EGU2020-19485
https://doi.org/10.5194/egusphere-egu2020-19485
EGU General Assembly 2020

Ecosystem services provided by groundwater dependent wetlands (turloughs) in karst areas

Fabio Delle Grazie, Laurence Gill, and Owen Naughton
Trinity College, Dublin, Civil and Environmental Engineering, Dublin, Ireland (fabiomassid@gmail.com)

Ecosystem services provided by groundwater dependent wetlands (turloughs) in karst areas

Fabio Massimo Delle Grazie[1], Owen Naughton[1,2], Laurence Gill[1]

[1] Department of Civil and Environmental Engineering, Trinity College, Dublin, Ireland

[2] Carlow Institute of Technology, Carlow, Ireland

E-mail: dellegrf@tcd.ie

According to the Irish National Parks and Wildlife Service (NPWS), Ireland hosts twenty-one types of Groundwater Dependent Terrestrial Ecosystems (GWDTEs). They include ecosystems like alkaline fens, transition mires, active raised bogs and turloughs.

Turloughs, the focus of this study, are ephemeral lakes which are present mostly in Ireland and have been compared hydrologically to polje for the period inundation and lacustrine deposits. They are flooded for some periods across the year (typically in the winter) but usually dry up in summer months. Turloughs are defined as Groundwater Dependent Terrestrial Ecosystems (GWDTEs) and as such they are protected under the Water Framework Directive (WFD, Directive 2000/60/EC). As they host protected fauna and flora, they are also designated as a Priority Habitat in Annex 1 of the EU Habitats Directive (92/43/EEC). As hydrology is the main driver of their ecosystem, a thorough understanding of their hydrological regime is crucial. The water-bodies supporting GWDTE's are also protected under the WFD and it is important to establish whether the status of these groundwater bodies is impacting on the functioning of the GWDTE's and if so, what measures can be introduced to mitigate this impact.

Ecosystem services can be defined as the conditions and processes through which natural ecosystems sustain and fulfil human life. These can be classified as provisioning, regulating, supporting and cultural and examples of them are water and raw materials production, flood risk

attenuation, carbon sequestration (Millennium Ecosystem Assessment, 2005). The determination of the ecosystem services can help analyse different scenarios linked to pressures like road drainage schemes, water supply and wastewater disposal.

Previous data and field studies (including soil and water sampling and greenhouse gas emission measurements) were performed on seven turloughs. The ecosystem services of the turloughs were determined through appropriate models and software packages and quantified in appropriate biophysical units as well as in monetary terms.