ESDecide project:

from Ecosystem Services Framework to Application for Integrated Freshwater Resources Management

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Specialists in Environmental Economic Research

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Funded by:
epa Research
Climate - Water - Sustainability
Identifying pressures • Informing policy • Developing solutions

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

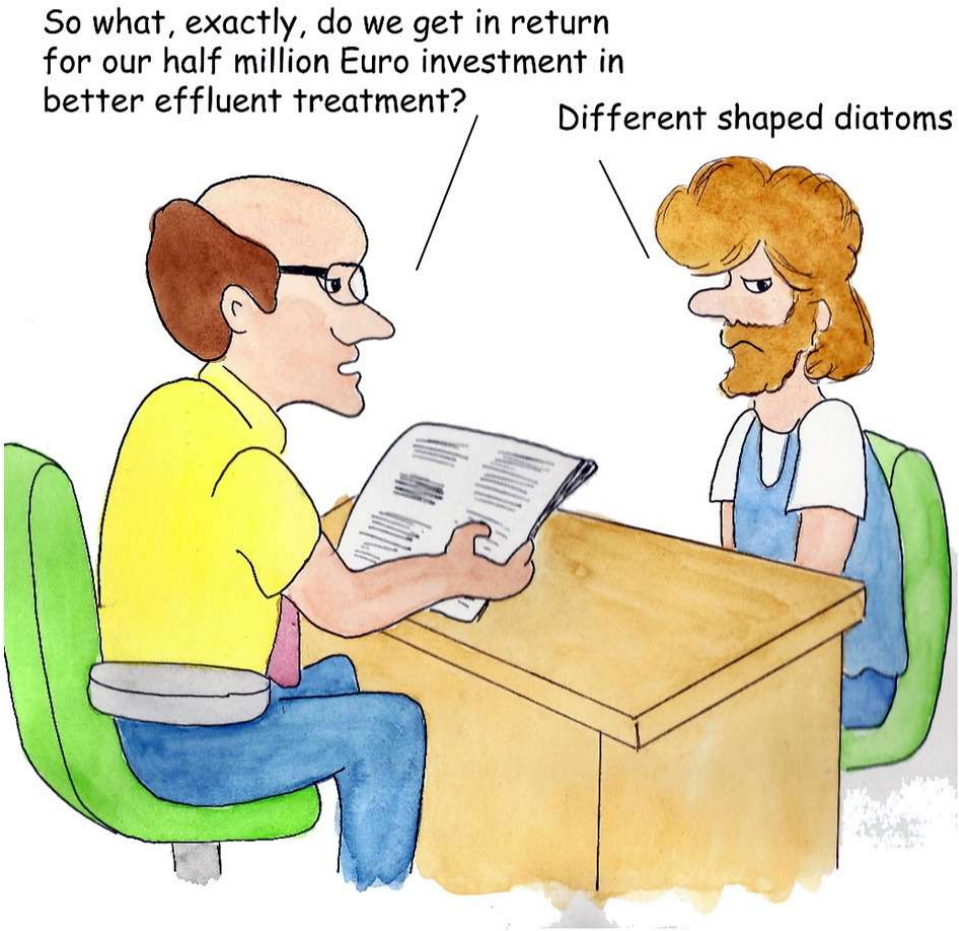
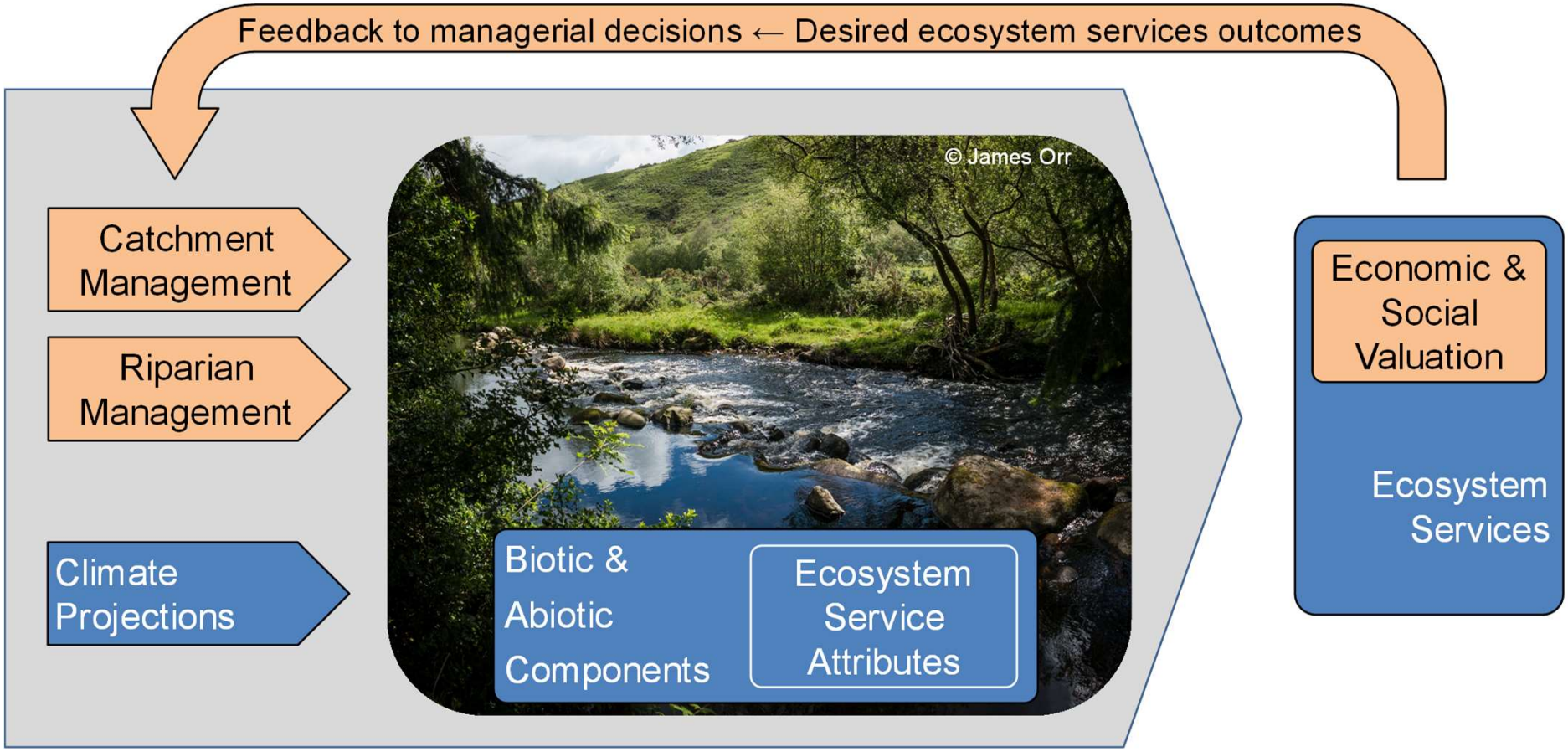


