

Assessing the integration of ecosystem services into decision making for implementing natural flood management measures



UNIVERSITY OF LEEDS

JBA
trust

JBA
consulting

This project assesses how ecosystem services are incorporated into decision-making when short-listing options to implement natural flood management (NFM) measures during a formal project appraisal. It identifies the information gaps and make suggestions of how this process can be improved. NFM is a way of managing flood risk through working with natural processes and using it to store or slow down water (SEPA 2015).

The wider co-benefits provided by NFM can be assessed through the concept of ecosystem services - defined as the “services provided by the natural environment that benefit people” (Millennium Ecosystem Assessment, 2003).

An ecosystem services approach can therefore be used during a project appraisal and allows these benefits to be incorporated into the decision making process (De Groot et al. 2010).

Photo (right): NFM example of a managed realignment site (Tollesbury Managed Realignment, 2007)



Desk-based study

Reviewed academic and grey literature.

Gathered NFM project appraisals and independent NFM ES assessments using a systematic approach by Sargeant et al., (2006).

Analysed documents using assessment framework by Hein et al. (2006) and Millennium Ecosystem Assessment (2005).

Semi-structured interviews

Interviewed Project Managers and Team Members of NFM projects

Formulated questions based upon appraisal documents gathered.

Questions asked related to reasons for/against conducting an ES assessment, methodology, approach and general understanding of ES approach.

Summary of Findings

A total of **21 study sites** were identified

From qualitative ES assessments gathered 44% and 33% of studies were upland storage/wetland and managed realignment studies respectively (Fig 1).

From the quantitative ES assessments 22% and 50% of studies were upland storage/wetland and managed realignment studies respectively (Fig.1).

This reveals that ES assessments for a vast range of NFM measures are yet to be explored.

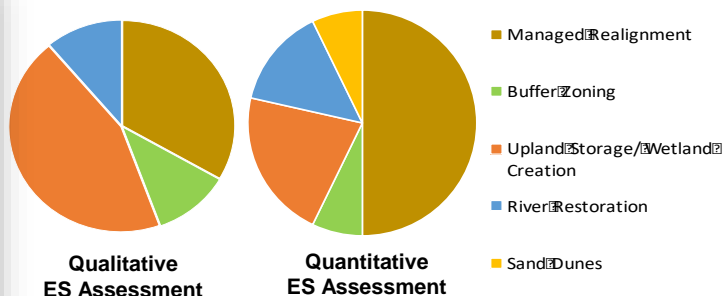


Figure 1. Proportion of NFM measures conducting a qualitative and quantitative ecosystem services assessment.

Assessing the integration of ecosystem services into decision making for implementing natural flood management measures



UNIVERSITY OF LEEDS

JBA trust

JBA consulting

Valuation of Ecosystem Services

The most commonly used method of valuing ecosystem services for NFM projects was the **value transfer method** and the **avoided cost method**.

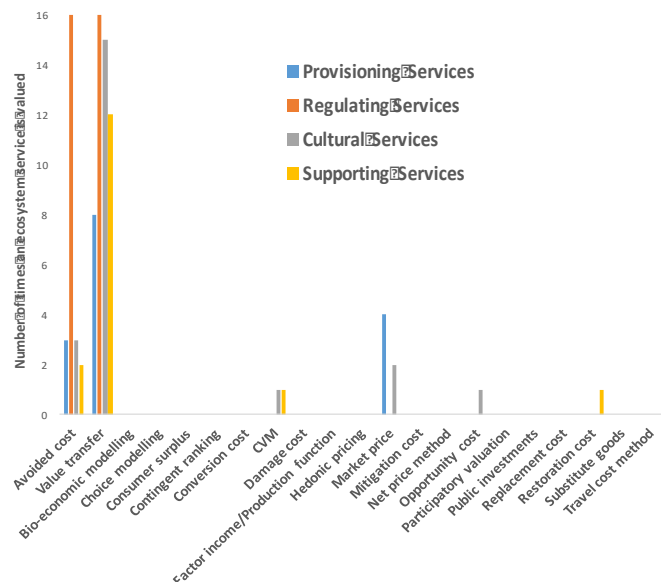


Figure 2. Range of valuation techniques against the number of ecosystem services valued under 4 broad categories.

Semi-structured Interviews

Reasons for conducting an ES assessment included:

- The client specified an ecosystem services assessment was necessary
- The project was legally obligated to take into account Outcome Measures 4a and 4b.
- They wanted to make environmental improvements which would unlock funding contributions.

Reasons for not conducting an ES assessment included:

- The options decision was mainly focused on flood protection and storage, wetlands was seen as an add-on, requested by the community.
- ES was seen as “woolly” and did not have quantifiable numbers that could be incorporated into a cost benefit analysis
- Clients can play a role in deciding where money and time is invested

Other findings showed that:

- Project managers and team members working on NFM had a limited understanding of ES.
- The cost and time required to conduct an ES assessment was a key barrier
- ES assessment could be useful for NFM projects where cost:benefit ratio is close to 1



Recommendations

1. Need for more examples of ecosystem services assessments applied to wider NFM measures
2. Need for more primary valuation studies applicable to wider NFM measures
3. Changing the attitude and understanding towards ecosystem services
4. Reducing the cost, time and simplifying ecosystem service assessments
5. Raising wider stakeholder awareness of the benefits of ecosystem services

References

- De Groot, R.S. et al., 2010. Challenges in integrating the concept of ecosystem services and values in landscape planning, management and decision making. *Ecological Complexity*, 7(3), pp.260–272. Available at: <http://dx.doi.org/10.1016/j.ecocom.2009.10.006>.
- Hein, L. et al., 2006. Spatial scales, stakeholders and the valuation of ecosystem services. *Ecological Economics*, 57(2), pp.209–228.
- Iacob, O. et al., 2014. Evaluating wider benefits of natural flood management strategies: an ecosystem-based adaptation perspective. *Hydrology Research*, 45(6), pp.774–787.
- Millennium Ecosystem Assessment, 2003. *Ecosystems and human well-being*. Washington, DC: Island Press.
- Millennium Ecosystem Assessment, 2005. *Ecosystems and human well-being*. Washington, DC
- Tollesbury Managed Realignment Site in June 2007. Wikipedia. [image] Available at: https://en.wikipedia.org/wiki/File:Tollesbury_bare_ground.jpg (Accessed on: 16th June 2016).
- Sargeant, J.M. et al., 2006. The process of systematic review and its application in agri-food public- health. *Preventive veterinary medicine*, 75(3), pp.141–151.
- SEPA, 2015. *Natural Flood Management Handbook*,