

Planting Methods Statement, Biodiversity, Navigation and Fisheries Considerations

Sound of Harris Seagrass Restoration Project

Activities to be delivered by Namara Projects Ltd as a community benefit project

1.0 Overview

The Sound of Harris Seagrass Restoration Project will begin to stabilise and rebuild one of Scotland's few remaining areas where subtidal seagrass (*Zostera marina*) exists at scale (approximately 1/3 of Scottish resource).

Recent survey work (Rodger, A.N.S, 2024; Rodger, A.N.S. and Rodger, H.W.S., 2025), illustrated an approximate 200 ha decline of seagrass immediately SE of the Berneray causeway over the last 38 years. This decline has recently been set within the wider national and international context (Carstairs and Carstairs, 2026).

Shown below, is national data on extent of the *Zostera marina* habitat in the Sound of Harris, Figure 1, extracted from NMPI portal (<https://marinescotland.atkinsgeospatial.com/nmpi>). The area shown amounts to 661 ha of seagrass habitat and the geographical focus of this proposal is highlighted to the SE of Berneray.

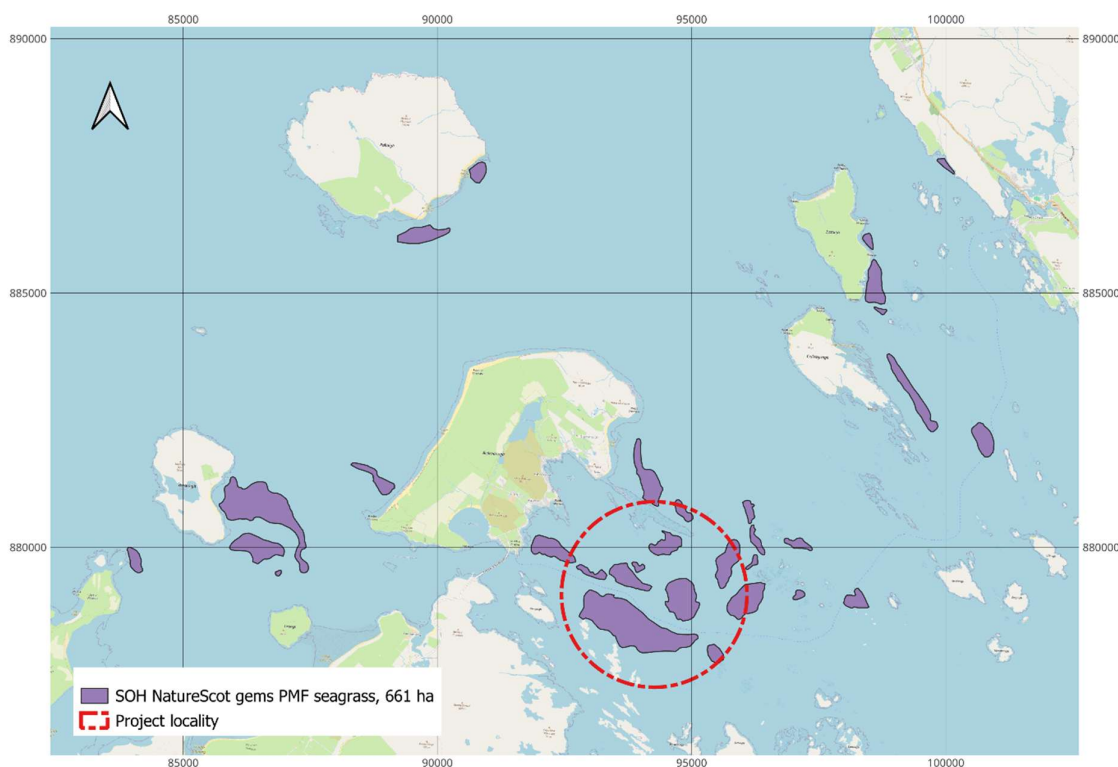


Figure 1 - Distribution and extent of seagrass around the Isle of Berneray, Sound of Harris, Western Isles, as assumed within the national PMF gems database, <https://opendata.nature.scot/datasets/snh::gems-scottish-priority-marine-features/>.

