp/rock).
GTS15.1	91650	228100	91700	228100	Mud/Kelp.
GTS15.2	91700	228100	91750	228100	Living maerl/kelp.
GTS15.3	91750	228100	91800	228100	Living maerl/kelp.
GTS15.4	91800	228100	91850	228100	Living maerl/kelp.
GTS15.5	91850	228100	91900	228100	Living maerl/kelp.
GTS15.6	91900	228100	91950	228100	*Zostera marina* (patchy abundant)/ living maerl.
GTS15.7	91950	228100	92000	228100	*Zostera marina* (patchy abundant)/ living maerl.
GTS15.8	92000	228100	End Point	End Point	*Zostera marina* (patchy abundant) on living maerl.
GTS16.1	92040	228000	91990	228000	Mud (inch mud/rock).
GTS16.2	91990	228000	91940	228000	Living maerl.
GTS16.3	91940	228000	91890	228000	Living maerl.
GTS16.4	91890	228000	91840	228000	Living maerl.
GTS16.5	91840	228000	91790	228000	Living maerl.
GTS16.6	91790	228000	91740	228000	Living maerl.
GTS16.7	91740	228000	End Point	End Point	*Zostera marina* (abundant) and live maerl.
GTS17.1	91675	227900	91725	227900	Living maerl.
GTS17.2	91725	227900	91775	227900	Living maerl.
GTS17.3	91775	227900	91825	227900	Sand (including sand/rock).
GTS17.4	91825	227900	91875	227900	Sand (including sand/rock).
GTS17.5	91875	227900	91925	227900	Sand (including sand/rock).
GTS17.6	91925	227900	91975	227900	Living maerl/kelp
GTS17.7	91975	227900	92030	227900	Living maerl/kelp.
GTS17.8	92030	227900	End Point	End Point	Living maerl/kelp.
GTS18.1	92790	227800	92740	227800	Mud/Kelp.
GTS18.2	92740	227800	92690	227800	Mud/Kelp.
GTS18.3	92690	227800	92640	227800	Mud/Kelp.
GTS18.4	92640	227800	92590	227800	Mud/Kelp.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS18.5	92590	227800	92540	227800	Mud/Kelp.
GTS18.6	92540	227800	92490	227800	Mud/Kelp.
GTS18.7	92490	227800	92440	227800	Mud/Kelp.
GTS18.8	92440	227800	92390	227800	Mud/Kelp.
GTS18.9	92390	227800	92340	227800	Living maerl.
GTS18.10	92340	227800	92290	227800	Living maerl.
GTS18.11	92290	227800	92240	227800	Living maerl.
GTS18.12	92240	227800	92190	227800	Living maerl.
GTS18.13	92190	227800	92140	227800	Living maerl.
GTS18.14	92140	227800	92090	227800	*Zostera marina* (abundant) and live maerl.
GTS18.15	92090	227800	92040	227800	Maerl live and dead.
GTS18.16	92040	227800	91990	227800	Maerl live and dead.
GTS18.17	91990	227800	91940	227800	Maerl live and dead.
GTS18.18	91940	227800	91890	227800	Maerl live and dead.
GTS18.19	91890	227800	91840	227800	*Zostera marina* (patchy abundant) and living maerl.
GTS18.20	91840	227800	91790	227800	Maerl live and dead.
GTS18.21	91790	227800	91740	227800	Maerl live and dead.
GTS18.22	91740	227800	91690	227800	Maerl live and dead.
GTS18.23	91690	227800	91640	227800	Maerl live and dead.
GTS18.24	91640	227800	91590	227800	Maerl live and dead.
GTS18.25	91590	227800	91540	227800	Maerl live and dead.
GTS18.26	91540	227800	91490	227800	Maerl live and dead.
GTS18.27	91490	227800	91440	227800	Maerl live and dead.
GTS18.28	91440	227800	91390	227800	Kelp (inc kelp/rock).
GTS18.29	91390	227800	91340	227800	Kelp (incl kelp/rock).
GTS18.30	91340	227800	91290	227800	Kelp (incl kelp/rock).
GTS18.31	91290	227800	91240	227800	Living maerl.
GTS18.32	91240	227800	91190	227800	Living maerl.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS18.33	91190	227800	91140	227800	Living maerl.
