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Biohaven® Floating Wetlands

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BIOHAVEN® FLOATING WETLANDS

About

Deployment of floating islands is a form of bioengineering. The arrangement of the islands (and access to them), ease of launch, type of anchoring, planting scheme, root structures and habitat creation above and below the surface of the water are all important design considerations, as is the decision to fence or leave an island unfenced. Understanding the launch site is key to success.

The BioHaven® design allows for complete naturalisation after 1 growing season

BioHaven® is a floating island that is designed to provide a natural riparian edge from the moment of launch.

A percentage breakdown of BioHaven® components by weight is noted below:

- **55% natural coir fibre** (coir fibre, sustainably sourced, fully biodegradable)
- **22% HPDE connection grid** (fully recyclable and UV stabilised, capable of withstanding freeze and thaw)
- **12% typical plant biomass on launch** (existing root and shoot structures), this will increase dramatically during the first growing season
- **10% thick denure HDPE growing platform** (fully recyclable, UV stabilised and capable of withstanding freeze and thaw)
- **1% marine grade closed cell foam for buoyancy** (carbon stabilised, non-leaching, non-recyclable).

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Key Points

- **BioHaven® is designed with self installation in mind. The system is fully modular, with each component being moveable by hand. This reduces any manual handling risk and allows an installation to be undertaken without any heavy plant such as cranes or lifting devices.**
- **The integral connection grid allows BioHaven® modules to be joined side by side, end on end or in a variety of different shapes to suit the water body.**
- **The BioHaven® module design allows for quick and easy connection of modules with no ancillary parts or pieces. The connection grid is robust and has been proven in moderate energy environments. It is fully recyclable.**
- **BioHaven® modules are designed with internal buoyancy. This means that a high level of buoyancy is distributed across the whole of the module, not just around the edges of the island. This unique buoyancy design provides very high stability across the whole surface area of the module, allowing for narrow installations to support a fully mature vegetation scheme with diverse height and biomass distribution.**
- **The internally buoyant design leads to quick establishment of a natural riparian vegetation right to the water's edge, improving the visual appeal from the moment of launch**
- **The module design allows for complete submersion and impacts e.g. in the case of deliberate damage/vandalism, without compromising the integrity of the buoyancy.**
- **Modules have multiple anchoring connection points. The anchoring design will also allow for adjustment if the need to move the installation in the years ahead is required.**
- **The anchoring design is a key element to any BioHaven® project and using tamper proof shackles for installations with public access is a key element to effective design. Installing and adjusting anchors during the installation process is quick and simple**
- **BioHaven® has more peer reviewed and externally verified data than any other floating islands system when it comes to improving water quality.**
- **All planting schemes for BioHaven® are provided pre-grown, making for quick and simple installations without the need for plug planting, which can be time consuming and more costly.**

*There are very serious concerns about plastics in the environment, and rightly so. BioHaven® uses only thicker denure *(>3mm) HDPE that is carbon stabilised, fully UV resistant and able to handle freeze and thaw processes without loss of structure over time. The BioHaven® design does not use thin plastic mesh or grids that can be subject to fragmentation and also present a potential trap for reptiles and amphibians.*

We have many years of experience working with a wide range of customers to deliver successful floating island schemes. Project references are available on request.

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Planning a Floating Island

Floating islands are a great habitat creation tool that have also been proven to improve water quality in a wide range of peer reviewed literature.

Floating Islands deliver a means of introducing emergent vegetation into water bodies that could otherwise not accommodate this colourful and diverse habitat.

As well as creating the perfect invitation for nature to thrive above the water line, the root structures that develop below the island provide a complex and biodiverse substrate.

This substrate has been proven to process nutrients and remove pollutants from the water column, as well as provide a totally different habitat to the surface of the island.

There are many different types of floating islands, from naturally occurring examples found in different parts of the world through to home-made efforts and a range of commercial offerings from the cheap & cheerful to the highly engineered.

Finding the right approach to planning a floating island project will be a case of defining budget as well as defining the wildlife and water quality outcomes.

When it comes to planning a floating island project, big is not necessarily beautiful.

Creating small pockets of new floating wetland habitat can deliver a big benefit for wildlife and be delivered inexpensively.

