Biodiversity Knowledge

Creating a Network of Knowledge for biodiversity and ecosystem services
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Multifunctionality of floodplain management: A matrix relating interventions to ecosystem services

Schindler, S., **Sebesvari, Z**., Damm, C., Hermann, A., Euller, K., Mauerhofer, V., Kropik, M., Biro, M., Kanka, R., Gasso, V., Krug, A., Lawaars, S., Pusch, M., Schulz-Zunkel, C., van der Sluis, T., Zulka, K.-P., Lazowski, W., Franz, E., Hainz-Renetzeder, C., Wrbka, T.
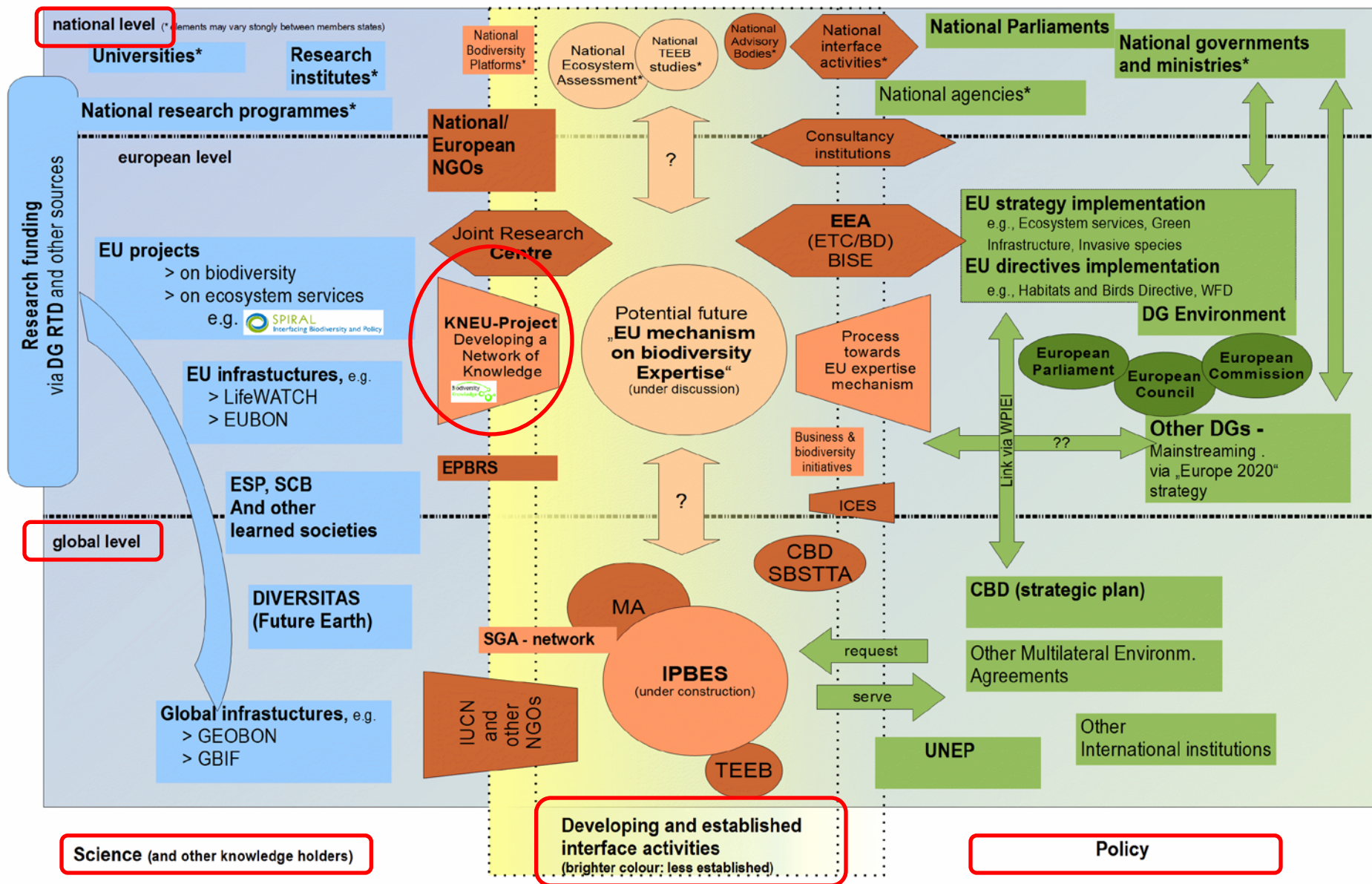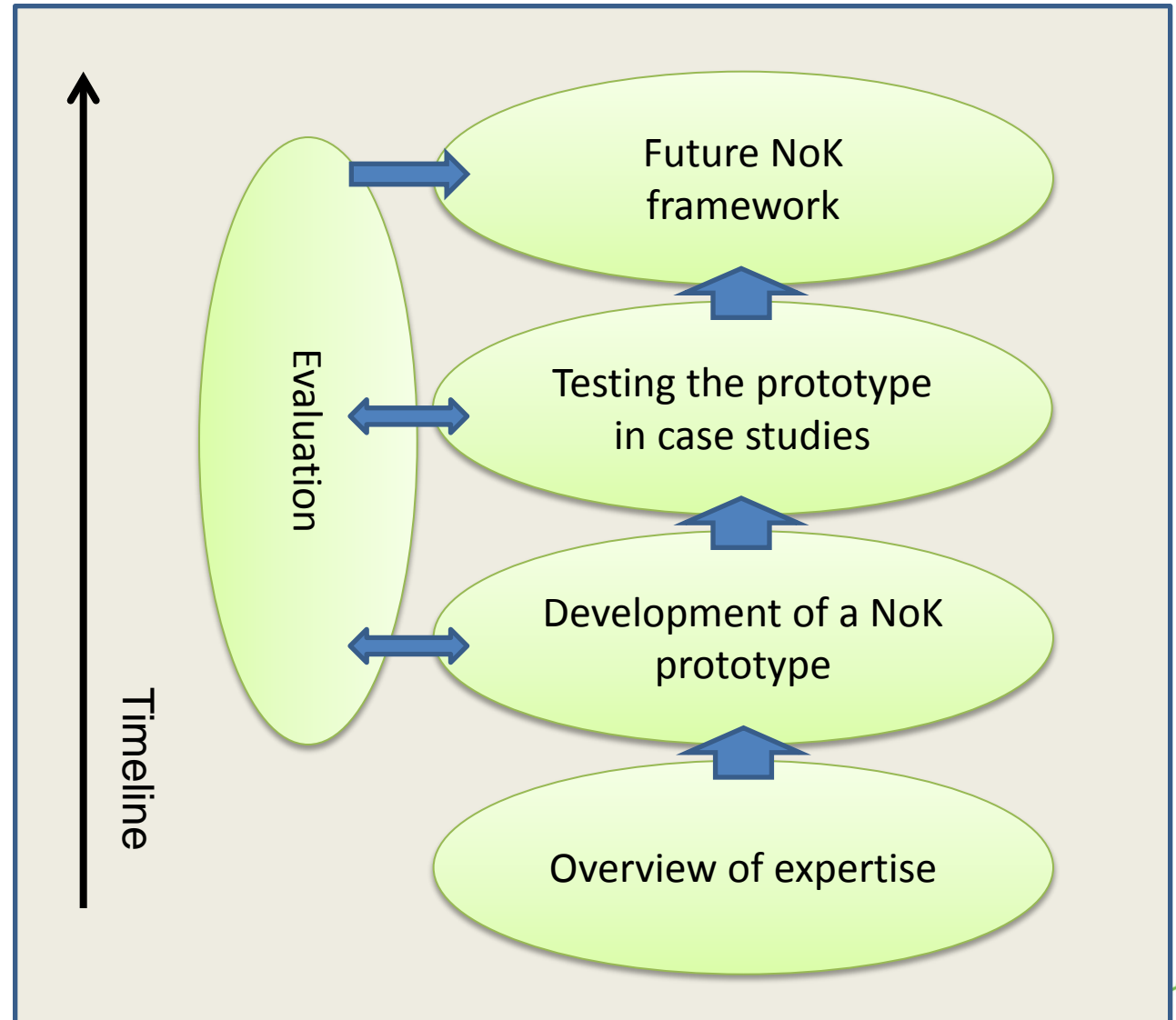
KNEU (Coordination Action Project in FP7)