GTS18.34	91140	227800	91090	227800	Living maerl.
GTS18.35	91090	227800	91036	227800	Living maerl.
GTS18.36	91036	227800	End Point	End Point	Kelp (including kelp/rock).
GTS19.1	91050	227700	91100	227700	Living maerl/kelp.
GTS19.2	91100	227700	91150	227700	Live maerl/shell.
GTS19.3	91150	227700	91200	227700	Sand (including sand/rock).
GTS19.4	91200	227700	91250	227700	Sand (including sand/rock).
GTS19.5	91250	227700	91300	227700	Sand (including sand/rock).
GTS19.6	91300	227700	91350	227700	Sand (including sand/rock).
GTS19.7	91350	227700	91400	227700	Sand (including sand/rock).
GTS19.8	91400	227700	91450	227700	Sand (including sand/rock).
GTS19.9	91450	227700	91500	227700	Sand (including sand/rock).
GTS19.10	91500	227700	91550	227700	Sand (including sand/rock).
GTS19.11	91550	227700	91600	227700	Sand (including sand/rock).
GTS19.12	91600	227700	91650	227700	*Zostera marina* (patchy) and living maerl.
GTS19.13	91650	227700	91700	227700	*Zostera marina* (patchy abundant).
GTS19.14	91700	227700	91750	227700	Living maerl.
GTS19.15	91750	227700	91800	227700	Living maerl/shell.
GTS19.16	91800	227700	91850	227700	Living maerl.
GTS19.17	91850	227700	91900	227700	Living maerl.
GTS19.18	91900	227700	91950	227700	Living maerl.
GTS19.19	91950	227700	92000	227700	Living maerl.
GTS19.20	92000	227700	92050	227700	Living maerl.
GTS19.21	92050	227700	92100	227700	Living maerl.
GTS19.22	92100	227700	92150	227700	Living maerl.
GTS19.23	92150	227700	92200	227700	Living maerl.
GTS19.24	92200	227700	92250	227700	Living maerl.
GTS19.25	92250	227700	92300	227700	Living maerl.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS19.26	92300	227700	92350	227700	Living maerl.
GTS19.27	92350	227700	92400	227700	Living maerl.
GTS19.28	92400	227700	92450	227700	Living maerl.
GTS19.29	92450	227700	92500	227700	Living maerl.
GTS19.30	92500	227700	92550	227700	Living maerl.
GTS19.31	92550	227700	92585	227700	Living maerl.
GTS19.32	92585	227700	End Point	End Point	Mud (including mud/rock).
GTS20.1	92525	227600	92475	227600	Mud (including mud/rock).
GTS20.2	92475	227600	92425	227600	Mud (including mud/rock).
GTS20.3	92425	227600	92375	227600	Mud (including mud/rock).
GTS20.4	92375	227600	92325	227600	Living maerl.
GTS20.5	92325	227600	92275	227600	Living maerl.
GTS20.6	92275	227600	92225	227600	Living maerl.
GTS20.7	92225	227600	92175	227600	Living maerl.
GTS20.8	92175	227600	92125	227600	Living maerl.
GTS20.9	92125	227600	92075	227600	Living maerl.
GTS20.10	92075	227600	92025	227600	Living maerl.
GTS20.11	92025	227600	91975	227600	Living maerl.
GTS20.12	91975	227600	91925	227600	Living maerl.
GTS20.13	91925	227600	91875	227600	Living maerl.
GTS20.14	91875	227600	91825	227600	Living maerl.
GTS20.15	91825	227600	91775	227600	Living maerl.
GTS20.16	91775	227600	91725	227600	Living maerl.
GTS20.17	91725	227600	91675	227600	Living maerl.
GTS20.18	91675	227600	91625	227600	Living maerl.
GTS20.19	91625	227600	91575	227600	Living maerl.
GTS20.20	91575	227600	91525	227600	Living maerl.
GTS20.21	91525	227600	91475	227600	Living maerl.
GTS20.22	91475	227600	91425	227600	Living maerl.

