Version	Date	Description	Author(s)	Revised by
V1.0	10/04/2025	Draft	Beth Marshall Stevie Jarron	

Index

01 Introduction

Cär-Y-Môr are a Community Benefit Society based in Pembrokeshire, West Wales - Registered Company Number RS008172 as "For the love of the sea Limited". Trading address – Upper Clegyr, St Davids, Pembrokeshire, SA62 6QN.

Cär-Y-Môr operate 2 neighbouring test aquaculture sites Carn Ar Wig (Fig 1) and Porthlysgi (Fig 3), which were originally licensed as trial seaweed and shellfish IMTA sites, both under Marine License DEML2013.

This license was granted by NRW to run from 01/08/2020 to 31/07/2025. Cär-Y-Môr intend to expand both these sites (Fig 2 and Fig 4). This documentation is designed to give Regulators confidence that appropriate consideration and where required mitigation to all factors concerning their expanded sites.

This License Re-application and associated documents contained and referred to in this submission provide critical information required for Natural Resources Wales (NRW) and other Statutory Consultees and Stakeholders to ensure consenting of the farm sites.

01.01 Carn Ar Wig – existing site

The boundaries of the existing Marine License - DEML2013 for the Carn Ar Wig site are:

51.868074	-5.315736
51.867900	-5.315337
51.867141	-5.315830
51.867242	-5.316227

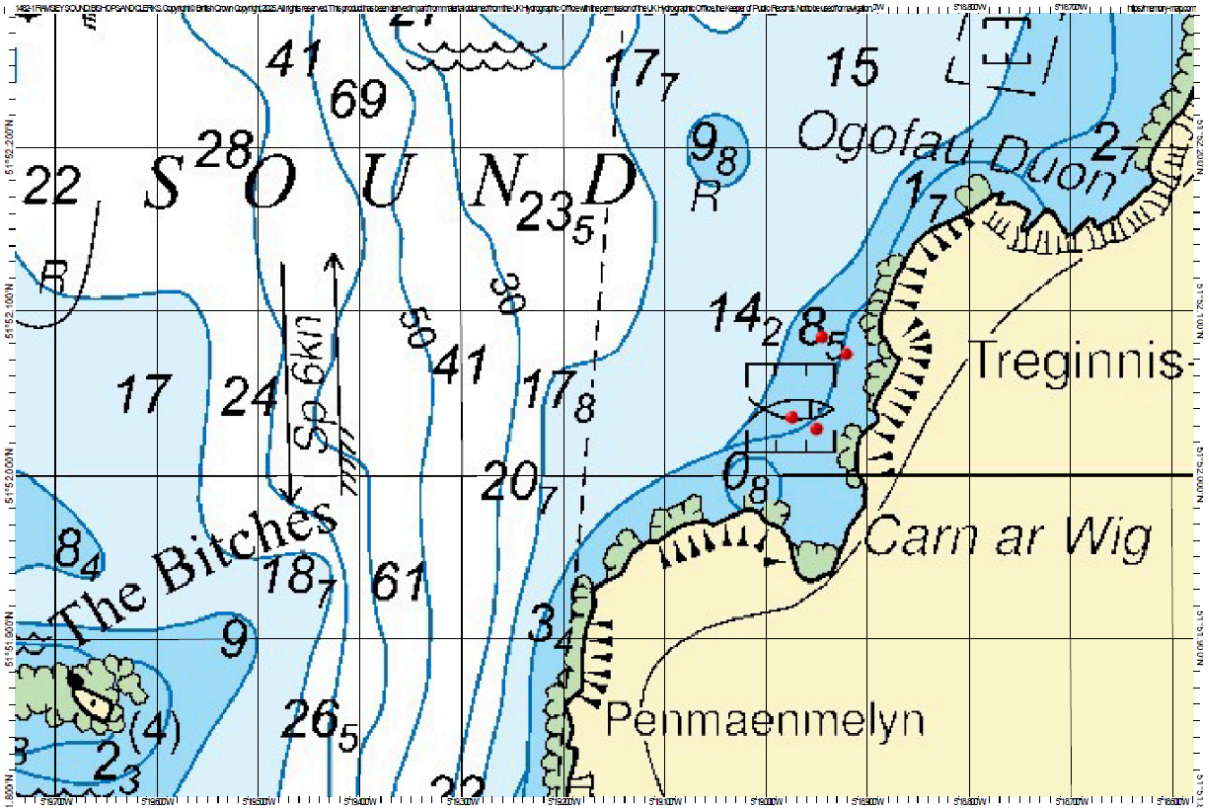


Fig 1 - Chart showing existing license site boundaries (red dots)

According to Current license DEML 2013, Carn Ar Wig site can hold a maximum of 20 floats and according to The Crown Estate License is for 1x 100m headline with seaweed seeded on 5m lengths of this headline and shellfish cultivating under the floats.

01.02 Carn Ar Wig – expanded site
Cârr-Y-Môr wish to expand the site at Carn Ar Wig to the boundaries laid out as:

51.8690	-5.3151
51.8674	-5.3160
51.8691	-5.3156
51.8677	-5.3171
51.8684	-5.3163
51.8682	-5.3155

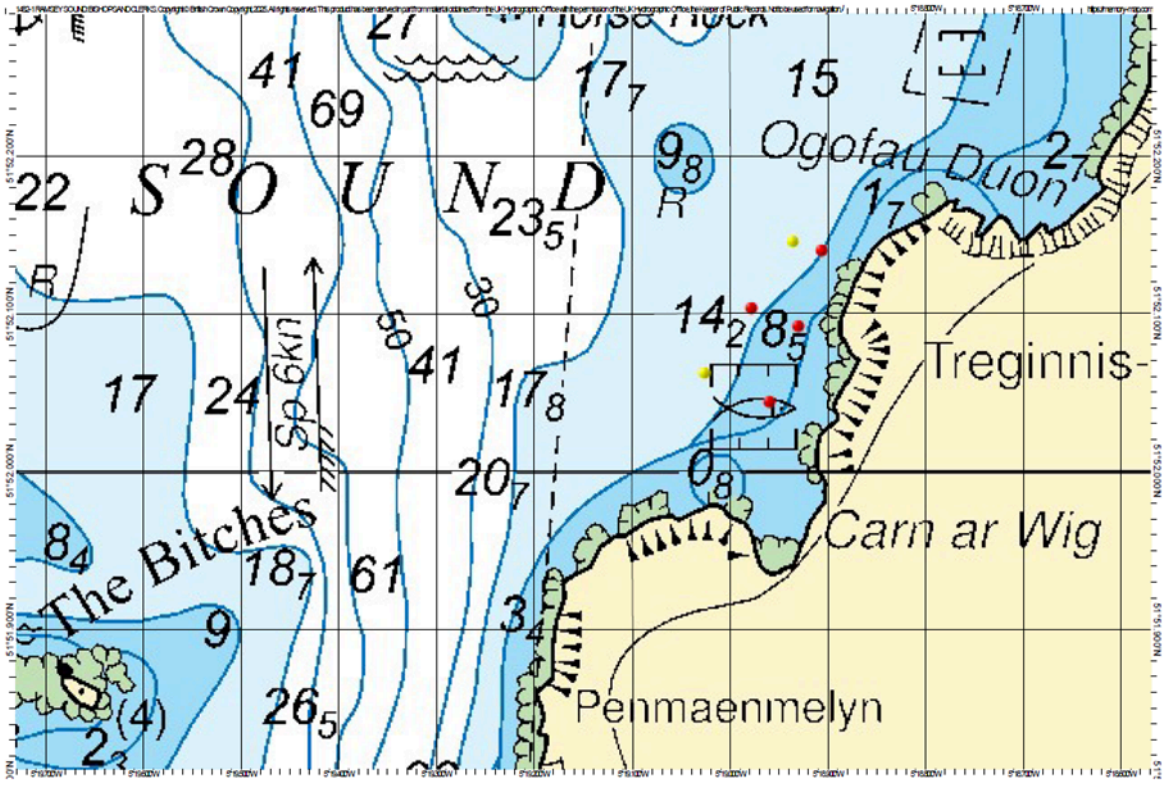


Fig 2 - expanded Carn Ar Wig boundaries (red dots), with special mark positions (yellow dots).

Cârr-Y-Môr will deploy 2 x Special Marks as recommended for aquaculture sites, with colour scheme of yellow and flashing scheme of 1 yellow flash every 5s, visible from 2 nautical miles - Y Fl 5s (2m).

Cârr-Y-Môr intend to expand to a total of 4 longlines with 20m spacing between them and buoys every 7m along each line, and use for shellfish and seaweed cultivation (Fig 3).

