

Aird Fada Seaweed Farm - Biosecurity Plan

Site Description

The proposed site of the Seaweed Farm at Aird Fada sits ¼ km offshore from the coastline on Loch Scridain, Isle of Mull. The site is overlooked by one dwelling house and will be visible from the public road (A849) that passes the proposed Seaweed Farm site.

The coastline at Aird Fada is a long cobble strewn shore in a fish hook shaped bay with rocky outcrops at the lower intertidal zone. The site of the proposed Seaweed Farm is set back from these Rocky Reefs in rapidly deepening water to beyond 25m deep, giving way to soft pelagic mud seabed at the site of the nearest proposed Farm anchors.

Seaweed Species

Species to be cultivated are – *alaria esculenta*, *laminaria hyperborea*, *laminaria digitata*, *saccharina latissima*, *himanthalia elongata*, *porphyra species*, *palmaria palmata*, *osmundea pinnatifida* and *ulva lactuca*. All of the species mentioned grow wild in the local area.

The main target species at this time are *alaria esculenta* (Atlantic Wakame) and *saccharina latissima* (Sugar Kelp).

In water equipment

A subsurface grid will be used similar to that used by finfish farming, but with no surface cages. Only corner floats will be visible on surface as will appropriate special marks denoting the site outer limits. The farm will be set out as a grid of 3 rectangles (3 x 100m x 200m) and will give a growing area of 6ha. 2ha will be used for seeded line in year 1 and this will rise to the whole 6ha in year 2.

The anchoring system will be robust to ensure farm stability but use the minimum amount of infrastructure possible to reduce the footprint of the site and reduce seabed impact. The anchoring system will be removeable if required as is all of the in water equipment being used.

Light seaweed growing lines will be laid across these grids and held roughly 1.5m below the surface. We envisage a 1.5m to 2m spacing between the seaweed lines.

No equipment or ropes based on the Aird Fada site will be moved to another site and no equipment or ropes used on another site will be brought to Aird Fada. Any equipment or ropes brought ashore from the Aird Fada farm site will be treated by cleaning with fresh water above the high tide mark.

Seeding Process

Seeded stock of preferred species, most probably *alaria esculenta* (Atlantic Wakame) and *saccharina latissima* (Sugar Kelp) will be sourced from local shore sites and will be cultured onto growing medium at commercial hatcheries such as Scottish Association for Marine Science (SAMS) at Dunstaffnage or any of the other hatcheries that are emerging around Scotland.

The collection of seeding plants will be very small volumes (<1 wet kg) and by taking no more than around 25% in any given patch on a shore. The species to be farmed are all found locally at or near the farm site. The seeds will be transported discretely, on ice in sealed polystyrene boxes. There are no chemical additions or treatments used for the seaweed growing process. The small amounts collected are propagated in laboratory conditions into huge amounts of fertile material. This can be stored for long periods to suit operational needs.

Full biosecurity procedures will be followed from delivery of seeds to SAMS or alternate hatchery and on return of the seeded lines to Aird Fada.

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String Method Deployment Process

Deploying seaweed on string will be the main deployment method for seaweed cultivation. There is an alternative method of direct seeding, where propagated material is affixed to ropes directly instead of the string medium. This is in development and may become a cost effective method of deployment once research test results are more consistent.

Fertile seaweed material is allowed to settle onto thin string wound round spools in 100m lengths. This is done in controlled conditions in an aquarium. These spools will be laced onto seaweed lines to be grown in the sea on the Seaweed Farm. The lines will be deployed by existing small creel vessels or mussel farm landing craft style vessels. Narrow ropes (10mm or 12mm) are passed through the spools of Alaria string and the two fixed together.

These combined lines are strung out in either horizontal, vertical or zig-zag patterns (optimum growing patterns are still being assessed) at depths between 0m and 3m below the surface. Line deployment is done between mid October and late December to give the juvenile plants time to settle on the lines before the darkest winter days shut down their growing. Growth should start to pick up again in late February as day length grows.

The vessels used to deploy the seaweed lines onto the farm site are based on Mull and work locally. It is therefore unlikely that non-native invasive species will be brought to site by this route.

Harvesting Process

Regular monitoring of seaweed growth will be done via visits to the seaweed farm by small vessels. This will decide the optimum harvest periods. Harvest vessels brought onto the farm site are based on Mull and work locally.

Harvesting will initially be hand, using scissors or shears. Automated harvesting machines are being developed which will use a simple roller frame with cutting heads that will trim the useable frond of the plant into bins or boxes while leaving the rope and growing base (stipe) of the plant intact. This is coppicing method may allow multiple harvest from these rapid growing plants.

All vessels and equipment will be washed thoroughly and equipment, ropes etc will be brought ashore, washed and stored ashore.

Onward Processing

To keep the seaweed to the highest standard the product needs to be brought ashore and loaded onto temperature controlled vehicles, then to be processed as soon as possible.

Drying is the main processing method, essentially lowering the water content without using excessive heat (which would cook the plant) similar to herb processing. This creates a stable, storable product that can be rehydrated as an ingredient. For other processing routes, seaweed will be kept as a wet, fresh ingredient with shorter shelf life.

For either processing routes, any surplus or waste product will be disposed of via controlled waste routes as per normal commercial waste procedures.

Effective disease/INNS identification and diagnosis.

We do not envisage disease issues at our seaweed farm site as would be seen in animal husbandry around mussels, oysters or finfish. Staff working at Aird Fada will be trained in identifying invasive non-native species (INNS) and an effective reporting process put in place. In the event of the positive identification of an outbreak, staff will ensure that no product leaves the site. Any equipment and ropes taken ashore will be treated and Nature Scotland informed immediately.