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West Thurrock Salt Marsh Creation

Design and build a polder revetment system.

The West Thurrock Lagoon and Marshes SSSI is designated for the populations of overwintering birds the site supports, and it is recognised as one of the most important sites for wintering waders and wildfowl on the Inner Thames Estuary (Natural England, 1991). The reserve, which is a site of special scientific interest (SSSI), was designated as unfavourable and declining. The saltmarsh had suffered from significant erosion as a result of wave action from a large fetch and boat activity on the River Thames

Salix were appointed to design and build a polder revetment system to both protect the salt marsh lagoon from further erosion and to trap and retain silt regenerating the salt marsh habitat. Salix's natural bioengineering solutions, native plants and brushwood fascines were used to prevent further erosion. The restoration works needed to retain sediment, while also encouraging saltmarsh vegetation to re-establish, which came about due to the hard engineered flood defences to the rear of the saltmarsh contributing to coastal squeeze.

Salix wanted to create a healthy saltmarsh that would show zonation of species from lower reaches to upper reaches so that natural colonisation of saltmarsh species could occur. We planted with plug plants with the aim to reduce the time taken to full colonisation, and increase rates of sediment deposition, helping to compete against invasive species. Undertaking the works involved use of specialist equipment to traverse the soft mudflats whilst also working in between the tides. Limited access from the north bank meant launching from the south bank of the Thames to reach the project site.

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Design

Full topographical survey was undertaken by our subsidiary company Cbec Eco Engineering which not only informed the design but set a base survey for recording the build-up of deposited silts. To prevent any possible damage to the SSSI Salix devised a work method using a motorised flat-bottomed pontoon which allowed plant and materials to be transported to the worksite from a wharf on the opposite side of the river on each high tide. The pontoon was positioned and bottomed out on each low tide allowing construction to take place from the working platform.

The project encompassed 600m of eroding saltmarsh and the design made use of brushwood fascines as a biodegradable method to retain sediment, whilst allowing water levels to rise and recede unimpeded.

The brushwood slowed the flow as the tide goes out, depositing sediment out of suspension and build back the saltmarsh levels, to provide a more suitable environment for vegetation to establish. The establishment of saltmarsh vegetation has provided long-term, sustainable erosion protection, whilst also improving its SSSI status.

Fish passes were incorporated into the polder design to ensure that continued use of saltmarsh habitat as a nursery and refuge area for smaller and juvenile fish will remain, and this habitat retains more of its ecological value. The fish passes had to be designed and built to allow free movement, whilst also retaining sediment without creating channels that would reroute receding tides.

Plug planting of arrowgrass and sea aster was undertaken to stimulate the establishment of saltmarsh pioneer species. Invasive common cordgrass is present on the site and so expected to spread further into the lower reaches once sediment retention creates suitable conditions.

The rapid buildup of sediment and protection from erosion has allowed the marsh to begin colonizing new areas.

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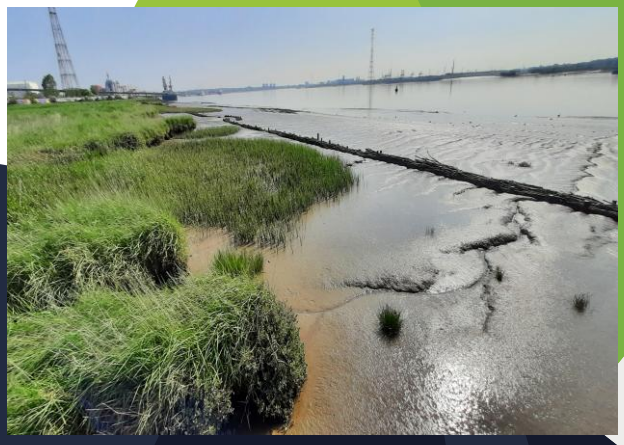
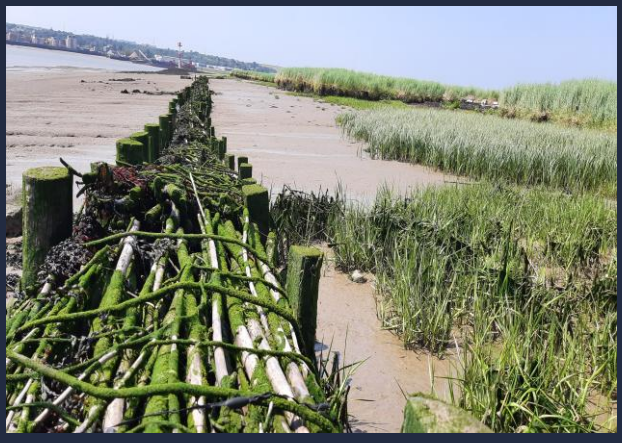
The Benefits

By retaining sediment on the saltmarsh and reducing erosion, Salix has helped maintain this critical habitat, with the soft mud providing feeding grounds essential for wading birds, fish, and invertebrates. Saltmarsh sequesters carbon, improves water quality, and slows the flow during tide cycles to provide a natural flood defence through vegetation establishment.

Sea club rush, sea arrowgrass and sea aster are establishing within the restored saltmarsh area. This will create a habitat for invertebrates and nursery refuge for small fish during high tide.

The physical characteristics of the vegetation further slows the flow allowing for sediment deposition. With increased vegetation on the lower reaches of the saltmarsh there is further facilitation of colonisation by other saltmarsh species.





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