- KNEU = Developing a **K**nowledge **N**etwork for **EU**ropean expertise on biodiversity and ecosystem services to inform policy making

Drafted by UFZ Science-Policy Expert Group, 2nd revision, 1.8.2012

Work flow

Testing the prototype: the demonstration cases

Objectives

perform three policy-relevant demonstration cases to:

– test the NoK prototype in praxis

– produce policy relevant output in the topics of the demonstration cases

Demonstration cases:

should cover different sectors and test the NoK prototype ->

„Marine case"
*„Agriculture case"*
„Conservation case"

Policy context: "Conservation case"

- **DG Environment** involved in the selection of the topic

- **EU Biodiversity Strategy 2020**

  "By 2020, ecosystems and their services are maintained and enhanced by establishing Green Infrastructure and restoring at least 15% of degraded ecosystems"

  Question:

  How does Green Infrastructure contribute to multifunctional land-use and well balanced delivery of ecosystem services
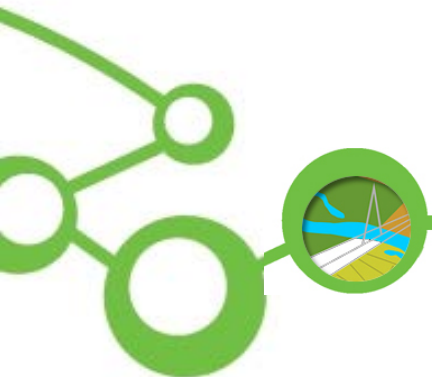
Approaches

- **Systematic review protocol** (Schindler et al. 2013a) and systematic map (Schindler et al. 2013b) dealing with the impact of floodplain management measures on biodiversity

- **Country specific expert consultation** covering IRE, NL, D, SLK, H and UKR to assess regulation history, multifunctional management projects and biodiversity effects (Schindler et al. 2013, in prep.)

- **Expert consultation** that elaborated a matrix specifying the effects of 38 bundles of floodplain interventions to 21 ecosystem services (Schindler et al. 2013, submitted)

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Intervention – ES matrix

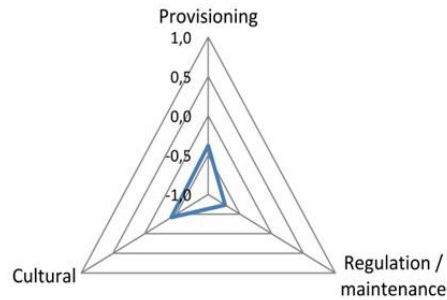- **Developing a matrix to relate floodplain management interventions to ES**
  - Compilation of a list of the most relevant floodplain management measures
  - List of ES based on the CICES classification
  - Compilation of a capacity matrix: relates 38 bundles of interventions for the provision of 21 ES
  - based on expert knowledge (at least 3 experts per judgment)
 - Choices (0, +, -, +/-) combined with explanation

