



Work Package 2 Practice



Operationalising Ecosystem Research Applications (OPERAs)

- Collaborative project to bridge the gap between ecosystem science and practice.
- Advance current understanding of ecosystem functioning, including its relationship with Ecosystem Service provision
- Testing and developing methods to value the flow of Ecosystem Services from the stock of Natural Capital
- Establishing what constitutes good governance of these concepts and of ecosystem management.



OPERAs aims and objectives

Improve understanding of how applying ES/NC concepts in managing ecosystems contributes to human well-being across different social-ecological systems

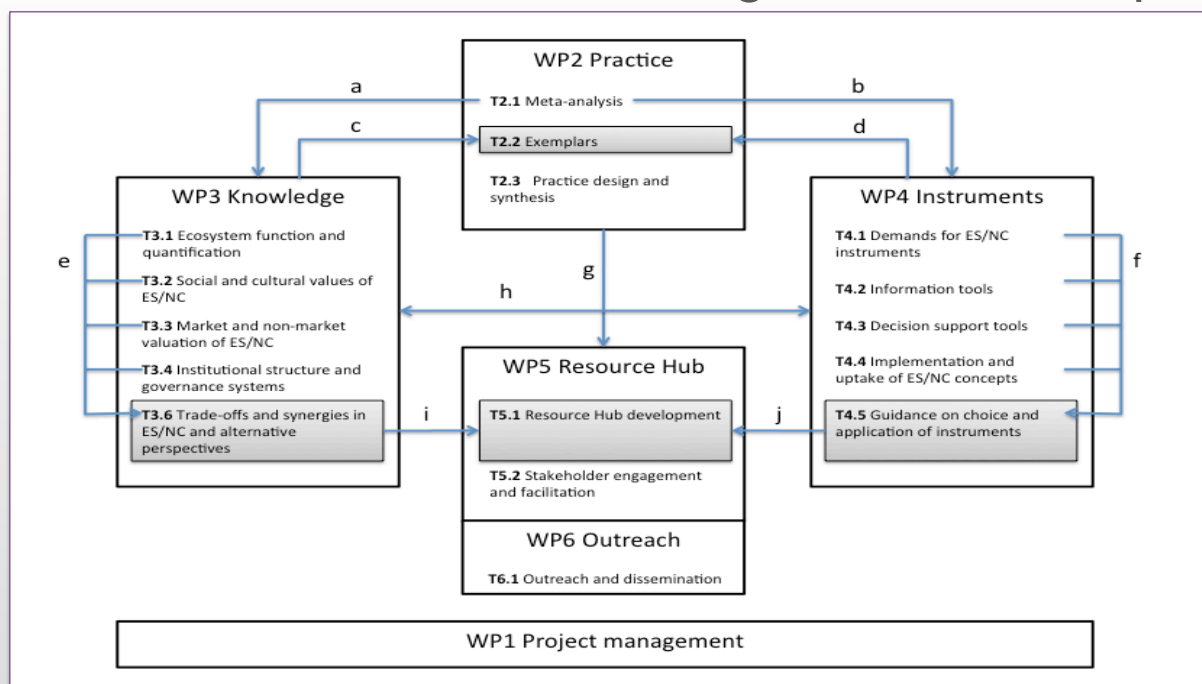
- **Knowledge:** Advance understanding, by testing and developing methods that assign values to the flow of ES from the stock of NC, and by establishing what constitutes good ES/NC governance and associated ecosystem management.
- **Instruments:** Develop new instruments to operationalise the ES/NC concepts, in direct partnership with relevant policymakers and stakeholders and tested in exemplar case studies.
- **Practice:** Communicate with ecosystem practitioners through exemplars and a resource hub and associated Community of Excellence that will ensure the perennity of the project outcomes.

The OPERAs WPs allow for iterative



wide CoE

Work Program relationships



WP 2 Practice Activities

Meta Analysis:

Carsten Dorman, Sven Lautenbach | Univ of Bonn

- Review existing ES/NC assessment protocols
- Report on knowledge gaps, instruments demand

Exemplars:

Kim Nicholas, Lund Univ

Ariane Walz, Univ Potsdam

Meriwether Wilson, Univ Edinburgh

Exemplars Study Design

Synthesis:

