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River Gardens Intertidal Habitat

Salix were involved the supply and install of coir rolls and rock rolls for intertidal habitat at Riverside Gardens, Greenwich. The opportunity arose from a new housing development.

The project consisted of capping the old sheet piling to a much lower level which allows for tidal inundation, where Salix materials were supplied in November 2019.

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Case Study

Integrated Constructed Wetlands

The Design

Due to the nature of the flood defence along the River Thames, there is limited capacity to encourage natural intertidal river habitats. However, intertidal habitats provide high ecological value, being particularly important for fish and invertebrates.

With this in mind, the design philosophy for the River Gardens would increase the potential for natural habitats along the river bank.

The River Thames is a particularly difficult growing environment and requires a careful choice of brackish-tolerant plants, an establishment technique and a method to stabilise the growing medium.

An established reed bed was installed within a 250m2 'planting' bed, mimicking the shallow gradient found naturally in saltmarsh and mudflats. The solution had to consider the following:

- The plants must cope with brackish water.
- A level bed with alternating dry periods or sudden inundation.
- Allow for a rush of water, and often wave energy that reflects back off the vertical walls, creating a zone of extra turbulence.
- When emptying, the plants, the sediment accreted and the base growing medium must all be retained within the bay.
- Provide a long-term reed bed solution as a potential habitat.

The Plants

Rock rolls and coir rolls are used interchangeably on the River Thames to provide mature vegetation whilst also providing the resilience to difficult growing environments.

Plants were pre-established in 300mm diameter biodegradable Coir rolls, laid side by side with Rock Rolls. The plants had to be robust enough to colonise the coir rolls and survive being placed directly into the intertidal environment.

A Brackish tolerant species specific mix was used, these can withstand both periods of wet and dry as well as coping with physical constraints of brackish water. The pre-established coir rolls were grown at Salix's nursery to provide mature plants at the moment of install.

The lower half of the intertidal terrace was left unplanted, to create a mudflat habitat.

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The Benefits

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Alternating Rock Rolls and Coir Rolls provides multiple benefits including sediment accretion and erosion protection whilst allowing vegetation to establish to provide improved saltmarsh habitat, providing a range of sediment traps that benefit the biodiversity of the habitat and continue to allow natural processes to occur, enabling plant establishment and maturation.

The Rock Rolls utilise a 40mm to 75mm graded stone which increases the abundance and diversity of benthic invertebrates due to the larger surface area for them to colonise.

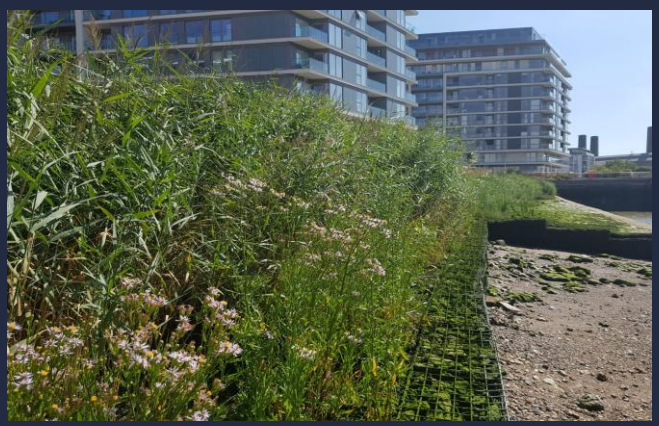
All the Coir Rolls and Rock Rolls were stitched together to provide a unified structure.

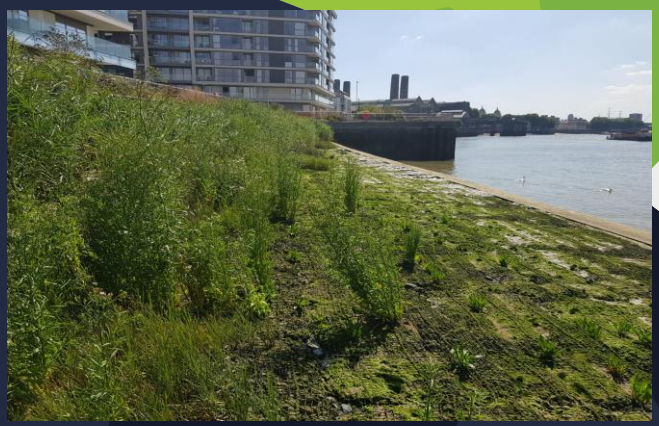
The Rock Roll component of this system provides long-term stability to the whole reed bed system in a very challenging growing environment. In time, the plants found within the coir rolls colonise the rock rolls to provide greater ecological value.

The intertidal vegetation helps absorb wave energy which would otherwise impact on the sheet piling behind and be reflected back into the watercourse.

The accreted sediments provide further habitat for a range of invertebrates and bacteria which benefit pollution remediation within the watercourse. And the vegetative biomass sequesters carbon.

Only about 2% of the edges of the intertidal Thames are natural. Projects such as this, increase the habitat along the edges which will have a significant positive ecological impact on plants, invertebrates, fish and birds.





The Rock mattresses used in the installation have over the last few years been able to accrete sediment in from the tidal fluctuations and are creating habitat for further intertidal vegetation as well as the local invertebrate communities. The knock on result of increased habitat for invertebrate communities is to provide increased foraging habitat for birds.

The pre-established coir rolls which had been installed are now thriving in this environment, and the intertidal vegetation spreading out from the coir rolls. As can be seen in the photos below; our site visits in 2021 and 2022.

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