The new site dimensions will be 200m long by 85m wide area totalling around 2Ha, with 4 mussel longlines spread 20m apart. Each line will have 220L mussel floats roughly 7m apart, totalling between 100-150 floats across the whole site. Each line will be attached at either end to anchors on the seabed and ground chain will attach the anchors to each other.

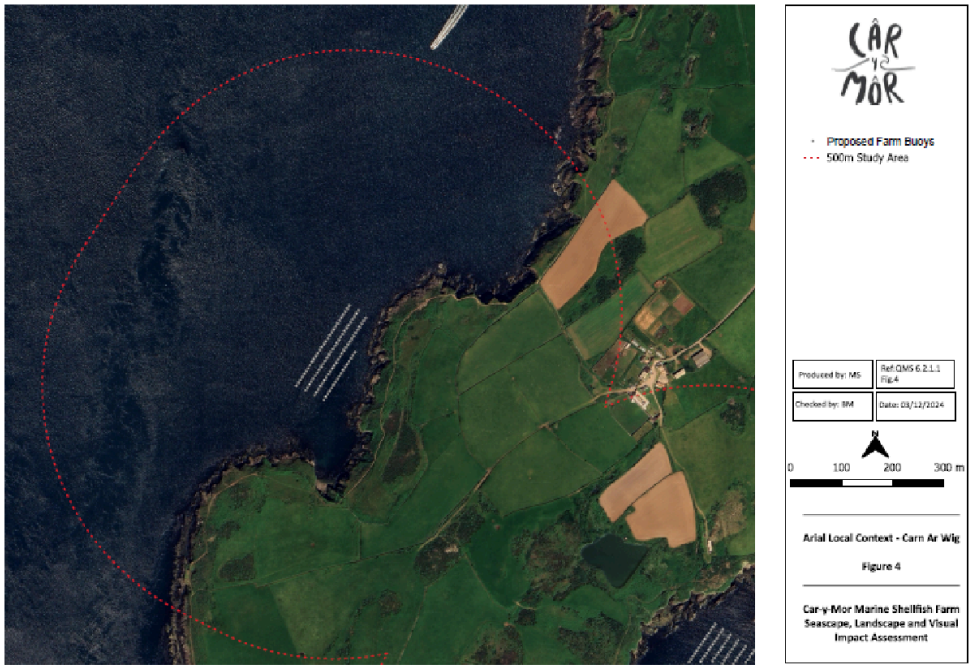


Fig 3 – New Carn Ar Wig aquaculture farm layout

01.03 Porthlysgi – existing site
The boundaries of the existing Marine License - DEML2013 for the Porthlysgi site are:

51.863036	-5.304682
51.862895	-5.304309
51.862058	-5.304918
51.862199	-5.305277

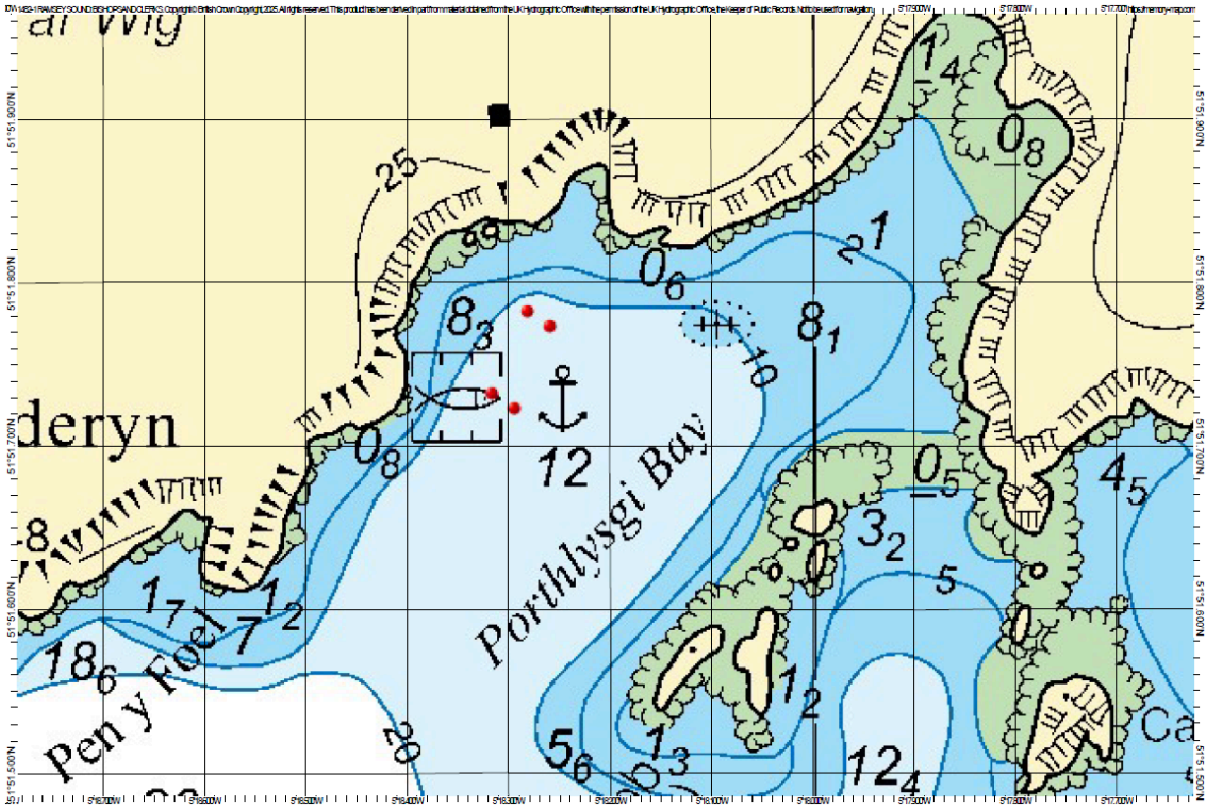


Fig 3 - Chart showing existing license site boundaries at Porthlysgi (red dots)

According to Current license DEML 2013, Porthlysgi is for a maximum of 20 floats and according to The Crown Estate License is for 1x 100m headline with seaweed seeded on 5m lengths of this headline and shellfish cultivating under the floats.

01.04 Porthlysgi – expanded site
Cârr-Y-Môr wish to expand the site at Porthlysgi to the boundaries laid out as:

51.8628	-5.3028
51.8602	-5.3055
51.8634	-5.3041
51.8607	-5.3069

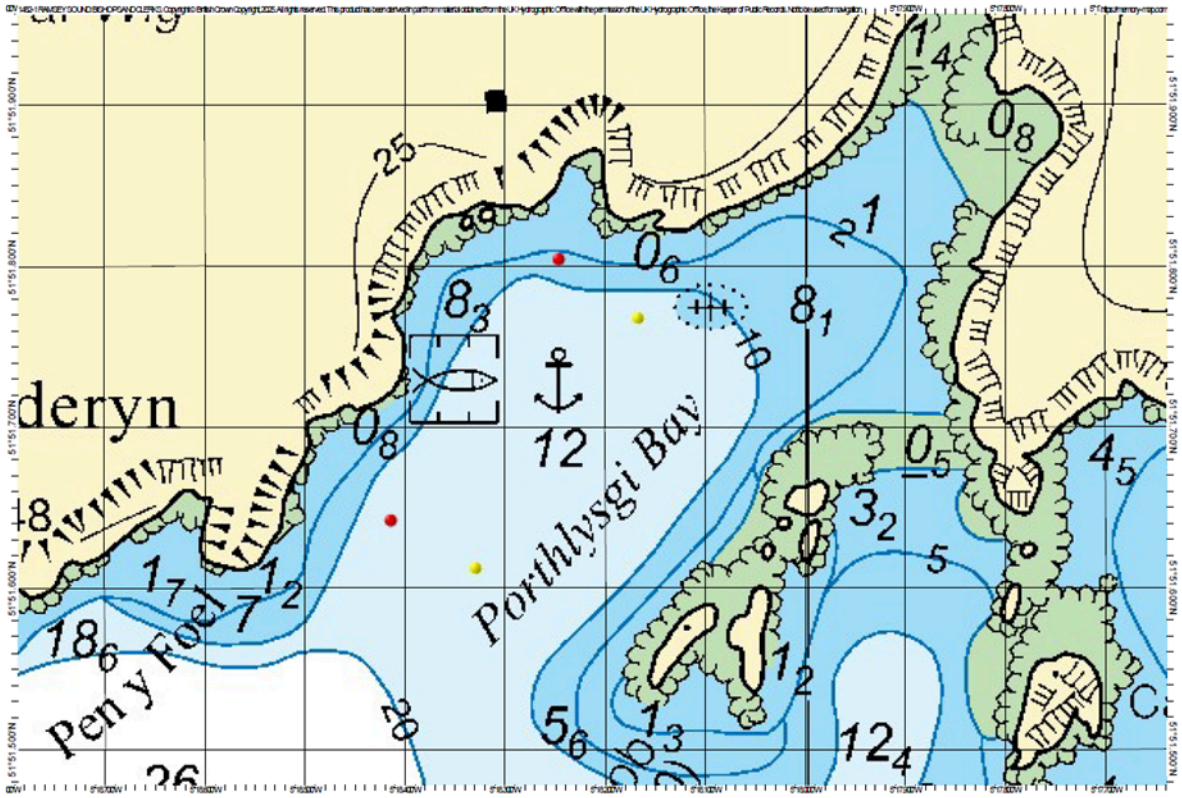


Fig 4 - expanded Porthlysgi boundaries (red dots), with special mark positions (yellow dots).