Genvieve Patenude, Univ Edinburgh

James Patterson, Univ Edinburgh |

*Blue Print Protocols

Synthesis and Lessons Learned



Meta-analysis – knowledge gaps report

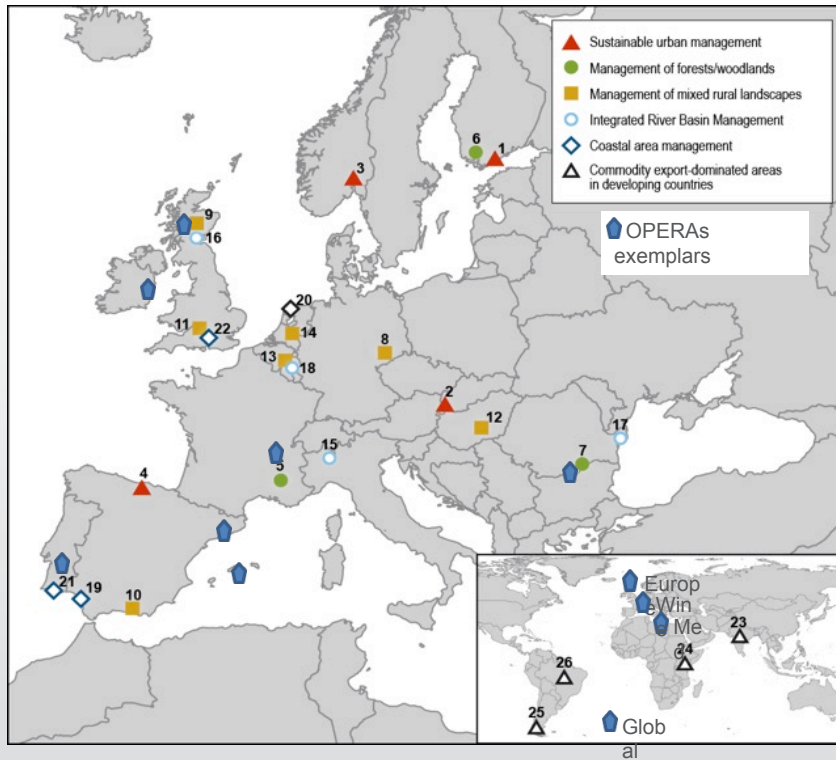
Lack of case studies for a number of services such as biochemical products and medicinal resources, genetic material, ornamental species but also for soil formation, and spiritual and artistic inspiration

Majority of studies does not consider any type of scenarios but analyses the current state. That means that the current ecosystem service assessments are treated mainly as a static analysis without considering changes on both the demand as well as the supply side of services.

Most studies on ecosystem services have been carried out in the USA and China, while tropical countries especially Africa have been underrepresented

Stakeholders have been involved in a relatively high number of studies in both periods, there is still a further incorporation of stakeholders needed





OPERAs Exemplars & OpenNESS Case studies



OPERAs Exemplars – Testing Ground for Instruments and Tools

- Suite of case studies cover a wide range of scales, areas, ecosystem services, and management schemes.
- Provide insight into the needs of practitioners.
- Empirical testing ground upon which to assess ecosystem services based instruments.
- Evaluation to integrate and synthesise best practice across a range of settings.
- Stakeholder engagement throughout the process, Learning and approaches to be replicated in other settings.
- Contribute to a growing Community of Excellence.
- Stakeholder engagement throughout the process, Learning and approaches to be replicated in other settings.



Coverage of exemplars and instruments

	1. Greater Dublin	2. Urban Dunes	3. Montago	4. Baleric islands	5 Lower Danube	6. Central Alps	7. Wine	8. Scotland	9. Circum-Med	10. Pan European	11. Global
Scenario tool	(x)	X	x				x	x			x
CBA (iodine)		X							x		(x)
CBA (wwf)				x	x						
LCA							x	(x)			
ToSIA			x				x	x			x
mDSS		x			x						
ALUAM						x					
CollWeb PF	(x)					x					
TESSA	x	x	x		(x)			x			(x)
Volante Canvas	x	x						x			
ES indicator	x	x	x				x				
OE	(x)	(x)	x	X		x	x	x			(x)
PES				(x)							
PA soc-eco assessment / Regulations			x	(x)	x			(x)			
SEEA framework					X			(x)		(x)	x
EHS Toolkit								(x)			
Offsetting /NLL					X	x		x		x	
Finance tools						(x)					
Spatial Planning & Governance	x										



Scotland ESCom Working Groups

1. ES Frameworks, indicators and data
2. ES Stakeholder engagement and communication
3. ES Information tools
4. ES Valuation (economic and social valuation)
5. ES Modelling
6. ES Futures & scenarios
7. ES Decision support

OPERAs contributions

BluePrint (UEDIN)

Resource Hub

Mapping (Ecometrica)
TESSA toolkit (WCMC)