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Small is Beautiful

Here are a few other reasons why we think small is beautiful when it comes to creating new areas of floating wetland:

- **Ease of project delivery:** it is easier to build and position a number of smaller islands as opposed to one bigger island, this can lead to lower installation time and associated costs.
- **Better installation footprint:** creating a mosaic of smaller islands can deliver a better aesthetic, a larger project 'footprint' and have a bigger impact. It is amazing how small a single 'big' island can look when it is positioned in the middle of a pond or lake.
- **Amount of Riparian edge:** a single 10 x 10 metre island project delivers 40 linear metres of riparian edge. 5 islands each measuring 5 x 4 metres delivers 90 metres of riparian edge. Same amount of island, more benefit for wildlife and water.
- **Lower anchoring engineering:** there is a greater engineering stress on a bigger island, especially as the plants grow tall and a 'sail effect' is realised when the wind gets up. Smaller islands are less prone to this cumulative impact as the planting scheme matures.
- **Ease of maintenance:** If a wild sown tree starts to grow in the middle of a 10 x 10 metre island or windblown litter is stuck there, no one can manage this easily. Smaller islands are much easier to access and maintain with only basic equipment.
- **Flexibility:** smaller islands can be re-positioned more easily, this gives greater operational flexibility as perhaps the needs of wildlife and users of the waterbody change in future.

If you are thinking about using floating islands to create new wetland habitat and to improve water quality contact us for advice on project planning.

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Launching a Living Island

How to launch a living island and create the perfect invitation for nature.

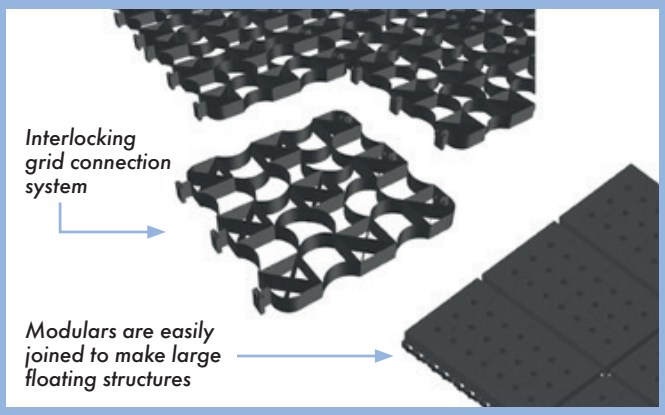
Easy to construct

BioHaven® is a modular floating habitat creation system. Each module measures 2 x 1 x 0.1. Large natural structures are built from this basic module. Each module has a dry weight of 9 kg.

The product is constructed from a planting matrix that has been specifically engineered for wetland plant establishment. The matrix is joined to a HDPE grid with an interlocking connection system.

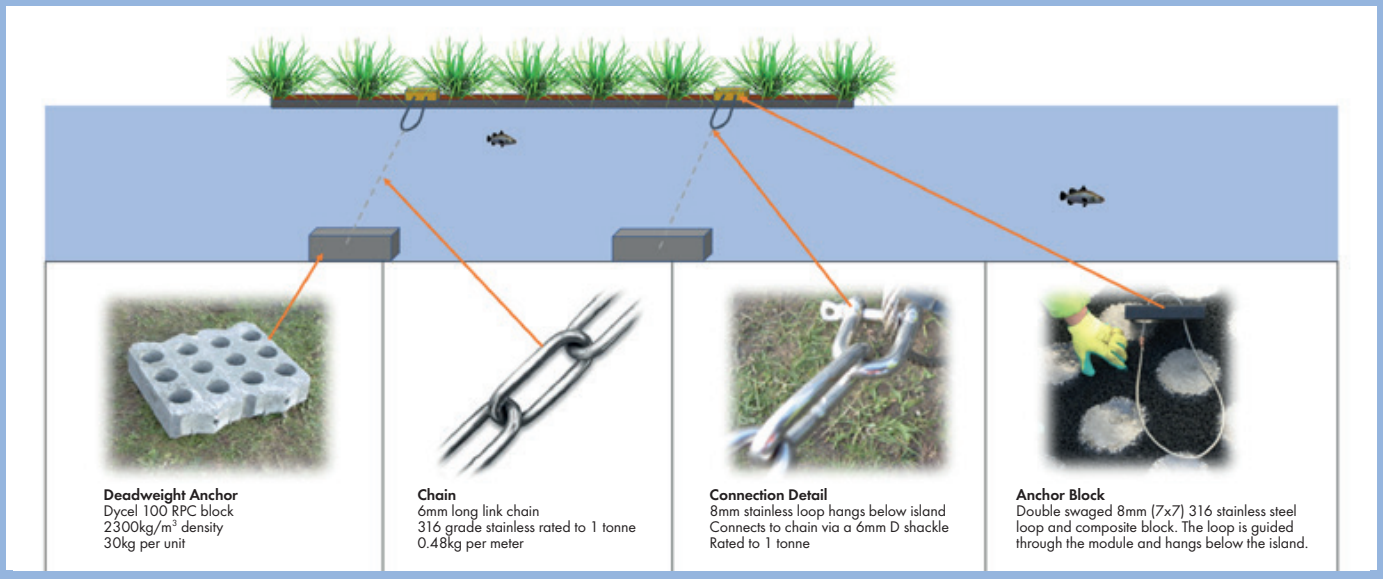
Connection system

The connection system is an integral part of the BioHaven® module. The system allows for quick and simple connection with no need for extra components. This minimises labour and material costs associated with installation.



