Whitewool Stream Wetland Project
Meon Springs, East Meon, Hampshire
Meon Springs and Tetra Tech

BIG Biodiversity Challenge Award Category: *Habitat creation Project of the Year (>5 ha)*

Project overview

The project, the first of its kind, involves the creation of wetland and associated habitats to deliver biodiversity gains, reduce nitrogen levels in the water, attenuate peak flows and reduce low flows going down Whitewool Stream, into the River Meon and the European sites in the Solent.

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

Prior to the project, the reach of the Whitewool Stream to be enhanced was straight and canalised, with little in the way of emergent vegetation. Baseline ecology surveys by Tetra Tech found the site offered poor habitat for species associated with the River Meon such as water voles. The land either side of the stream was in use as arable farmland, again with a very low baseline biodiversity value. Riparian tree lines were present to the north and south, but not along the canalised reach, limiting connectivity for species such as bats using the valley corridor.

What were the reasons behind this project ?

The original aim was reducing nitrogen levels in the River Meon, and Solent European sites (in the order of 2000 kg/yr.) to mitigate outputs from new residential developments in the region. It has since expanded as part of a whole business approach for the Butler family of transforming an intensively farmed landscape into a productive, regenerating landscape to improve water quality and flows, whilst still being a productive farm. The project will attenuate peak flows, reducing winter flooding downstream, reduce low flows in summer and deliver biodiversity net gain with c.6ha of wet woodland and other riparian habitats.

Canalised section of Whitewool Stream (Tetra Tech)

Arable fields either side of the stream prior to the project (Tetra Tech)

What were the biodiversity measures taken?

The wetland has been designed specifically for its headwater location and, using permaculture principles, it creates various environments and microenvironments to slow the flow and remove nutrients from the water. Part of the area is wet woodland, where swales have been formed to develop an extensive “edge area” along which mulch has been placed and wetland plants planted to create diverse micro ecosystems. The main part has been developed by broadening what was a highly incised river channel to a wide flat area, where the water can find multiple flow channels. This is known as taking the stream back to “Stage Zero”. In between the various wetlands is riparian buffer and trees which re-connect the previously severed stream corridors to the north and south of the site.

The project as a whole is innovative, as the first large-scale wetland designed to deliver nutrient neutrality since the issue was identified by Natural England in late 2018, leading to an effective moratorium in housebuilding. Both pre- and post-construction, regular water quality sampling has been undertaken to monitor the effectiveness of the project and it is hoped that this will enable the approach to be replicated elsewhere. This is particularly important as in March 2022 Natural England identified a further 20 European sites (across 42 local authorities) as requiring nutrient neutrality.

Extensive engagement was undertaken during the planning application process with South Downs National Park Authority (who approved the scheme) and Natural England. This made sure that the project also met local objectives such as landscape design and the delivery of ecosystem services. Part of the wider farm operation is also education-based, hosting school and corporate events and the wetland project will form part of the accessible area of the farm with a circular walking route and information boards.

Long-distance view of the wetland post-implementation (Meon Springs)

Closer view showing habitat variation within the wetland (Meon Springs)

Further information

Construction entailed the removal of topsoil from the wetland area, before the area was carefully regraded and rolled to prevent infiltration. Topsoil was then replaced before the planting stage was undertaken. Numerous baffles and swales were also installed to reduce flow rates and maintain a large wetland area (preventing incised channels from developing). In addition to water quality monitoring, which is being undertaken to measure the effectiveness of the nitrogen removal, habitat and protected species monitoring will be undertaken to measure the effectiveness of the habitat creation, and compliance with the management plan. Oversight of this process is the responsibility of South Downs National Park Authority. Although detailed monitoring has not yet commenced following the establishment phase, there have been a number of key observations. Water vole activity south of the wetland within the fishery has increased since the wetland was implemented (backing up the theory that the canalised section was a deterrent). There is also visibly more activity by fauna within the area, including invertebrates and two pairs of nesting lapwing. Even at this stage it is clear that the biodiversity objectives will be achieved. A key lesson learnt for similar projects, particularly where they are unusual or innovative, is the early engagement of stakeholders. Discussions with South Downs National Park Authority and Natural England enabled key requirements (which were not originally aims of the project) to be integrated early on (such as landscape principles), and the resulting scheme to be more cohesive and higher quality.

Project Team

Meon Springs ; Tetra Tech (Ecology, Hydrology and Planning); Five Rivers (Wetland Design); Biologic Design Ltd. (Construction, Planting and Establishment)

What was the motivation for carrying out the enhancement?

The key motivations were twofold. One, using our leading with science approach to deliver a pioneering, efficient mitigation project as a solution to a significant constraint to sustainable development in the region, at a time when little was being offered in the way of solutions. Two, to achieve a significant improvement for biodiversity which fit the aims of the farm and which the whole project team could be proud of.

Vegetated swale adjacent to main wetland, with woodland planting along mulched margins (Meon Springs)

Successful establishment of wetland flora (Meon Springs)