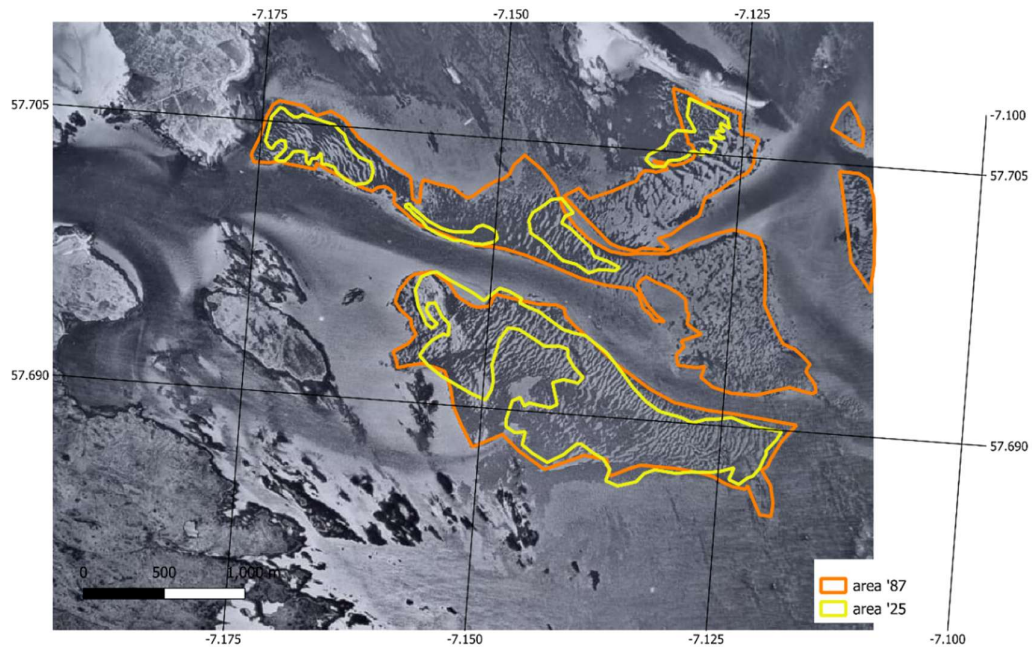


Figure 2- Aerial image of seagrass beds to SE of Berneray in April 1987, showing current and historic extent (image source archive, NatureScot, Stilligarry).

