

# Detailed Guidance for Seaweed Hand Harvesting



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**Document Owner:** Marine Programme Planning and Delivery Group

# Guidance Note

## What is this document about?

This document contains information on gathering seaweed by hand in Wales. It outlines the importance of seaweed to the marine ecosystem, provides the legal basis surrounding collection and gives advice on sustainable harvesting.

## Who is this document for?

The document is aimed at anyone who has an interest in harvesting seaweed by hand in Wales and would like further information. It is also a resource for those who will be giving advice on seaweed harvesting by hand.

## Contact for queries and feedback

Marine and Coastal Ecosystems Team via NRW enquiries. Email: [enquiries@naturalresourceswales.gov.uk](mailto:enquiries@naturalresourceswales.gov.uk) Telephone: 0300 065 3000.

## Version History

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To report issues or problems with this guidance please contact [guidance.development@cyfoethnaturiolcymru.gov.uk](mailto:guidance.development@cyfoethnaturiolcymru.gov.uk).

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## Crynodeb

Mae gwymon yn adnodd naturiol morol pwysig. Mae cynaeafu gwymon yn weithgaredd mwyfwy poblogaidd a gofynnir i Cyfoeth Naturiol Cymru (CNC) yn amlach am gyngor ynghylch y pwnc hwn. v

CNC yw'r corff amgylcheddol statudol yng Nghymru ar gyfer yr amgylchedd a'n dyletswydd yw ymgynraedd at reoli adnoddau naturiol yn gynaliadwy er mwyn cynnal a gwella gwytnwch ecosystemau a'r buddion a ddaw yn eu sgil.

Mae CNC wedi llunio dwy ddogfen ganllaw ar gyfer y rheini sydd â diddordeb mewn darganfod mwy am gynaeafu gwymon â llaw. Ategir y ddogfen ganllaw fanwl gan ddogfen gryno '*Byddwn yn hoffi cynaeafu gwymon fy hun – beth sydd angen i mi wybod?*', sydd ar gael yn ddwyieithog.

## Summary

Seaweed is an important marine natural resource. The hand harvesting of seaweed is an increasingly popular activity in Wales and Natural Resources Wales (NRW) is being approached more frequently for advice on this activity.

NRW is the statutory environmental body in Wales and it is our duty to pursue the sustainable management of natural resources to maintain and enhance the resilience of ecosystems and the benefits they provide.

NRW has produced two guidance documents for those interested in finding out more about harvesting seaweed by hand. This detailed guidance document is accompanied by a summary document, 'I'd like to harvest seaweed by hand – what do I need to know?', which is available bilingually.

## Key points if you are considering seaweed harvesting by hand

The following summarises the advice for hand harvesting seaweed; see the sections indicated for more information.

- You must gain permission from the landowner before harvesting seaweed (Section 2);
- In some circumstances you will need a licence to hand harvest seaweed; for example, if you are harvesting seaweed for commercial reasons on Crown Estate owned shores, or gathering by hand from a vessel for non-commercial reasons (Section 2);
- You should consult Natural Resources Wales before harvesting seaweed in a protected site. Further evidence may be required by NRW in these cases (Section 4);
- It is illegal to drive mechanised vehicles on to the shore without permission from the landowner;
- It is an offence to cause the spread of certain non-native species (Sections 3 and 6).

## Summary of best practice guidelines for harvesting seaweed by hand

We advise you to read the sections indicated for more information.

- Avoid disturbing sensitive wildlife by keeping at least 100m away, especially in bird nesting season (March-July), areas important for overwintering birds (October-March) and seal pupping season (August-January) (Section 6);
- Avoid or minimise trampling on other plants and species (Section 6);
- If you move any rocks, replace them as you found them (Section 6);
- Cut fronds cleanly with sharp tools such as scissors or knives, well above the point of growth. **Always leave the holdfast attached** (Section 6);
- Try to avoid collecting 'bycatch' of other species attached to the seaweed (Sections 3 and 6);
- Harvest sparsely, taking only a small proportion of attached seaweed from the site (Section 6);
- Rotate harvesting areas to allow ample time for recovery (Section 6);
- Harvest during the active growth season, and after reproduction has occurred if possible (see Section 6);
- Seek advice from NRW if you wish to harvest non-native species (Sections 3 and 6);
- Follow '[Check, Clean, Dry](#)' biosecurity principles for all equipment and clothing before moving between sites (Section 6);
- Do not collect all the drift seaweed from a strandline – harvest sparsely from various locations on the beach (Sections 3 and 6);
- Minimise collecting drift seaweed in front of sand dunes – Sections 3 and 6;
- Take care when accessing the site; do this by foot only and avoid damaging sensitive habitats and species
- Be aware that foreshores can be hazardous. Do not put yourself at risk of injury by collecting seaweed in adverse weather conditions and be aware of tides.

# 1.Introduction

Seaweed hand harvesting is an increasingly popular activity and Natural Resources Wales (NRW) is being approached more frequently for advice on this topic. The information in this document is based on the best evidence currently available.

This guidance covers the hand harvesting of seaweed, for both personal and commercial use. It includes the collection of attached seaweed, whilst on-foot and from a vessel, and seaweed cast up on beaches as drift. It is relevant for both the foreshore and for subtidal areas out to 12nm from the shore.

## Contact Natural Resources Wales if:

- You would like to harvest in (or are likely to impact) a protected site (see Section 4);
- You would like to harvest non-native species (see Sections 3 and 6);
- You have any further questions.



The guidance does not cover mechanised collection or the cultivation of seaweed. Any activity associated with cultivation and/or harvesting of seaweed that requires the deposit or removal of any substance or object from any kind of vehicle, vessel or structure onto or from the seabed within the UK marine licensing area (Mean High Water Springs seaward to the edge of the Welsh offshore region), may require a marine licence from NRW, see Annex 1.

Please contact the Natural Resources Wales Marine Licensing Team regarding any harvesting activity which may require a Marine Licence or an Exemption.

Web link: [Marine Licensing Website](#)

Email: [marinelicensing@naturalresourceswales.gov.uk](mailto:marinelicensing@naturalresourceswales.gov.uk)

## Checklist to use when contacting NRW

If you contact us about harvesting seaweed by hand, we will assess each enquiry on a case-by-case basis. Please make sure you have the following information ready:

### Where

We will need details on the exact locations of harvesting (i.e. grid references, plan or map). Do you propose to harvest on the foreshore only (i.e. between Mean Low Water and Mean High Water) or on the seabed below Mean Low Water as well?

### Who

- Who will be carrying out the harvesting? (individual, company, contractor etc)
- Who owns the land in question? (if known)

### What

The seaweed species that you would like to harvest.

### How

The method of collection and whether you wish to use a boat.  
Details of access and whether you wish to use a vehicle on the foreshore.

