

Welton Farm, Blairgowrie

River: Ericht

Date: 2nd July 2018

Costs: £80k



DESCRIPTION

The River Ericht is part of the wider Tay catchment and has a steep, flashy catchment with an area of 432km² to its confluence with the River Tay. The project was located 2km downstream of Blairgowrie, Scotland and located within a Special Area of Conservation (SAC), UK0030312. The project was undertaken on a historic landfill site on the south riverbank of the River Ericht. There is considerable ecological variety in the Tay catchment, resulting in the Tay supporting the full range of salmon life-history types found in Scotland, with adult salmon entering the River Tay throughout the year to spawn in different parts of the catchment. In addition, Otter, Beaver, Bird and three Lamprey species (Sea, Brook and River) were found within the SAC.

The project was estimated at £150k with a final cost of £80k; significant savings were made by following the waste hierarchy to reduce, reuse, recycle and recover prior to considering disposal to landfill. The project took approximately 5 weeks to complete with works commencing on 2nd July, 2018 and completion in early August. The project consisted of landfill and riverbank remediation work. Landfill material was polluting the River Ericht impacting the watercourse and subsequent SAC following numerous spate events in 2015/16. This had a direct impact upon the ecology and environment. The aim of the project was to prevent further landfill material entering the watercourse and to install protective measures to protect the riverbank and reduce further erosion.

Numerous stakeholders were identified and consulted prior to and during the works. These include the Landowner, Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH), National Farmers Union (NFU), Tay District Salmon Fisheries Board (TDSFB) and Scottish Government.

Perth & Kinross Council applied for a CAR engineering licence (Controlled Activities (Scotland) Regulations) Licence, a Waste Exemption Licence (Waste Management Licencing (Scotland) Regulations 2011) and a Habitats Regulation Appraisal (Habitats Directive), due to the site being within a SAC, were all necessary.

DESIGN

The landfill material was excavated, removed and capped to prevent further pollution. Excavation works consisted of removing 3000 tonnes of landfill; this was then separated on site using a trommel. The separated clean earth was reused to reform the profile of the embankment whilst the waste was sent for recycling. During the site clearance a number of trees (14) were removed intact; these were set aside and later installed into the toe of the embankment (root wads) at 5m intervals to offer protection against erosion. Additional non-structural green measures in the form of coir matting, willow and hedgerow seed mix was sown for extra stabilisation – this will enhance the Special Area of Conservation and protect the embankment. A number of European Protected Species (otter, beaver, salmon and bird) were identified on site following a Phase 1 Habitat Survey; these were managed throughout the works in parallel with sediment and waste management systems.