Cârr-Y-Môr will deploy 2 x Special Marks as recommended for aquaculture sites, with colour scheme of yellow and flashing scheme of 1 yellow flash every 5s, visible from 2 nautical miles - Y Fl 5s (2m).

Cârr-Y-Môr intend to expand to a total of 7 longlines with 18m spacing between them and buoys every 7m along each line, and use for shellfish and seaweed cultivation (Fig 4).

The new site dimensions will be 350m long by 110m wide area totalling around 3Ha, with 7 mussel longlines spread 18m apart. Each line will have 220L mussel floats roughly 7m apart, totalling between 320-450 floats across the whole site. Each line will be attached at either end to anchors on the seabed and ground chain will attach the anchors to each other.

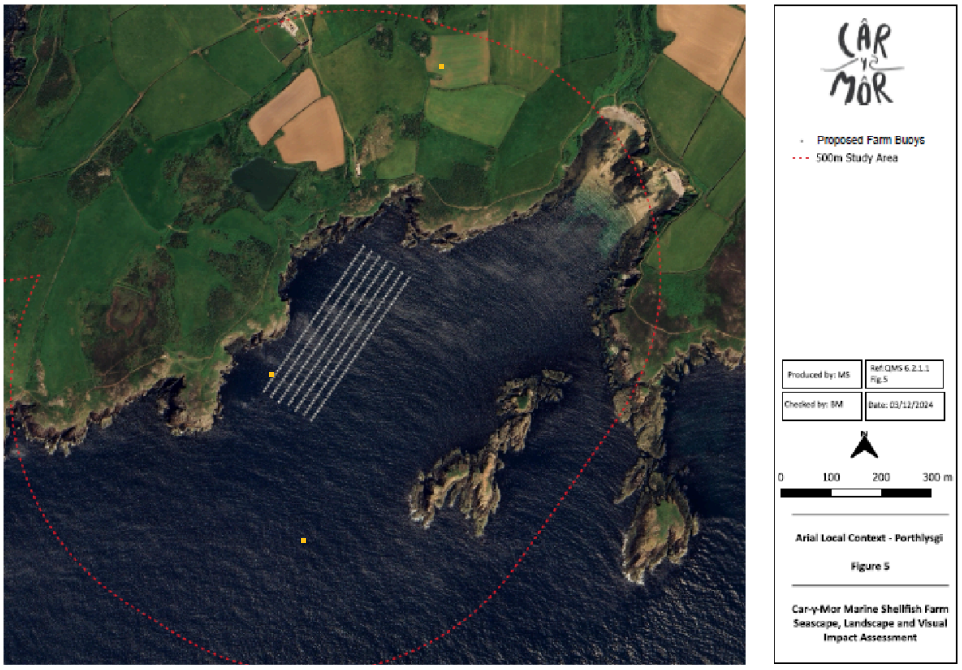


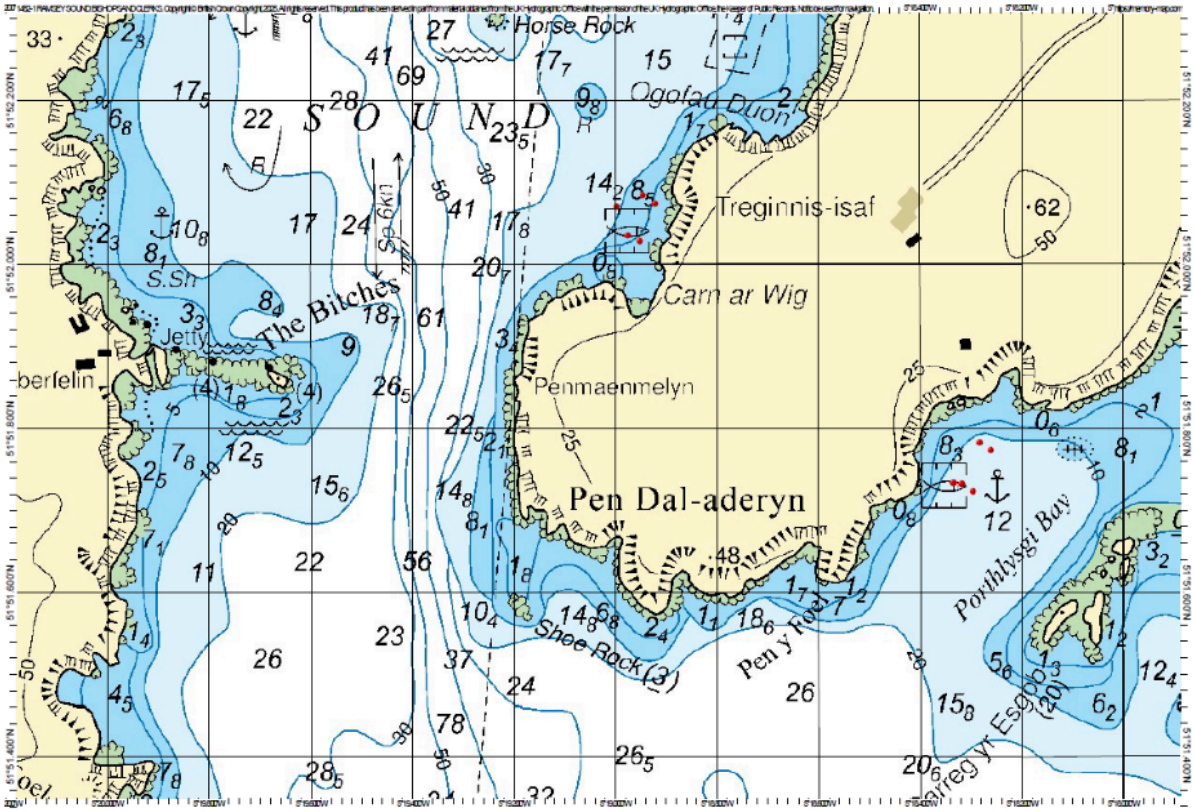
Fig 4 – New Porthlysgi aquaculture farm layout

02 Cârr-Y-Môr – IMTA farm group

Cârr-Y-Môr have used the waters of Ramsay Sound and the shores around the Pen Dal-aderyn peninsula for over 10 years for the hand harvesting of seaweed and the aquaculture of mussels and seaweed. Cârr-Y-Môr have 2 licensed sea farms at Carn Ar Wig and Porthlysgi (Fig 5) using them as Integrated Multi-Trophic Aquaculture systems (IMTA) growing mussels and seaweed from 2019. Cârr-Y-Môr have fully developed the 2 sites and have reached the capacity of the farming structures consented under license Marine License DEML2013. For continued success as a business and to relive overcrowding of mussel growth at their sites, Cârr-Y-Môr seek to re-apply for the IMTA licenses (due to expire by 31/07/2025) whilst also expand both sites to improve animal and crop husbandry and increase capacity to ensure business sustainability.

Cârr-Y-Môr have invested in considerable equipment, currently in water and onshore for the growing and handling of seaweeds and mussels. Investment in buildings and equipment for the preparation of harvests for transport from site for further processing and marketing. Also the investment in time and training for the community based staff. Cârr-Y-Môr are a pioneer in the development of the Welsh aquaculture industry.