TRANS	Start E'	Start N'	End E'		SEABED
GTS20.23	91425	227600	91375	227600	Living maerl.
GTS20.24	91375	227600	91325	227600	Living maerl.
GTS20.25	91325	227600	91275	227600	Living maerl.
GTS20.26	91275	227600	91225	227600	Living maerl.
GTS20.27	91225	227600	91175	227600	Living maerl.
GTS20.28	91175	227600	91125	227600	*Zostera marina* (abundant) and maerl.
GTS20.29	91125	227600	91080	227600	Maerl.
GTS20.30	91080	227600	End Point	End Point	Maerl.
GTS21.1	91050	227500	91100	227500	Maerl.
GTS21.2	91100	227500	91150	227500	Maerl.
GTS21.3	91150	227500	91200	227500	*Zostera marina* (abundant) and maerl.
GTS21.4	91200	227500	91250	227500	Sand (including sand/rock).
GTS21.5	91250	227500	91300	227500	Sand (including sand/rock).
GTS21.6	91300	227500	91350	227500	Sand (including sand/rock).
GTS21.7	91350	227500	91400	227500	Sand (including sand/rock).
GTS21.8	91400	227500	91450	227500	*Zostera marina* (abundant) and live maerl.
GTS21.9	91450	227500	91500	227500	*Zostera marina* (abundant) and live maerl.
GTS21.10	91500	227500	91550	227500	Living maerl.
GTS21.11	91550	227500	91600	227500	Living maerl.
GTS21.12	91600	227500	91650	227500	Living maerl.
GTS21.13	91650	227500	91700	227500	Living maerl.
GTS21.14	91700	227500	91750	227500	Living maerl.
GTS21.15	91750	227500	91800	227500	Living maerl.
GTS21.16	91800	227500	91867	227500	Living maerl.
GTS21.17	91867	227500	End Point	End Point	Kelp (including kelp/rock).
GTS22.1	91760	227400	91750	227400	Live maerl/sand/mud.
GTS22.2	91750	227400	End Point	End Point	Maerl.
GTS23.1	92550	227789	92950	228000	All of transect mud and weed (16) Rossroe Bay
GTS23.2	92950	228000	End Point	End Point	All of transect mud and weed (16) Rossroe Bay