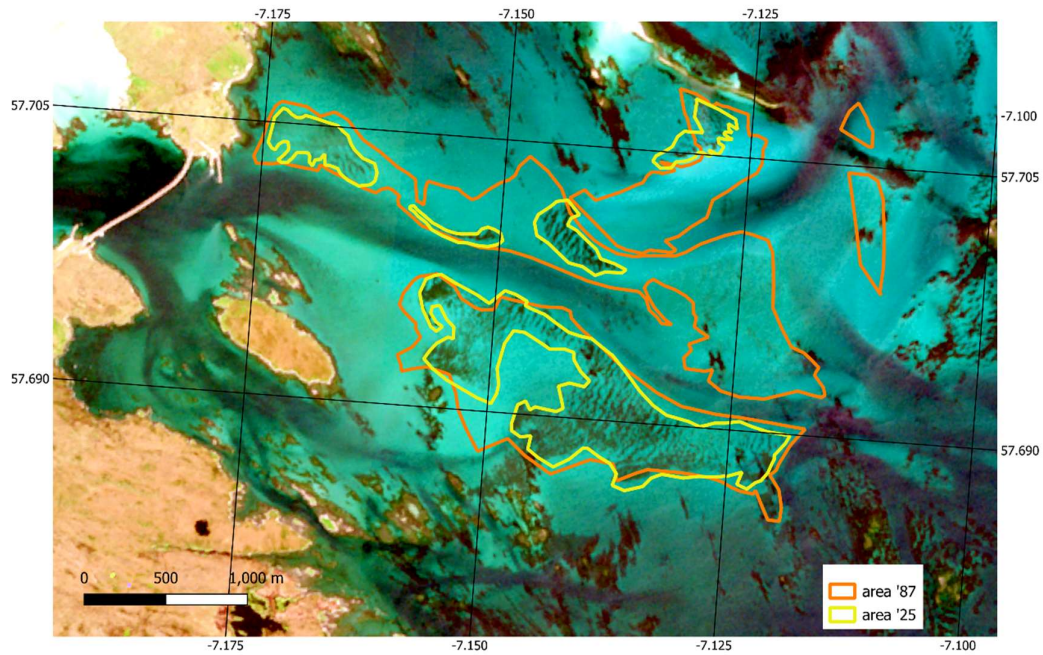


Figure 3 – Satellite image of seagrass beds to SE of Berneray in May 2025, showing current and historic extent (image source Sentinel 2, copernicus.eu).

Changes in the distribution of seagrass in the Sound of Harris, Figures 2 and 3, amount to an approximate 200 ha of decline over the course of the 38 years.

Reasons for seagrass decline have not been defined conclusively but the most likely actors are changes in water flow, nutrient concentrations and sedimentation patterns. These changes are most likely associated with the physical disturbances caused by construction of the Berneray causeway, the development of the ro-ro ferry with associated wash and channel dredging and trials in water-jet/suction dredging fishing methods in the intervening period.

2. 0 Applicant and Project outline

Namara Projects Ltd (NPL) is a Berneray based marine resource focused business, who conduct marine science projects, commercial boat charter, creel and diving fishing. They have developed this project in consultation with Berneray community in a bid to restore and better manage the local marine environment, while creating new employment opportunities (6 part-time posts). NPL recognise that to safeguard local marine resources, manage climate and address biodiversity loss, marine restoration must now be delivered with urgency and at large scale. Restoration must also be part of a wider strategy which employs an ecosystem-based approach.

The project outlined in this note will be financed by a grant from SMEEF (<https://smeef.scot/seabed-enhancement/>) and awarded 17/03/26. Future development of parallel science and community benefits projects will be progressed as funding and opportunities arise.

The project is to restore 2.5 ha of seagrass SE of Berneray and in areas thought likely to support restoration, where the habitat was formerly present. The exact locations for restoration planting will be decided once the project is underway and once trialling of methods can be undertaken. Four 0.625 ha 'Probable Planting Areas' are illustrated in Figure 4 and within a wider Marine Licence 'Working Area' of 193 ha (coordinates Appendix 1). The 4 planting areas will be circles of approximately 89 m in diameter. The extensive working area will allow room for selecting best restoration donor beds as well as areas for transplanting. The Working Areas will also bound all temporary mooring locations (central to the planting areas), in support of diving and boat activity and also all longer term scientific sampling (sediment cores), to monitor changes in biology and physiochemistry over the restoration period and out to 2032.

As the project is effectively trialling planting methods proven elsewhere (Busch *et al.*, 2008; Gamble C. *et al.*, 2021; Kent, F. *et al.*, 2021; Moksnes PO *et al.*, 2021a; Newman *et al.*, 2024), some positioning flexibility is required, and hence the Working Area is much larger than what will be actually planted, allowing for technique refinement.

It should be noted that during the project the only visible features on the surface will be a workboat, 4 high visibility floats (central to the planting areas) and some small moveable marker floats moved with each dive, to enable effective alignment and spacing of planting activity.

Appendix 1 lists coordinates for corners of the 3 Working Areas. Final location of planted areas cannot be determined at this point, but their 'Probable Planting Area' centroids are shown on Figure 4, with coordinates in Appendix 2

Main planting will occur in years 2026 to April 2028. Monitoring of success of the planting sites will be monitored until September 2032.

