



ESDecide project:

from Ecosystem Services Framework to Application for Integrated Freshwater Resources Management

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 @ESDecideProj



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Ecosystem Services as a management framework: focus on targets that policy makers, managers and stakeholders can directly relate to

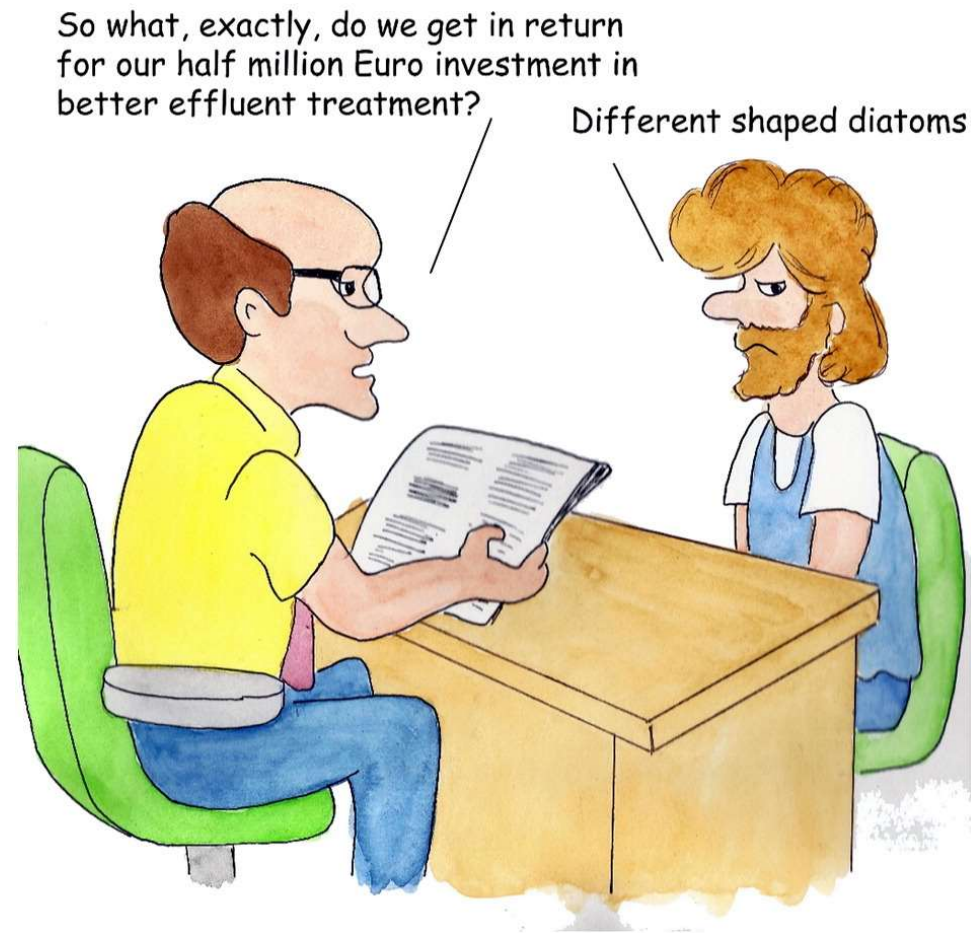


Fig. 5 in: Poikane et al. (2016). Benthic algal assessment of ecological status in European lakes and rivers: challenges and opportunities. *Science of the Total Environment* 568: 603-613.

Objective: to develop an evidence-based decision-support tool for Ireland's river ecosystems by linking **managerial decisions** to the **desired ecosystem service outcomes** through **biotic and abiotic causality chains**.