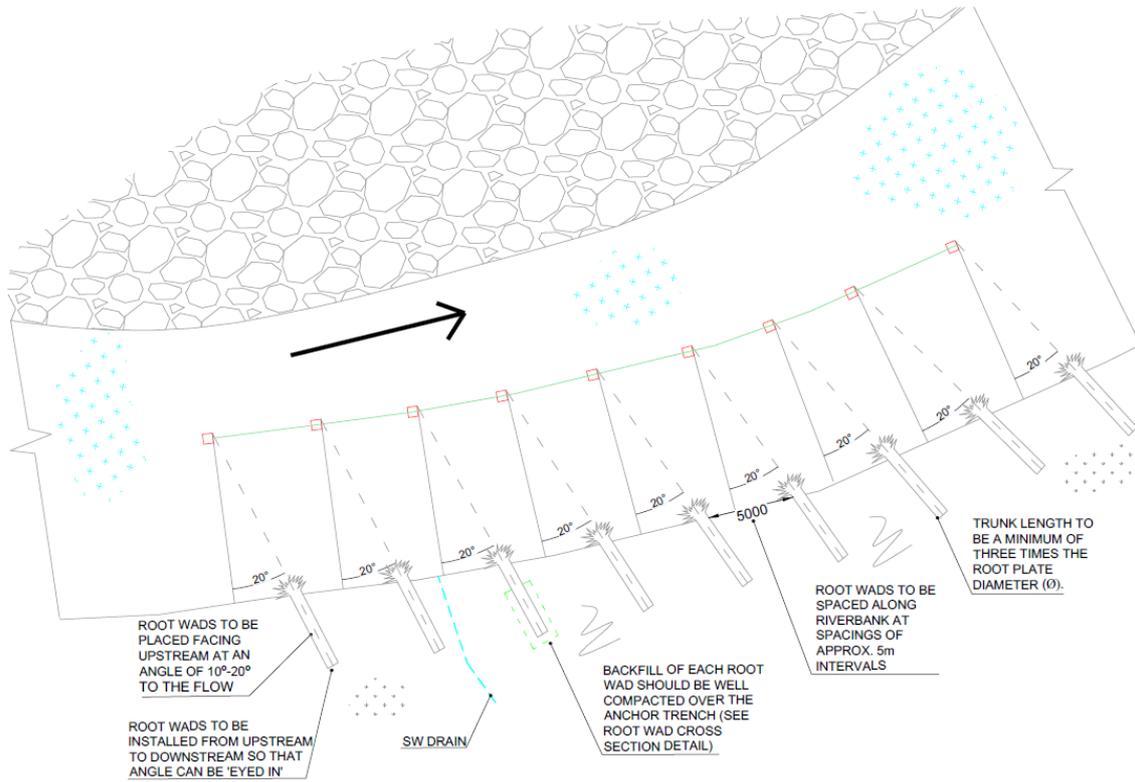


The waste generated following the trommeling process was approx. 50 tonnes; upwards of 97% was recycled. Waste consisted of timber, plastic, metal and green waste. Timber was shredded and used for fuel, green waste was put into anaerobic digestion and turned into electricity and/or mixed with food waste to make compost (both 100% diverted from landfill) and general waste was handpicked and recycled (approx. 97% - 100% diverted from landfill). This is within the targets set out in Scotland's Zero Waste Plan which aims at 70% waste to be recycled and maximum 5% to landfill by 2025.

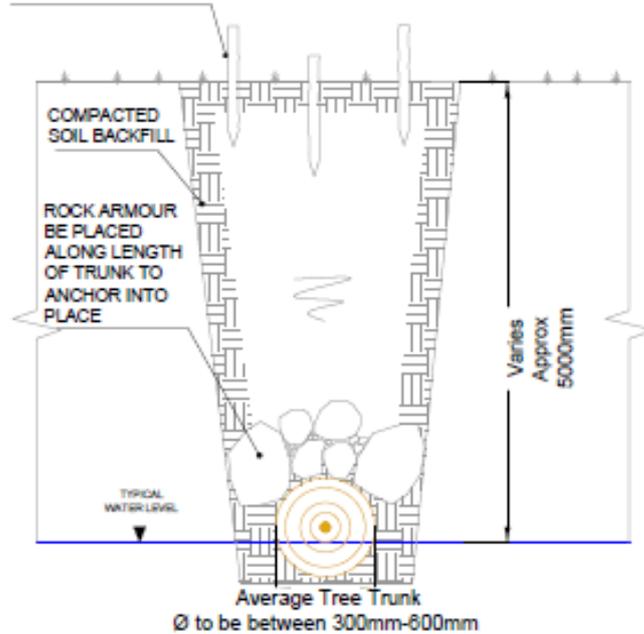
Savings were generated by eliminating landfill tax, minimising haulage costs and the project designed ensuring no imported earth was required. I was able to circumvent subsequent methane gas production by diverting waste from landfill.