The activities will be regulated under a Scottish Government Marine Licence and the new Crown Estate Scotland (CES) Marine Enhancement Licence, <https://www.crownestatescotland.com/news/enabling-marine-enhancement>.

The CES licence is a non-commercial licence for community benefit and does not impart exclusivity of access to the licence holder, meaning existing rights such as commercial fishing and navigation are protected.

3.0 Planting Activity - Materials and Methods

The main activities of the project will involve transplanting healthy vegetative shoots/rhizomes from nearby donor beds, Figure 4.

All seagoing activities will be conducted using qualified professional staff, MCA coded workboat and HSE scientific dive team. Opportunities for community involvement and volunteering will be built into the project as appropriate.

Harvesting of donor material will be conducted by divers, following best practice, and taking no more than 1/3 available shoots in any given area.

Harvested donor shoots will then be sorted for quality and health, then prepared for direct transplant or embedded in small area (150 X 150 mm) biodegradable wool/jute transplanting matting.

Planting will deploy shoots at a rate of up to 30 000/ha. Harvesting will occur on alternate days from planting and in total will gather 75 000 shoots + 5% (78750- assuming wastage/rejections).

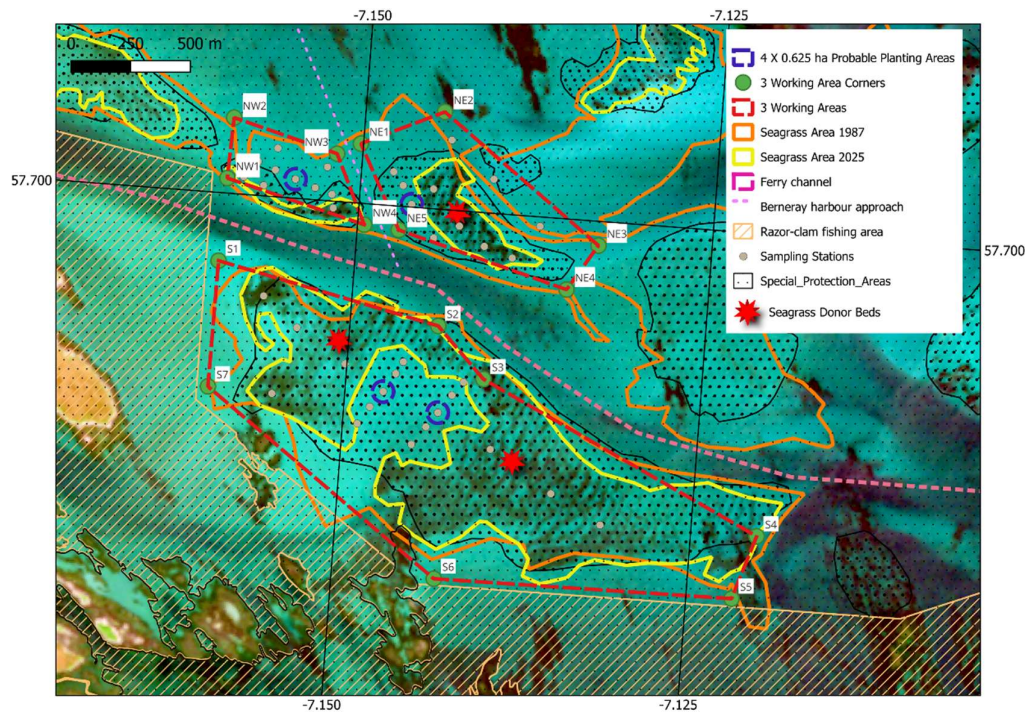


Figure 4 – Satellite image of project area to SE of Berneray, 2025, with proposed 3 Working Areas and probable Planting Areas 4 X 0.625 ha. Also shown, extent of seagrass in 1987 and 2025 and outline of extent of Priority Marine Feature (*Zostera marina*) gems polygons. Likely donor areas for seagrass transplants are shown. The ferry channel and usual harbour approach are illustrated. 38 long term sediment sampling stations are shown, although exact positioning would be subject to further scientific assessment.