### When

The seasonality, frequency, pattern of collection and duration (e.g. 1 year or multiple years).

### How much

An indication of the amount / volume sought. We appreciate that you may not know this in any detail, but to know whether it will amount to grams, kilograms or tonnes etc. will help us to give you appropriate advice.

### What for

It would be valuable for us to understand why you wish to collect seaweed.

For all enquiries, please contact:

Telephone: 0300 065 3000

Email: [enquiries@naturalresourceswales.gov.uk](mailto:enquiries@naturalresourceswales.gov.uk)

By Post:

Natural Resources Wales

c/o Customer Care Centre

Ty Cambria

29 Newport Road

Cardiff

CF24 0TP



## 2. Harvesting seaweed by hand – The Basics

This section answers some common questions about seaweed harvesting by hand and directs you to the sections of this document where you can find more detailed information.

### Do I need permission to collect seaweed by hand?

Anyone is permitted to collect seaweed by hand which is both floating and unattached. If the seaweed is growing on the foreshore or seabed or has been deposited on shore by the tide (drift seaweed), then you must obtain the landowner's permission.<sup>23, 24, 25, 26, 27</sup> Harvesting seaweed from a SSSI may also require permission from NRW (see Section 4).

### What area counts as the foreshore?

The foreshore, or intertidal zone, is the area of land between the high water and low water marks.

### How do I find out who the landowner is?

You have three options:

1. Search the [Crown Estate Foreshore and Estuary Map](#). The Crown Estate owns approximately 65% of the foreshore in Wales, and most of the seabed out to 12 nautical miles, as indicated on the map. Some of this land may be leased to other authorities.
2. Search the [Land Registry](#)
3. Ask locally for more information

### Do I need a licence to harvest seaweed?

A licence may be required depending on where you want to collect and for what purpose. There are different types of licences that you may need to obtain:

#### Crown Estate Licences

You do not need a licence to harvest seaweed by hand on The Crown Estate foreshore for personal use, although you may still need a Marine Licence if it is harvested from a vessel. You will need a licence to harvest seaweed for any monetary or other reward from the foreshore or seabed owned by the Crown Estate.

In Wales, The Crown Estate will only grant a licence if they receive documented confirmation from NRW, stating NRW are satisfied that the proposed activity is sustainable and will not result in any adverse environmental effects. We will require certain information from you in order to do this – see Checklist on page 8.

#### Marine Licences

You only require a Marine Licence (issued by NRW) if you plan to deposit or remove any substance or object from any kind of vehicle, vessel or structure onto or from the seabed

(e.g. structures to cultivate seaweed). Gathering of seaweed by hand is unlikely to require a Marine Licence (unless it is done using a vessel).

You do not need a Marine Licence if you are removing seaweed from a beach on behalf of a local authority as it is an exempted activity (see Annex 1). However, the removal might be subject to other restrictions if the area of removal is in or could affect a protected site or a protected species (see Section 4). You should contact us if you are unsure if a protected site may be impacted.

### **Can I sell the seaweed I collect?**

Yes, providing you have the landowner's permission to collect it and, if on Crown Estate land, a licence from the Crown Estate. There may be other environmental health permissions required for the sale of seaweed that should be considered.

### **Where can I collect seaweed?**

You can collect seaweed from many parts of the Welsh coast and inshore waters wherever it is safe to do so. However, there are a number of protected sites in Wales where harvesting might be subject to certain conditions or be prohibited. You should contact NRW if you wish to harvest in one of these areas. See Section 4.

### **How do I know if the coast is in a protected area?**

Protected site boundaries for Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest, Ramsar and Marine Conservation Zones can be found on [DataMapWales](#). Section 4 has more details on protected sites.

### **Which species of seaweed can I collect?**

Section 6 contains details of some of the species which you may collect. There are a few rare species which we advise you do not collect, and you should also avoid any damage to their associated habitats and species – see Section 5.

### **When can I collect seaweed? How often, and how much can I collect? What are the recommended methods for harvesting seaweed?**

All of these things will vary depending on the species you wish to collect, and the location. Please read Section 3 'Why seaweed matters' before consulting Section 6 'A Practical Guide'.

### 3. Why Seaweed Matters - Environmental Considerations

'Seaweed' is a general term for a diverse group of marine macroalgae which are an important component of the marine ecosystem. Seaweed is an important natural resource whose main human uses include food, fertilisers, fuel and as components in the alginate, chemical and cosmetic industries.



#### The importance of seaweed

Seaweed has several important functions in marine and coastal ecosystems, including:

- primary production
- habitat for a wide variety of species <sup>1, 2, 3</sup>
- foraging habitat and a food source for wildlife <sup>4</sup>
- spawning and nursery ground, including for commercial species <sup>5, 6, 7</sup>
- refuge from predators for fish and invertebrates <sup>5, 8</sup>
- coastal protection (dissipation of wave energy <sup>9, 10, 11</sup>) and dune development <sup>9, 12</sup>
- improving the quality of water by capturing sediments and nutrient cycling <sup>9, 10, 13</sup>
- a carbon dioxide sink which is important in the regulation of climate



## Potential effects of seaweed harvesting

If not carried out sensitively and sustainably, seaweed harvesting activities can have detrimental impacts on the above functions. For example, they can cause:

- changes in plant and animal communities on the shore<sup>17, 18, 19, 20</sup>
- loss of habitat for marine plants and animals
- depletion of the harvested seaweed stock
- damage and disturbance to the shore (including access routes), seabed, habitats and species<sup>21</sup>
- reduced storm resistance, by removing a buffer to wave energy
- degradation of strand-line communities by removing drift seaweed

These potential impacts will depend on the frequency, intensity and volume of removal, as well as the needs of the species harvested and the biological community in which the harvesting occurs. Small-scale occasional harvesting may often be sustainable, but it is known that continual commercial-scale harvesting significantly affects ecosystems<sup>17, 22</sup>.

## A supporting habitat

Seaweed supports a variety of marine life by providing a complex habitat structure for many species of algae and animals, some examples are given in Figure 1. Species can be found attached to or using the holdfast, stipe and frond. Removing associated species unnecessarily when harvesting should be avoided. See Section 6 for more information on avoiding bycatch.