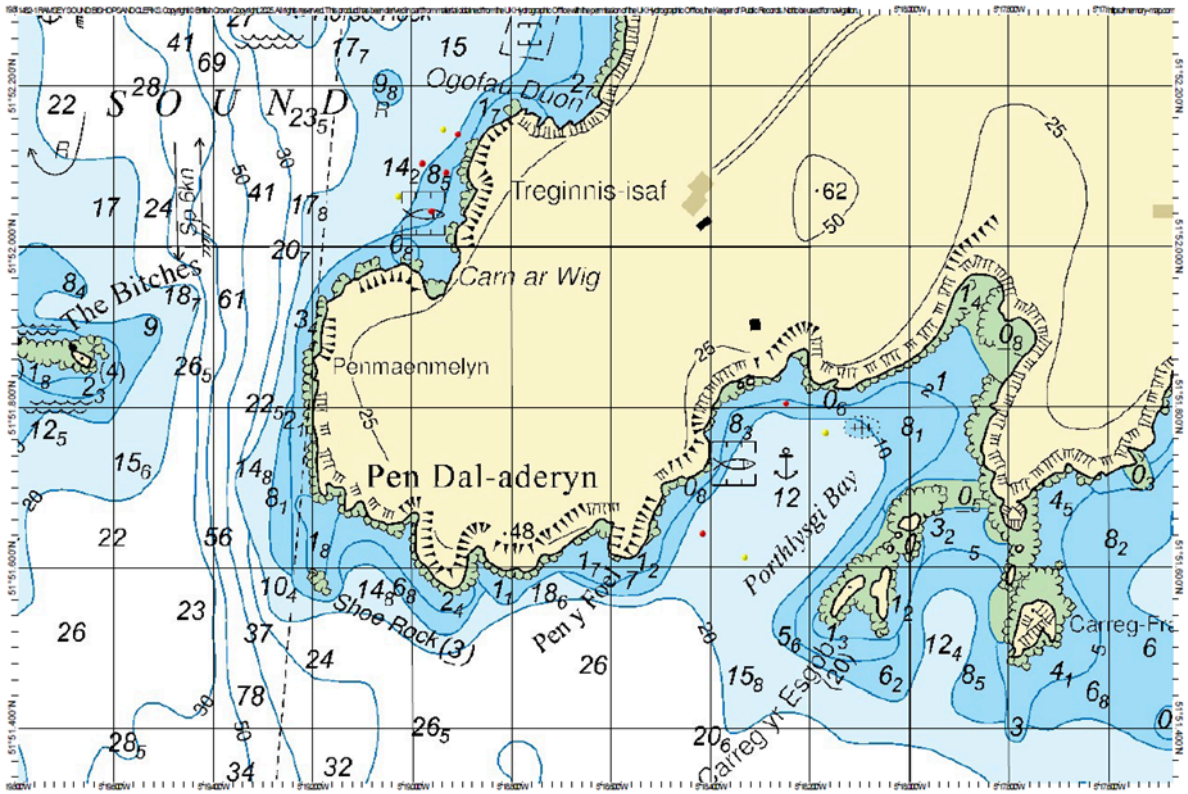
Fig 5 – Cârr-Y-Môr, showing both existing sites.



Different trophic species will require a range of space and structure configurations to develop fully. For example:

- large brown kelps such as *Saccharina latissima* (sugar kelp) will grow up to 4m long in a season, on horizontal growing lines, spaced up to 4m apart.
- mussels require to be tended (regular husbandry to prevent predation by starfish etc), on long vertical droppers spaced 1m apart.

The expanded Cârr-Y-Môr IMTA sites (Fig 6) have been purposely deployed in active waters for the growth of large brown kelps that require higher levels of agitation to grow clean, quality fronds and well flushed by strong tide flow perfect for the filter feeding shellfish.
Fig 6 – Cârr-Y-Môr expanded sites consented area limits (red) and navigation markers (yellow).



Longlines and subsurface structures are made of high quality ropes as standard throughout the aquaculture industry and buoyancy is provided by heavy duty floats. The use of chains are limited to the minimum necessary to extend life of the structure and produce less rust pollution in the water (harmful to both shellfish, seaweeds and the wider ecosystem).

The existing and expanded IMTA farm structures have a low visual and environmental impact. We foresee no indication of risk to wildlife or other marine user interactions. The adapted structures and all farming activity will still be undertaken wholly within the licensed area boundary being applied for and all operations at the site(s) will be undertaken in daylight.

03 Seaweed seeding and operations

Cârr-Y-Môr intend to cultivate several native species of seaweed. At this time, the main seaweed cultivation species at the site will be, Sugar Kelp (*Saccharina latissima*) and Oar Weed (*Laminaria digitata*), with the potential to trial other large brown seaweeds, such as Atlantic wakame (*Alaria esculenta*) and Furbelows (*Saccorhiza polyschides*) to test for natural self-seeding of lines and for their chemical and nutrient content. All these large brown seaweeds or "kelps" are found naturally on lower littoral and sub-littoral rocks on the Pembrokeshire coast.

The Kelps have similar seeding seasons and scatter seeds into the water in late November through to early January. Fruiting bodies develop on varying parts of the seaweeds, near the base of the plants in the case of *alaria*, or along the fronds in the other species. Fertile seeded stock will be collected from local shore sites and will be cultured onto growing medium at a commercial hatchery.

Dulse (*Palmaria palmata*) and Pepper Dulse (*Osmundea pinnatifida*) are valuable, small red seaweeds and Sea Lettuce (*Ulva lactuca*) a valuable, small green seaweed that are native to the area. At the moment they are mostly hand harvested but the technology to cultivate them has been in development by commercial hatcheries. Cârr-Y-Môr wish to include these species in the application in anticipation of viable technology to farm them being available imminently.

The volumes of seeding plants required to be collected will be very small, a standard bucket of fertile seaweed could nurture 20km worth of seeded farm growing line which could produce over 150 tonnes of mature seaweeds.

The process for seaweed farming is to wrap seaweed seed infused string (0.5mm) around growing lines (thin ropes 10mm to 12mm) which are deployed to mimic the seeding cycle of seaweeds in autumn and harvested in late spring before the natural biofouling of other sea organisms spoil the quality of the seaweed crop.

04 Shellfish seeding and operations

Cârr-Y-Môr intend to cultivate the native shellfish blue lipped mussel (*Mytilus edulis*). This has been cultivated successfully at both farm sites for over 5 years and the need for expansion is critical for responsible animal husbandry. Other species such as the Native Oyster (*Ostrea edulis*) and Scallops (*Pecten maximus/Aequipecten opercularis*) are also included in this application.

Blue lipped mussel farming may clash with seaweed farming as the heavy spat from mussels may cover seaweeds and reduce crop and quality levels.

05 Site Designations

Integral to the original license consenting process in 2018 was the scrutiny of Site Designations by the Regulatory Authority Natural Resources Wales (NRW). This Re-licensing process will similarly require full Due Diligence by Cârr-Y-Môr to satisfy NRW that any risks to wildlife and the wider environment are recognised and any mitigation possible taken.

05.01 Protections

Cârr-Y-Môr's two IMTA cultivation sites are situated to the western end of the Arfordir Penfro/Pembrokeshire Coast National Park. This designation allows a Planning Authority special powers to protect the spectacular and environmentally significant coastline of the rugged cliffs and sandy bays, whilst also to promote opportunities for the local population and enjoyment of visitors.

The sea area the farms sit within the large Special Area of Conservation (SAC) designation of Gorllewin Cymru Forol/West Wales Marine SAC, covering a large sea area for the protection the Harbour Porpoise (*Phocoena phocoena*) and Sir Benfro Forol/Pembrokeshire Marine SAC for the protection of the rich biodiverse waters, significant habitats and endangered sea mammals and fish species that thrive locally around the peninsula.