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS24.1	92964	227940	92724	227692	All of transect mud and weed (16) Rossroe Bay
GTS24.2	92724	227692	End Point	End Point	All of transect mud and weed (16) Rossroe Bay
GTS25.1	91472	227006	91342	227006	*Zostera marina* (patchy) and live maerl.
GTS25.2	91342	227006	91332	227006	*Zostera marina* (patchy abundant) and live and dead maerl.
GTS25.3	91332	227006	91322	227006	*Zostera marina* (patchy abundant) and live and dead maerl.
GTS25.4	91322	227006	91022	227006	Vision gone.
GTS25.5	91022	227006	90972	227006	*Zostera marina* (abundant).
GTS25.6	90972	227006	90682	227006	Living & dead maerl.
GTS25.7	90682	227006	90462	227006	Shell/sand.
GTS25.8	90462	227006	End Point	End Point	Shell/sand.
GTS26.1	90400	226806	91040	226806	Sand/kelp with bands of live & dead maerl.
GTS26.2	91040	226806	91360	226806	Living & dead maerl/sand/mud.
GTS26.3	91360	226806	91480	226806	Live and dead maerl on mixed bottom.
GTS26.4	91480	226806	End Point	End Point	Live and dead maerl on mixed bottom.
GTS27.1	91350	226654	90650	226654	Maerl live.
GTS27.2	90650	226654	90610	226654	*Zostera marina* (abundant).
GTS27.3	90610	226654	90580	226654	Kelp (including kelp/rock).
GTS27.4	90580	226654	End Point	End Point	Kelp (including kelp/rock).
GTS28.1	90578	226495	90718	226495	Kelp (including kelp/rock).
GTS28.2	90718	226495	91128	226495	Live maerl.
GTS28.3	91128	226495	91198	226495	Live and dead maerl on mixed bottom.
GTS28.4	91198	226495	End Point	End Point	Live and dead maerl on mixed bottom.
GTS29.1	91115	226295	90675	226295	Living & dead maerl.
GTS29.2	90675	226295	End Point	End Point	Sand/kelp.
GTS30.1	90575	226105	90625	226105	*Zostera marina* (patchy abundant).
GTS30.2	90625	226105	91125	226105	Sand (including sand/rock).
GTS30.3	91125	226105	91145	226105	*Zostera marina* (abundant).
GTS30.4	91145	226105	End Point	End Point	*Zostera marina* (abundant).
GTS31.1	91533	225908	91483	225908	Live maerl.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS31.2	91483	225908	90543	225908	Patchy live and dead maerl on mixed bottom.
GTS31.3	90543	225908	End Point	End Point	Patchy live and dead maerl on mixed bottom.
GTS32.1	89973	225708	90453	225708	*Zostera marina* (abundant).
GTS32.2	90453	225708	90473	225708	Maerl live.
GTS32.3	90473	225708	91513	225708	Living and dead maerl/sand/mud.
GTS32.4	91513	225708	91523	225708	Mud (including mud/rock).
GTS32.5	91523	225708	End Point	End Point	Mud (including mud/rock).
GTS33.1	91447	225510	91147	225510	Mud (including mud/rock).
GTS33.2	91147	225510	90627	225510	Live and dead maerl.
GTS33.3	90627	225510	90577	225510	*Zostera marina* (abundant).
GTS33.4	90577	225510	90357	225510	Sand (including sand/rock).
GTS33.5	90357	225510	90327	225510	*Zostera marina* (abundant).
GTS33.6	90327	225510	90277	225510	Sand (including sand/rock).
GTS33.7	90277	225510	End Point	End Point	Sand (including sand/rock).
GTS34.1	90157	225333	90337	225333	Maerl live & dead.
GTS34.2	90337	225333	90447	225333	Mud (including mud/rock).
GTS34.3	90447	225333	90707	225333	*Zostera marina* (abundant).
GTS34.4	90707	225333	91397	225333	Patchy live and dead maerl on mixed bottom.
GTS34.5	91397	225333	End Point	End Point	Patchy live and dead maerl on mixed bottom.
GTS35.1	91380	225135	90650	225135	Living & dead maerl/sand/mud.
GTS35.2	90650	225135	90340	225135	*Zostera marina* (abundant).
GTS35.3	90340	225135	90330	225135	Sand/kelp.
GTS35.4	90330	225135	End Point	End Point	Sand/kelp.
GTS36.1	90506	224935	90686	224935	*Zostera marina* (abundant).
GTS36.2	90686	224935	91140	224935	Dead maerl/sand/mud.
GTS36.3	91140	224935	End Point	End Point	Maerl/sand/mud.
GTS37.1	91146	224745	90606	224745	Maerl/sand/mud.
GTS37.2	90606	224745	90470	224745	*Zostera marina* (abundant).
GTS37.3	90470	224745	End Point	End Point	*Zostera marina* (abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS38.1	90584	224542	90674	224542	Sand (including sand/rock).
GTS38.2	90674	224542	91400	224542	Dead maerl/sand/mud.
GTS38.3	91400	224542	End Point	End Point	Maerl/sand/mud.
GTS39.1	91424	224355	91354	224355	Kelp (including kelp/rock).
GTS39.2	91354	224355	90674	224355	Dead maerl/sand/mud.
GTS39.3	90674	224355	90564	224355	Dead maerl/shell.
GTS39.4	90564	224355	90550	224355	*Zostera marina* (abundant).
GTS39.5	90550	224355	End Point	End Point	*Zostera marina* (abundant).
GTS40.1	90540	224158	90580	224158	*Zostera marina* (abundant).
GTS40.2	90580	224158	91300	224158	Living & dead maerl/shell.
GTS40.3	91300	224158	91310	224158	*Zostera marina* with living & dead maerl/kelp/rock.
GTS40.4	91310	224158	End Point	End Point	*Zostera marina* (patchy abundant).
GTS41.1	91270	223961	91230	223961	*Zostera marina* (patchy abundant).
GTS41.2	91230	223961	90500	223961	Live and dead maerl.
GTS41.3	90500	223961	90470	223961	Kelp (including kelp/rock).
GTS41.4	90470	223961	End Point	End Point	*Zostera marina* (patchy abundant).
GTS42.1	90527	223763	90617	223763	Kelp (including kelp/rock).
GTS42.2	90617	223763	91207	223763	Dead maerl.
GTS42.3	91207	223763	91237	223763	Kelp (including kelp/rock).
GTS42.4	91237	223763	End Point	End Point	*Zostera marina* (patchy abundant).
GTS43.1	91070	223566	91050	223566	Kelp (including kelp/rock).
GTS43.2	91050	223566	90500	223566	Dead maerl/shell.
GTS43.3	90500	223566	End Point	End Point	Maerl/shell.
GTS44.1	90484	223369	90504	223369	*Zostera marina* (patchy abundant).
GTS44.2	90504	223369	90514	223369	Kelp (including kelp/rock).
GTS44.3	90514	223369	91064	223369	Dead maerl.
GTS44.4	91064	223369	End Point	End Point	Kelp (including kelp/rock).
GTS45.1	91092	223171	90472	223171	Dead maerl.
GTS45.2	90472	223171	End Point	End Point	*Zostera marina* (abundant).