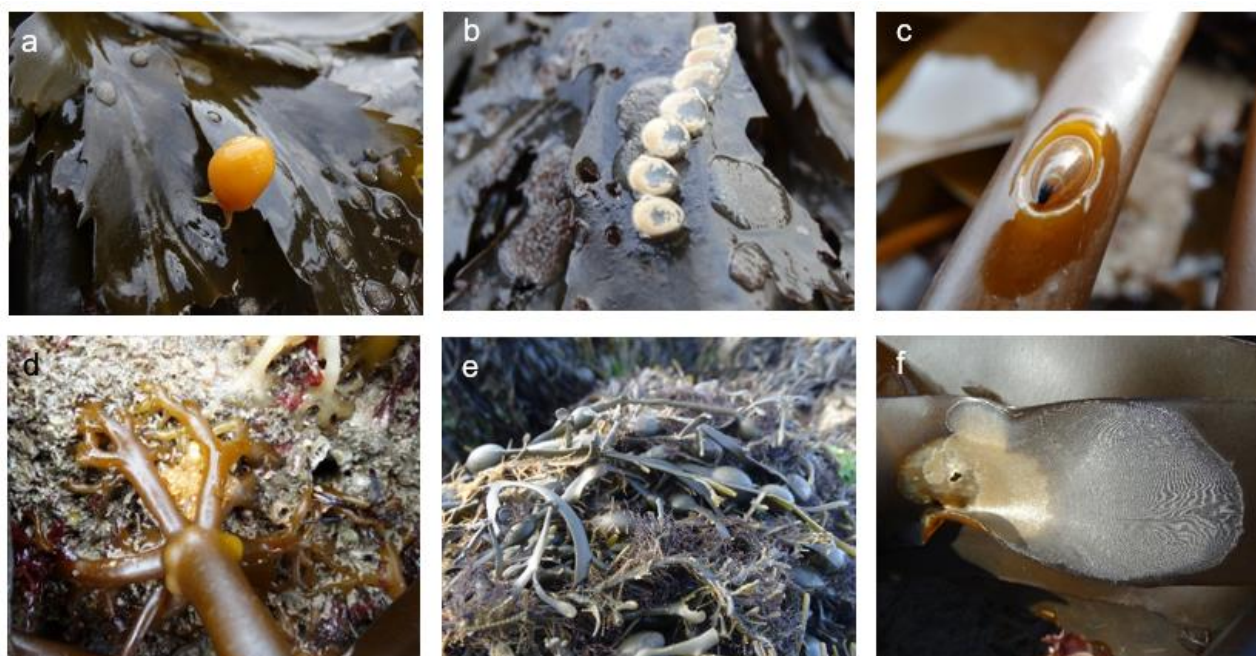


Figure 1. Examples of species which could be found on seaweed a) Flat periwinkle on *Fucus serratus* b) Egg cases of netted dogwhelk on *Fucus serratus* c) Blue rayed limpet on kelp stipe d) Fish eggs within a kelp holdfast e) *Ascophyllum nodosum* with associated species (red algae and hydroids) f) Kelp frond with a mat-like bryozoan.

## Drift seaweed

'Drift' or 'cast' seaweed forms part of the strandline which has been left on the shore by the tide. It is a very important habitat and food source for invertebrates such as sandhoppers, bristle worms, flies and beetles. Decomposed seaweed also provides a rich source of nutrients to dune, strandline and marine ecosystems<sup>36, 37</sup>. Removing drift seaweed reduces the numbers and diversity of invertebrates, with a knock-on effect for shore bird populations which feed upon them.<sup>30, 31, 33, 34, 35</sup>

Drift seaweed helps to stabilise beaches and reduce wind-blown sand and plays a role in sand dune development by allowing salt-tolerant plants to establish along the drift line.<sup>12</sup> Removing drift seaweed can adversely affect this dune development process.<sup>9</sup>



Figure 2: Example of drift lines backed by sand dunes in Wales

## Non-native seaweed species

Non-native species are those that have established themselves on these shores with human assistance, either intentionally or unintentionally. They can sometimes have a negative effect on native marine life and commercial activities; for example, by out-competing native species or fouling artificial structures. Several species of non-native seaweeds are now commonly found on our shores (see below).

Section 14 of the Wildlife and Countryside Act (1981) makes it an offence to spread certain non-native species and you must take care to avoid this. It is illegal to plant or otherwise cause to grow in the wild any plant listed in Schedule 9 this Act, and this currently applies to two seaweed species in Wales, *Sargassum muticum* and *Undaria pinnatifida*. This could include replacing or disposing of certain seaweeds to the sea, even if they were put back at the site where they were collected. More information is available on the [GB Non-Native Species \(GBNNSS\) website](#).

## Reporting non-native species

If you can, take a photo and note of the location and report to one of the following:

- iRecord [online](#) / iRecord [App](#) on Google Play
- LERC Wales [App](#) on Google Play
- iNaturalist [online](#) / iNaturalist [App](#) on Google Play

## Examples of established non-native seaweed species found in Wales

### *Sargassum muticum* (Wireweed)



This species' native range is China, Japan, Korea and Russia.

Negative impacts include:

- Out-competes native seaweed species;
- Fouling of artificial structures, oyster beds, nets. May form large masses which can block propellers and intakes;
- Schedule 9 species.

### *Undaria pinnatifida* (Wakame)



This species' native range is China, Japan and Korea.

Negative impacts include:

- Competition with native seaweed species;
- Fouling of artificial structures;
- Schedule 9 species.

## ***Asparagopsis armata* (Harpoon weed)**



This species' native range is New Zealand and Australia.

Negative impacts include:

- Can cause a minor nuisance by sticking to clothing and can clog up nets;
- Ability to dominate seaweed communities as it can form harmful algal blooms.

## ***Agarophyton vermiculophyllum***



This species' native range is the NW Pacific (Japan, Korea, China and Vietnam).

Negative impacts include:

- Can cause macroalgae blooms;
- Changes the physical character of the mudflats;
- Possible interaction with seagrass communities.

Our advice on removing drift seaweed and harvesting non-native species is found in Section 6 - A practical guide to seaweed harvesting.

## 4. Protected Sites

Many coastal areas in Wales are protected in law. See Annex 1 for details of relevant legislation.

If you wish to collect seaweed from any of these protected areas, we may need to assess whether this will negatively affect any features of the site; for example, habitats such as rocky reefs, or species such as grey seal and otter.

Protected site boundaries can be found on [DataMapWales](#), by following these links:

[Sites of Special Scientific Interest \(SSSIs\)](#)

[Special Areas of Conservation \(SACs\)](#)

[Special Protection Areas \(SPAs\)](#)

[Ramsar sites](#)

[Marine Conservation Zones \(MCZs\)](#)

There is additional information on protected sites on our website: [Protected sites](#).

### SSSIs

Most SSSI boundaries do not extend into the subtidal zone. However, adjacent underwater habitats, such as kelp beds, are often part of the SSSI citation and are thus often afforded some protection.

Steps to harvesting seaweed in an SSSI:

- The harvester must obtain the landowner's permission;
- Owners and occupiers of the land must obtain written permission from NRW; if the activity is a listed Potentially Damaging Operation for the SSSI
- NRW will assess the activity against the Potentially Damaging Operations list for the site (which could include, for example, removal of plants or algae);
- NRW will issue a consent / assent to the landowner if it can be demonstrated that the activity will not significantly affect the special interest of the site.

