

## Van Oord & Seawilding Joint Sand-capping Seagrass Restoration Biosecurity Plan (Based on NatureScot Research Report 1286 - Seagrass restoration in Scotland - handbook and guidance)

Updated May 2024

Van Oord and Seawilding take biosecurity seriously and have a vested interest in the health and biosecurity of Loch Craignish and beyond. This biosecurity plan is based on Seawilding's own seagrass restoration biosecurity plan and has been updated to include biosecurity in relation to our sand-capping research project.

### Monitoring

Monitoring for INNS forms part of our seagrass monitoring plan which is reviewed and reported on annually.

### Current Status of priority high impact INNS in Loch Craignish

Species common name	Scientific name	Status in Loch Craignish	Notes
Pacific Oyster	<i>Magallena gigas</i>	Rare	A few have been found on the intertidal area around Ardfern Village, likely placed there by villagers to store prior to consumption. No indication of increased spread or breeding
Wakame	<i>Undaria pinnatifida</i>	No recorded	
Carpet sea squirt	<i>Didemnum vexillum</i>	Absent	Other colonial tunicates have been tested by Rosslyn Institute as not <i>D. vex.</i>
Slipper limpet	<i>Crepidula fornicata</i>	Not recorded	
Leathery sea squirt	<i>Styela clava</i>	Rare	Observed on occasion in low numbers. No indication of increased spread
American oyster drill	<i>Urosalpinx cinerea</i>	Not recorded	
Japanese sting winkle	<i>Ocinebrellus inornatus</i>	Not recorded	
Wire weed	<i>Sargassum muticum</i>	Rare	Observed in a small area of Loch Craignish, widespread in nearby lochs and sounds. As recommended by David Donnan of NatureScot, the small area near our restoration project was removed in 2023 and any regrowth observed in 2024 is planned for removal.
Common cord grass	<i>Sporobolus anglicus</i>	Not recorded	
Bonamia	<i>Bonamia</i>		Tested by Marine Directorate and Rosslyn Institute in 2023 as part of the oyster restoration project

### Movement of Seagrass

The seagrass project is a self contained project within the confines of Loch Craignish. Seagrass seeds and rhizomes are moved only within Loch Craignish. Seagrass seeds are processed in the Seawilding boathouse on the shores of Loch Craignish using water from Loch Craignish. No seagrass plant material including seeds is brought in from outside Loch

Craignish\*. Seawilding does not provide plant material for use in other areas outside Loch Craignish\*\*

\*Seawilding may wish to pursue the feasibility of using the adjacent Crinan Sound as a donor source of *Z. noltei* restoration in the future but no such plans are currently in place.

\*\*A small amount of plant material has been removed for academic study, for which Seawilding cannot control, but has indicated that such material should be destroyed after use and not returned to the environment. Seawilding does not accept such material to be returned to Loch Craignish.

### Processing and Storage

Seagrass seeds are moved to our lochside boathouse for processing. A small amount of seawater from the loch is used for this process, for which Seawilding has been informed is below the limit needed to be licenced by Sepa. Seeds are stored overwinter in a chiller in a nearby powered shed using artificial hyper-saline seawater and a mild copper sulphate solution.

### Staff

Staff mainly use equipment within Loch Craignish and which is stored in the lochside boathouse. When staff and equipment is used elsewhere, equipment is checked, cleaned, and dry\* both before use elsewhere and before being returned to the boathouse or used in/on Loch Craignish. Seawilding staff have undertaken biosecurity training and received a certificate of training from the GB NNSS (<https://elearning.nonnativespecies.org/>).

\*<https://www.nonnativespecies.org/what-can-i-do/check-clean-dry/>

### Visitors

Visitors to Seawilding at Loch Craignish that are going on or in the water are briefed in biosecurity and those using their own equipment are asked to check, clean, dry their equipment before use. Virkon spray is made available for equipment. Loch Craignish is a popular venue for water-based tourism and many boaters use the marina and anchorages as their first port of call after transiting the Crinan Canal from the Clyde. Seawilding has no control over the spread of INNS from other users of the loch.

### Sand-capping

All materials (sand and proxy seeds) that will be included in the first phase of sand-capping project will be terrestrially sourced to avoid introducing marine invasive species into Loch Craignish. The sand that will be used to cap the seafloor will be of terrestrial origin and sourced from a local supplier who quarries from a terrestrial source.

Proxy seeds will be used in the first phase in order to not waste valuable seagrass seeds on a pilot that is designed to test the practicalities of the method and fine tune the equipment. The proxy seeds used will be of terrestrial origin and therefore cannot germinate or grow in seawater. Alfalfa, Millet and Clover seeds were found to be of a similar size and density, and having similar settling velocities to *Zostera marina* seeds. The exact species used will be determined based on comparison with seeds collected from Loch Craignish.

Seagrass seeds used in the second phase of the research project will be collected from Loch Craignish, and stored and processed as described above and therefore do not pose a threat to biosecurity.

All equipment used to sand-cap will be placed on boats or pontoons either from Loch Craignish or sourced from the West Coast of Scotland (refer to the "Staff" and "Visitors" section above). No international vessels will enter Loch Craignish for this project. All mechanical equipment (e.g. mixing tank, pipeline, excavator) will be washed prior to use..

Text from NatureScot Research Report 1286 - Seagrass restoration in Scotland - handbook and guidance:

### Biosecurity

Invasive non-native species (INNS) can have serious negative impacts on native Scottish habitats and species. For example, the carpet seasquirt, *Didemnum vexillum* is known to smother other animals, which could alter entire habitats and have severe consequences for biodiversity and the economic activity within the marine environment. Invasive species such as *Spartina anglica*, *Sargassum muticum* and *Codium fragile* can also pose a threat to seagrass. Introduction and spread of INNS with seagrass can lead to a downgrade in classification of the entire water body under the Water Framework Directive.

All activities associated with restoration that can lead to introduction or spread of INNS and plant diseases (see Seagrass bed distribution and historic extent in Scotland section) have to be identified in a Biosecurity Plan including the steps needed to minimise this risk. Proposals that include transplanting adult seagrass, seeds or sediment from a different location must carefully consider risk of accidental transfer of INNS and plant disease. Activities that have the potential to move biological material between locations should take steps to minimise the spread of INNS and plant disease.

Research at Swansea University suggests that sterilising seagrass seeds can minimise the risk that INNS will spread due to movement of seeds between sites and this does not impact the viability of seagrass growth and development. This process involves soaking seeds in 5% sodium hypochloride (see Churchill, 1992).

However, it is recommended that seeds should be sourced from local beds, where possible, to reduce the risk further.

Carrying out surveys for the presence of INNS at proposed sites is highly recommended as INNS can cause problems and reduce the chance of successful restoration. Swansea University

are currently examining whether the high prevalence of *Sargassum muticum* in particular areas may become problematic for the use of hessian bags in seagrass restoration. Continued monitoring for the presence of INNS and pathogens throughout the entire restoration project and even after beds establishment is recommended. The presence of INNS and plant pathogens can be reported to Marine Scotland (MarineNonNativeS@gov.scot) and support with identification of suspicious organisms can be provided.

Biosecurity should be a key consideration for any seagrass restoration proposal, particularly where seeds or adult plants are being moved from one site to another. For any project involving fieldwork, the Check, Clean, Dry procedure should be followed. Marine Scotland and NatureScot can provide specific biosecurity recommendations on a case by case basis depending on location. The Biosecurity Plan should be submitted to Marine Scotland prior to any restoration activities.