



Pen Llŷn a'r Sarnau Special Area of Conservation

Porthdinllaen Seagrass Project

Information Note

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Pen Llŷn a'r Sarnau



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# 1. Introduction

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## 1.1 *Pen Llŷn a'r Sarnau Special Area of Conservation (PLAS SAC)*

Because of the varied and unusual underwater landscapes, type of habitat, and the amazing animals and plants that live in the area, the coast and sea area around the Llŷn peninsula and north Cardigan Bay is protected as the Pen Llŷn a'r Sarnau Special Area of Conservation (PLAS SAC) – a wildlife conservation site that has earned its designation as one of the best wildlife areas in Europe (the SAC designation is made under the EC Habitats Directive which is helping implement globally agreed targets to help prevent loss of biodiversity). This large SAC encompasses the Llŷn peninsula to the north, Tremadog Bay, and the Sarnau reefs in its southern half, as well as the large estuaries along the coast of Meirionnydd and north Ceredigion.



Figure 1: Map of PLAS SAC

The SAC has a Relevant Authorities Group (RAG), which consists of Natural Resources Wales, Gwynedd Council, Powys Council, Ceredigion Council, Welsh Water, Severn Trent, Snowdonia National Park Authority and Trinity House; these are organisations with a particular remit in the marine environment. Being part of the RAG supports delivery of their responsibilities to the SAC and helps promote collaborative working to meet these authorities' commitments to achieve favourable management of the SAC.

The role of the RAG is to oversee the management of the SAC and, through working as a group, identify actions and share learning and resources to manage the site and integrate this with other work/initiatives. There is a SAC Officer for the site who facilitates the

RAG, working with them to deliver aspects of SAC project work, helping ensure commitment from their authority to fulfil their duties towards the SAC, and by leading the implementation of specific management projects. The SAC also has a Liaison Group consisting of a large number of representatives from different industries and interest groups around the site. The Liaison Group acts as a forum for a wider group of interests to be involved in developing and implementing the management of the site. The RAG and the Liaison Group together provide the existing PLAS SAC management structure.

Some of the projects identified by the RAG and Liaison Group and co-ordinated by the SAC Officer include:

- Porthdinllaen Seagrass Project – addressing impacts on seagrass
- Dolphin Watch – addressing cetacean disturbance issues
- Llŷn Marine Ecosystems Project – working with the fishing industry on various projects
- Marine Code
- Marine litter project
- Morfa Gwylt Project – addressing issues on the Morfa Gwylt lagoon
- Numerous raising awareness projects such as school visits, website, social media, events etc



## 1.2 Porthdinllaen



Porthdinllaen is a small coastal village on the north coast of Pen Llŷn near the village of Morfa Nefyn. It is a spectacular location comprising of a small number of buildings with the Tŷ Coch pub at the centre.

Porthdinllaen was originally a fishing port due to the large sheltered bay and over 40 ha of sheltered anchorage. This natural harbour is the main safe haven for vessels for miles around. Today, due to the natural sheltered conditions of the bay, a number of small scale fishing vessels as well as a large number of recreational vessels use Porthdinllaen.

Porthdinllaen has a long history as a harbour of refuge. In 1864 a boat shed and slipway were commissioned to support a lifeboat, which has been manned ever since.

The National Trust has owned Porthdinllaen since 1994. Vehicular access to the village is restricted to tenants and fishermen so visitors must walk across the beach from Morfa Nefyn (tide permitting) or walk across the golf course on top of the headland.

Porthdinllaen is also special for its landscape, seascape and wildlife. The sea around Porthdinllaen holds a wealth of habitats and species including seagrass. At low tide, the seagrass can be seen extending out into the bay.

This information note has been prepared to provide more information about seagrass, the issues facing it and to stimulate discussion about how it can be looked after now and for future generations.

### 1.3 *What is seagrass and where is it?*



Seagrass is a flowering plant that grows mostly on muddy and sandy shores, but can also live completely submerged in shallow water locations such as Porthdinllaen, where the water is clear. Seagrass has green ribbon-like leaves, about 1 cm wide, and looks very much like the grass you find on land. Like flowering plants on land, seagrasses produce flowers, fruits and seeds (although these can be difficult to see) and, because of their underground root system they contribute oxygen into the sediments where they grow, making these areas a great habitat for small animals. They also require high light levels to grow and shelter from physical stress such as waves and strong currents. Because of this, seagrass is only found in harbours, estuaries and well protected bays where it can form dense beds or meadows.