Connection system, locks into place quickly and easily.

Anchoring System



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An important note before you begin:

Working around water can be dangerous. We recommend that a lone person does not undertake an installation

By proceeding you acknowledge that you are fully responsible for your own safety and wellbeing whilst undertaking all tasks connected with the launching and maintaining a BioHaven®.

- Have gardening gloves, a buoyancy aid and any other personal protective gear to hand.
- Weights such as sand bags or stone (supporting note A).
- Edges of ponds and lakes can be slippery – appropriate footwear is recommended
- A single BioHaven® module will become heavy when planted and even heavier when saturated, sliding the modules around on a tarpaulin can significantly reduce lifting.
- Remove expensive phones and jewelry before working in water
- Gardening pegs or staples can be used to keep planting mats in place if required (these are not usually required in ponds)
- Modular schemes grow large and heavy quickly! Planning to feed planted modules into the water and connect new modules at the waters edge can minimise manual handling
- Have rope or chain to hand for tethering or anchoring your new island

Supporting notes:

A. We recommend keeping an eye on the planting scheme during the first few weeks following a launch. After the island has been dunked underwater with pre grown plants, weights such as sandbags are sometimes used to keep plants at water level whilst roots establish, these can be removed after roots have established and plants are growing hydroponically.

The island is a living system and buoyancy can be affected by weight of biomass, rainfall (saturation) and atmospheric pressure. Under normal conditions the saturated module will sit at the correct level to allow root contact with water.

B. Garden staples are used for pinning the coir mats to the BioHaven® in larger water bodies where rough conditions are expected. Staples can be pushed in by hand or knocked in gently using a rubber mallet; if the staple doesn't go straight into the island you may have struck buoyant foam. In this case damage won't be caused to the island, simple adjust the staple position until it pushes in more easily.

C. The grid at the edge of the island is ideal for fixing rope tethers or anchoring ropes from. We do not specify anchoring solutions for customer led installations. Ensure that the ropes, chain or cable used to keep islands in place are tied or connected to the thicker edge of the grid as these provide stronger fixing points.

D. Bags or nets of local stone/ gravel provide a good cost effective option for anchoring an island in a low energy environment such as a pond.

E. If the pond is lined care must be taken with choice of anchoring so as not to risk damaging the liner. We bear no responsibility for your choice of anchor. BioHaven® can also be tethered to the bankside if the risk of liner damage is high.

F. Even working around shallow water can be dangerous, please take all reasonable precautions and ensure that you are able to manage local hazards appropriately. We take no responsibility for accidents resulting in loss, damage or injury sustained whilst launching or maintaining a BioHaven®.

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Installation Instructions

Please note every launch environment is different, the following instructions provide a general launching guide and each step may not be appropriate or necessary in all cases.

1. Unpack island modules and plants (plants arrive pre grown on coir mats which are placed directly onto the module).
2. Transport all materials to point of assembly/ launch
3. Ensure you have all safety equipment and personal protective equipment such as gloves to hand
4. Place a tarpaulin on the launch area, this can be used for assembling islands on, connecting modules and sliding them into the water to reduce lifting.
5. If there is enough space, lay out the modules in the desired configuration on the tarpaulin to help plan your launch.
6. Place a pre grown coir mat onto each module and peg in place (pegging is not always necessary in low energy environments such as ponds)
7. Connect modules by firmly pressing the connection joints in place at the desired points. A rubber mallet can be used to gently tap the connections together until locked.
8. Attach guide ropes / anchoring ropes / tethering ropes to your island, these can be secured onto the thicker outer sections of the connection grid
9. Gently slide the installation into the water as it is constructed using a tarpaulin to move modules and reduce lifting.
10. Fully dunk the islands and plants underwater so that the island is completely submerged.
11. Ensure the installation is tethered to the bank and/ or anchored (see note D, E & F on anchoring)
12. Where pre-planted coir mats are used, weights such as sand bags or stone are sometimes used to keep the islands sitting low in the water while roots establish through the porous matrix (see note A on page 9)

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