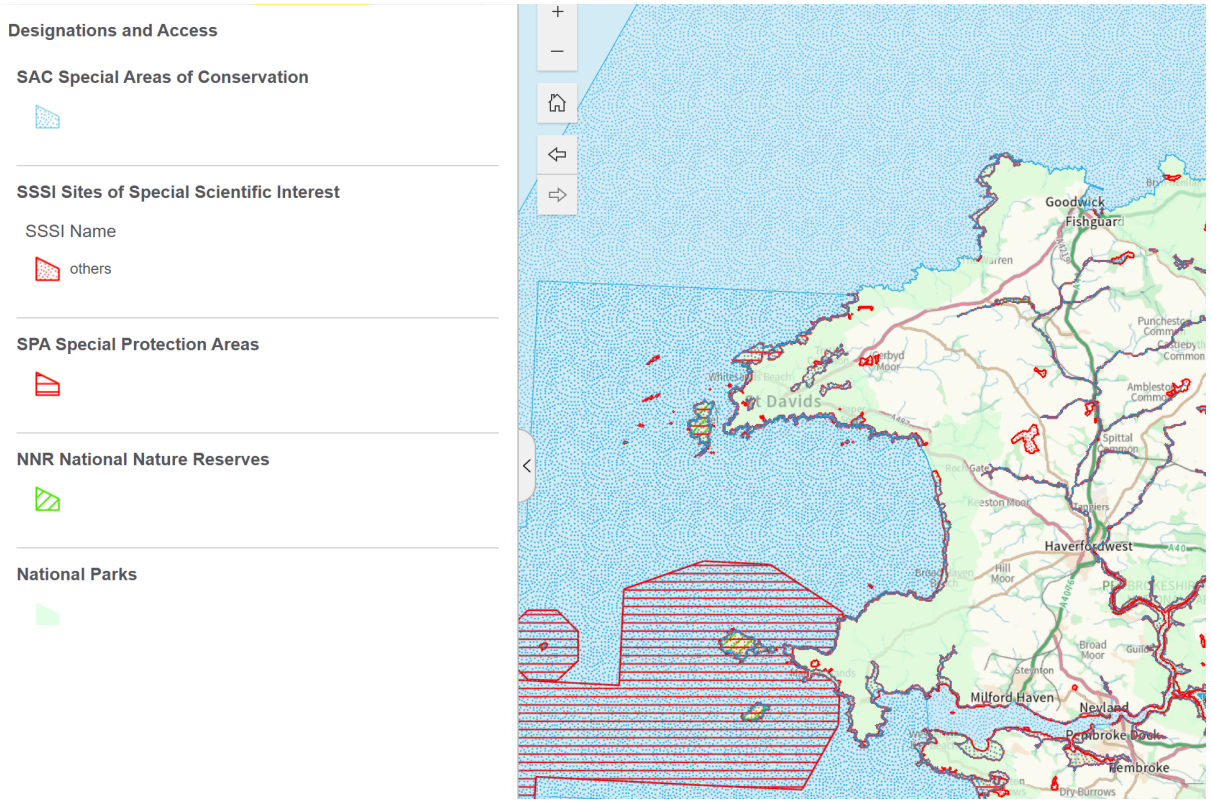


Fig 7 – marine, terrestrial designations of the wider Pembrokeshire area.

The coastline itself around the peninsula is designated as a Site of Significant Scientific Interest (SSSI) St. David's Peninsula Coast SSSI and Ty Ddewi/St David's SAC, also Special Protected Area (SPA) Ramsey SPA and St David's Peninsula Coast SPA. This myriad of designations protect the marine and coastal habitats and wildlife.

To the west of the farm sites sits Ramsey Island which holds multiple designations, being part of the National Park, the Ramsey SPA, but also holding designations as Ramsey SSSI and Ramsey Island National Nature Reserve (NNR). This is in recognition of the island as a vital wildlife location for rare corvid Choughs (*Pyrrhocorax pyrrhocorax*) and other cliff breeding seabirds and is closely managed by the RSPB, maintaining a flock of sheep to graze the vegetation to suit food foraging and nesting of birds.

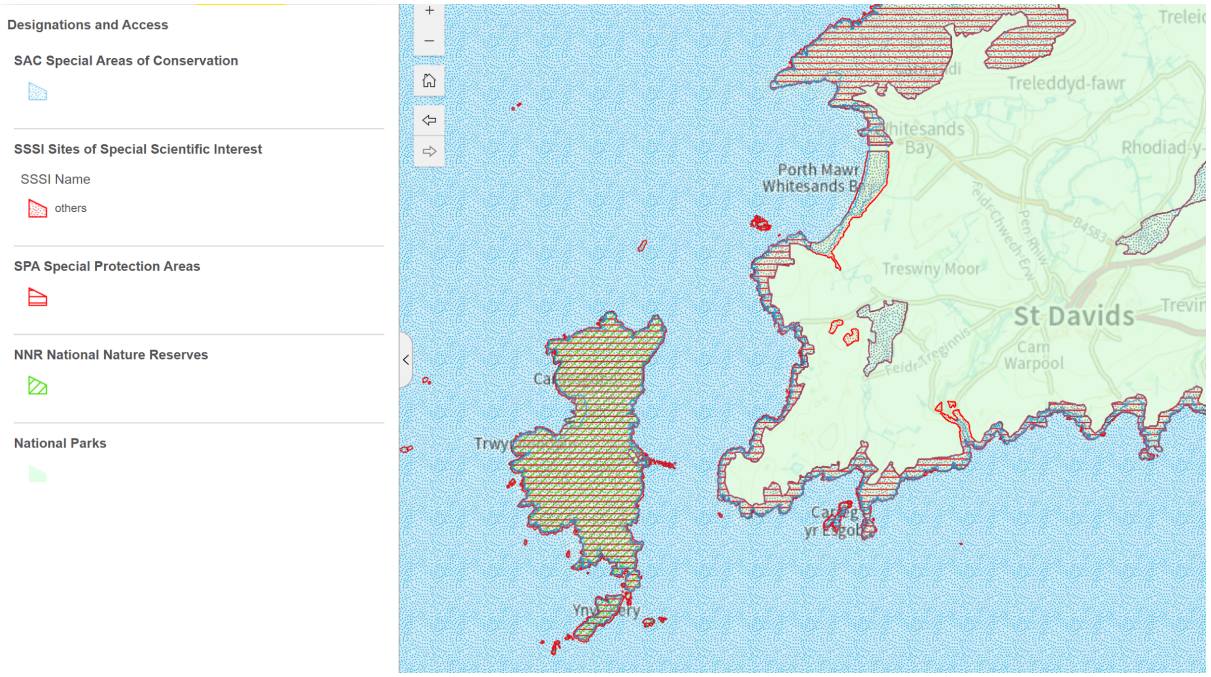


Fig 8 - marine, terrestrial designations of the St. David's Peninsula Coast

05.02 EUNIS Classification

The Habitat classification by EUNIS 2019 for the existing consented area and the expanded sites are A5.13: Infralittoral coarse sediment, Shallow Circalittoral coarse substrate. Dives and anchor remnants at the site back this up (Fig 9).

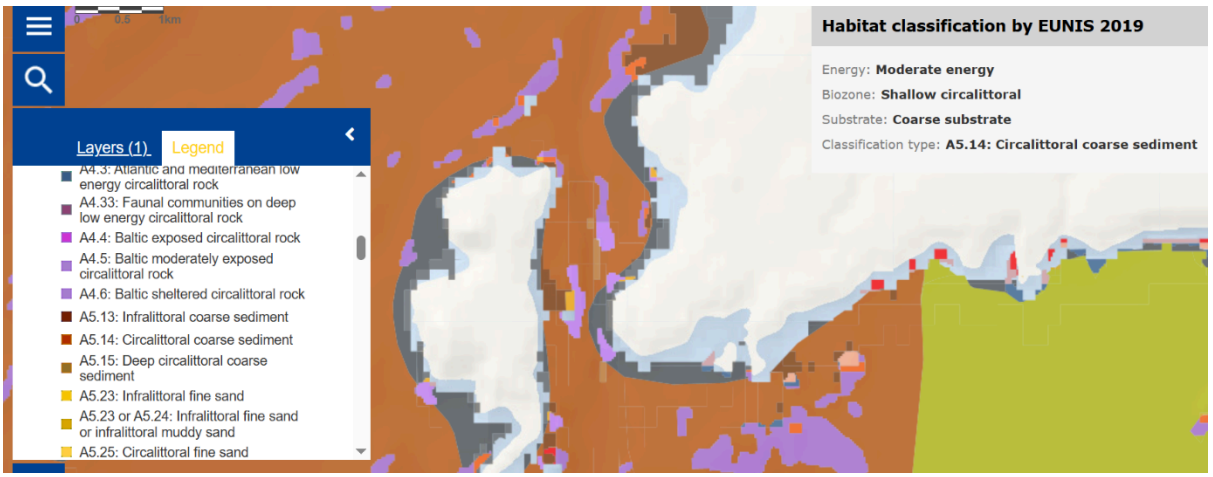


Fig 9 - EUNIS classification for site, probably deep to shallow Circalittoral mud

The existing IMTA and expanded farm sites are clear of Rocky Reefs, which are seen as highly valuable, but vulnerable habitats for marine species. All anchors and subsurface structures will be set on coarse sediment, clear of any rocky reefs. Anchor systems have short lines, retaining a footprint within the consented proposed IMTA farms sites offering low seabed impact.

05.03 Underwater Archaeology
There are no underwater Scheduled Monuments located at the IMTA farm sites, including protected wrecks according to Cadw data.

05.04 Other Marine users
There are no other aquaculture sites near either of the currently consented/proposed expanded sites. Small local creel vessels set pots along the cliff edges near the farm sites, having worked closely with Cân-Y-Môr for a number of years. Most other fishing activities are undertaken in the more open waters of the Irish Sea. None of the local vessels put creels inside the IMTA farms consented areas.

