



Assessment of the extent and impact of obstacles on freshwater hydromorphology and connectivity in Ireland

Introduction

Reconnect is a 3-year project (January 2016 – January 2019), funded by the Irish Environmental Protection Agency. The overall objective is to develop a validated methodology for prioritising a selection of river obstacles for modification or removal, to improve hydromorphology and connectivity in Irish freshwater systems. Key tasks include the development of a systematic methodology to map the location of obstacles, assessment of the impact of obstacles on aquatic biota and sediment transport, and testing of the feasibility to use eDNA to assess impacts of obstacles on fish and macroinvertebrates.

A river obstacle is a physical structure, either natural or man-made, located within a river channel. Man-made obstacles include dams, bridge aprons, weirs, sluices and culverts. Natural obstacles include waterfalls, log-jams and fallen trees. Some examples of these obstacles are shown on the next page.

For details on the specific project tasks see our website [here](#).

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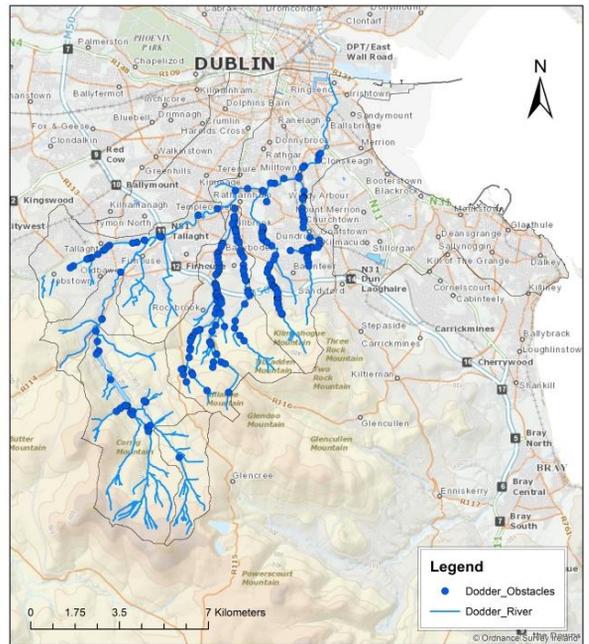
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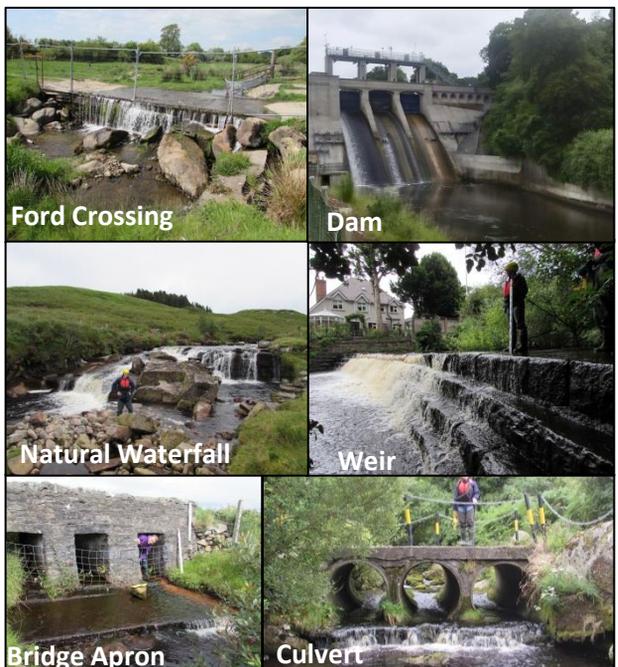
Barriers, Obstacles: Similar, but Different

Barriers or obstacles are typically structures such as culverts, dams, weirs etc. which have the potential to prevent or delay the movement of fish, invertebrates and river sediment, and thus affect connectivity in freshwater systems. The Oxford English Dictionary (2016) defines a “barrier” as something that is “erected (or serving) to bar the advance of persons or things, or to prevent access to a place”. In this sense, the word “barrier” implies that the structure in question is completely impassable to aquatic biota. This however, may not be the case for each in-river structure. The ability of aquatic organisms to pass a structure varies depending on species, the life stage, flow conditions, and the physical nature of the structure. With this in mind, it is better to refer to many such structures as “obstacles” rather than complete “barriers”, as an obstacle is something that can hinder and/or impede progress rather than fully prevent it. Nonetheless, “barrier” and “obstacle” are used interchangeably in the scientific literature on this topic.

