HYDROFOR

Assessment of the impacts of forest operations on the ecological quality of water

PROJECT TEAM

Prof. Michael Bruen, University College Dublin
Dr Mary Kelly-Quinn, University College Dublin
Tom Drinan, University College Cork
Hugh Feeley, University College Dublin
Joanne Finnegan, National University of Ireland, Galway
Dr Conor Graham, University College Cork
Dr Simon Harrison, University College Cork
Dr Mark Healy, National University of Ireland, Galway
Gero Jahns, University College Dublin
Prof. John O'Halloran, University College Cork
John Regan, National University of Ireland, Galway
Dr Michael Rodgers, National University of Ireland, Galway
Martina Woods, University College Dublin
Sean Blacklocke, University College Dublin*

** Email: sean.blacklocke@ucd.ie*

COMPLETION DATE: August 2013

BACKGROUND

HYDROFOR is an EPA- and COFORD-supported multi-sector co-operative project to investigate the impacts of forestry operations on Ireland's aquatic ecology. In addition to further investigating the nature and effects of these impacts, the study partners are assessing the effectiveness of certain measures such as riparian buffer strips to mitigate these impacts. Impacts under study include acidification, eutrophication, sedimentation and hydromorphological change. The HYDROFOR researchers' professions span the natural, engineering and social sciences.

OBJECTIVES

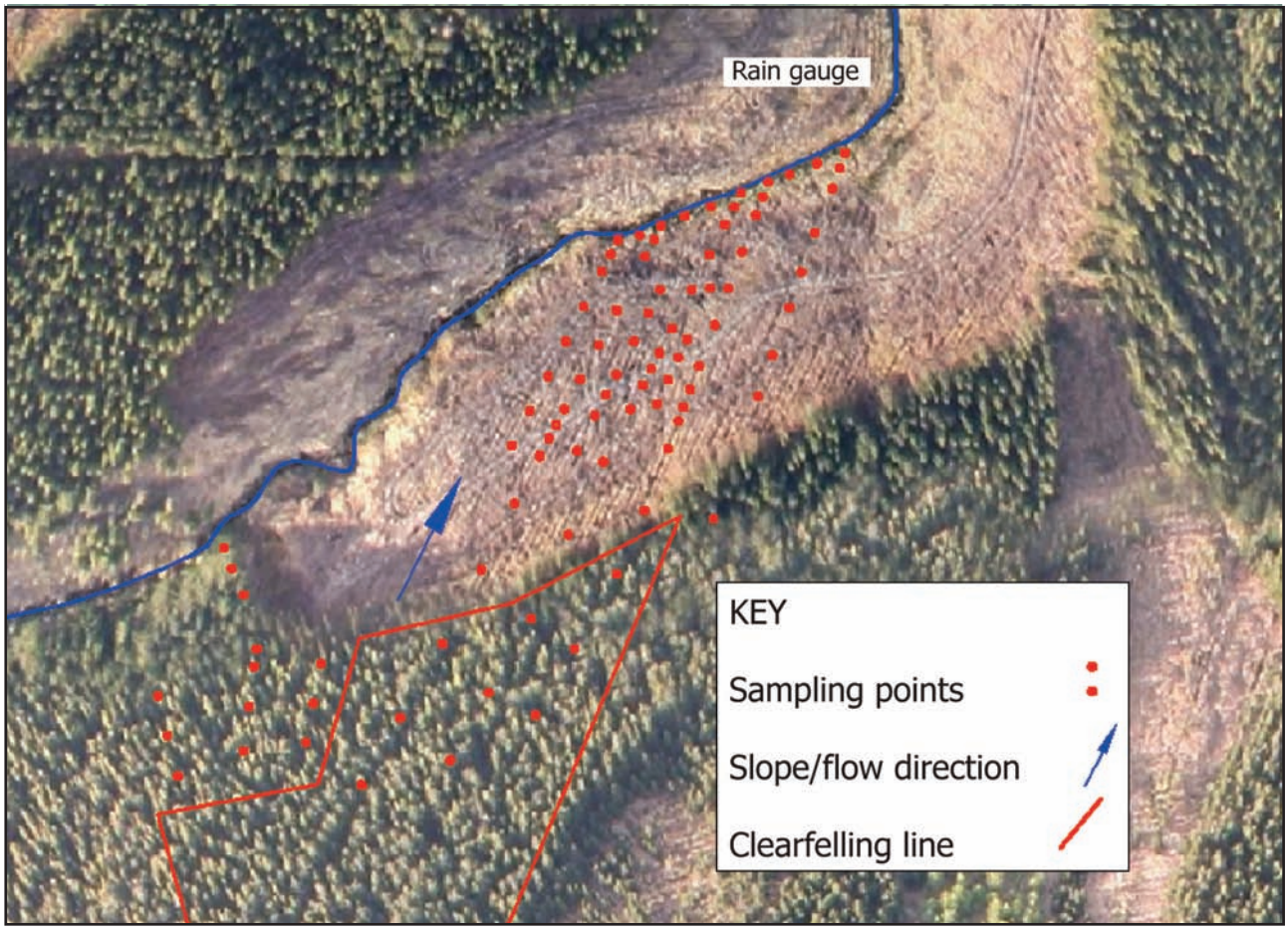
- Review relevant international and national literature.
- Compile a database of relevant data from previous similar projects and combine and analyse with HYDROFOR data.
- Undertake temporal and spatial assessment of the inputs from forest activities.
- Quantify nutrient and sediment losses to water in relation to the nature, scale and duration of forestry activities.
- Test the effectiveness of buffer strips as forestry mitigation measures.
- Evaluate the likely impact of expansion of forest cover in Ireland on hydro-ecology.