Fig. 5 in: Poikane et al. (2016). Benthic algal assessment of ecological status in European lakes and rivers: challenges and opportunities. *Science of the Total Environment* 568: 603-613.

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**.



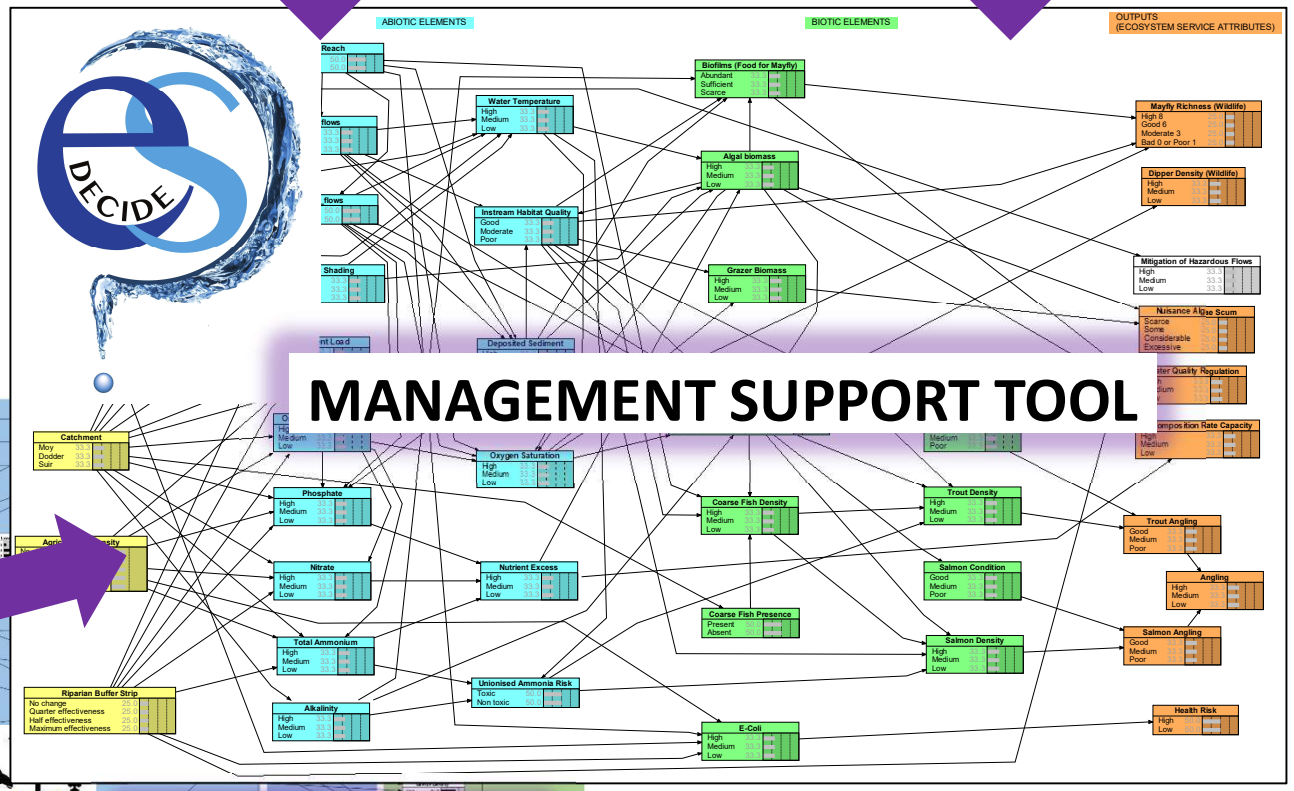
BAYESIAN BELIEF NETWORK (BBN)

1st author	Ye	Type of study	countr y	Continen t
Colas et al.				
Van Looy e				
Lange et al				
Mantyka-P				
Tonkin&De				
Cunjak et a				
Mondy&Us				
Rasmussen				
Rolls et al.				
Sunderman				
Bruno et al				
Falke et al.				

General details	Example
Name of analyst	Leoni Mack
Institutional affiliation (if any)	University of Duisburg-E
Data owner (Insti	
Email address of	
Phone number o	
Study meta-data	
Study type (Fiel	
Laboratory micro	
Name of water b	
Average depth o	
Salinity in the w	
Average numbe	
Exposure (expos	
Substrate/sedim	

Short reference	Year	Full reference
Harrison et al. 2019	2019	Harrison, S., McAree, C., Mulville...
Davis et al. 2019	2019	Davis, S.J., Ó hUallacháin, D., Me...
Da	18	Davis, S.J., Ó hUallacháin, D., Me...
Co	16	Conroy, E., Turner, J.N., Rymszev...
Co	16	Conroy, E., Turner, J.N., Rymszev...
Conroy et al. 2016	2016	Conroy, E., Turner, J.N., Rymszev...
Conroy et al. 2016	2016	Conroy, E., Turner, J.N., Rymszev...
Ryan & Kelly-Qui 5	2015	Ryan, D.K. & Kelly-Quinn, M. 201...