Bundle of intervention	Intervention	Terrestrial plants and animals for food	Freshwater plants and animals for food	Water for human consumption	Water for agricultural use	Water for industrial and energy uses	Biotic materials	Biomass based energy	Bioremediation	Dilution and sequestration	Air flow regulation	Water flow regulation	Mass flow regulation	Atmospheric regulation	Water quality regulation	Pedogenesis and soil quality regulation	Lifecycle maintenance, habitat and gene pool protection	Pest and disease control (incl. invasive alien species)	Aesthetic, Heritage	Spiritual	Recreation and community activities	Information & knowledge
1	Surface water extraction	↘↗	↘	↘↗	↘↗	↘↗	↘	↘↗	↘	↘	0	↘↗	↘	↘	↘	↘	↘	↘↗	↘	↘	↘	↘↗
1	Groundwater extraction	↘↗	↘	↘↗	↘↗	↘↗	↘	↘↗	↘	↘	0	↘	0	↘	0	↘	↘	0	0	0	0	0
1	Mineral resource extraction	↘	↘↗	↘	↘↗	0	↘	↘	↘	↘	0	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘↗	↘↗
2	Settlement and traffic infrastructure	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	0	↘	↘	↘	↘	↘	↘	↘	↘	↘
2	Energy conversion	↘	↘	↘	↗	↗	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘↗	↘↗
2	Navigational infrastructure	↘	↘	↘	↘	↘	↘	0	↘	↘	0	↘	↘	0	↘	↘	↘	↘	↘	↘	↘↗	↘
3	Forestry intensive	↘	↘	↘	↘	↘	↘↗	↗	↘	↘	0	↘	↘	↘↗	↘	↘	↘	↘	↘	↘	↘	↘
3	Agriculture intensive	↗	↘	↘	↘	↘	↘↗	↗	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
3	Fishery intensive	↘	↘↗	↘	0	0	↘	0	0	0	0	↘	↘	0	↘	0	↘	↘	↘	↘	↘	↘
4	Forestry extensive	0	0	0	0	0	↗	↗	0	0	0	0	0	0	0	0	↘	0	0	↘	↗	↘↗
4	Agriculture extensive	↗	0	↘	0	0	↗	0	0	0	0	0	0	0	0	0	↘↗	↘	↘↗	↘	↗	0
4	Fishery extensive	0	↗	0	0	0	0	0	0	0	0	0	0	0	0	0	↗	0	↗	↗	↗	↗
4	Hunting	↗	0	0	0	0	↗	0	0	0	0	0	0	0	0	0	↘	↘↗	0	↘	↘↗	0
5	Channel corrections	↘↗	↘	↘	↘	↘	↘↗	↗	↘	↘	0	↘	↘	↘	↘	↘↗	↘	↘	↘	↘	↘↗	↘
5	Dike construction	↗	↘	↘	0	↗	↗	↗	↘	↘	0	↘↗	↘	↘	↘	↘	↘	↘	↘	↘	↗	↘↗
5	Bank/bed stabilization	↗	↘	↘↗	↘↗	↘↗	↘↗	↗	↘	↘	0	↘	↘	↘	↘	↘↗	↘	↘	↘	↘	↘↗	↘
5	Sediment removal/dredging	0	↘	↘	↘	↘	0	0	0	↘↗	0	↘	↘	↘	↘	↘↗	0	↘	0	0	↘↗	0
5	Detention basins	↘	↘	0	0	0	↘	↘	↘	↘	0	↘↗	↘	↗	↘	↘	↘	↘	↘↗	↘	↘↗	↘↗
5	Controlled retention areas	↘	↘	↘	↘	↘	↘	0	↘	↘	0	↗	0	0	↘	↘	↘	↘	↘	↘	↘	0
6	Dike relocation	↘↗	↗	↗	↗	↗	↘↗	↘	↗	↗	0	↗	↗	↗	↗	↗	↗	↘↗	↗	↗	↘↗	↗
6	Ecologically improved groynes	0	↗	0	0	0	0	0	0	0	0	0	0	0	0	0	↗	0	0	0	↘	0
6	Lowering floodplain/foreland	↘↗	↗	↗	↗	↗	↘↗	↘↗	↘↗	↗	0	↗	↗	↗	↗	↘↗	↘↗	↘↗	↘↗	↘↗	↘↗	↘↗
6	Sediment addition into river bed	0	↗	↗	↗	↗	↗	↗	↗	↗	0	↗	↗	↗	↗	↗	0	↗	↗	↗	↘↗	↗
6	Removing obstacles	0	↗	0	0	0	↗	↘	0	↗	0	↗	0	↗	↗	↗	0	↗	↗	↗	↘	0
7	Removal of bank fixations	↘	↗	↗	↗	↗	↘↗	↘	↗	↗	0	↗	↘↗	↗	↘↗	↗	↗	↘↗	↗	↗	↘↗	↗
7	Removal of dams and weirs	0	↗	0	0	0	0	0	↗	0	0	0	↗	0	↗	0	↗	↘↗	↘↗	↗	↘↗	0
7	Lateral floodplain reconnection	0	↗	↗	↗	↗	↘↗	↗	↗	↗	0	↗	↗	↗	↗	↗	↘↗	↗	↗	↗	↘	↗
7	Channel, oxbow and pond creation	↘	↗	↗	↗	↗	↘↗	↗	↗	↗	0	↗	↗	↗	↗	↗	↘	↗	↗	↗	↗	↗
7	Construction of fish passages	0	↗	0	0	0	↗	0	0	0	0	0	0	0	0	0	↗	↘	0	0	↗	0
8	Creating natural habitat from forest	↗	↗	↗	↗	↗	↘↗	↘	↗	↘↗	0	↗	↗	↗	↗	0	↗	↗	↗	↗	↘↗	↘↗
8	Creating natural habitat from agro land	↘	↗	↗	↗	↗	↘↗	↘	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↘↗	↘↗
8	Creating nat. habitat from extraction sites	↗	↗	↗	↗	↗	↗	↘	↗	↗	0	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↘↗
8	Control of invasive alien species	↗	↗	↘	0	0	↗	↘↗	↘↗	0	↘↗	0	0	0	0	↗	↗	↗	↗	↗	↗	↗
8	Creation of gravel banks	0	↗	0	0	0	0	0	↗	↗	0	0	0	↗	0	↗	↗	↗	↘	0	↗	↗
8	Elimination of top soil	↘	0	↘	0	0	↘	↘	↗	↗	0	↘	↗	↘	↗	↘↗	↗	↘↗	↘	0	0	↘↗
8	Land use extensification	↘	↘↗	↗	0	0	↘↗	↘	↗	↗	0	↘	↗	↗	↗	↗	↗	↗	↗	0	↗	↗
9	Recreational infrastructure	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	↘	↘	↘↗	↘	↘↗	↗
9	Recreational use of the floodplain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	↘					