### SACs, SPAs and Ramsar sites

If you wish to harvest seaweed from any of these sites, the impact of harvesting on the features of the site will be assessed for any permissions applied for and will need to assess the implications for the site in view of that site's conservation objectives.

Where SAC/SPA areas overlap with SSSIs, implications of the harvesting will be assessed on both the SAC/SPA conservation objectives and the special interest of the SSSI.

### MCZs

MCZs are designated in order to protect nationally important marine wildlife, habitats, geology and geomorphology. Skomer is Wales's only MCZ, covering the coast and sea off Skomer and the neighbouring Marloes Peninsula in Pembrokeshire. Seaweed harvesting is prohibited at this site under the Skomer MNR conservation byelaw.



## Important Plant Areas (IPAs) for algae

IPAs for algae have been selected through a process that identifies the most important plant areas in the world<sup>59</sup>. In Wales these are:

- Cymyran Strait, Anglesey
- Porth Cwyfan, Anglesey
- Rhosneigr Reef, Anglesey
- Enlli (Bardsey) and Pen Llŷn, Gwynedd
- Oyster Bank, Tremadog Bay, Gwynedd
- The Sarnau, Gwynedd
- Milford Haven Waterway, Pembrokeshire
- Skomer Island, Pembrokeshire
- St. Anne's Head, Pembrokeshire
- West Angle Bay, Pembrokeshire
- Gower/Swansea, Glamorgan

Please contact us if you wish to harvest in an IPA.

## 5. Protected Species and Habitats

### Environment (Wales) Act 2016

Section 7 of the Environment (Wales) Act 2016 contains interim lists of species and habitats that are considered to be of key significance for maintaining and enhancing biodiversity in Wales. The algal species on the interim Section 7 list (see below) are rare in Wales and NRW advise that they should not be collected.

Under Section 6 of this Act, NRW along with other public authorities, has a duty to 'seek to maintain and enhance biodiversity' and 'promote the resilience of ecosystems'. When providing guidance or issuing a licence or consent for seaweed harvesting in Wales, NRW must ensure that any activity is consistent with these duties. See Annex 1.

### Protected seaweeds (harvesting not advised)

#### *Padina pavonica* (Peacock's Tail)

A brown seaweed, known as Peacock's Tail due to its distinctive morphology.

You can find more info at the MarLIN website: [MarLIN - The Marine Life Information Network - Peacocks tail \(\*Padina pavonica\*\)](#)



#### *Lithothamnion corallioides* / *Phymatolithon calcareum* (Maerl)

These coralline algae, known as maerl, grow as unattached nodules. Maerl forms a unique habitat which is listed on the UK's Biodiversity Action Plan and is a Section 7 habitat in Wales. Maerl is a non-renewable resource <sup>28, 29</sup>.

You can find more info at the MarLIN website: [MarLIN - The Marine Life Information Network - Maerl \(\*Lithothamnion corallioides\*\)](#)



### ***Anotrichium barbatum* (Bearded red seaweed)**

An extremely rare species in the UK, this red, filamentous seaweed grows to a height of 2-6cm.

You can find more info at the MarLIN website: [MarLIN - The Marine Life Information Network - Bearded red seaweed \(\*Anotrichium barbatum\*\)](#)



### ***Cruoria cruoriiformis* (Burgundy maerl weed)**

A rare species of non-coralline crustose algae usually found associated with maerl beds.

You can find more info at the MarLIN website: [MarLIN - The Marine Life Information Network - A red seaweed \(\*Cruoria cruoriiformis\*\)](#)



### ***Dermocorynus (Grateloupia) montagnei* (Red seaweed)**

A non-coralline crustose alga associated with small pebbles and occasionally on detached maerl fragments.

You can find more info at the MarLIN website: [MarLIN - The Marine Life Information Network - Grateloup's pimple weed \(\*Dermocorynus montagnei\*\)](#)



The following species and habitats on the interim Section 7 lists are either associated with seaweed or could be impacted by its collection. You should avoid causing any damage to these important habitats and species when harvesting seaweed. Potential damage could be either direct or indirect, for example by access, trampling or accidental removal.

- Estuarine rocky habitats
- Intertidal mudflats
- Intertidal boulder communities
- Maerl beds
- Honeycomb worm (*Sabellaria alveolata*) reefs
- Seagrass beds
- Tide-swept channels
- *Haliclystus auricula* (stalked jellyfish)
- *Lucernariopsis campanulata* (stalked jellyfish)