Empirical data



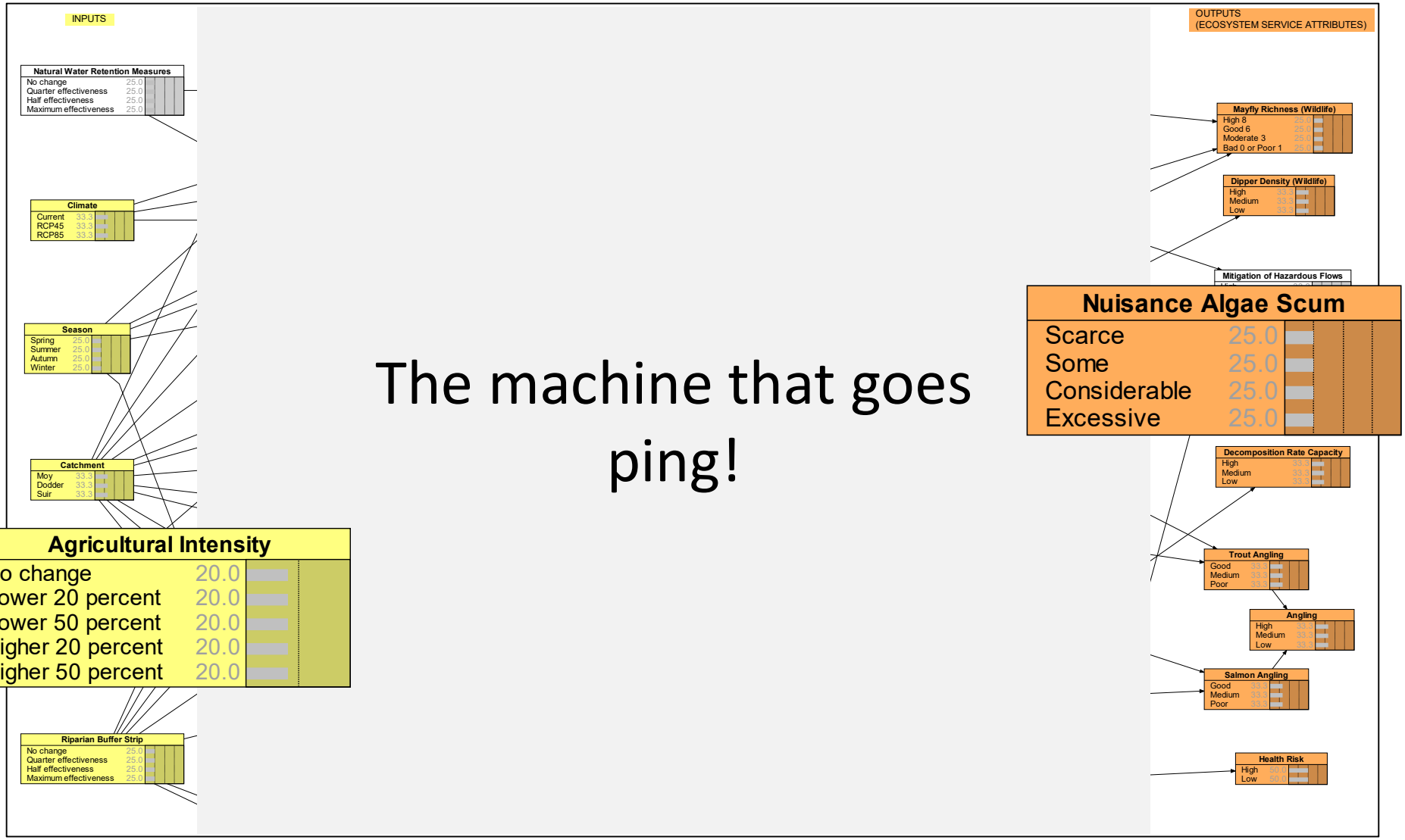
DECIDE

MANAGEMENT SUPPORT TOOL

ESManage
Incorporation of Ecosystem Services Values in the Integrated Management of Irish Freshwater Resources

PROOF OF CONCEPT

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)

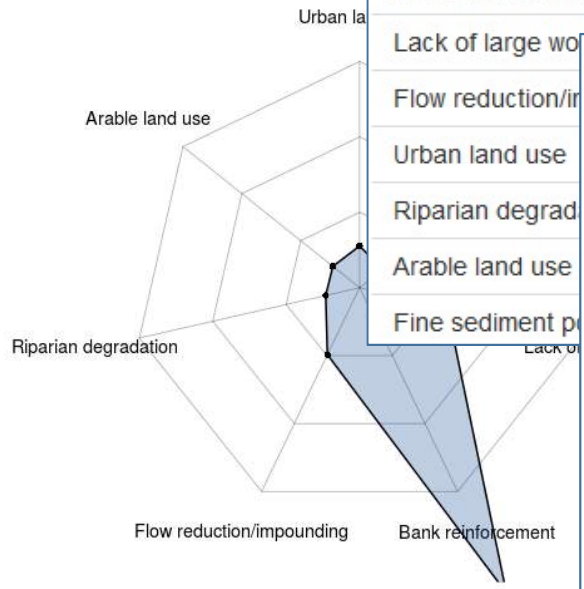
What is the pr (%) ?