The sea area around the currently consented/proposed expanded sites are well used by passage and local pleasure vessels of a variety of sizes. Small yachts and sea kayakers can be seen near the sites, but as the farms are set back against the coast they are out of the natural sailing space for small vessels and afford easy passage for kayaks between the farms and the coastline.
The activities at the IMTA farm site will not interfere with passage of vessels as it sits tightly to the south coast of the loch, away from the normal navigation transit routes.
The expanded consented areas of IMTA farm sites will be marked in accordance with normal navigational practice for aquaculture sites, with 2 yellow Special Marks. Two documents for Navigational and marine safety can be found in the attachment "4.1 – Cân-Y-Môr Re-license – Carn Ar Wig - NRA MEAC Decom v1.0" and 4.2 – Cân-Y-Môr Re-license – Porthlysgi - NRA MEAC Decom v1.0" which accompanies this application and lays out the marine safety side of the Re-application proposal.

06 Visual Impact

Cân-Y-Môr's two proposed expanded IMTA cultivation sites are situated to the western end of the Arfordir Penfro/Pembrokeshire Coast National Park. This designation allows a Planning Authority special powers to protect the spectacular and environmentally significant coastline of

the rugged cliffs and sandy bays, whilst also to promote opportunities for the local population and enjoyment of visitors.

Visual Impact has been thoroughly consulted upon by the production of a Seascape Visual Impact Assessment for the Pembrokeshire Coast Authority and is added in full in the attachment "6 – Cârr-Y-Môr Re-license – Seascape Visual Impact Assessment v1.0"

From a marine based vantage point, an IMTA farm can be difficult to make out from the land background and the dark colours of the water itself. IMTA farms have a low profile, with the visible surface equipment being a series of parallel farm headlines, with buoys every 10m. These permanent structures of the farm blend in with the dark shoreline, ensuring minimum visual impact.

The seabed anchoring system sinks well into the coarse benthic materials and are kept well away from any rocky reef systems nearer the shore. The sub surface structure of the farm systems will be constructed of heavy duty synthetic ropes to minimise the use of steel chains (which wear faster and pollute the area with rust). There are no rocky peaks within the farms' footprint. All growing structures (seaweed and shellfish) will be deployed and held under tension subsurface between 1.5m and 5m depths.

The most visible indicator of the farm will be Special Mark buoys placed to clearly mark the outer seaward limits of the site for mariners and will be a condition of Re-licensing. This is standard aquaculture marking of sites, the specific details of these special marks are given as;
a) The sites are to be marked to the most seaward corner, with 2 x lit yellow buoys each, fitted with yellow ''X' topmark.
b) Each light displays a character of flash one yellow every five seconds (Fl Y 5s) with a nominal range of 2 nautical miles and is installed above the 'X' topmark.
c) The buoys are approximately 1 metre in diameter at the waterline with the focal plane of the light 2 metres above that level, the 'X' topmark is greater than or equal to 50cm length by 7.5cm width.

07 Wildlife Considerations and the environment

Seaweed and shellfish cultivation are relatively benign forms of aquaculture. The seaweed plants need no more than sunlight and both need ocean nutrients to grow. There are no feed additives or waste from the plants or animals.

Seaweeds are plants, so the growing lines are laid horizontally to receive the optimum amount of sunlight. Mussel lines hang vertically. The lines are spaced out to allow water flow for nutrients to reach the plants and shellfish to catch food particles flowing through the site. Seaweed requires relatively more surface area than other forms of aquaculture. This we will hope to balance out by the farming of mussels hung under the rafts and headline floats. The impacts for low trophic IMTA farming are considered low or 'not significant' given the lack of waste these systems produce.

Cârr-Y-Môr are aware of the potential for impact on wildlife, most notably seabirds, seals and cetaceans which the wider area has varying designations for. From observations at other seaweed farms and sea farm sites, it has been noted that wildlife can become tolerant of low level human activity especially when kept out of sensitive breeding times and kept at respectful distances.

07.01 Bird and Pinniped Entanglement

The IMTA sites will use no nets in the cultivation process for crop protection (e.g. as netting against eider ducks on mussel farms or anti predator netting against seals on fin fish farms). These nets are known to cause entanglement of diving birds and seals.

07.02 Seal Haul outs

Harbour seals (*phoca vitulina*) and grey/Atlantic seals (*halichoerus grypusare*) are both European Protected Species (EPS) and as such have legal protection from harm, disturbance and habitat interference. Both seal species are regularly seen in the area, feeding in open water and basking on the rocky shores. Both farm sites are off from the coastline and therefore no activities will involve landing vessels and personnel onto the coastline. This will keep all activities well out of visual sight from any beached seals.

As mitigation to avoid seal disturbance, all of Cârr-Y-Môr's activities will be well outwith the 100m distance that "The Pembrokeshire Marine Code" recommend as safe to avoid disturbance should you encounter a seal or other wildlife at sea. Transit routes to and from the sites will avoid tight shore passage to the Cârr-Y-Môr shorebase/slipways.

Cârr-Y-Môr vessels and crew will be carefully trained on how to interact with wildlife. Many Cârr-Y-Môr vessel staff will be local to the area and are already involved in fishing or marine wildlife work and therefore be fully aware of the value of an undisturbed wild environment and the legal and moral obligations of limited interactions with wildlife.

The peak times for kelp seaweed operational activity at the existing farm site is October/November for Growing Line deployment and late March through early May for harvesting (timing will be subject to agreement with statutory consultees to avoid the most sensitive timescales locally). Peak times shellfish farming vary but are low impact and follow similar transit routes for vessels as used for kelp seaweed farming.

Cârr-Y-Môr vessels will never intentionally steer toward seals seen in the water. Vessels will slow or where safe to do so, steer to avoid seals seen in the water. Additional advice around slowing and stopping vessels to prevent disturbance has been given and will be adhered to.

07.03 Cetacean Entanglement

Whilst there have been no reported cases of entanglement of cetaceans in kelp or shellfish longline farming (Kraus et al., 2005[1]; NOAA, 2016[2]), Cârr-Y-Môr are designing IMTA farms with wildlife in mind. It is nearly impossible to entangle in a taught rope. Farm design will ensure that lines are held taut at all times and sea states. Most cases of cetacean entanglement is evidenced to be from discarded fishing nets (ghost fishing) or from loose mooring lines or creel ropes.

Cârr-Y-Môr's research on NBN Atlas Wales within a 10km radius of St Davids, has found multiple sightings of the harbour porpoise (*Phocoena phocoena*) recorded mainly in the waters of the in the waters of Ramsey Sound, but they are a common sight in the seas along the Welsh coasts, hence their protected status in the area (see **04 Site Designations**). A navigational risk assessment has been produced for each IMTA farm site, which includes emergency contact details to various organisations, including BDMLR This can be found in the attachments "4.1 – Cârr-Y-Môr Re-license – Carn Ar Wig - NRA MEAC Decom v1.0" and 4.2 – Cârr-Y-Môr Re-license – Porthlysgi - NRA MEAC Decom v1.0".

Cârr-Y-Môr staff will visit the expanded IMTA farm sites at a minimum of once a week (weather allowing) and will contact this number if there is any concern over a cetacean in the farm lines. Cârr-Y-Môr staff will be encouraged to attend the BDLMR courses, and we will assist in strandings and entanglements of animals wherever they may happen locally. The existing farm requires no acoustical deterrent devices (ADDs) to ward seals off. As with seals, Cârr-Y-Môr vessels will never intentionally steer toward cetaceans seen in the water. Vessels will slow or where safe to do so, steer to avoid cetaceans seen in the water.

07.04 Foraging and Breeding Bird disturbance

Cârr-Y-Môr's research has found many thousands of seabird records over many decades entered on NBN Atlas Wales within a 10km radius of St Davids. Seabirds are often seen roosting on the buoys of similar seaweed and mussel lines at this and other aquaculture sites. They are an important resting provision for foraging birds throughout the year, but particularly in the breeding season.

Cormorants, shags and various gulls can regularly be seen perched on the surface floats of the IMTA farms whilst harvesting was maintenance are underway. These birds would have been in the stages of nesting and feeding of offspring but seem undeterred by the vessel and human operations. Diving birds of various species are often observed swimming down below the surface structures to hunt (cormorants and shags are the most seen birds at aquaculture farms). The IMTA farm attract many small fish (particularly juvenile lumpsuckers), crustaceans and other arthropods, molluscs and various Annelida.