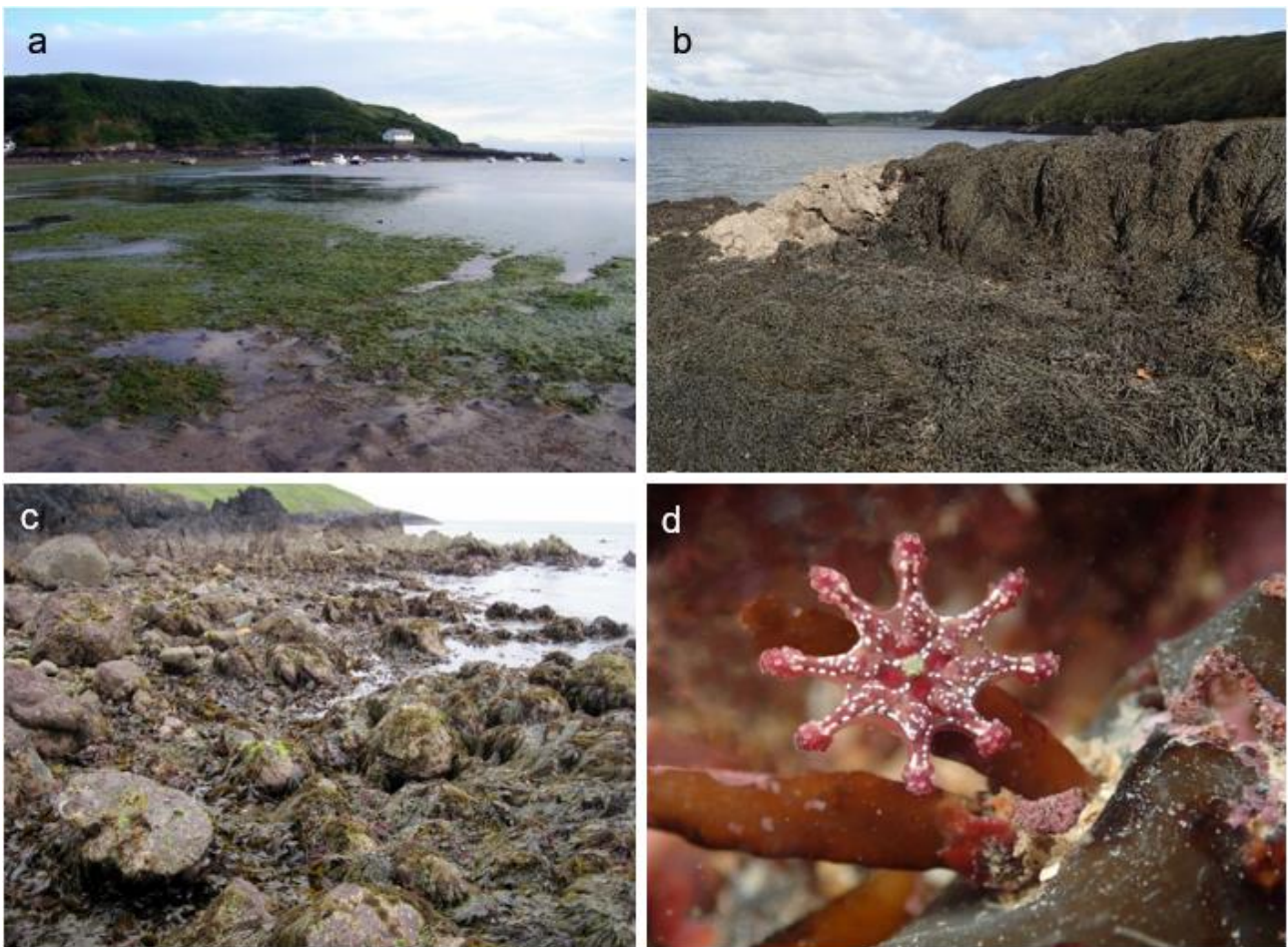
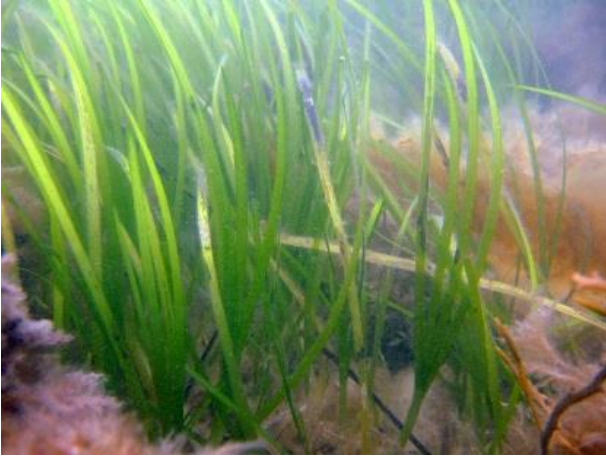


Figure 3: Some important habitats and species which could be negatively impacted by seaweed harvesting activities, including access. a) Seagrass bed; b) Estuarine rocky habitats; c) Intertidal boulder communities; d) Stalked jellyfish

## Seagrass

Seagrasses are grass-like flowering plants with long thin leaves which grow in intertidal and subtidal areas. They resemble seaweeds but are not related. NRW would not advise the collection of any seagrass. It is an important habitat and is included in a number of conservation designations. Applications would be considered on a case by case basis.



*Figure 4: Seagrass Zostera marina*

## 6.A Practical Guide to Harvesting Seaweed

This section contains general information on the biology of a number of species of seaweeds and advice on how to harvest them by hand sustainably. This advice is not exhaustive but is based on the best evidence currently available.

It is important to harvest seaweed in a sustainable and ecologically sensitive manner. See Section 3 for the important role seaweed plays in natural ecosystems and coastal processes.

### Attached seaweeds

Seaweed species differ in their patterns of growth, regrowth, growing season and reproductive cycles. They should be harvested during the active growth season to allow for quicker recovery, and after reproduction has occurred if possible. See below for further details. See also below an illustration of many of the key features of seaweed mentioned in this document.

### Cutting method

As a general rule you should cut fronds well above the point of growth (meristem), and never remove the holdfast (the base of the seaweed), see below.

Harvest by hand, using sharp hand tools such as scissors. This will have a less detrimental impact. Ensure you cut cleanly to avoid tearing seaweed from the rock and causing unnecessary damage. Mechanical harvesting methods are more likely to have a detrimental impact on the marine environment and are not covered under this guidance. If you wish to undertake mechanical harvesting, then please contact NRW.

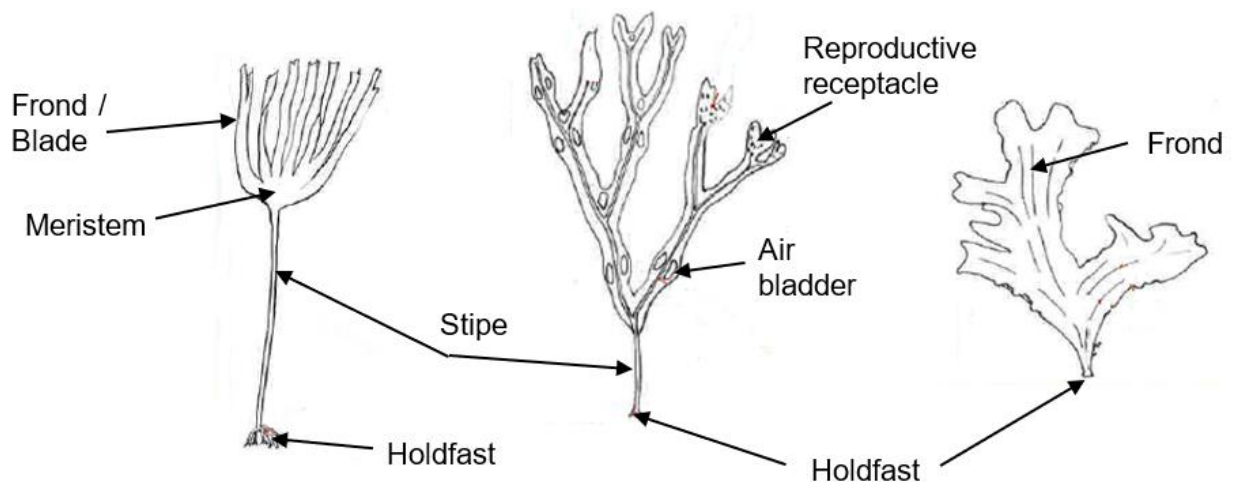


Figure 5: Key features of seaweed mentioned in this document (from Bunker et al., 2017 (ref 55))

## Frequency, pattern and method of harvesting

Harvest sparsely, taking only a small proportion of the total seaweed and ensure a substantial proportion of mature seaweed remains. This may be especially important in protected sites. There is limited evidence regarding the amount of attached seaweed that it is sustainable to harvest. Advice will depend on the species and may be amended in future versions of this document if new evidence becomes available.

Harvest from different locations on the shore and rotate harvesting areas to allow ample time for recovery. In some cases, depending on the species, areas should be left for several years before harvesting again after a harvesting season.

