

Scottish Wildlife Trust

Briefing



Kelp Harvesting

Overview

The Scottish Wildlife Trust considers kelp habitats to be a fundamental component of marine ecosystems in Scotland and that their state of health directly and indirectly affects ecosystem functioning. The full extent of the impact large-scale kelp harvesting has on the marine environment is largely unknown and there is a clear need to investigate further the broader and long-term impacts of this activity before its introduction in Scotland.

The Trust believes that natural recovery (through protection) and enhancement of Scotland's kelp habitats should be a priority and that larger and healthier kelp habitats could make a significant contribution towards achieving Good Environmental Status of Scotland's seas.

The Trust considers that, due to insufficient data and understanding on the ecological impacts of kelp harvesting, it is not possible to determine whether it can happen sustainably at large-scales and, therefore, should not be permitted in Scottish waters.

Key recommendations

- Further research on the long-term impacts of large-scale kelp harvesting is required to improve our understanding of the broader ecosystem impacts and habitat recovery rates.
- Habitat survey data is needed to identify the distribution, abundance and health of kelp habitats within Scottish seas and assess if large-scale harvesting can be performed sustainably.
- Alternative, less-damaging methods, such as seaweed aquaculture, should be investigated, supported and encouraged by the Scottish Government.
- Trials of mechanical seaweed harvesting methods should be carried out prior to any large-scale activity and must demonstrate sustainable harvesting practices and adequate mitigation against long-term and wider-ecosystem impacts.
- Kelp habitats are a natural capital asset and the ecosystem services provided by these habitats, such as carbon storage and coastal protection, must be included in management decisions.

Context

Scotland has an expansive marine environment that contains a wide range of natural resources that humans have exploited for centuries, such as minerals, energy, fish, shellfish, and plants. The harvesting of seaweed in Scotland, in particular *Laminaria hyperborea* (kelp), *L. digitate* (oarweed) and *Saccharina latissimi* (sugar kelp), already takes place at small scales (by hand), but technological advancements and an increase in commercial demand for seaweed-based products has created interest in large-scale harvesting (trawling by boat).

Scotland holds a significant proportion of UK kelp beds, which are considered to be greater in biomass, height and age than those found in the warmer waters off England and Wales.¹ Kelp beds are highly productive and support a diverse range of marine species due to the highly complex and varied habitats they create – shaded seafloor under canopies, vertical stem structures (stipes), and large leaf-like blades. Kelp beds provide homes, protection, food and nursery grounds for many species, such as lobster, crabs, seabirds and seals. Any detrimental impact to the abundance and health of these habitats could have knock-on effects throughout the marine ecosystem.

The recent interest in large-scale seaweed harvesting in Scotland, in particular for kelp, is of concern due to the importance of these habitats for supporting a healthy and diverse marine environment. It is imperative that any large-scale harvesting of seaweed is carried out sustainably and does not cause irreversible damage to marine ecosystems.

Threats to Scotland's seaweed habitats

Seaweed harvesting poses a significant threat to the health of Scotland's kelp beds^{2,3}, which already face a range of other pressures, including:

- **Eutrophication** caused by nutrient and sediment run-off from land,
- **Physical disturbance** from human activity, such as bottom-trawl fishing,
- **Overgrazing** by invertebrate herbivores, in particular sea urchins, can decimate kelp forests and create 'barren' grounds and restrict growth of juveniles,
- **Rising sea water temperatures** can affect the structure, functioning, distribution and survival of kelp beds,
- **Coastal development** can physically disturb kelp forests and cause alterations in water flow, leading to changes in sedimentation.

All assessments on the sustainability of large-scale seaweed harvesting in Scotland must also consider the cumulative impact of all these pressures.

Protecting and enhancing Scotland's seaweed habitats

Kelp beds are recognised as Priority Marine Features (PMFs) and there are currently four nature conservation marine protected areas (MPAs) in Scotland that provide protection for 'kelp beds' or 'kelp and seaweed communities on sublittoral sediment'.

Outside the MPA network, where most kelp habitats lie, PMFs are offered protection through Scotland's National Marine Plan, which states that the 'development and use of the marine environment must not result in significant impact on the national status of Priority Marine Features' (General Policy 9b).⁴ Due to the lack of adequate data on the distribution, abundance and health of kelp habitats in Scotland⁵, the 'national status' of kelp beds cannot be assessed. Therefore, it is not possible to determine whether large-scale seaweed harvesting will have a significant impact on the 'national status' of kelp beds or not.

