

REFORM Summer School - Lectures available online

The REFORM summer school was held on 27-29 June 2015 in Wageningen, The Netherlands and was aimed at students and early career researchers, covering the topic “Restoring regulated streams linking theory and practise”. Experts in a range of disciplines such as hydrology, morphology and ecology addressed key topics for cost-effective river rehabilitation planning, discussing problems and solutions. The 3 day programme was interactive, it encouraged group discussions and participants applied theory to practice by drafting a restoration strategy. The summer school was attended by 12 participants.

Careful planning of the course has made it possible to use the course outputs for those interested in teaching river restoration, wherever river or stream restoration projects are available. The complete PowerPoint presentations and the video-recorded lectures are available online (see Summer Course | REFORM Rivers | 2015) and can be used for teaching and training purposes.

DAY 1- FIELD VISIT

Participants were taken to two contrasting restoration projects, Hierdense Beek and Lunterse Beek. During the field visit experts overviewed the reasons for river degradation and the restoration options applied at each of the sites. Participants were encouraged to ask questions and initiate discussions to solve problems and produce strategies to meet specific environmental and societal objectives.



Site 1 Hierdense Beek (Photographer: Tom Buijse)

The Hierdense Beek is a lowland stream situated on the north site of the Veluwe; the largest push moraine in The Netherlands. It does not meet the requirements of the EU Water Framework

Directive, with main problems being the desiccation of wetland nature causing the stream to incise, pile planking, straight stream path, too much discharge dynamics, fish migration bottlenecks and high nutrient levels. Restoration measures were selected according to the “Building with nature” concept, to make use of natural processes as an alternative to constructing instant solutions. The main measures applied at Hierdense Beek were to shallow the stream by introducing sand, insertion of dead wood to increase structure, restoration of historical meanders, restoration of the natural spring sources by filling excavated channels and better use of natural depression as inundation areas.



Site 2 Lunterse Beek (Photographer: Tom Buijse)

Lunterse Beek is a relatively small stream degraded by water quality problems, channelisation, widening and deepening. Furthermore, land use changes have resulted in deforesting, urbanisation, agriculture and river regulation. Due to these changes the water barely flows and almost stands still in summer. Maintenance is another disturbance factor, several times a year all vegetation, dead trees and sometimes sediment are removed. Two sites were visited at Lunterse Beek:

Upstream project: Wittenoord

The goal of the restoration program was to introduce moderate discharge dynamics and stable, diverge habit patterns through hydrological and morphological measures. The main measures were reduction of the depth and width of the creek, creation of an inundation zone and the introduction of dead wood.

Downstream project: Wolfswinkel Klein-Engelaar

The goal was to convert the straight and deep channel to a meandering shallow stream and bring back flow velocity and variation. In summary, a historical stream was reconnected to the river, during high flow water can flow over a division structure and access the main river reducing peak

flow in the newly meandered section. The river was also reconnected to its flood plain.

DAY 2 - LECTURES

During the second day of the programme participants were taught how to plan restoration schemes, considering two main planning stages 1) catchment scale and 2) project specific scale. The theory for assessing degradation, identifying suitable restoration measures and other stages of the planning process were taught and discussed. A number of tools and guidelines for best practice, to measure performance and determine appropriate targets for river restoration were discussed through a sequence of lectures:

- Restoration planning, Prof Ian Cowx
- Hydromorphological Framework, Prof Angela Gurnell
- Hydromorphological assessment, Prof Massimo Rinaldi
- Biological assessment, Dr Christian Wolter
- Hydromorphological degradation and impact on biota, Dr Nikolai Friberg
- Selection of restoration measures, Dr Jochem Kail
- Applying REFORM, Dr Gertjan Geerling

Lectures were recorded and are available for viewing on the video channel of STOWA (Netherlands Foundation for Applied Water Research) under the title: Summer Course | REFORM Rivers | 2015.

DAY 3 - PLANNING RESTORATION SCHEMES

In groups, participants planned restoration schemes using the knowledge they acquired from the previous two days. Each group chose one of the restoration schemes from the field visit and discussed current restoration measures and possible options for their improvement. They were also encouraged to use the REFORM WIKI, a knowledge and information web-based tool developed to guide practitioners through the planning stages of river restoration. The Summer School ended with participants presenting their restoration schemes and a fruitful discussion.



One group of summer school participants preparing a presentation on restoration schemes (Photographer: Tom Buijse)

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