Very low (<1

What is the pr

Medium (20-

Potential causes of deterioration



Potential causes of deterioration	Probability (%)
Bank reinforcement	59.9
Lack of large wo	
Flow reduction/ir	
Urban land use	
Riparian degrad	
Arable land use	
Fine sediment p	

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 enginieering') 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.

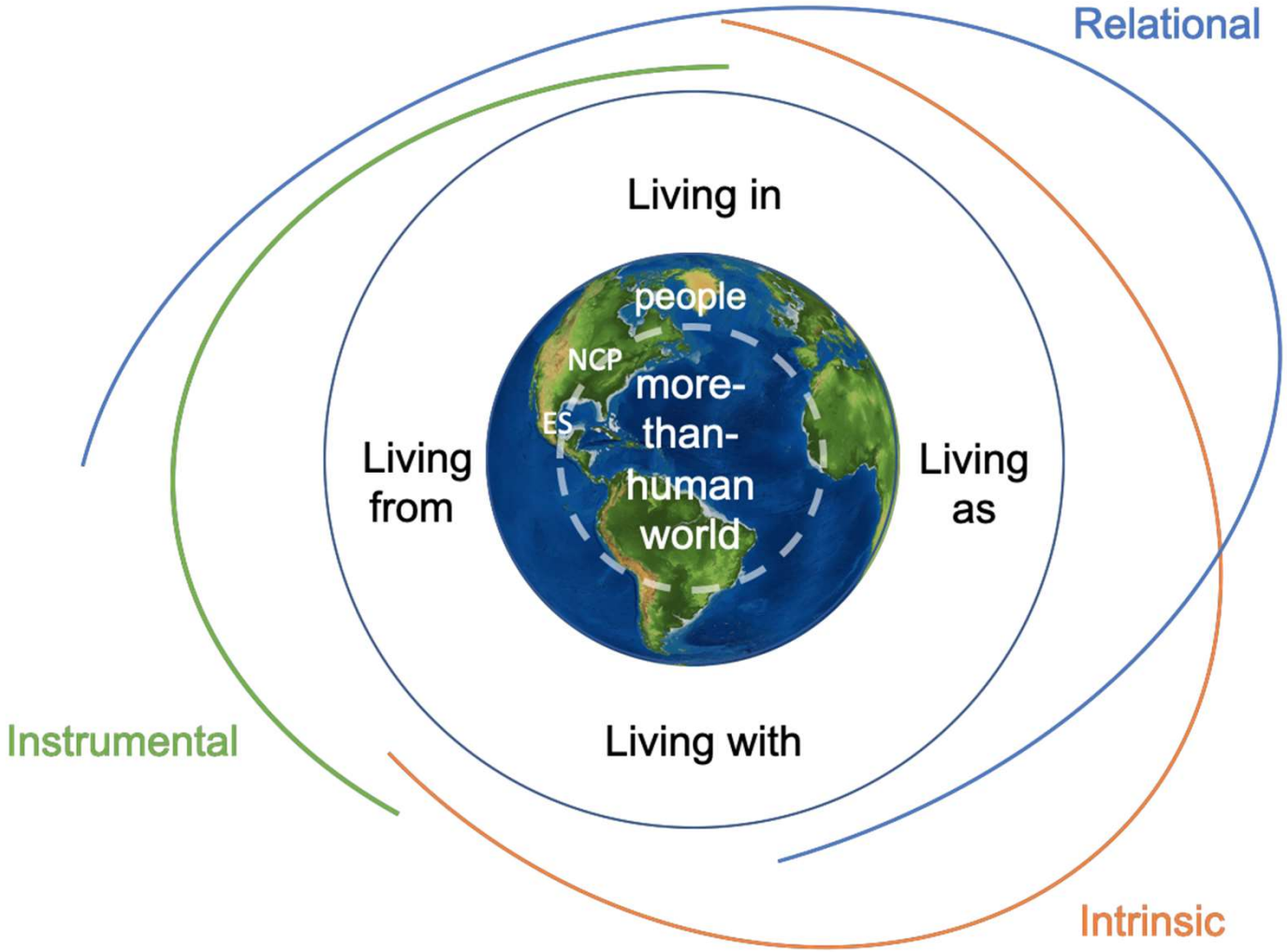
Bank (side) erosion is a natural process and a key mechanism behind meandering. Eroding banks constantly re-locate the stream course, enhance its dynamics and provide (natural) sediment to the stream system, to form habitats and balance the sediment dynamics (i.e., the dynamics between erosion and deposition). 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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