At the IMTA farm sites, it is not uncommon to see various divers over winter and throughout the summer. Vessel movements around sea farm sites do not dislodge the birds from roosting

[1] https://www.researchgate.net/publication/7704221_North_Atlantic_Right_Whales_in_Crisis
[2] https://media.fisheries.noaa.gov/dam-migration/wcr_2016_whale_entanglements_3-26-17_final.pdf

on the floats or scare them off from foraging. Birds very quickly become tolerant of the human activity at the sites.

The IMTA farming vessel activity predicted by Cârr-Y-Môr at their farm site will be low level (a day or a few days per week on only a few weeks of the year) using small vessels (6m to 13m vessels), that are similar or the same vessels that will work and transit through the sea area throughout the year. We believe that any local birds or other wildlife will be tolerant to our levels of activity.

07.05 Benthic data and seabed disturbance (of PMFs)
The Habitat classification by EUNIS 2019 for the existing consented area and the expanded sites are A5.13: Infralittoral coarse sediment, Shallow Circalittoral coarse substrate. Dives and anchor remanets at the site back this up (Fig 9).

To secure the IMTA farm structures so they are robust enough to survive winter storms for many years, the farm is anchored to the seabed with steel 250kg and 500kg anchors. These anchors are designed to dig in to the coarse benthic material of the farm site. They quickly bury deep into the sediment and form a secure anchor to carry the load of the subsurface structure and floating surface structure.

Cârr-Y-Môr are confident that other than the obvious impacts to the direct spots on which the anchors are set, that operational activities will have a negligible impact on the benthic conditions of the site.

This has been discussed with NRW and a **Benthic Monitoring Plan** for both IMTA farm sites set up. Consideration has been given that there are no chemical or feed additions, no faecal or wate deposits and that outputs, beyond the initial damage dome during the initial construction phase where anchors are laid, there is negligible impact on immoveable PMF species under or near a IMTA aquaculture site. As a benign aquaculture method, IMTA farming provides more habitat enhancements (roosting, feeding etc) than any negatives.

07.06 Eurasian Otter (*lutra lutra*) disturbance
Otters are a European Protected Species (EPS) and as such have legal protection from harm, disturbance and habitat interference. Cârr-Y-Môr's research has found many otter records over the decades entered on NBN Atlas Wales within a 10km radius covering the sea farm site. Also, from discussions with local residents and marine users around the area, it was confirmed that otters are regularly seen on the shorelines, crossing roads and near rivers across the area, and that they had heard other residents discuss seeing otters as well.

We have applied the precautionary principle and the section below discusses potential for disturbance to otter during operation of the IMTA farm. Otters are regularly seen on in most parts of the Pembrokeshire coast. They can be remarkably tolerant of people, vehicle and vessel movements.

Nothing in Cârr-Y-Môr's development or operational phases of the IMTA farm will constitute a threat to the life of an otter. Nor will any part of our operation touch land to damage or destroy their holts or holes. Landing of the seaweed uses established piers.

The discussion on potential sources of disturbance can be split into 3 parts;

07.07 development phase disturbance
Any development work at site eg, weight or structure replacement, maintenance or repair will be of short duration (estimated less than a few days, weather dependent). It will likely require the 13m work vessel Cär-Y-Môr's to lay any anchors accurately into the seabed and to use winches to pull tension on ropes and lines. No cables will be strung to the coastline. All anchors will be laid in sublittoral positions and all ropes strung from these anchors head directly away from the shore to subsurface structures.

Otter disturbance guidance suggests that "If otters are known or suspected to be breeding, the exclusion zone should normally be at least 200m radius. However, it could be reduced to 100m depending on the nature of the works, topography and natural screening. For shelters, or holts where otters are not breeding, the boundary of the exclusion zone should be a minimum of 30m.". These exclusion zones are nominally looking at physical changes to the land near otters. As the IMTA farms will be sited off from the coastline and will not physically touch or alter the holt or hole of any otter, we would hope that the 30m rule would apply as a maximum. And the fact that the farms already have been in place for many years is taken into account. It could be argued that the most direct disturbance to the otters could be the presence of any surveyor conducting an otter habitat survey on the shoreline itself.

A male otter's territory can be significant, using 20 km of rivers and coastline to hunt and defend up to 3 females against intrusion by other males. The female otters form sub-territories within, in which they produce up to 3 cubs, usually in early summer. The mother will rarely leave them for the first 10 weeks from birth at which point the cubs will begin to become mobile. They will then follow their mother as she hunts and suckles the young. She will use multiple holts and holes to dry off (otters don't like being wet!) and to sleep (which they do for more than half the day). They will nurture the cubs for a year up to 18 months to teach them to fish by catching and releasing live fish for the cubs to re-catch.

It is difficult (without the aid of photo traps) to assess whether otter shelters or holts are being used by a breeding otter or not as females with cubs reduce sprainting to avoid detection. Indeed, it is an offence use photo traps without appropriate licenses.

No works that are undertaken fall within the minimum 30m exclusion zone. The minimum distance from the Mean Low Water Spring (MLWS) and distance to Mean High Water Spring (MHWS) is 30m (sheer shoreline) to avoid encroaching into the shoreline areas. The predicted timing of any upgrades to the IMTA farm structures is late summer, which will coincide with any otter cubs becoming fully mobile.

07.08 Operational phase disturbance
All farming operations will take place in daylight. Seaweed deployment periods will be October to November for seaweed line deployment. Seaweed harvesting periods will be from mid-March through into late-May. The mainly nocturnal nature of otters will hopefully allow us to present no disturbance to feeding patterns. Shellfish work will be occasional and mostly confined to the late spring to early autumn time window. Winter weather will discourage small boat work at the sites, beyond occasional visits to check the IMTA farm structures (a condition of license consent).

See "6 - Car-Y-Mor license - Marine Mammal Entanglement protocol" for further details on proposed protocols relating specifically to Marine Mammals.

07.09 Ongoing presence and its effects
For the greater part, the IMTA farms will be left unattended by vessels. Outwith the operational phases (including all evenings, nights and weekends during the operational phases) little or no activity will take place over the winter months of September to April. Farm activity to tend lines, set lines or harvest will be modest, one to two days a week for a few weeks at the busiest periods.

A brief diurnal phase of otter feeding during the shortest days of the year will coincide with the winter slow growing period, where the IMTA farm is left mostly unattended save for occasional visits by small boat to check condition of the farm structure (a condition of license consent) and to take samples for quality and growth monitoring. We will ensure we do not visit the site near dawn or dusk to prevent disturbance to otter feeding times during the hard winter months. This is also a good practice for safe use of small vessels in winter.

07.10 Water column and seabed shading
IMTA cultivation Growing Lines are placed out at sea on the farms at various times of the autumn months and the lines over-winter there. Shellfish are laid out in low density dropper lines or small lantern baskets and have a negligible effect on shading.

Seaweed growing lines are laid in autumn and the seaweed grows rapidly February through to April and harvested out by end of May/June. The low angles of the sun in the spring months the estimate of shading of the seabed and water column is less than 1% in Dec, less than 4% in Jan, less than 7% in Feb, less than 10% in Mar, less than 15% by end of April and the seaweed is harvested out by end of May. The chosen sites of the IMTA farms are coarse benthic sands. It is therefore calculated that the IMTA farms will have a negligeable effect from shading on the wider marine environment.

07.11 Nutrients
Low trophic IMTA cultivation does not require the input of feed or conditioning chemicals. All the plants require to grow is sunlight and the shellfish a flow water as they draw in nutrients and minerals essential for their growth. These are then available to us when we consume the crop. Cár-Y-Môr's IMTA farm sites are in a relatively active sea area which attracts significant tidal currents flows. These strong tides replenish the nutrients constantly preventing nutrient depletion in local waters.

08 Cârr-Y-Môr Biosecurity Plan

This section forms the basis of a stand alone policy that will be broadened and become Cârr-Y-Môr's Biosecurity Plan. In addition to this section, please see the proforma Biosecurity Plan (Annex 1 – Biosecurity Plan – Mock Template).

08.01 Invasive non-native species (INNS)

INNS are one of the biggest global threats to biodiversity, undermining the inherent resilience of ecosystems and causing significant economic costs for sectors such as agriculture and fisheries. Along with disease transfer, INNS cost £billions per year globally in harvest and infrastructure damage and the loss of local biodiversity presents an incalculable threat to future generations.

Cârr-Y-Môr have based their Biosecurity Plan around such publications as NRW's - Marine Biosecurity Planning. Cârr-Y-Môr will lay out each part of their existing farm operations and then describe the actions they will ensure are undertaken to protect from transfer of INNS or disease.

It is considered that overall, INNS are a Low Risk issue for IMTA aquaculture as the main materials used for cultivation are placed in the water for only short periods (6 months to 18 months) before being removed and replaced or cleaned thoroughly for reuse. No feeding barges or cages are used in seaweed cultivation and no equipment or vessels transfer to other aquaculture sites other than their own farm sites which are roughly 3km apart by sea and road.