## Bycatch

'Bycatch' in this context is the term for the accidental collection of other species while hand gathering seaweed. Seaweed which is heavily settled with other species should not be harvested. Mobile species like snails should be carefully removed from fronds before harvesting.

## Drift seaweed

Because of its important role in the shoreline ecosystem as a habitat, food source, nutrient input and dune builder / stabiliser, it is best not to completely clear drift seaweed from strandlines. Our current guidance is to harvest sparsely; gather from a number of locations along the strandline, not just one area, and remove a maximum of one third of the total seaweed as a guide<sup>1</sup>. This is especially important during winter months (October to March), when overwintering birds may depend on it as a food source and could be disturbed by collecting activities. Some protected areas of coast, especially in SSSIs, have additional protection for the strandline, and we will give specific advice in these cases.

Note that you will still need permission from the land owner before collecting drift seaweed, and that seaweed cast above the high-water mark belongs to the land owner, who is often different from the owner of the foreshore.

## Harvesting non-natives

We advise extreme caution if harvesting non-native species, as this can cause fragments of seaweed or spores to break off and be transported to other areas, allowing the species to spread<sup>38, 39</sup>. (See Section 3).

We will consider enquiries regarding harvesting non-natives on a case-by-case basis. If harvesting does take place, we advise that you to use '[Check, Clean, Dry](#)' biosecurity principles when moving between sites to ensure that invasive species, pests and diseases are not spread to new areas. Any equipment and clothing should be thoroughly checked for fragments of seaweed and other debris, then cleaned and dried after use.

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<sup>1</sup> There is limited evidence regarding the amount of drift seaweed that it is sustainable to harvest. This advice is based on the best available evidence from a 2013 study on kelp collection in Scotland (ref 34) and could change in future versions of this document if new evidence becomes available.

## Good practice on all sites

- Avoid damaging habitats and species by trampling when accessing or using the shore. It is illegal to drive on the foreshore without permission from the landowner / occupier.
- Avoid disturbing sensitive species when accessing or using the shore. You should not approach aggregations of seals hauled out on rocks, especially during pupping times (August to January), and keep at least 100m away from seals at all times.
- Bird species are most sensitive to disturbance during the nesting season (March to July) and in some areas where overwintering (October to March). Avoid approaching nesting birds on cliffs and be aware of ground nesting birds at the back of the shore. Give birds plenty of space and do not proceed if the bird appears agitated.
- If you turn rocks over during collection, replace them the correct way up to avoid damage to animals and algae which may be on the surface or underside of the rock.
- Use '[Check, Clean, Dry](#)' biosecurity principles when moving between sites to ensure that invasive species, pests and diseases are not spread to new areas.



# Species specific considerations for harvesting

## Brown Seaweeds

### *Himanthalia elongata* (Thongweed / Sea Spaghetti)



### Species ecology

- Has a unique life history and growth pattern with a two-stage morphology, producing small button-like thalli and then long strap like fronds in autumn.
- Usually reproduces at 2 years. Reproduces once before dying.
- Unusual morphology, reproductive fronds (up to 2m long) make up 98% of the seaweed's biomass.<sup>40</sup>
- Reproductive fronds grow throughout the winter and spring, before summer reproduction. Fronds then disintegrate.<sup>41, 42</sup>

### Sustainable harvesting advice

- Very limited evidence was found on sustainable harvesting levels<sup>60</sup>
- Reproductive structures are visible as dark circles on fronds.
- Harvest in summer after the reproductive season if possible.
- If harvesting occurs during the reproductive season, then harvest only one of the two main fronds (per button).
- Do not remove the buttons which remain attached to the rock.

## *Laminaria digitata* (Kelp / Oarweed)



### Species ecology

- Perennial, can live for 4-6 years <sup>61</sup>.
- Can reach 4m, but 1-3m more common
- Growth is from the meristem at the base of the fronds, rather than the tips. Growth is fastest throughout spring and summer. <sup>32</sup>
- Two reproductive peaks; in summer and autumn/ winter but varies with location. <sup>32</sup>

### Sustainable harvesting advice

- Cut by hand, avoiding the meristem (growing point) at the base of the fronds.
- Cut approximately 20cm above the top of the stipe (as in picture above) and collect only the upper parts of the frond <sup>62</sup>.
- Harvest areas sparsely, as kelp forests have a function in wave dissipation, shoreline protection, habitat provision and a major food source.
- Harvest during early spring, before the summer reproductive peak.

## *Laminaria hyperborea* (Northern Kelp / Oarweed)



### Species ecology

- Perennial, can live up to 20 years and can reach 3.5m
- Growth is from the meristem at the base of the fronds, rather than the tip of the fronds. The new blade grows below the older one and the old blade is shed in spring and early summer, referred to as 'May cast', which produced detritus material, often washed up
- Growth occurs November to June and completely ceases at the end of summer until the next year.<sup>32</sup>
- Has a role in supporting highly diverse assemblages. Habitat for at least 238 species of macrofauna.<sup>1</sup> Studies suggest full biological recovery of associated species after harvesting may take up to 10 years<sup>63</sup>. This species is also important for large mobile mammals, such as grey and common seals.

### Sustainable harvesting advice

- Cut by hand, avoiding the meristem (growing point)
- Cut approximately 10-20cm<sup>60</sup> above the top of the stipe (as in picture) and collect only the upper parts of the fronds.
- Growth is most rapid in the first half of the year.<sup>43</sup> Spores are produced over much of the blade surface from September to April<sup>44</sup> so harvesting of fronds advised from May to August.
- Harvest areas sparsely.
- If the stipe is cut, *L. hyperborea* will die. If the stipe is to be harvested, this will be considered on a case-by-case basis.

## ***Saccharina latissima* (Sugar Kelp)**



### **Species ecology**

- Perennial, typically living for 2-4 years and potentially reaches 4m.
- Can live as an annual opportunist<sup>64</sup>. Can exhibit fast growth and early maturation<sup>65</sup>.
- Growth is from the meristem at the base of the fronds, rather than the tips.
- Growth is fastest in late winter to spring and declines from June onwards and may cease in late summer.<sup>45</sup>
- Reproduction starts during autumn and continues until early spring.<sup>46</sup>

### **Sustainable harvesting advice**

- Cut by hand, avoiding the meristem (growing point) at the base of the fronds. Cut approximately 20cm above the top of the stipe<sup>62</sup>.
- Harvest during spring and summer, avoiding the autumn/winter reproductive season.
- Avoid collecting juvenile plants

## ***Pelvetia canaliculata* (Channelled Wrack)**



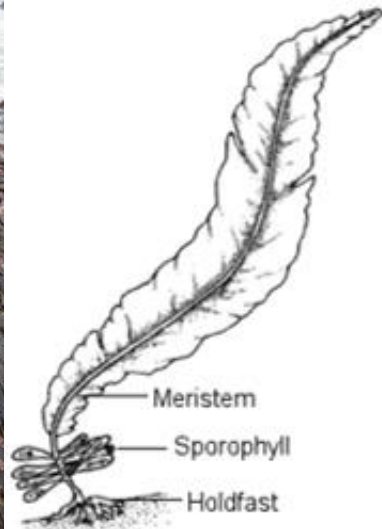
### **Species ecology**

- Perennial; lives up to 4 -5 years.
- Reproduction peaks in early late summer / early autumn, although reproductive receptacles are initiated in January.