Baseline surveys of potential donor beds (Rodger, A.N.S. and Rodger, H.W.S., 2025), illustrated a range of shoot densities from 1-150 shoots/m². If only beds with densities between 100-150 shoots/m² were harvested, an approximate 825 – 550 m² area would be required.

To the SE of Berneray and in the immediate vicinity of proposed project area, 140 ha of seagrass have been recorded. For much of this, the observed shoots density was between 100-150 shoots/m². For conservative illustration, if of this area only 20 % (28 ha) was considered harvestable, the portion of this 'harvestable' area

required for the project (825 – 550 m²) would amount to only 0.2-0.29 %. This area of project-required donor shoots is considered insignificant and well within what others have demonstrated to be sustainable (Moksnes PO *et al.*, 2021 b).

Direct transplanting methods would leave no introduced materials to the seabed. Transplanting using wool/jute matting would employ biodegradable bamboos staples to secure (150 X 150mm) mats to the seabed. Matting is assumed to biodegrade within 1 year and bamboo <2 yrs.

Should the wave exposure and current regime prove energetic, it may be required to ballast group of shoots to allow effective settlement. For this mild steel washers with biodegradable string would be used (1 X M12 washer per group 5 plants for example). The mild steel would likely decompose within 1-2 years.

The ratio of areas to be direct transplanted vs matting transplanted will potentially change during the project as experience gained. At outset it is assumed 2/3 of the harvested shoots will be directly planted and 1/3 deployed using transplanting matting.

Each biodegradable mat will be of 150 X 150 mm area, and to plant 1/3 of harvested shoots (22 500), would require 7 500 mats, or 3 shoots per mat.

If each mat was placed at 1 m spacings, a total area of 0.75 ha seagrass bed could potentially be restored. Within this area 169 m² of sediment would initially be covered with wool/jute matting until it biodegraded. Total area of matting as a percentage of the total area being restored by this method is 2 %.

4.0 Temporary moorings

Harvesting and planting activities will be supported by an MCA coded workboat, providing materials, standby and supervisor cover for divers. Temporary anchoring of vessel will only occur over bare sand, where anchors will not cause damage to the seagrass habitat. In addition, four fixed helical screw moorings will be placed in the centre of each planting area and removed on completion, see Figure 4. Only approximately 150mm of helical screw will protrude from seabed once installed, reducing likelihood of damage to vessels sing the area at low water.

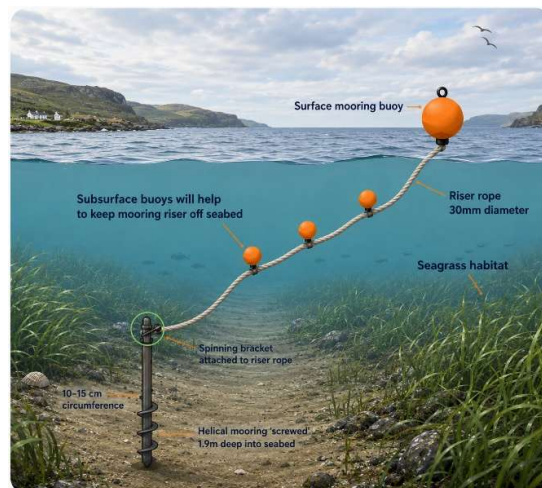


Figure 5 – Sketch of helical screw moorings placed to avoid anchor and chain damage to seabed and planted seagrass.

Each planting dive will be guided by temporary rope transects and surface marker buoys arranged in a grid. These will be moved on a daily basis as required.

5.0 Scientific observations

Sediment core samples for scientific assessments of carbon content, particle size analysis, nutrients, infauna and environmental DNA will be collected during the project to assess environmental changes over time. The project will sample relatively small quantities of sediment and use small diameter cores of 70 mm, but potentially up to 1000 mm depth. A worst-case sediment volume scenario assumes, per core 0.0038 m³, with potentially 40 sampling stations (each with 3 replicates) being sampled 4 times, within 7 years. The total volume of all sediment collected during the project and over 7 years, would be 1.85 m³.

