

AquaticEngineering

Working Above Water, On Water & Under Water

Case Study : 2 x R&D Projects at Rockland St Mary



Client: Broads Authority working in partnership with Rockland Parish Council.

Contractor: AquaticEngineering

Location: Rockland St Mary – Rockland Broad

Purpose: Research & Development – Island Erosion

Period: March 2011 – 5yrs

Rockland Broad lies to the north-east of the village of Rockland St Mary. It comprises an area of approximately 50 acres (200,000m²) and is surrounded on all sides by open marshland and tall reed beds. The Broad is connected to the River Yare by two navigable dykes, Short Dyke and Fleet Dyke; a further dyke leads south connecting the Broad with Rockland Staithe.

The site is in a designated area and the impact of the proposed development on the SSSI, Ramsar site, SAC and SPA was considered and planning consent approved.



There are three small reed islands situated in the south-east corner of the Broad, remnants of the original peat workings which created the Broads. Over time these reed islands have degraded as the margins eroded. This is a natural process accelerated by wash from boats.

AquaticEngineering were commissioned by the Broads Authority to provide innovative and cost effective solutions to the erosion of these last remaining reed islands.

Planning consent was approved to protect two of the remaining three reed islands and endeavour to reverse the process of erosion through the installation of two experimental techniques. The third island would remain unprotected and act as a control against which to monitor the effectiveness of the experiment over a 5yr period.



Systems unloaded at Rockland Staithe ready for the short trip up to the Broad

Installation 1 – A ‘breathable’ silt curtain





The island was surrounded by a silt accretion curtain, supported by floating tubes at the water surface and anchored to the bed of the broad with a heavy chain. Incorporated in the silt curtain were a series of one-way flaps which allow turbid water to enter the calmer area between the curtain and the island edge. Sediment then settles in this space, accelerating the natural process of island expansion through sediment aggregation.



Natural England – We are supportive of the principle of sustainable management of lake edge erosion and reedbed loss, and the methodology proposed.

RSPB – The RSPB fully supports the proposed works.



Above – at the time of installation (March 2011) Below - 18 months on (October 2012)



The reed islands are regarded as a positive feature contributing to both the cultural heritage of the Broads, the aesthetics of the area and providing a valuable protected habitat for native flora and fauna. Loss of the islands would be detrimental to these interests. The erosion of the islands has a further negative effect by contributing to silt levels within the broad, resulting in problems to both navigation and the aquatic environment.



Following a scheduled site appraisal in October 2012, a mere 18 months after the initial installation, there appears to be a marked improvement in reed growth. Within the protected area of the curtain clear water conditions exist which has resulted in a proliferation of submerged macrophytes, several species were noted. Above callatriche ssp, also ranunculus ssp & myriophyllum ssp were observed to a lesser extent. This rapid regeneration of submerged aquatic vegetation will further speed up the accrual of silt within the protected zone and hasten its binding through reed (*Phragmites communis*) expansion. First indications are therefore that the 'breathable' curtain is having a significant positive impact on the immediate area of the Broad.

Installation 2 – A Floating Raft System



The second Island is protected by a 50m long x 1m wide interconnected floating raft system, this creates approximately 60m of new profile around the external perimeter of the island.



The rafts have a unique matrix content below water and were planted with locally sourced emergent vegetation, once site surveys establish that this vegetation is fully established and stable (a time period estimated to be between one and two years), the buoyancy supporting the rafts will be removed causing them to sink. The plants, selected to be able to grow in a water depth of between 50cm and 100cm, will continue to grow from the raft base. This vegetation will create a new outer edge to the reed island, protecting the remnants of the original island from erosion and allowing turbid water to pass through the vegetation and settle in the calm water between the vegetated raft and the original island edge. It is anticipated that this will both protect the existing island from the effects of erosion and promote the natural process of sedimentation and regeneration of the island.





After sinking the rafts (by removing the floatation devices and fencing) the above water appearance will be that of a natural bank edge, however with the added advantage of an integral reinforcing component with an indefinite life span



Following the site appraisal in October 2012, again it would appear that this innovative installation has been highly successful with reed growth and vigour appearing to have improved. A more detailed appraisal will be undertaken this year (2013) and a decision made as to when to remove the floatation tubes, thus allowing the system to come in contact with the deep benthic silt.



One of the principle objectives of this island restoration project is the net positive effect of the development on the ecology of the Broads: island stabilisation and restoration would result in less sediment in the water (and associated increased light levels and benefits to ecology) and increased island surface area meaning more 'safe' habitat for birds and other animals within the Broad.

Regular project updates will be made through our websites or if you have a site in mind which would benefit from such an approach please do not hesitate to contact us.

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