### **Sustainable harvesting advice**

- Harvest sparsely
- Cut the seaweed well above the holdfast to allow it to re-grow. Do not scrape from the rocks as this will prevent re-growth and remove any sporelings.<sup>68</sup>

## *Alaria esculenta* (Dabberlocks, Atlantic Wakame)



Amended from Fish and Fish (1996)

### Species ecology

- Perennial. May live for 4-7 years <sup>66, 67</sup>.
- May reach 4m in length, but less in exposed conditions.
- Maximum growth rates in April-May <sup>66</sup>. Growth is from the meristem at the base of the fronds, rather than the tips. From June-July growth rate slows and continual erosion can reduce the blade to the midrib.
- Reproduction occurs during the autumn and winter. Reproductive sporophylls are located in clusters at the top of the stipe, just below the fronds. <sup>47</sup> Has a lower dispersal capacity than other kelp due to location of the sporophylls.

### Sustainable harvesting advice

- Cut by hand, avoiding the meristem (growing point). Cut approximately 20cm above the top of the stipe <sup>62</sup>.
- Avoid cutting the sporophylls at the base of the fronds.
- Avoid harvesting in autumn and winter, when the seaweed is reproductively active.

## *Fucus vesiculosus* (Bladder Wrack)



### Species ecology

- Short-lived (4 to 5 years) perennial species.

- Fast growing species, and growth rate varies with temperate, light and exposure.
- Reproduction peaks in the spring and summer.<sup>48</sup> It also has the ability to generate vegetative growth in response to damage.

### Sustainable Harvesting Advice

- Cut fronds at 30cm or more from the holdfast<sup>48</sup>, as the frond can re-generate.
- If possible, avoid harvesting during the spring/summer reproductive period.
- Harvest in a mosaic pattern, leaving regular unharvested patches to help re-colonisation as spores can not disperse far.<sup>68</sup>

### *Fucus serratus* (Serrated Wrack, Toothed wrack)



### Species ecology

- Short lived, 4-5 years, perennial species.<sup>47</sup>
- Typically grows up to 70cm but have been recorded at over 2m in very sheltered environments<sup>60</sup>. Growth peaks in summer.
- Reproduction peaks in the autumn/winter, although can vary greatly with locality.<sup>48</sup>

### Sustainable harvesting advice

- Cut fronds at 30cm or more from the holdfast<sup>48</sup> as the seaweed can re-generate.
- Harvesting should be done in patches to allow for re-colonisation
- If possible, avoid harvesting during the autumn/winter reproductive season.

### *Ascophyllum nodosum* (Knotted Wrack, Egg wrack)



## Species ecology

- Long lived (several decades) perennial species, with individuals lasting 10-20 years<sup>69</sup>, and clumps reported being 60-550 years<sup>70, 71</sup>.
- Growth occurs from tip of the blade.
- Growth is at its maximum in spring / summer<sup>69</sup>.
- Takes 5 years to become sexually mature<sup>72</sup>. Reproduction peaks during spring.<sup>49</sup> Can reproduce sexually or vegetatively.
- Lots of other seaweeds and animals live on knotted wrack, particularly when older individual plants link up to form a complex habitat.<sup>50</sup>

## Sustainable harvesting advice

- Cut approximately 10-20cm from the holdfast, leaving some of the older, more complex habitat, to allow re-growth.
- Avoid harvesting during the spring reproductive peak and time of maximum growth.
- Slow growing and a poor recruiter so harvesting should be substantially limited. Harvest only from small areas and leave unharvested areas in between. This may help avoid detrimental effects on associated fauna.<sup>17</sup> Leave at least two years before re-harvesting, preferably longer.<sup>51</sup>
- Easily damaged by trampling: sites to be carefully selected in discussion with NRW.

## Green Seaweeds

### *Ulva* spp. (Sea Lettuce)

Includes sheet like (*U. lactuca*) and tubular forms (previously *Enteromorpha intestinalis*)



## Species ecology

- Pseudo perennial with the base, but not the fronds, surviving from year to year.<sup>73</sup>
- Rapid growth in spring and summer, reproduction peaks in summer.<sup>52, 60</sup>
- Can rapidly form algal blooms in favourable conditions, sometimes known as 'green tides' which can be damaging to both other marine organisms and wider ecosystem.<sup>53</sup>

## Sustainable harvesting advice

- Harvest during the rapid growth phase in spring and summer.

## Red Seaweeds

### *Palmaria palmata* (Dulse)



#### Species ecology

- Perennial
- Growth occurs each year from the holdfast during February and March.
- It is often found growing on other algae, especially kelps

#### Sustainable harvesting advice

- Ensure the holdfast and some of the blade is left intact for re-growth.
- Harvest from small areas to ensure successful reproduction, as spores do not disperse far<sup>68</sup>.

### *Chondrus crispus* (Carrageen / Irish Moss)



#### Species ecology

- Perennial, lives 2-3 years<sup>74</sup> but may live up to 6 years in sheltered waters<sup>75</sup>.
- Rapid growth during spring and summer.<sup>54</sup>
- Reproduction occurs during the autumn and winter / early spring.<sup>54, 76</sup>.



## Sustainable harvesting advice

- Re-grows from the holdfasts and the edge of severed fronds so leave these intact.
- Harvest only a small proportion of the largest blades in an area <sup>54</sup>, during the spring / summer rapid growth period.
- Avoid harvesting during autumn and winter when reproduction is ongoing and recovery is much slower.<sup>54</sup>

## ***Mastocarpus stellatus* (False Irish moss / Grape Pip Weed)**



### Species ecology

- Perennial, reaching up to 17cm in length
- Long reproductive season.

### Sustainable harvesting advice

- Ensure the holdfast and some of the blade is left intact for re-growth.
- Harvest only a small proportion of the largest blades in an area. Harvest during the spring/summer rapid growth period. Avoid harvesting during the autumn and winter when reproduction is ongoing and recovery is much slower.

## ***Porphyra* species (Laver)**



### Species ecology

- Ephemeral, often on sand-scoured rocks, where it can grow rapidly and reach maximum size of 20cm within a few months.
- There are several species of Laver in Wales, separating different species is difficult.