Exact positioning of the sampling stations would be subject to further experimental design process, but the illustrated sample stations in Figure 4 show the intent to sample within the proposed restoration areas, existing seagrass beds and other reference stations.

6.0 Conservation Features

The basis of this project is that within the proposed project region, project activities are designed to improve the status (extent) of the seagrass Priority Marine Feature. The PMF has suffered damage in the last 30-40 years and the project is designed to begin to address issues and initiate restoration.

The project area also lies within the West Coast of the Outer Hebrides SPA - a large area to the west of the Western Isles which extends through the Sound of Harris, area: 1,321.70 km² (132,170.04 ha). Location centre: 57° 03.842' N, 007° 19.964' W.

6.1 Qualifying Interests

The West Coast of the Outer Hebrides Special Protection Area (SPA) qualifies within Conservation (Natural Habitats &c.) Regulations 1994 under Article 4.1 by regularly supporting a non-breeding population of European importance of the following Annex 1 species: great northern diver *Gavia immer* (a mean peak annual non-breeding population of 1,298 individuals (52% of the Great Britain (GB) population) for the years 2002/03 to 2006/07), black-throated diver *Gavia arctica* (a mean peak annual non-breeding population of 43 individuals (7.2% of the GB population) for the years 2007/08-2009/10) and Slavonian grebe *Podiceps auritus* (a mean peak annual non-breeding population of 51 individuals (4.6% of the GB population) for the years 2007/08-2009/10).

The site also qualifies under Article 4.1 by regularly supporting a population of European importance of the Annex 1 species red-throated diver *Gavia stellata* during the breeding season. The foraging area is available for up to 58 pairs breeding on the nearby islands (4.5% of the Great Britain population in 2006).

The site further qualifies under Article 4.2 by regularly supporting populations of European importance of the following migratory species: common eider *Somateria mollissima* (a mean peak annual non-breeding population of 5,074 individuals (8.5% of the Great Britain population) for the years of 2002/03 to 2006/07), long-tailed duck *Clangula hyemalis* (a mean peak annual non-breeding population of 821 birds (7.5% of the Great Britain population) for the years of 2002/03 to 2006/07) and red-breasted merganser *Mergus serrator* (a mean peak annual non-breeding population of 239 individuals (2.8% of the Great Britain population) for the years of 2007/08 to 2009/10).

6.2 Conservation Objectives for SPA

1. To ensure that the qualifying features of West Coast of the Outer Hebrides SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2. To ensure that the integrity of West Coast of the Outer Hebrides SPA is maintained in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

- 2a. The populations of the qualifying features are a viable component of the site.
- 2b. The distributions of the qualifying features throughout the site are maintained by avoiding significant disturbance of the species.
- 2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained.

6.3 Planting work and timing with respect to SPA features

The main planting work for the project will have a seasonal bias, focused mainly between April and September for each of 2 years. During this period there will be some very focused periods of work, with vessels and up to 6 people working for approximately 6 hours each day within the project work areas. In total, the project time at sea for planting will be less than 90 days over the whole project and boat speeds and directions can be regulated to avoid scaring birds in the water.

The seagrass areas may provide foraging habitat for some of the qualifying bird species. Most of the populations of interest are in greater numbers during winter months, and for those who breed in the Hebrides, nesting sites are usually situated adjacent to freshwater lochs or sheltered coastal areas and away from the proposed planting area.

It is anticipated there will be very little interaction with SPA qualifying features and primarily on account of the seasonality of work and preference for most species to nest at locations far from the proposed planting activities.

The project's planting region is situated very close to a busy ferry channel and Berneray harbour approach route. Both these routes have vessels active on them most days and every few hours, so bird populations will be well accustomed to this background activity. This would infer the project development is therefore unlikely to cause any significant change to established bird behaviour.

