

**Avonmouth Severnside Enterprise Area (ASEA) Ecology Mitigation and Flood Defence
Avonmouth, Somerset
Environment Agency, BMMjv**

BIG Biodiversity Challenge Award Category: *Habitat Creation – Project of the year award (>5ha and above)*

Project overview

The ASEA Scheme is located on the eastern side of the Severn Estuary. It covers 17km of coastline from the village of Aust in the north to the southern end of Avonmouth Docks in the south and incorporates two new inland habitat areas located at Hallen Marsh and Northwick.

What were the biodiversity conditions on site, prior to the enhancement?

The land is council owned with tenant farmers. The sites are partially within the Severn Estuary Special Protection Area, Site of Special Scientific Interest, Special Area of Conservation, Ramsar site. All works were subject to Habitats Regulations Assessment and CRoW/SSSI assent. Natural England licenses had to be obtained for work that may affect protected species (bats, great crested newts and water voles). Works have been undertaken in accordance with license conditions, supervised by a suitably qualified ecologist.

An ornithological watching brief was in place to monitor bird numbers and ensure that the wintering bird noise restriction has been adhered to.

What were the reasons behind this project ?

Northwick Ecological Mitigation Area and Hallen Marsh Mitigation Area have been transformed into new wetland habitats, incorporating areas of wet grasslands, wetland scrapes and new planted vegetation. The objective of the new designed habitats is to provide sheltered wetland habitat for overwintering wading birds. There are also some plots dedicated to provision of open water in the form of ponds. 175 ha of wetland habitat have been created between the two areas.



Photo showing typical land prior to enhancement. The areas were mostly used by the tenant farmers to graze their cattle.



Photo shows newly created pond and scrapes with planting in the foreground.

What were the biodiversity measures taken?

- Newt ponds – both with newt fencing for relocating newts during construction works and ponds for after works have finished with stockproof fencing to prevent cattle access
- Bat mitigation areas with boxes put up on retained trees
- Barn owl mitigation areas with boxes installed
- Hibernaculums constructed
- Existing vegetation/trees/hedges retained where possible
- Pond Edge and Wetland Meadow Seed Mixes sown over 77ha
- Mixed Broadleaf Woodland, Broadland Woodland Edge and Tree and Native Shrub Mix planting carried out over 6ha
- Hydrological management of wetland habitats was achieved by managing the water levels within each habitat unit independently by the following measures: construction of new scrapes and shallow ditches to trap water; excavating linear trenches around the boundaries of each hydrological unit to break up the existing land drain network and backfilling of the trenches; construction of shallow earthwork bunds around the hydrological units to obstruct overland flow and retain trapped rainwater in the habitat areas; construction of small stoplog control structures across the existing field boundary ditches to provide local penning of water levels within each hydrological unit for the required period of wetting, whilst also allowing release of penned water during other times to reduce wetting for periods when agricultural productivity is to be encouraged.
- The construction of a bridge was moved so that a water vole habitat was not disturbed
- The reprofiling was created via a cut/fill earthworks exercise and the excess material created was used elsewhere on the project so that all material was reused
- Historic ridge and furrow features retained where possible and protected during construction works



Construction of newt pond with newt fencing so that they could be relocated during construction activities. The newt fencing is then removed and replaced with stockproof fencing to protect them from cattle.



Flow control structures constructed.



Further information

The hydrological redesign was carried out using GPS modelling to cut/fill where required, we have re-used all the soil dug out for the wetlands elsewhere in construction. Flow control structures were built using a combination of sheet piling, concrete base slabs and stop logs. The height of the stop logs can be changed to control the water flow and are designed for low maintenance regimes.

The network of ponds and areas of shallow water (that dry up in summer) will attract wetland birds, which will be able to use the scrapes to feed and rest at high tide when the mudflats and saltmarsh in the Severn Estuary are underwater. A specialist landscaping contractor was used for the planting and seeding and also to install bat/owl boxes, newt fencing and to build the hibernaculas.

The hibernaculas are made from grass, mud and other natural materials, they make a warm, moist and safe habitat for Great Crested Newts, other amphibians, reptiles and insects. Hibernacula also act as a well-stocked larder, with earthworms, slugs and spiders on offer, and provide protection from predators too. During winter, they offer a safe place for reptiles and amphibians to hibernate. This is particularly important for Great Crested Newts who are largely inactive in winter, in summer they also offer shelter for breeding and from hot weather. Throughout the construction period, our JV's partner's ecologists were available to avoid and minimise the impact of design and delivery of the wetland habitats being created.

Project Team

- The project is a partnership between South Gloucestershire Council, Bristol City Council and the Environment Agency
- Design and build joint venture between Mott MacDonald and BAM Nuttall

What was the motivation for carrying out the enhancement?

The Severn Estuary is internationally important for biodiversity, large areas of mudflat, salt marsh and coastal floodplain provide feeding grounds for populations of several species of waterbirds. ASEA and the surrounding areas of coastal floodplain continue to be the focus for development. This has reduced the amount of available habitat for wetland birds. For economic development to continue within ASEA without adversely affecting the Severn Estuary, we have provided ecological mitigation via newly created wetland habitat. We are ensuring that a thriving environment will be established for people and wildlife, to last the rest of this century and beyond.



Photo showing hibernaculas during construction to provide new refuges for local wildlife.



Cut and fill to reprofile areas, with all excess materials generated used elsewhere on site for construction of embankments.