

## RIVER NITH DIVERSION, KIER MINING



### BIODIVERSITY ENHANCEMENT OVERVIEW

The project involved a permanent diversion of a 500m reach of the River Nith, a sensitive salmonid river, located near New Cumnock in Ayrshire, Scotland. This was a successful approach based upon characterisation and understanding of morphological processes to give a natural design whilst enhancing habitats and riparian corridors

Kier engaged the expertise of a renowned river morphology professor, David Gilvear from the Centre for River EcoSystem Science (CRESS), based at Stirling University, and gave an initial design in 2008 to discuss with environmental stakeholders. Kier undertook extensive consultation with stakeholders including the delivery of a stakeholder workshop involving the Scottish Environment Protection Agency (SEPA), the Nith District Salmon Fishery Board (NDSFB), New Cumnock Angling Association (NCAA), Scottish Natural Heritage, Scottish Wildlife Trust and East Ayrshire Council. Kier commissioned Halcrow to transpose the morphological design from CRESS into an engineering design for the construction phase of the channel.

The engineering work commenced in June 2011 and was completed by August 2011. This allowed a year for bank stabilising vegetation to take hold and provide sufficient protection prior to letting the flow through in August 2012. The process of switching the channels was overseen by SEPA, NDSFB and NCAA who took a hands-on approach to the project.

Biological and geomorphological monitoring of the channel is on-going as well as a 5 year programme of fish restocking to assist with the colonisation of the new channel. This was most recently undertaken in April 2014 by the NDSFB.

### Fact box

**Company name:**

Kier Mining

**Project name:**

River Nith Diversion at Greenburn Surface Mine

**Location:**

Ayrshire, Scotland

**Biodiversity enhancement:**

- Natural habitat creation
- Local seeds, plants and trees
- Fish restocking programme

**Size:**

500m diversion

**Cost:**

£400,000; funded through the successful Greenburn Surface Mine and from the wider Kier Group. The cost included the design work, construction costs and man hours

**Tips:**

- Others can benefit from using similar simple construction techniques and letting the channel develop naturally, rather than over engineering it
- The use of natural methods of reinforcement such as the willow whips and the trees along the banks forms a natural looking setting whilst also providing an engineering solution

**Year completed:**

2012

### Categories:

- Large scale permanent
- Most innovative

## BIODIVERSITY ENHANCEMENT OVERVIEW (cont.)

The main principles of the river diversion were:

- Meandering watercourse with natural profiles
- Creation of natural habitats to improve diversity
- Enhance habitat for a range of species within the channel and riparian corridor
- Provide the building blocks to allow natural morphological processes
- Improve the scenic value of the river channel
- Re-use of materials on site wherever possible
- Use of seeds and plant stock of local provenance, where possible
- Use of locally sourced willow whips for natural bank stabilisation.

The construction of the channel has provided the opportunity to enhance the salmonid spawning areas in the river by choosing bank-side species to promote rapid stabilisation and also to provide habitat diversity. By leaving the channel in-situ for a year allowed vegetation to successfully flourish and provide extra stability on the banks.

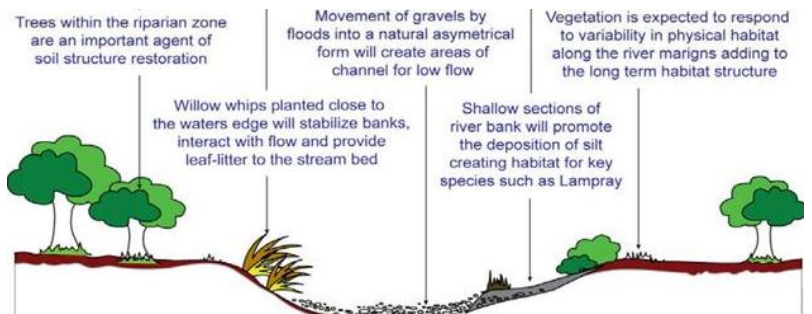
To assess whether habitat suitable for salmon and other species has formed the NDSFB are undertaking a programme of electrofishing along the diversion at 9 locations. This will be done on an annual basis to monitor the health of the river. The results from the first survey are encouraging and demonstrate the channel is functioning well due to the abundance of juvenile salmon and trout.

Early engagement with environmental stakeholders has been of major benefit to the project and provided technical advice throughout all stages of the project from the design, diverting the flow and the subsequent monitoring.

This was the largest scale river diversion undertaken at the Greenburn site and one of the most important aspects during the channel changeover was having the environmental stakeholders on site to provide advice as it was happening. The conditions can change quickly and important decisions needed to be made there and then to ensure the best outcome.

The biological and geomorphological characteristics of the channel will continue to be monitored; however the short term monitoring results from the electrofishing has provided encouraging results.

### Pictures of the river diversion



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