Only native species will ever be grown on Cârr-Y-Môr's IMTA farms and seed stock taken from the local area only. No seed stock of non-native species will be brought in. All equipment used will be thoroughly washed before and after use to prevent the spread of INNS. Cards showing the common INNS species will be supplied to staff and contractors to identify potential INNS growth on the farm structure.

All Cârr-Y-Môr staff and contractors will be trained in INNS recognition via ID cards placed on vessels, shore bases and at the Cârr-Y-Môr's processing Hub and an effective reporting process put in place. In the event of the positive identification of an outbreak, staff will ensure that no product affected leaves the site. Any equipment and ropes affected will be taken ashore and will be treated and Nature Scotland informed immediately. Low Risk

We do not envisage disease issues at our IMTA farm site but our crop and animal husbandry practices around seaweed, mussels and oysters will remain vigilant. All equipment and growing lines deployed will be returned to shore for cleaning or disposal. Low Risk

08.02 The Farm Site

Both the existing sites of the IMTA Group at Cârr-Y-Môr are over 1.5km from the nearest habitation on the coastline. As such the site is well away from any direct sewage or chemical outputs from direct source pollution.

Cârr-Y-Môr will ensure that all harvest taken from the farm sites will be washed ashore in fresh water at their processing Hub. The waste water from their processing is disposed through the areas' traditional Sewage Treatment Works (or septic tank system), which digests any materials in a microbial process, destroying and organic contaminant. Plant waste from the processing will be taken to be composted locally. No waste material from Cârr-Y-Môr's processing activities will find its way back into the sea. Low Risk

08.03 Seaweed Species

Cârr-Y-Môr intend to cultivate several native species of seaweed. At this time, the main seaweed cultivation species at the site will be Atlantic wakame (A*laria esculenta*) and Sugar Kelp (*Saccharina latissima*). These large brown seaweeds or "kelps" are found naturally on lower littoral and sub-littoral rocks on the shores of Loch Etive. Other large brown seaweeds, such as potentially Oar Weed (*Laminaria digitata*) and Furbellows (*Saccorhiza polyschides*) may also be trialled to test for natural self-seeding of lines and for their chemical and nutrient content.

The Kelps have similar seeding seasons and scatter seeds into the water in late November through to early January. Fruiting bodies develop on varying parts of the seaweeds, near the base of the plants in the case of *Alaria*, or along the fronds in the other species. Fertile seeded stock will be collected from local shore sites and will be cultured onto growing medium at a commercial hatchery.

Dulse (*Palmaria palmata*) and Pepper Dulse (O*smundea pinnatifida*) are valuable, small red seaweeds and Sea Lettuce (*Ulva lactuca*) a valuable, small green seaweed that are native to the area. At the moment they are mostly hand harvested but the technology to cultivate them has been development by commercial hatchery companies. Cârr-Y-Môr include these species in the application in anticipation that the technology to farm them will be available imminently.

The volumes of seeding plants required to be collected will be very small, a standard bucket of fertile seaweed could nurture 20km worth of seeded farm growing line which could produce over 150 tonnes of mature seaweeds.

All laboratories that Cârr-Y-Môr will employ in the duty of seaweed seed production will be fully accredited and work to hygiene standards to ensure no cross contaminated of seaweed stock (or diseases) are brought back to Cârr-Y-Môr's site. Low Risk

08.04 Shellfish Species

Cârr-Y-Môr intend to continue cultivation of shellfish native species blue lipped mussel (Mytilus edulis). Blue lipped mussel farming may clash with seaweed farming as the heavy spat from mussels may cover seaweeds and reduce crop and quality levels. So staggered farm rotation will be employed to ensure sites best suited to the species required are used.

No equipment or ropes based at the farm sites will be moved to another site outwith Cârr-Y-Môr's IMTA farming group and no equipment or ropes used on another company's site will be brought in. Any equipment or ropes brought ashore from the Cârr-Y-Môr farm sites will be treated by cleaning with fresh water above the high tide mark. All equipment stored ashore will be kept separate from equipment from any other sites.

Any equipment that has accumulated crustaceans or algae on them that is brought ashore will be washed down with fresh water and along with air exposure cause the demise of sea grown fouling. Low Risk

08.05 Onward Processing

To ensure the IMTA farm produce retains its quality it will be landed locally and loaded onto temperature controlled vehicles for onward delivery to be processed.

Drying is the main processing method used at this time for seaweeds. Water content is be reduced through compressing or spinning equipment before chopping then drying at low temperatures. This creates a stable, storable product that can be rehydrated as a future new ingredient. Cârr-Y-Môr has invested heavily in a biorefinery, which will allow we seaweed to be processed at low temperature into various products such as biostimulants and soil conditioners. This allows a less energy hungry type of processing, and therefore a lowered carbon footprint.

Shellfish have many local routes for further processing and distribution to a wide and well developed market.

For all processing routes, Cârr-Y-Môr will ensure that all harvest taken from the farm site will be washed onshore in fresh water at their processing Hub. The waste water from their processing will be disposed through the areas' traditional Sewage Treatment Works (or sceptic tank system), which digests any materials in a microbial process, destroying and organic contaminant. Plant waste from the processing will be taken to be composted locally. No waste material from Cârr-Y-Môr's processing facility will find its way back into the sea. Low Risk

08.06 Lost Lines and Site Waste

The IMTA farm sites will be visited on a weekly basis throughout the year to ensure the structure and any growing lines deployed are fixed and tensioned appropriately. Any broken lines will hopefully still be attached at one end and so can be recovered and either reattached or removed. During fallow periods the visits will be a simple passing visit by a local vessel to ensure all floats are present and that all is well with the site. There are no chemicals or cleaner additions to the water column at the site from any of Cär-Y-Môr's activities.

Any waste generated from the project will be disposed of ashore through local, certified commercial waste disposal. All ropes and equipment will be stored ashore during fallow periods of the farms. And all cleaning of ropes and equipment will be done ashore. There are no Special Waste requirements envisaged.

Cär-Y-Môr are forming research partnerships with multiple leading universities. Ongoing areas of research include biodegradable Growing Lines. At this time, operations will use tried and tested techniques and equipment, but also trialling, and in time hopefully fully committing to using ropes for our Growing Lines with an ability to breakdown harmlessly in the environment. It is hoped the resultant ropes will not be based on hydrocarbon derived plastics.

09 Annex 1 – Biosecurity Plan – Mock Template

MARINE BIOSECURITY PLAN

Site Name or Description of Operation:	IMTA Farm X
Site/Operation Location(s):	Cârr-Y-Môr (Site 1), Near shed and pier
Plan period:	Aug 2025 to Aug 2026
Biosecurity Manager:	Owen Haines

Site features affecting biosecurity:

Salinity	Full - 32 and 34 grams per litre
Submerged structures	2 x Special Marks (2 anchors and risers)
Surface structures	14 x 100m longlines
Non-native species known to be present	None

Vessel types using the site/involved in the operation:

	Vessel type	Risk factors; Pathway, speed, biofouling control	Risk: High/Medium/Low
1	Landing craft	Local harbours to site, 8 knots, vessel antifouled annually	
2	Harvest Boat	Local harbours to site, 8 knots, vessel antifouled annually	
3	Creel boat	Local harbours to site, 8 knots, vessel antifouled annually	
4			
5			
6			

Site Activities which have a significant risk of introducing or spreading non-native species:

	Activity Description
1	No activities are seen as significant risk of introducing or spreading INNS

2	
3	
4	
5	
6	

Biosecurity Control Measures – Instructions for staff/contractors/site users:

Who	What	Where	When
Charter Vessels	Biosecurity Plan	Given to Charter company	Before contract commences
Farm staff	Biosecurity Plan	Training given to staff by Farm Manager	On induction, annually reviewed
Processing Staff	Biosecurity Plan	Training given to staff by Processing Manager	On induction, annually reviewed

Site surveillance and reporting procedure:

Site Reporting log (aka MEAC log)	All activities relating to the farm site to be logged. This includes (but not limited to) debris entanglement, damaged lines, any wildlife interaction (including sightings of cetaceans), vessel interactions, suspected INNS

Contingency Plan:

Action	Responsibility	Location of Equipment
Suspected INNS found on Structure	Farm Manager	On vessels
Suspected INNS found on Growing Lines	Farm Manager	On vessels
Suspected INNS found amongst Harvest	Processing Manager	In Processing factory

Location of biosecurity logbook:

With Farm Manager

Plan Review Date: 01/08/2026