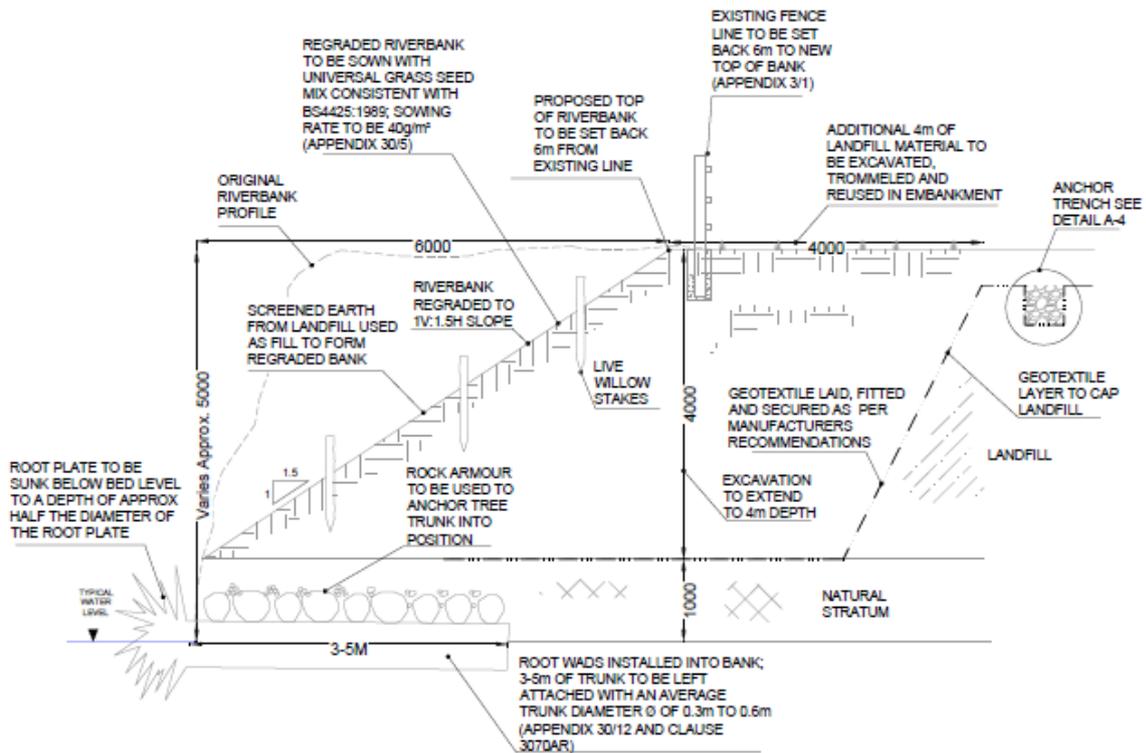
The project was innovative promoting green bank protection measures in the form of root wads at the toe of the embankment. Trees removed as part of the site clearance were re-used and inserted into the embankment facing upstream at an angle of 10-20° to the flow. Root wads were installed at 5m spacing's and anchored with rock armour. Each tree trunk was between 300mm – 600mm in diameter and the length of the trunk inserted into the embankment was at least 3 times the diameter of the root plate. The trees used were hard wood (angiosperm) adding durability to the embankment. Root wads have a positive influence on fish habitat; pools will develop providing critical hiding areas and velocity shelter for fish; ideal resting areas. Organic materials will build up against the root wads providing food for algae. Algae act as a food source for fish, which in turn preserves the symbiotic dependency between species. This enhances and protects the aquatic environment promoting sustainable water use which benefits the SAC, recreational users such as anglers.

Root wads were installed on the outer bend of the river; this will help to absorb and distribute the energy from helicoidal flows, reducing the erosive potential. Scour pools are predicted to form at the base of the root wad which reduces flow velocities enabling bankside habitats to form. Variation of the watercourse will increase by changing temperature and oxygen levels across its cross sectional area. The creation of riffles, pools and shaded areas benefit the macro-invertebrate population and help to improve water quality, vital for maintaining the interaction of species.



CONTRACTOR TO SUPPLY AND PLANT 2 LITRE POT LIVE OSIER WILLOWS. THESE ARE TO BE INSTALLED ACROSS THE FACE OF THE REPROFILED EMBANKMENT. THESE SHOULD BE PLANTED AT A SPACING OF 1m²





The new embankment was installed with biodegradable coir matting; this increases surface cover and generates roughness, key properties in controlling soil erosion. A hedgerow grass seed mix was sown into the coir matting; this provides a diverse plant assemblage (native grass & wildflower). This attracts insects and invertebrates including bees and butterflies; a step to provide habitats for species which are in national decline due to habitat loss.

Live Osier willow was planted at 1m² intervals, this introduces a root network which will help to stabilise the embankment. Willow provides habitat for flora and fauna, creating shading of riverbanks and spawning areas. Willow promotes bank stabilisation, protects the aquatic environment from polluted surface runoff and improves soil chemistry by increasing humus formation. Fourteen trees were removed as part of the site clearance and I replanted twenty to replace the habitats lost and achieve net biodiversity gain. Hawthorn and Crab Apple were planted; this benefits pollinators such as honey, bumble and solitary bee species, together with moths and butterflies. Fruits are eaten by birds and mammals and are an important resource for migrant birds.





SUBSEQUENT PERFORMANCE

The project has only recently been completed and the full benefits have yet to be quantified. The willow and grass seed has started to grow following a mild autumn in 2018 and the integrity of the riverbank has been tested following a number of spate events in December 2018 and February/March 2019. A monitoring regime has been set up in order to assess the longer term performance of the scheme.