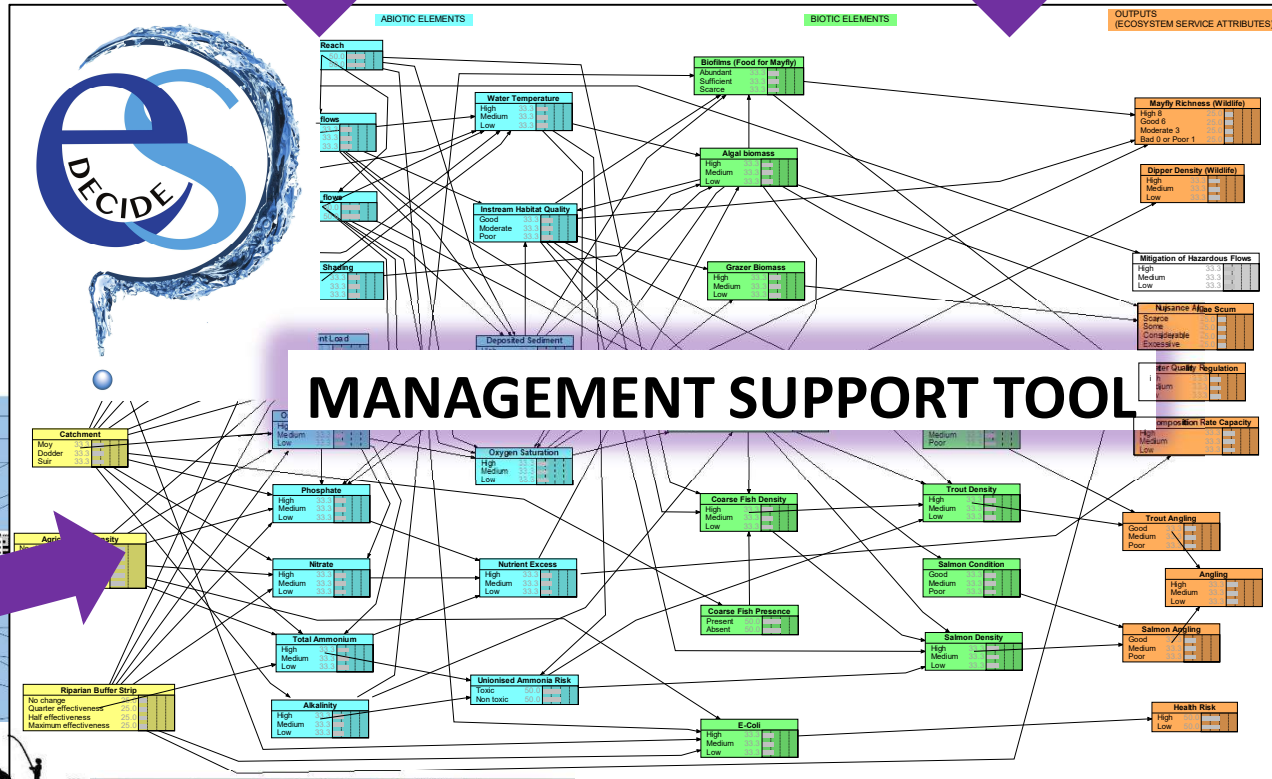


Expert workshop

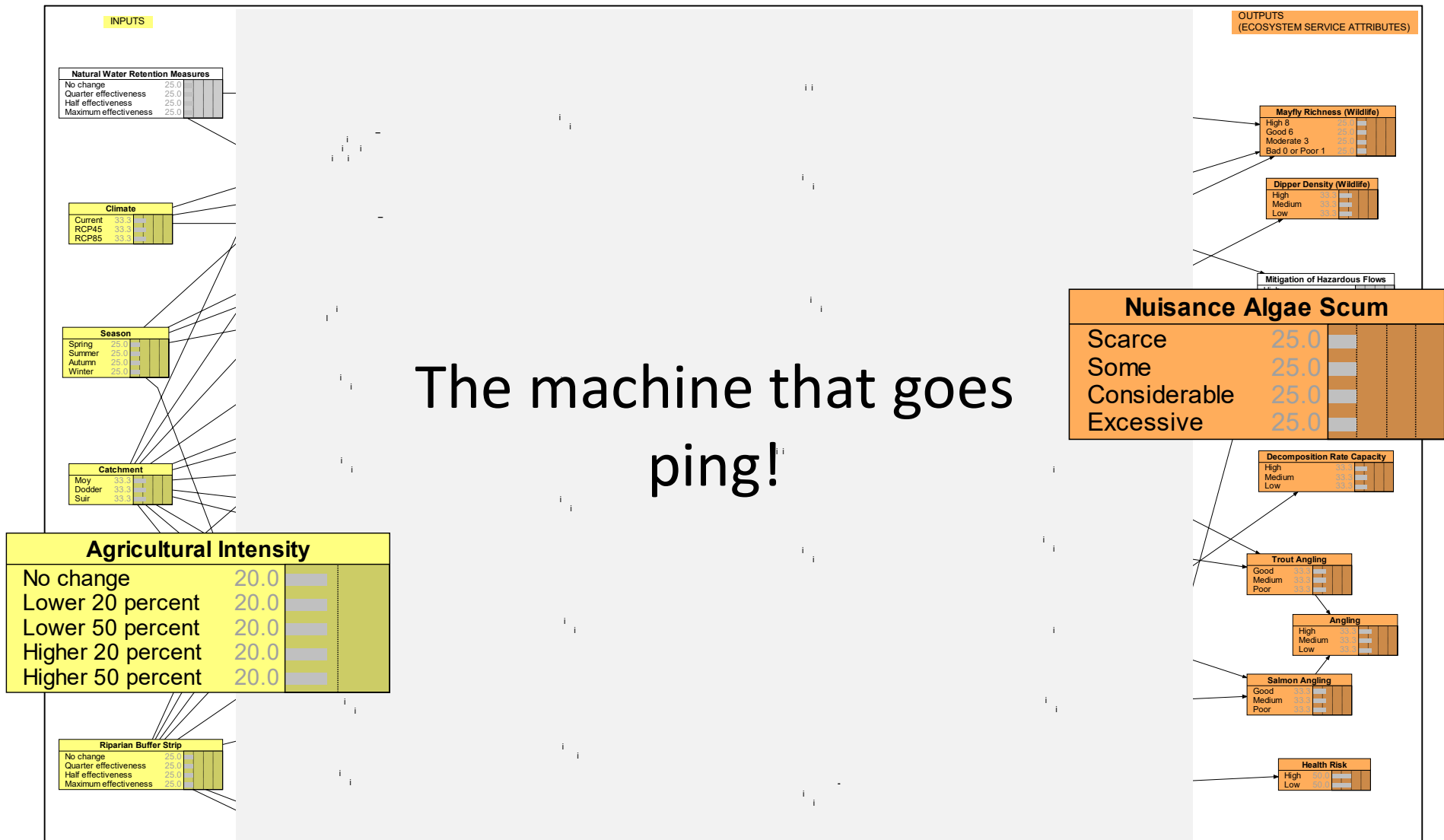
1st author	Year	Type of study	country	Continent
Colas et al.		General details		
Van Looy et al.		Name of analyst		Example Leoni Mack
Lange et al.		Institutional affiliation (if any)		
Mantyka-Podczaska et al.		Data owner (Institution)		
Tonkin & De Pauw		Phone number		
Cunjak et al.		Study meta-data		
Mondy & US		Study type (Field or Laboratory)		
Rasmussen et al.		Name of water body		
Rolls et al.		Average depth of water		
Sunderman et al.		Salinity in the water		
Bruno et al.		Average number of samples		
Falke et al.		Exposure (exposed or not)		
		Substrate/sediment type		

Year	Full reference
2019	Harrison et al. 2019
2019	Harrison, S., McAree, C., Mulville...
2019	Davis et al. 2019
2018	Davis, S.J., Ó hUallacháin, D., Me...
2016	Conroy et al. 2016
2016	Conroy, E., Turner, J.N., Rymaszew...
2016	Conroy, E., Turner, J.N., Rymaszew...
2016	Conroy, E., Turner, J.N., Rymaszew...
2015	Rvan & Kelly-Quinn 2015
2015	Rvan. D.K. & Kelly-Quinn. M. 201...

Empirical data



Implemented as a user-friendly visual interface



Implemented as a user-friendly visual interface

A recent example from our project team:

<http://www.freshwaterplatform.eu/index.php/mars-diagnostic-tools.html>



What is the proportion of EPT specimens in the community (%) ?

Low (10-20)

What is the proportion of EPT specimens in the community (%) ?

Very low (<10)

What is the proportion of EPT specimens in the community (%) ?

Medium (20-40)

Potential causes of deterioration

Potential causes of deterioration	Probability (%)
Bank reinforcement	59.9
Lack of large woody debris	
Flow reduction/impounding	
Urban land use	
Riparian degradation	
Arable land use	
Fine sediment pollution	

Bank reinforcement

What does it mean?

Bank reinforcement refers to (mainly) artificial structures, to stabilise stream banks and thus to reduce or inhibit bank erosion. Bank reinforcement may consist of ('hard engineering') rip-rap, gabions, concrete or sheet piling (steel walls), or of more soft materials such as woody fascines. Yet, even trees can be found to enforce stream banks, as they can enhance bank stability through their dense root system.