Seagrasses grow in shallow coastal waters in many different countries of the world, with different species favouring different areas. In the UK there are two seagrass species, only one of which is able to live permanently submerged. Although they are able to survive all around the UK, in the last century at least 80% of the UK's seagrasses have been lost, principally due to disease. Poor water quality, coastal development, dredging, pollution and repeated localised disturbance from coastal activities have hampered recovery and, in many areas, further contributed to its decline. Seagrass is now classed as a nationally scarce habitat in the UK, and in Wales now only occurs in a few sheltered sites along the coast, such as Porthdinllaen, the Inland Sea (Anglesey), Skomer and in Milford Haven.



### 1.4 *The seagrass beds of Porthdinllaen*

Porthdinllaen is at the northern end of the Pen Llŷn a'r Sarnau SAC. Seagrass is an important component of the SAC and is one of the reasons this area is so special. The

seagrass bed in Porthdinllaen is one of the largest and the densest in North Wales with recent surveys estimating it to cover an area of 286,350m<sup>2</sup>.

### 1.5 *Why is seagrass important / what are the benefits?*

Seagrass beds are an extremely important resource, not only are they important for wildlife but they are also of considerable economic importance and as such contribute to our way of life. Here are just a few examples of how important they are:

- **Estimated value** - It is difficult to quantify the economic value of an ecosystem, but seagrass meadows have been rated as the third most valuable ecosystem in the world preceded only by estuaries and wetlands.
- **Commercial fisheries** –
  - Seagrass beds are used as a nursery ground for a number of commercially important fish due the protection, shelter and food they supply. Juvenile cod, pollock, sea bass, cuttlefish, plaice, dab and mackerel have been observed in seagrass meadows, and herring preferentially lay their eggs in seagrass. Without nursery grounds commercial fish stocks would not be replenished. 37 species of fish have been recorded at Porthdinllaen, 10 of which have commercial value.
  - It has been found that seagrass is more resilient than other habitats to climate change and ocean acidification. So seagrass could become even more important for fisheries in years to come.
- **Tourism** - The high biodiversity found in seagrass supports larger animals such as seals, birds, dolphins and porpoise. This in itself attracts a high number of tourists to the Welsh coast. Seagrass also slows down water currents and traps mud and sand stabilising the seabed, increasing water quality making activities such as swimming and diving more enjoyable. It also absorbs nutrients and pollutants making the sand golden and more appealing to tourists.
- **Natural seashore defence** - With their long leaves and a dense network of roots seagrass is effective at slowing down water currents, dampening the effect of waves and trapping mud and sand, thereby stabilising the seabed. As a result, seagrass provides us with a natural form of seashore defence and can also help to reduce coastal erosion.
- **Carbon sink, nutrient sink and oxygen production** –
  - Plants are essential for producing the oxygen that we breathe. One square meter of seagrass can produce 10 litres of oxygen per day. This means the seagrass at Porthdinllaen can produce enough oxygen for 260 people every day.
  - Plants are not only important for producing oxygen, but they also have a crucial role in absorbing the carbon dioxide we produce. The oceans currently absorb 25% of global carbon emissions, and it is estimated that seagrasses ‘bury’ about 12% of this.
  - Seagrasses are nutrient sinks, absorbing nutrients and chemicals from coastal run-off. An overabundance of nutrients and chemicals can lead to algal blooms that impair water quality and damage seagrasses as well as

other marine life, however a hectare of seagrass absorbs 1.2 kg of nutrients every year - this is equivalent to the treated effluent of 200 people. Therefore, the seagrass at Porthdinllaen could absorb the treated effluent of 5,720 people every year.

- **Increasing biodiversity** - Seagrass often grows in large, dense meadows providing shelter and food for many creatures such as anemones, worms, fish, crabs and algae. As a result, the biodiversity of healthy seagrass beds is high. It is estimated that there about 40 times more animals found in seagrass beds than on bare sand.



## 2 Management and issues

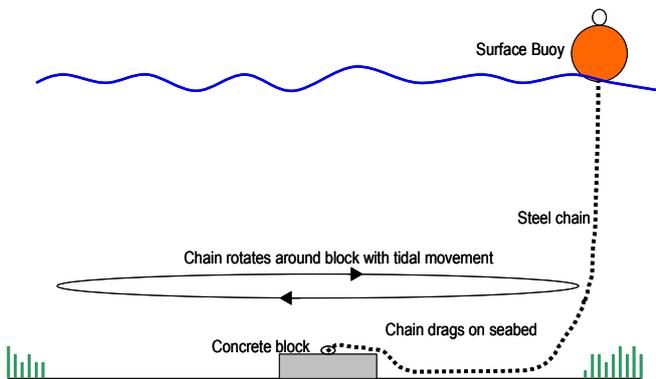
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### 2.1 *What is the issue at Porthdinllaen?*