7.0 Navigation and Fishing

The activities will be regulated under a Scottish Government Marine Licence and the new Crown Estate Scotland Marine Enhancement Licence.

The CES licence is a non-commercial licence for community benefit and does not impart exclusivity of access to the licence holder, meaning existing rights such as commercial fishing and navigation are protected.

The proposed project working areas are wholly out with the Sound of Harris ferry channel, the Berneray harbour approach route and Comhairle operated Harbour Orders covering Berneray and Otternish, Figure 6.

The main approach (shown) to Berneray Harbour is used daily by a number of fast vessels and other routes are possible/used when tide allows. Propeller wash from these vessels may cause deterioration of the seagrass, particularly at low tide, so it may be possible to develop voluntary routing with operators to help reduce impacts.

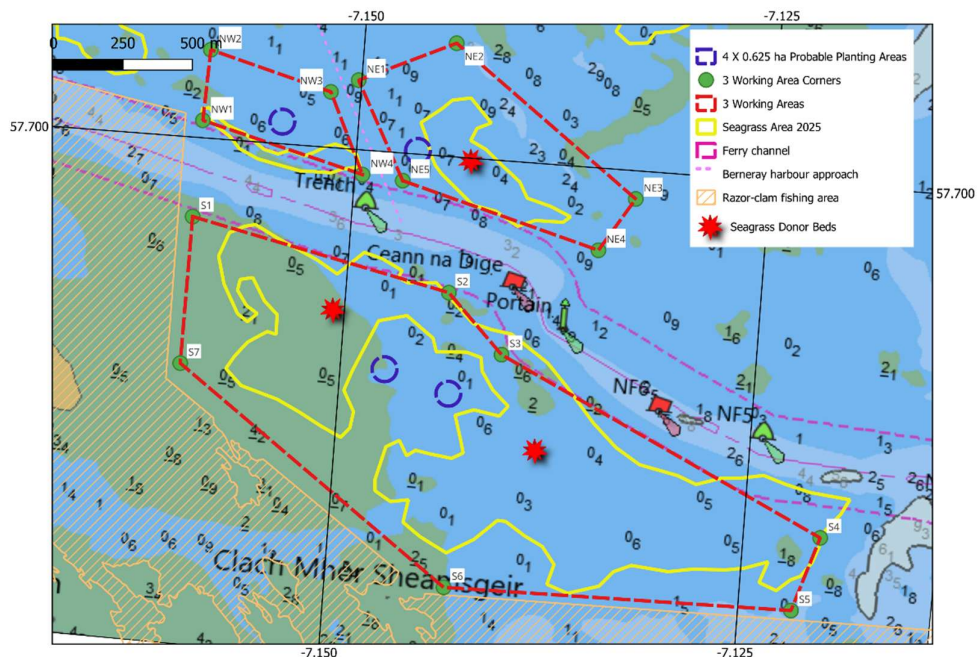


Figure 6 – Chart illustrating proposed project areas and overlays of navigation routes, current extend of seagrass and razor clam trial fishing area.

Historic fishing activities SE of Berneray have primarily been for velvet and shore crab. The project area is of limited commercial interest/value for these target species nowadays and anecdotal accounts suggest a significant reduction in crab success for the area, following building of the causeway.

More recently, wrasse fishing activity for supply to fish farms, has occurred SE of Berneray, as well as some fishing for shore crab as bait for this fishery.

The pots/creels used for fishing shore, velvet crab and wrasse are very light and are unlikely to cause significant impacts to the existing seagrass. Recently planted seagrass may be more vulnerable to contact and abrasion from hauled fishing creels, so it would be appreciated if fishermen wanting to fish the planting areas do so after discussing options with the project team. It is likely fishing of shore crab will be undertaken as part of the project to reduce predation by shore crab on newly planted shoots. The project operators have a licenced fishing boat for use in this context.