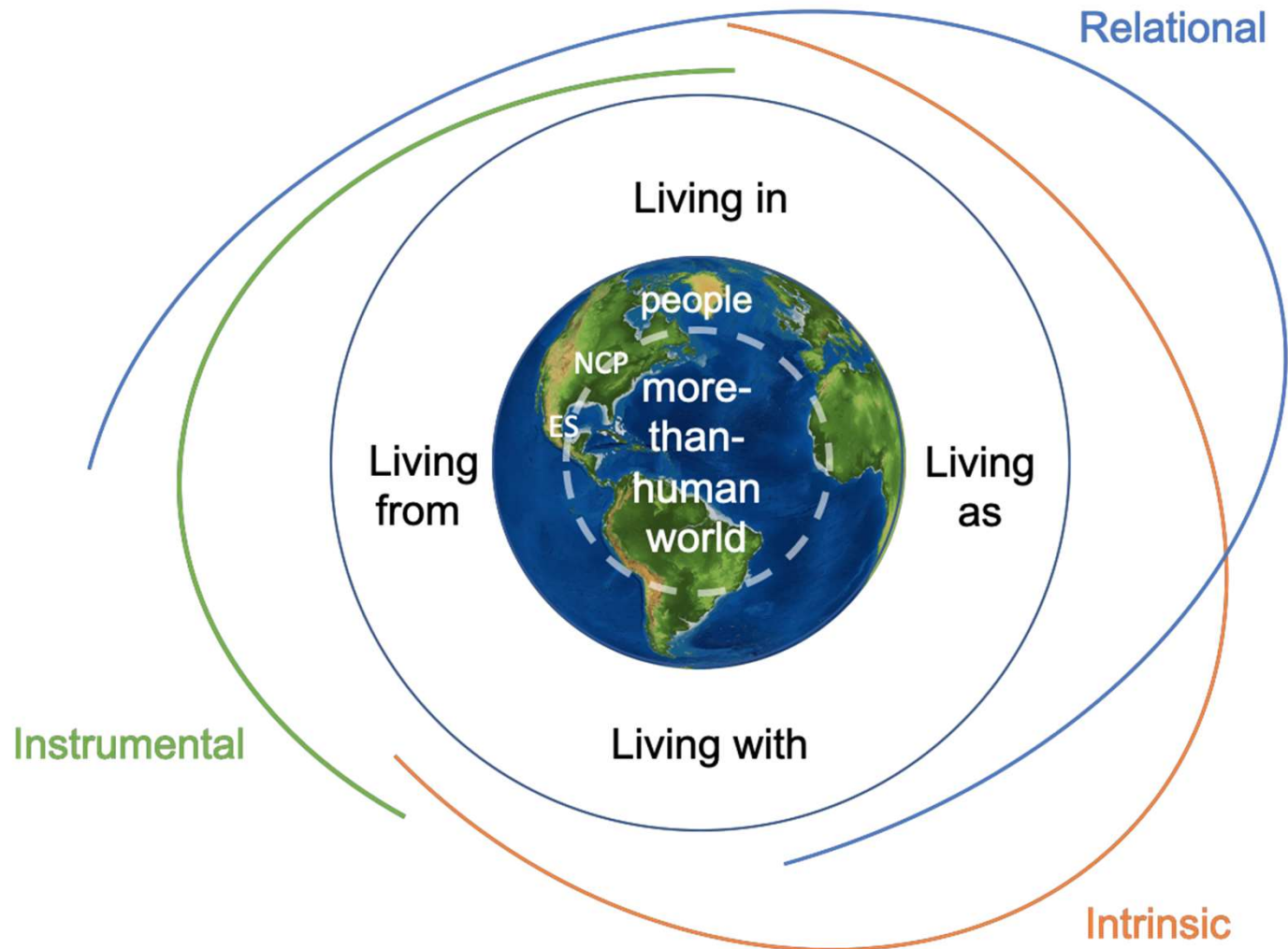
Bank (side) erosion is a natural process and a key mechanism behind meandering. Eroding banks constantly re-locate the stream course, enhance its dynamics and provide (natural) sediment to the stream system, to form habitats and balance the sediment dynamics (i.e., the dynamics between erosion and deposition). Bank reinforcement shifts sediment dynamics towards bed (bottom) erosion, thus leading to the long-term incision of the stream course. At the same time, bank habitat diversity is largely degraded and dominated by artificial (hard) substrates. This can cause dramatic changes in the composition of the aquatic fauna and flora (e.g., Schmetterling et al. 2001). Reinforced stream sections often resemble artificial navigation canals, and so does its fauna and flora.

What can be done?

The answer to this question is conditional on another question: Is the reinforcement really necessary? Often, bank reinforcement can be found that is no longer maintained. Because of its (very) slow decay, the reinforcement then continues to adversely impact a stream

Tool to inform decisions, not to make them!

Ecosystem Services valuation





Thank you!

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