TRANS	Start E'	Start N'	End E'	End N'	SEABED
GTS46.1	90471	222974	90551	222974	Sand/kelp.
GTS46.2	90551	222974	91061	222974	Sand (including sand/rock).
GTS46.3	91061	222974	End Point	End Point	Sand (including sand/rock).
maerlzosspotcheckD1	90519	231629	End Point	End Point	Spot check, maerl here 99% living.
maerlzosspotcheckD2	91387	231583	End Point	End Point	Mud and shell, no maerl.
maerlzosspotcheckD3	89077	230026	End Point	End Point	Maerl with boulders 80% dead 20% live.
maerlzosspotcheckD4	88963	230332	End Point	End Point	Mud with scallops (*Pecten maximus*) and dead maerl, small amount of living maerl.
maerlzosspotcheckD5	88118	230389	End Point	End Point	Rock and kelp.
maerlzosspotcheckD6	86721	230274	End Point	End Point	Flat bed rock and dead maerl.
maerlzosspotcheckD7	86500	229939	End Point	End Point	*Zostera marina* (abundant) on living maerl, maerl continues as you move away from shore.
maerlzosspotcheckD8	89354	230155	End Point	End Point	Mud, sprinkling of dead maerl.
NeoD1	84903	229198	End Point	End Point	*Neopentadactyla mixta,* too numerous to count. All submerged, needed to blow of sediment to uncover.
virgspotcheckD1.1	89680	231250	89999	231457	No *Virgularia mirabilis,* just mud.
virgspotcheckD1.2	89999	231457	End Point	End Point	No *Virgularia mirabilis,* just mud.
virgspotcheckD2.1	89999	231457	90031	231495	No *Virgularia mirabilis,* just mud.
virgspotcheckD2.2	90031	231495	End Point	End Point	No *Virgularia mirabilis,* just mud.
virgspotcheckD3.1	90110	231558	89935	231502	*Virgularia mirabilis* starts at start point ends at end point.
virgspotcheckD3.2	89935	231502	End Point	End Point	*Virgularia mirabilis* starts at start point ends at end point.
virgspotcheckD4.1	89866	231679	89870	231665	Mud at start point, *Virgularia mirabilis* starts at end point.
virgspotcheckD4.2	89870	231665	End Point	End Point	Mud at start point, *Virgularia mirabilis* starts at end point.
virgspotcheckD5.1	90172	231498	90089	231562	Mud at start point, *Virgularia mirabilis* starts at end point.
virgspotcheckD5.2	90089	231562	End Point	End Point	Mud at start point, *Virgularia mirabilis* starts at end point.
virgspotcheckD6.1	90089	231562	90125	231669	*Virgularia mirabilis* ends at end point, this dive a continuation of D163
virgspotcheckD6.2	90125	231669	End Point	End Point	*Virgularia mirabilis* ends at end point, this dive a continuation of D163
PachyD1.1	90819	234181	90930	234106	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD1.2	90930	234106	End Point	End Point	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD2.1	90819	234181	91144	234219	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD2.2	91144	234219	End Point	End Point	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.