A government coordinated scientific razor clam electro fishery is in operation in the Western Isles (3 boats) and the Sound of Harris is one of the areas allowed in the derogation. All the seagrass areas (existing and historical) are excluded from the fishable area, so none of the proposed planting has any impact on that fishery. The razor clams to the SE of Berneray have not been found to be plentiful since the opening of the trial fishery, numbers likely affected by the changes resulting from the building of the causeway.

References:

Busch, K.E. *et al.* (2008) 'Large-Scale *Zostera marina* (eelgrass) Restoration in Chesapeake Bay, Maryland, USA. Part I: A Comparison of Techniques and Associated Costs', *Restoration Ecology*, 18(4), pp. 490–500. Available at: <https://doi.org/10.1111/j.1526-100X.2010.00690.x>.

Carstairs, M. and Carstairs, S. (2026) *Review of Scottish Seagrass Declines*. 1388. NatureScot.

Gamble C. *et al.* (2021) *Seagrass Restoration Handbook*. Zoological Society of London, UK.

Kent, F. *et al.* (2021) 'Seagrass restoration in Scotland - handbook and guidance.' NatureScot Research Report 1286.

Moksnes PO *et al.* (2021a) 'Handbook for restoration of eelgrass in Sweden - National guideline.' Swedish Agency for Marine and Water Management, Report number 2021:5.

Moksnes PO *et al.* (2021b) 'Handbook for restoration of eelgrass in Sweden - National guideline.' Swedish Agency for Marine and Water Management, Report number 2021:5.

Newman, A. *et al.* (2024) *Seagrass Cultivation & Restoration Best Practice Guide: Final Report*. Ocean Conservation Trust; LIFE Recreation ReMEDIES. Available at: <https://saveourseabed.co.uk/wp-content/uploads/2024/11/ReMEDIES-Best-Practice-Report-Full.pdf>.

Rodger, A.N.S (2024) 'Comparison maps of extent of seagrass south of Berneray, SOH, 1987 vs 2023'.

Rodger, A.N.S. and Rodger, H.W.S. (2025) *Survey observations of existing and historic subtidal seagrass (Zostera marina) beds SE of Isle of Berneray, North Uist, Western Isles, Scotland*. Project Report NPL_SG_SOH01. Berneray: Namara Projects Ltd.

Appendix 1 – Coordinates for corners of 3 Working Areas

NE AREA CORNERS	LATITUDE		LONGITUDE	
NE1	57° 42.134'	N	07° 09.012'	W
NE2	57° 42.220'	N	07° 09.160'	W
NE3	57° 41.945'	N	07° 07.979'	W
NE4	57° 41.841'	N	07° 08.100'	W
NE5	57° 41.947'	N	07° 08.825'	W
NE6	57° 42.134'	N	07° 09.012'	W
S AREA CORNERS	LATITUDE		LONGITUDE	
S1	57° 41.846'	N	07° 09.573'	W
S2	57° 41.737'	N	07° 08.628'	W
S3	57° 41.625'	N	07° 08.421'	W
S4	57° 41.318'	N	07° 07.221'	W
S5	57° 41.173'	N	07° 07.307'	W
S6	57° 41.167'	N	07° 08.566'	W
S7	57° 41.561'	N	07° 09.578'	W
S8	57° 41.846'	N	07° 09.573'	W
NW AREA CORNERS	LATITUDE		LONGITUDE	
NW1	57° 42.034'	N	07° 09.563'	W
NW2	57° 42.171'	N	07° 09.553'	W
NW3	57° 42.108'	N	07° 09.108'	W
NW4	57° 41.952'	N	07° 08.972'	W
NW5	57° 42.034'	N	07° 09.563'	W

Appendix 2 – Probable Planting Area Centroids

PROBABLE MOORING AND PLANTING CENTROIDS	LATITUDE		LONGITUDE	
SE	57° 41.542'	N	07° 08.602'	W
NE	57° 42.006'	N	07° 08.778'	W
NW	57° 42.043'	N	07° 09.275'	W
SW	57° 41.580'	N	07° 08.839'	W