PROGRESS

- Negative correlations between percent forest cover in catchments and ecological quality of waterways (invertebrates) have generally been shown, but outliers persist.
- Felling in lake catchments has shown clear and consistent impact of lake chemistry as indicated by elevated levels of nitrogen, phosphorous, dissolved organic carbon, reduced metals and lowered levels of dissolved oxygen.
- Multiple study sites across several study plots are now fully equipped to measure the effects of felling and effectiveness of riparian buffers and baseline conditions have been established.
- The preponderance of the most recent and relevant GIS data needed to make the most informed judgments about the cause-and-effect relationships between forestry operations and ecological quality of water in Ireland have been acquired and are being analysed with the most advanced tools available.

ACTIVITIES PLANNED

- Set up instrumented catchment with FutMon Project.
- Select and finalise planting study sites.
- Continue monitoring of mature forestry sites.
- Select and commence sampling 2010 harvesting site.
- Complete plot instrumentation at Glennamong site.
- Complete plot instrumentation at Altaconey site.
- Collect pre-clearfelling data from Glennamong and Altaconey sites.
- Complete GIS characterisation of Glennamong and Altaconey sites.
- Complete water chemistry and invertebrate analysis for small lakes.



Subsurface and surface water sampling locations at Altaconey study site.

OUTPUTS

- Maintenance of project website: www.ucd.ie/hydrofor/home.htm.
- HYDROFOR GIS Database (Draft).

Feeley, H. and Kelly-Quinn, M. *HYDROFOR Literary Review.* December 2009 (Draft).

Blacklocke, S. 2009. *Development of Regression Models to Predict Forestry Impacts on Aquatic Ecology and Effectiveness of Mitigation Measures: The HYDROFOR Strategy*. Presentation for the Environmental Sciences Association of Ireland's ENVIRON '09 Annual Conference, Waterford, Ireland.

Blacklocke, S. et al. 2009. *Tapping old knowledge trees and growing new ones: the HYDROFOR Project strategy for developing predictive models of forest and water interactions in Ireland*. Presentation and proceedings for the International Water Association's 13th International Specialized Conference on Diffuse Pollution and Sustainable Basin Management, Seoul, South Korea.