TRANS	Start E'	Start N'	End E'	End N'	SEABED
PachyD3.1	91144	234219	91243	234062	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD3.2	91243	234062	**End Point**	End Point	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD4.1	90819	234181	90701	234177	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD4.2	90701	234177	End Point	End Point	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD5.1	90819	234181	90634	234077	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD5.2	90634	234077	End Point	End Point	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD6.1	90701	234177	90778	234088	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD6.2	90778	234088	End Point	End Point	*Pachycerianthus multiplicatus* found all along this transect plus *Virgularia mirabilis* end point of transect is end of *Pachycerianthus multiplicatus* distribution.
PachyD7.1	90634	234077	90779	234068	No *Pachycerianthus multiplicatus* found this transect. *Virgularia mirabilis* occurs.
PachyD7.2	90779	234068	End Point	End Point	No *Pachycerianthus multiplicatus* found this transect. *Virgularia mirabilis* occurs.
Risked distrib 2.1	90729	234156	90739	234239	*Pachycerianthus multiplicatus*
Risked distrib 2.2	90893	234192	90875	234277	*Pachycerianthus multiplicatus*
Risked distrib 2.3	91018	234207	91001	234252	*Pachycerianthus multiplicatus*
Risked distrib 2.4	90984	234120	91040	234032	*Pachycerianthus multiplicatus*
Risked distrib 2.5	90902	234185	90957	234020	*Pachycerianthus multiplicatus*
Risked distrib 2.6	90796	234131	90805	234100	*Pachycerianthus multiplicatus*
Risked distrib 2.7	90670	234138	90654	234065	*Pachycerianthus multiplicatus*
Risked distrib 2.8	90729	234156	90729	234186	*Virgularia mirabilis*
Risked distrib 2.9	90893	234192	90875	234277	*Virgularia mirabilis*
Risked distrib 2.10	91018	234207	91020	234293	*Virgularia mirabilis*
Risked distrib 2.11	91170	234196	91031	234297	*Virgularia mirabilis*
Risked distrib 2.12	90984	234120	91040	234032	*Virgularia mirabilis*
Risked distrib 2.13	90902	234185	90957	234029	*Virgularia mirabilis*
Risked distrib 2.14	90796	234131	90828	234026	*Virgularia mirabilis*
Risked distrib 2.15	90670	234138	90654	234065	*Virgularia mirabilis*

