Realm: Freshwater | **Biodiversity threat:** Nutrient pollution; Invasive Species; Change to morphology
Stakeholders/sectors: Agriculture, tourism, fishing, renewable energy | **Strengths:** Identifying EBM responses; Evaluation; Stakeholder processes; Semi-quantitative modelling

Case Study 4 — Management and impact of Invasive Alien Species in Lough Erne in Ireland

Managing Invasive Alien Species and Nutrient Pollution:

The goal of this study was to examine the implications of the regulation on Invasive Alien Species (IAS) (i.e. non-native plants and animals harming the local ecosystem) for practical management in Lough Erne, Northern Ireland, in the context of existing environmental commitments under EU legislation.

Where and what are the challenges?

Lough Erne sustains multiple competing activities, each with different demands from the system in terms of ecosystem services and physical resources. Lough Erne is a heavily modified water body, containing a range of non-native species following a long history of introducing new fish and other plants and animals. In recent times there has been an invasion and proliferation of the Nutall's Pond Weed (Elodea nutalli), which is listed as an Invasive Alien Species of Union Concern. This new arrival is able to colonise deeper areas of the Lough and has clogged many areas of the lake, interfering with popular recreational activities, in particular boating. Managing Elodea while meeting the needs of competing users requires consensus on ecosystem boundaries and effective cross border cooperation.

What was done?

The case study brought together a range of stakeholders from public service and NGOs, both north and south of the Northern Irish/Republic of Ireland border in a series of workshops. Mental models called "Fuzzy Cognitive Maps" of the Erne system were developed based on stakeholder inputs and were used to infer how the social and ecological systems behave. The models predict a likely decline in future water quality related to agricultural activities in the catchment. Models were used to map the impacts of altering lake levels on agricultural production in areas adjacent to the lake.

Local recommendations:

Stakeholder views, combined with model outputs were used to identify a range of possible management options. One set of measures involved altering the lake levels to enable recreational boating, but also leading to a potential loss to agriculture in terms of inundated land, which we evaluated and costed. Agricultural nutrient management measures to reduce proliferation of the weed were also evaluated. The potential costs of conducting these measures were assessed and presented to stakeholders for feedback and comparison.

General lessons learned for managing biodiversity:

The case study revealed the importance of considering the interconnections between policies. Potential solutions to the problem of Invasive Alien Species in Lough Erne will affect achievement of Water Framework Directive goals, as well as obligations under the regulation on Invasive Alien Species. At the same time, these goals cannot be considered in isolation from the overall driver of the Common Agricultural Policy.

Local impact:

"Ecosystem-based management is a valuable tool for communicating the value of water and how we all benefit from that resource"
– Kerry Anderson, Northern Ireland Department for Agriculture, Environment and Rural Affairs. Local regulators especially valued how ecosystem-based management considered invasive alien species within the context of how agriculture and other human activities have environmental consequences for water and biodiversity.

Find out more about Case Study 4 on the AQUACROSS Information Platform and aquacross.eu

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