Aerial images and underwater surveys have enabled us to begin to understand the extent of the seagrass bed in Porthdinllaen and show that parts of the seagrass bed are of a high quality with a dense growth of seagrass plants, see figure 1. However, the same information and surveys have also shown that the moorings at Porthdinllaen are having an effect on the seagrass bed. Mooring chains sweep across the seagrass bed with the shifting wind, tide and swell, removing and uprooting the seagrass, leading to large circular gaps in the seagrass bed, see figures 2 and 3.



**Figure 1: Circular scars visible around traditional fixed moorings in an aerial image of Porthdinllaen. © This orthophotography has been produced by COWI A/S from digital photography captured by them in 2006. Licensed by the Welsh Assembly Government's Department for Environment.**



**Figure 2: Design of a standard mooring system and how it impacts the seabed.**



**Figure 1: Scour impact to the Porthdinllaen seagrass bed by a mooring chain. Image: R. Holt CCW.**

In addition to losing a percentage of the seagrass these bald patches also fragment the seagrass bed so that it is becoming patchy and is no longer a continuous bed. Fragmented beds are more vulnerable to the effects of erosion and to suffocation by loose sand since a lot of the surrounding sand is not being held in place by the root network of the seagrass plants. This could become more of an issue if we experience more stormy weather leading to an even greater loss of the seagrass bed.

Anchoring can also be problematic for seagrass as it can break through, expose the seagrass roots, and uproot the plants. The holes created in the bed can erode and enlarge over time because the seagrass is no longer present to stabilise the sediment. Other low intensity repetitive activities, such as those on the intertidal seagrasses can also impact the seagrass bed. Anthropogenic pollutants also have an impact.

## 2.2 *What can be done to protect the seagrass beds?*

Many areas in the UK and throughout the world are facing the same problems as Porthdinllaen and a variety of approaches are being used to protect seagrass beds whilst also supporting the continuation of activities that occur in these areas. Methods used to protect seagrass beds elsewhere include:

- Changing / adapting existing moorings to seagrass friendly moorings
- Trialling different types of seagrass friendly moorings
- Creating a voluntary no anchor / mooring zone
- Creating an anchor zone
- Having a speed limit around the seagrass beds
- Posters / postcards / information explaining why seagrass is important and why it needs protecting

Porthdinllaen is an important haven for local and visiting boats and is a very popular area for tourists, particularly in the summer months. The challenge is to find a way to support and encourage the continued use of the area as well as ensuring the future health of the seagrass bed. The approaches used in other areas may or may not be appropriate at Porthdinllaen. We would like to hear your views and to work with you to ensure that the seagrass is protected in the best possible way that suits the users of the area.



## 3 Project Plan

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### 3.1 *What happens now?*

This information note has been produced by the SAC Officer on behalf of the Relevant Authorities<sup>1</sup> of the Pen Llŷn a'r Sarnau SAC and the National Trust to provide some background information about the seagrass bed and why it is thought that something needs to be done to look after it for future generations.

This project has been running for a number of years. To date the project has focused on gathering information in relation to:

- The impacts and the extent of these impacts at Porthdinllaen
- The importance of the seagrass bed at Porthdinllaen, especially in relation to local fisheries
- Monitoring

A number of reports have been produced and are available on the Pen Llŷn a'r Sarnau website [www.penllynarsarnau.co.uk](http://www.penllynarsarnau.co.uk).



A lot of work has also gone into ensuring as many people as possible are involved and have an opportunity to discuss concerns and ideas. This has been done via:

- Open days
- Workshops
- Meetings
- Visiting groups, individuals and organisations
- Production of interpretation material
- Social media
- Media (TV and radio)

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<sup>1</sup> The Relevant Authorities for the Pen Llŷn a'r Sarnau SAC include Gwynedd Council, Ceredigion Council, Powys Council, Natural Resources Wales, Welsh Water, Severn Trent, Trinity house and Snowdon National Park Authority



This project will continue to provide opportunities for joint working and be available to discuss concerns and ideas. The next phase of the project will further discuss potential ideas and trial them. It is imperative that solutions support boating, recreational and commercial use whilst at the same time safeguard the seagrass bed.

### *3.2 For more information*

For more information please contact the Pen Llŷn a'r Sarnau SAC Officer or the National Trust Coastal Ranger:

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