We prefer to use the term “obstacle” rather than “barrier” as it allows for a more wide-ranging interpretation of the impact of a given structure. It includes structures that have the potential to halt or delay the movement of one or more species, without leading to confusion about whether the structure in question is an absolute barrier to all species.



Map showing the location of obstacles to fish migration in the Dodder catchment, Co. Dublin.



Aasleagh Falls
Co. Mayo



Firhouse Weir
Co. Dublin



Culverts on the
Dodder River
Co. Dublin

Some of the obstacles mapped in the Dodder (Co. Dublin) and Erriff (Co. Mayo) catchments.

Here are some different types of obstacle. Dams are the largest structures. Bridge aprons and culverts are found under or downstream of bridges, they can have a drop at their downstream end. Weirs are small dams, controlling the upstream water level. Fords are road crossings that allow the river to flow over the structure. These can be raised above the river bed. Natural waterfalls can form the natural upstream limit to the movement of aquatic biota. It is useful to know their locations relative to other man-made obstacles.



riverobstacles

River Obstacles and Citizen Science via a Mobile App

Mapping the locations of river obstacles is not a simple task. Ireland has a vast river network (74,000 km) and it is suspected that there are hundreds of obstacles in most major river catchments.

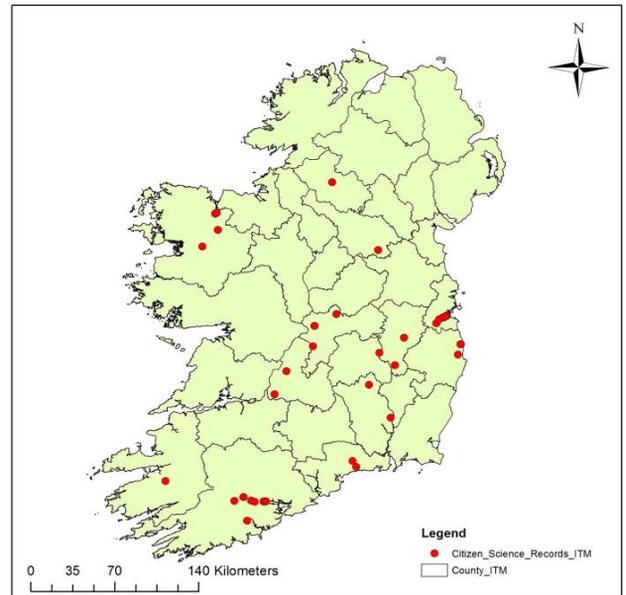
The Reconnect project has linked up with the UK River Obstacles project to use their mobile phone app to allow anyone near a river to record the location and type of man-made and natural obstacles they see. We encourage all citizens who access rivers (e.g. anglers, canoeists, walkers) or have an interest in the health of Ireland's rivers to download the app and use it to record any river obstacles that they may encounter.

The app is free to download and easy to use. One simply takes a photograph of the obstacle and notes some details. The app uses the GPS facility built into a smartphone to record the location. It is also possible to upload details on obstacles via the online platform on the River Obstacles website [here](#).

The river obstacles app can be downloaded for free from Google Play and the iTunes App Store. Links to the app can also be found on the River Obstacles website and the Reconnect Facebook page (links below).



Siobhán Atkinson (PhD student), demonstrating the River Obstacles app to some keen citizen scientists in the river Dodder catchment.



The locations of obstacles recorded by citizen scientists via the mobile app (April 2016 – January 2017)

For more information and updates on the project, click on the below icons:



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