Multifunctionality index of intervention types
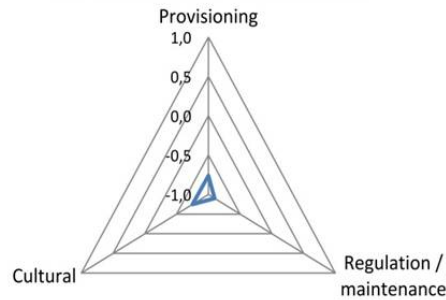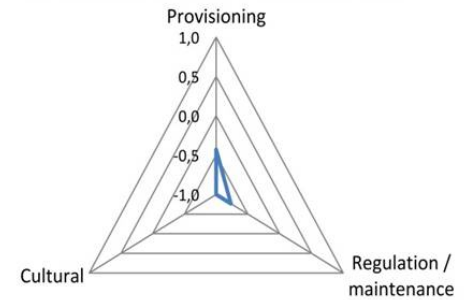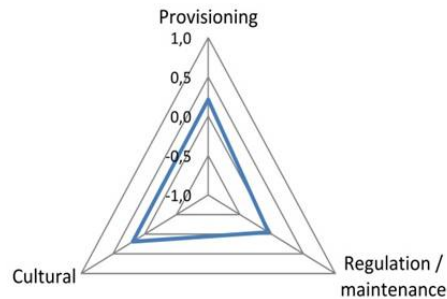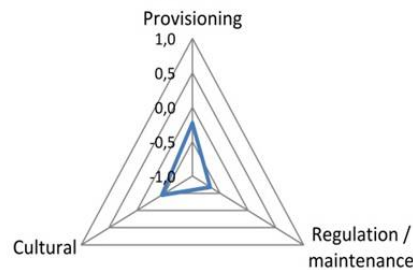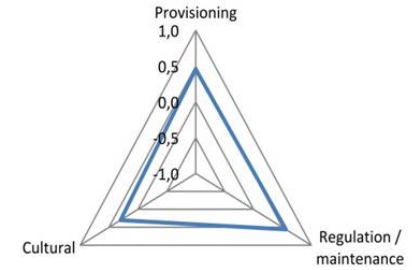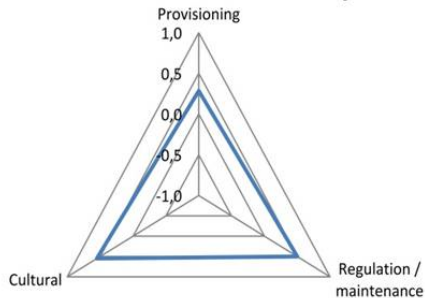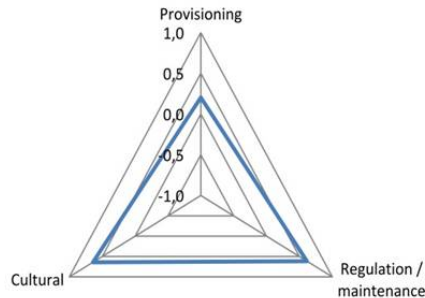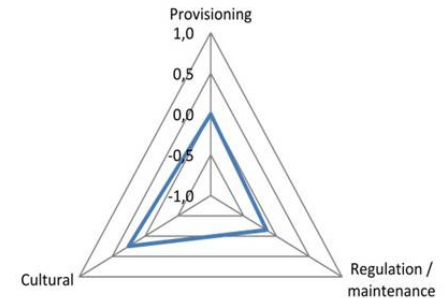
Conclusion