- They have a microscopic shell boring stage in their life cycles.<sup>55</sup> This cryptic stage enables *Porphyra* spp. to survive periods of intense disturbance or grazing which removes adult plants and allows a sudden bloom to form when conditions are suitable<sup>77</sup>.

### Sustainable harvesting advice

- There is some evidence that regeneration is quicker if the base of the seaweed remains intact.<sup>56</sup>
- Harvest in spring to allow faster re-growth<sup>78</sup>.
- Leave small plants attached where possible and harvest in small patches, leaving other patches unharvested nearby<sup>68</sup>.

### Corallina species (Coral Weed)



### Species ecology

- Perennial base, with new fronds growing each year. Fronds can regrow from base.<sup>57</sup>
- Grows to only 12cm.
- Calcareous seaweed with an unusual appearance, more like that of coral. Distinctive pink colour, due to the white lime in the base and the seaweed's reddish pigment.<sup>47</sup>

### Sustainable harvesting advice

- Ensure the crustose base is left intact for regrowth.
- NRW would not support large scale collection of this seaweed.

## Osmundea species (Pepper dulse)



### Species ecology

- Perennial <sup>58</sup>
- There are various species in this group, but the most frequently encountered (*O. pinnatifida*) reproduces mainly from March to June.
- Can show considerable variation in form and colour due to its position on the shore.

### Sustainable harvesting advice

- Ensure the holdfast and some of the blade is left intact for re-growth.
- Turfs of Pepper Dulse may expand through lateral growth of the perennial holdfast, so reproductive season is not so critical for the species most frequently encountered on the shore.

## 7. Glossary

**Blade:** Sometimes referred to as a frond. The large flat part of a seaweed which is important for the absorption of light.

**Brittlestar:** A marine invertebrate closely related to starfish.

**Bryozoan:** Sea mat. An aquatic invertebrate, usually colonial. Bryozoans often form mats or sheets on the fronds of seaweeds, often looking like pieces of lace.

**Commercial:** Concerned with or engaged in commerce. Making or intended to make profit.

**Community:** A group or assemblage of interacting species living in the same place.

**Cultivation:** The deliberate introduction of seaweed to the environment by the placement of young algae or new substrate on which it may naturally establish and grow.

**Foreshore:** The land between Mean High Water and Mean Low Water mark.

**Frond:** See 'blade'

**Harvesting:** Involves the removal of part or all of a living seaweed from its position of growth. Picking is a form of harvest of algae by hand cutting. In this document, harvesting also includes collection of drift weed on the shore.

**Holdfast:** A root-like structure that anchors seaweed to the substrate.

**Hydroid:** An aquatic invertebrate, usually colonial and often attached to seaweeds. Usually branched.

**Intertidal:** Relating to the land between Mean High Water and Mean Low Water mark

**Meristem:** The region of the seaweed capable of division and growth.

**nm:** Nautical mile. One nautical mile is 1.15 land measured miles.

**Perennial:** Having a life cycle of more than two years.

**Personal use:** A use which is not for business, not commercial.

**Pseudo perennial:** Appearing as perennials, most of the seaweed dies back and the seaweed is regenerated by a residual basal material.

**Sporangia:** A cell or structure in which spores are produced.

**Sporophyll:** A structure of a seaweed that bears sporangia.

**Stipe:** The stem-like part of a seaweed, especially common in brown seaweed such as kelps. It may be absent in some seaweeds.

**Subtidal:** Relating to the area of the sea below the level of Mean Low Water spring tides.

**Vesicle / air bladder:** Air-filled swelling that floats the seaweed up in the water column.

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## Annex 1 - Legislation and Policy

This section provides more information about the major legislation and policies which govern how the sea around Wales is managed and how it relates to seaweed harvesting.

### Habitats Directive

A European Union directive adopted in 1992 to conserve important habitats and species in a European context. The Conservation of Habitats and Species Regulations 2017 (as amended), transpose the Habitats Directive (and elements of the EU Birds Directive) into National law and provide for the designation and protection of Special Areas of Conservation, Special Protection Areas and Ramsar sites.

Some seaweed species have further protection under the Conservation of Habitats and Species Regulations schedules or in Annex IV of the EU Habitats Directive, where a licence would be required to take and possess samples of the seaweed. Currently there are no species of seaweed in Wales to which this would apply.

### Wildlife and Countryside Act 1981

SSSIs are designated, protected and managed under the Wildlife and Countryside Act (WCA) 1981, as amended by the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006.

Under the WCA 1981, it is illegal to uproot any wild plant without permission from the landowner or occupier. This could include the removal of algae (if it is unable to re-grow).

Species listed on Schedule 8 of the Act (rare plants which have additional protection) require a licence for collection. This does not currently apply to any seaweed species in Wales.

### Environment (Wales) Act 2016

Section 7 of the Environment (Wales) Act 2016 contains interim lists of species and habitats that are considered to be of key significance for maintaining and enhancing biodiversity in Wales. The seaweed species listed in Section 7 of the Act are discussed in Section 5 of this document.

Under Section 6 of this Act, NRW, along with other public authorities, has a duty to '*seek to maintain and enhance biodiversity*' so far as it is consistent with the proper exercise of its functions, including ownership functions. We must also seek to '*promote the resilience of ecosystems*'. When providing guidance or issuing a licence or consent for seaweed harvesting in Wales, we must ensure that any activity is consistent with these duties.

[Link to Environment \(Wales\) Act 2016](#)

### Sustainable Management of Natural Resources (SMNR)

At NRW we are committed to considering the principles of SMNR in our work. These principles are a key component of the Environment (Wales) Act 2016 and include:

- considering the resilience of ecosystems
- taking a long-term view
- using all relevant available evidence in order to ensure our management and advice is based on the condition and adaptability of ecosystems.

Adhering to these principles helps us to achieve the seven well-being goals set out in the Well-being of Future Generation (Wales) Act 2015.

## **Marine and Coastal Access Act 2009**

The Act puts in place a system for improved management and protection of the marine and coastal environment.

Under Section 66 of this Act, any activity associated with cultivation and/or harvesting of seaweed that requires the deposit or removal of any substance or object from any kind of vessel or structure onto or from the seabed within the UK marine licensing area (Mean High Water Springs seaward to 12nm), is likely to require a marine licence from NRW.

Under Sections 153, 154 and 155, seaweed is considered to be a 'sea fisheries resource'. As such, seaweed collection can be regulated by Welsh Ministers, who also have the power to make byelaws to control seaweed harvesting.

## **Marine Licensing (Exempted Activities) (Wales) Order 2011**

Exemption 20 states that if you are removing seaweed from a beach on behalf of a local authority you are exempt from requiring a marine licence.

However, if a protected site is likely to be impacted, it is advisable to contact the NRW Marine Licensing team before removal of seaweed.

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