Appendix III Species Lists

Key to AFOR scale: (A) abundant, (F) Frequent, (O) Occasional, (R) Rare.

Greatmans Bay: 22-8-05 (*Zostera marina* (linnaeus) bed)
Location: 090550 225590

Species	**AFOR**
Anemonia viridis (Forskål)	A
Haliclystus auricula (Rathke)	F
Gibbula cineraria (Linnaeus)	A
Necora puber (Linnaeus)	O
Pagurus bernhardus (Linnaeus)	O
Chorda filum (Linnaeus) Stackhouse	R
Ulva lactuca (Linnaeus)	R
Colpomenia peregrina (Sauvageau) Hamel	O
Maja squinado (Herbst)	O
Ensis ensis (Linnaeus)	F
Gobius niger (Linnaeus)	F
Myxicola infundibulum (Renier)	R
Plocamium cartilagineum (Linnaeus) Dixon	F
Syngnathus acus (Linnaeus)	R
Anthopleura balli (Cocks)	F
Cancer pagurus (Linnaeus)	O

Greatmans Bay 22-8-05: (Maerl bed)
Location: 090825 226102

Species	**AFOR**
Anemonia viridis (Forskål)	A
Cerianthus lloydii (Gosse)	F
Turritella communis (Risso)	O
Pecten maximus (Linnaeus)	O
Pagurus bernhardus (Linnaeus)	F
Callionymus lyra (Linnaeus)	F
Pisidia longicornis (Linnaeus)	O
Ulva lactuca (Linnaeus)	O
Raja clavata (Linnaeus)	O
Liocarcinus depurator (Linnaeus)	F
Gobius niger (Linnaeus	R
Sabella pavonina (Savigny	O
Taurulus bubalis (Euphrasen	R
Marthasterias glacialis (Linnaeus)	R
Ensis ensis (Linnaeus)	O
Cereus pedunculatus (Pennant)	F
Suberites sp.	O
Pomatoceros lamarcki (Quatrefages)	F
Phymatolithon calcareum (Pallas) W.A. Adey & D.L. McKibbin	A
Boergeseniella fruticulosa (Wulfen) Kylin	A

Greatmans Bay 22-8-05: (Maerl bed)
Location: 090825 226102

Species	**AFOR**
Anemonia viridis (Forskål)	A
Cerianthus lloydii (Gosse)	F
Turritella communis (Risso)	O
Pecten maximus (Linnaeus)	O
Pagurus bernhardus (Linnaeus)	F
Callionymus lyra (Linnaeus)	F
Pisidia longicornis (Linnaeus)	O
Ulva lactuca (Linnaeus)	O
Gobius niger (Linnaeus)	R
Sabella pavonina (Savigny)	O
Taurulus bubalis (Euphrasen	R
Liocarcinus depurator (Linnaeus)	F
Raja clavata (Linnaeus)	O
Marthasterias glacialis (Linnaeus)	R
Ensis ensis (Linnaeus)	O
Cereus pedunculatus (Pennant)	F
Suberites sp.	O
Pomatoceros lamarcki (Quatrefages)	F
Phymatolithon calcareum (Pallas) W.A. Adey & D.L. McKibbin	A
Boergeseniella fruticulosa (Wulfen) Kylin	A

Kilkieran Bay: 03-10-05 (*Zostera marina* (linnaeus) on Maerl bed)
Location: 086051 230798

Species	**AFOR**
Phymatolithon calcareum (Pallas) W.A. Adey & D.L. McKibbin	A
Gibbula cineraria (Linnaeus)	A
Haliclystus auricula (Rathke)	O
Necora puber (Linnaeus)	O
Esperiopsis fucorum (Esper)	O
Pecten maximus (Linnaeus)	F
Pagurus bernhardus (Linnaeus)	F
Myxicola infundibulum (Renier)	O
Ensis ensis (Linnaeus)	O
Cereus pedunculatus (Pennant)	F
Liocarcinus depurator (Linnaeus)	F
Liocarcinus corrugatus	O
Delesseria sanguinea (Hudson) Lamouroux	O
Chorda filum (Linnaeus) Stackhouse	F
Anemonia viridis (Forskål)	F
Cerianthus lloydii (Gosse)	F

Kilkieran Bay: 03-10-05 *Ostrea edulis* and Maerl bed)
Location: 089797 236474

Species	**AFOR**
Phymatolithon calcareum (Pallas) W.A. Adey & D.L. McKibbin	A
Chlamys varia (Linnaeus)	A
Ostrea edulis (Linnaeus)	A
Necora puber (Linnaeus)	O
Inachus dorsettensis (Pennant)	O
Pecten maximus (Linnaeus)	F
Maja squinado (Herbst)	R
Pagurus bernhardus (Linnaeus)	O
Myxicola infundibulum (Renier)	O
Ensis ensis (Linnaeus)	O
Pholis gunnellus (Linnaeus)	R
Liocarcinus depurator (Linnaeus)	F
Esperiopsis fucorum (Esper)	O
Hinia reticulata (Linnaeus)	O
Cadlina laevis (Linnaeus) on *Dysidea fragilis* (Montagu)	R
Mycale sp. (growing on *Chlamys varia)*	A