- **Restoration and rehabilitation measures strongly improve the multifunctionality of the landscape and cause win-win situations for** enhancing overall ecosystem supply from all three sections, i.e. provisioning, regulation/maintenance, and cultural services.

- **Conventional regulation** but also interventions related to extraction, infrastructure and intensive land **use cause lose-lose situations.**

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Reflection on the session topic

- NOK approach
  - Evidence scarce, scattered
  - Spatial and temporal scales of available studies doesn´t necessarily meet the policy needs
- Emergence/perception of conflicts between potential users (contested landscape)
- Lack of awareness on economic and social advantages of ecosystem based solutions compared to grey solutions

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Time to harvest the fruit of our excellent work together

Finalizing a recommended design for a Network of Knowledge on Biodiversity and Ecosystem Services in Europe

Invitation to the 2nd BiodiversityKnowledge Conference in Berlin, September 24-26

With IPBES starting its work, Horizon2020 to be launched soon and the 7th Environmental Action Programme soon to be adopted, the efforts to strengthen the science-policy interface on biodiversity and ecosystem services in Europe are at a decisive point.

After 2 years of challenging but highly gratifying work with you and about 300 other contributors, BiodiversityKnowledge is now organizing its second conference to discuss and finalize the recommended design of a future Network of Knowledge (NoK) on biodiversity and ecosystem services. With the conference, we aim to provide an important building block for the future development of the interface between science and society in Europe.

Your opinion and participation are again crucial at this point and we would like therefore to kindly invite you to attend this event, which will take place in Berlin from the 24th to 26th of September, 2013, as previously announced.

The focus of the conference will be on presenting options for the NoK, which the BiodiversityKnowledge team has been developing over the past two years through working jointly with the biodiversity knowledge community. Stakeholders involved ranged from practitioners, researchers to policy makers.

The conference will provide the space for institutions and any interested players to discuss these options and to voice their interests in contributing to the network of knowledge and outline the roles they can envisage for themselves.

If you are interested in joining the final conference of BiodiversityKnowledge, please register here. **The deadline for registration is August 7th.**

You can also find the preliminary programme of the conference on our website.

When?
from 24 Sept, 1PM
to 26 Sept, 3PM

www.biodiversityknowledge.eu

Register via *stefan.schindler@univie.ac.at*

stefan.schindler@univie.ac.at
sebesvari@ehs.unu.edu

www.biodiversityknowledge.eu
Thank you for your attention!

- Schindler S, Kropik M, Euller K, Bunting SW, Schulz-Zunkel C, Hermann A, Hainz-Renetzeder C, Kanka R, Mauerhofer V, Gasso V, Krug A, Lauwaars SG, Zulka K-P, Henle K, Hoffmann M, Biró M, Essl F, Jaquier S, Balázs L, Borics G, Hudin S, Damm C, Pusch M, van der Sluis T, Sebesvari Z, Wrbka T (2013a) **Floodplain management in temperate regions: is multifunctionality enhancing biodiversity? Environmental Evidence 2:10.** http://www.environmentalevidencejournal.org/content/2/1/10

- Schindler S, Livoreil B, Sousa Pinto I, Araújo R, Zulka K-P, Santamaría L, Euller K, Kropik M, Wrbka T (2013b) **Final knowledge assessment reports of the 3 case studies and lessons learned.** Deliverable 3.1 of the EU-FP7-project KNEU (in press).

- Schindler et al. (submitted) **Multifunctionality of floodplain landscapes: relating management options to ecosystem services**. Landscape Ecology.

- Schindler et al. (in prep.) **Multifunctional floodplain management in temperate Europe and evidence for biodiversity effects: an expert consultation.**

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