Kelp beds are one of many marine habitats that play an important role in storing carbon – known as blue carbon habitats. They are a key pathway for carbon entering long-term storage in sediments (1.8 MtC/yr) and have the highest carbon sequestration rate for marine habitats in Scotland (1,732,000 t C yr⁻¹).⁶ However, due to a high turnover rate, the carbon storage capacity of kelp is short-term. Therefore, carbon storage capacity is directly related to standing crop size and health – the larger and healthier the standing crop, the higher the carbon storage capacity. The large-scale harvesting of kelp beds will directly affect their capacity to sequester carbon.

Kelp beds are regularly found in exposed areas with high wave action and strong tidal movement and serve an important function in protecting coastlines from wave action and in moderating current flows. The temporary, or potentially permanent, removal of large areas of kelp could have wide-ranging impacts through increasing exposure of the coastline to wave action. Further research is needed on the impact of seaweed harvesting on hydrodynamic systems.

Future management of seaweed harvesting

Crown Estate Scotland, as the owner of the seafloor out to 12nm, is the body responsible for granting permission for harvesting kelp. In granting permission to individuals for small-scale seaweed collection from the foreshore, Crown Estate Scotland demonstrates stewardship of their asset by imposing licence conditions to ensure sustainability, which includes:

- *'All seaweed should be cut by hand and no length to be cut below that which would inhibit re-growth'*
- *'Sensitive methods of collection should be used, including avoidance of mechanical harvesting, avoidance of uprooting any plant, cutting heights as high as possible and only removing a proportion of the plant, i.e. one third.'*
- *'Sustainable quantities of biomass to be harvested in relation to standing crop biomass should be estimated, taking into account the precautionary principle'*
- *'Community composition should be monitored to ensure no changes (above natural variation) in assemblage structure. There should also be no change in habitat structure. The potential impacts on associated species should be considered, for example, blue-rayed limpets, hydroids, bryozoans, echinoderms and particularly for any protected species that may be present. Invertebrate by-catch should be quantified and recorded.'*
- *'Coastal erosion should be considered in any method statement as some algal communities, particularly kelp forests are known to dissipate wave energy and stabilise coastlines.'*

If large-scale kelp harvesting were found to be sustainable, the Trust considers that a similar set of conditions should be developed and applied to large-scale harvesting practices.

The Trust believes that further investigation is needed into the potential for seaweed aquaculture to meet commercial demand. Studies on the practicalities and economic viability of seaweed aquaculture are already taking place in Scotland (e.g. Scottish Association of Marine Science, Oban and NAFC Marine Centre, Shetland), which show potential for a seaweed aquaculture industry that could relieve/remove pressure on natural seaweed habitats.

The Trust considers it important to view seaweed habitats as natural capital assets and that the decision-making process for determining how best to manage this asset, particularly regarding large-scale harvesting, should include the ecosystem services that these habitats provide society, such as carbon sequestration, coastal protection, and nursery grounds for commercial fish and shellfish species.

The Trust considers that there is currently a lack of understanding on the long-term and ecosystem-scale impacts of large-scale kelp harvesting and that it is not possible to assess whether it can be carried out in an environmentally sustainable way. The Trust believes that, until extensive research and trialing of large-scale harvesting methods has been carried out and long-term sustainability can be demonstrated, large-scale kelp harvesting should not be permitted in Scottish waters.

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¹ Smale, D.A. et al. 2016. Linking environmental variables with regional-scale variability in ecological structure and standing stock of carbon within UK kelp forests. Marine Ecology Progress Series 542

² Priority Marine Feature in Scottish Seas - www.nature.scot/sites/default/files/2018-

³ Scotland's Marine Atlas - <https://www2.gov.scot/Topics/marine/science/atlas>

⁴ Scotland's National Marine Plan - www.gov.scot/publications/scotlands-national-marine-plan/

⁵ Smale, D.A. et al. (2013) Threats and knowledge gaps for ecosystem services provided by kelp forests: a northeast Atlantic perspective. Ecology and Evolution 3(11), pp.4016-4038

⁶ Burrows, M.T. 2014. Assessment of carbon budgets and potential blue carbon stores in Scotland's coastal and marine environment. SNH Commissioned Report 761.