Economic Valuation (UEA)
No Net Loss (Biotope)
Socio Cultural Valuation (UP)
Crowdsourcing (UEDIN)

Scenario Toolkit (UEDN)

Trade-off analysis (IVM)



OPERAs Exemplars

Coastal-Aquatic Systems on the Edge |

- Scotland multi-scalar biomes and environmental policy
- Transboundary Lower Danube River Wetlands
- Blue Carbon and seagrass in the Balearic Islands
- Urban dunes in Barcelona

Regional Identity |

- Urban-rural fringe of Greater Dublin
- Wine production in Europe
- Conservation cultural landscapes: LTER region Montado, Portugal
- Rural and peri-urban areas of the central Alps

Large Scale |

- Circum-Mediterranean land use change
- Pan-European Exemplar on Regulative Directives
- Global Mechanisms: climate protection and habitat conservation



Abstract Study Rationale Research Questions Exemplar Goals
Linking Stakeholders, Instruments, and Ecosystem Services
Collaborations within OPERAs

Aquatic systems on the edge



Barcelona Dunes | Balearic Blue Carbon | Lower Danube | Scotland Multiscalar



Aquatic systems on the edge

System Synergies

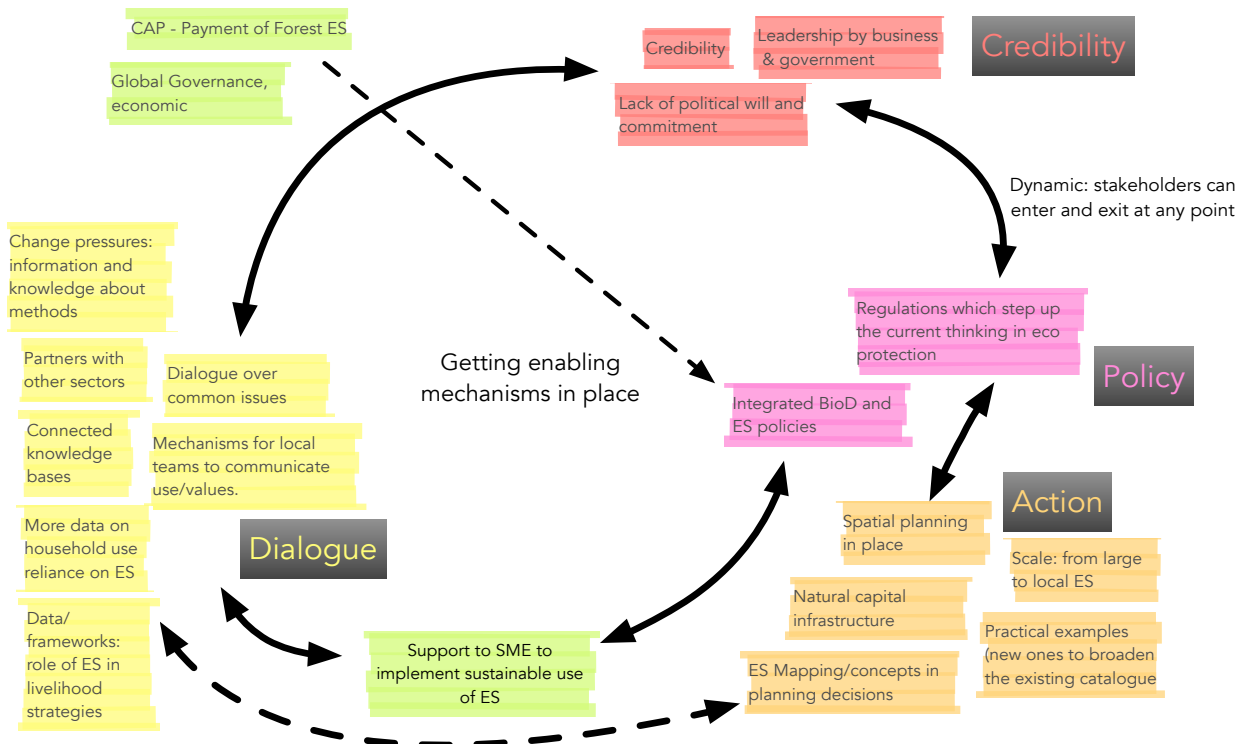
- **Keystone habitats** as ecosystem engineers and high biodiversity
- Restoration thresholds of **fragmented habitats, corridors, connections**
- **Cumulative urbanization** over time
- **Common drivers:** tourism, energy, agriculture, fisheries
- **ES services:** shore protection, fish / agric / aqua productivity, recreation
- **New science horizons:** carbon sources and sinks, hybrid (built-nature) habitats

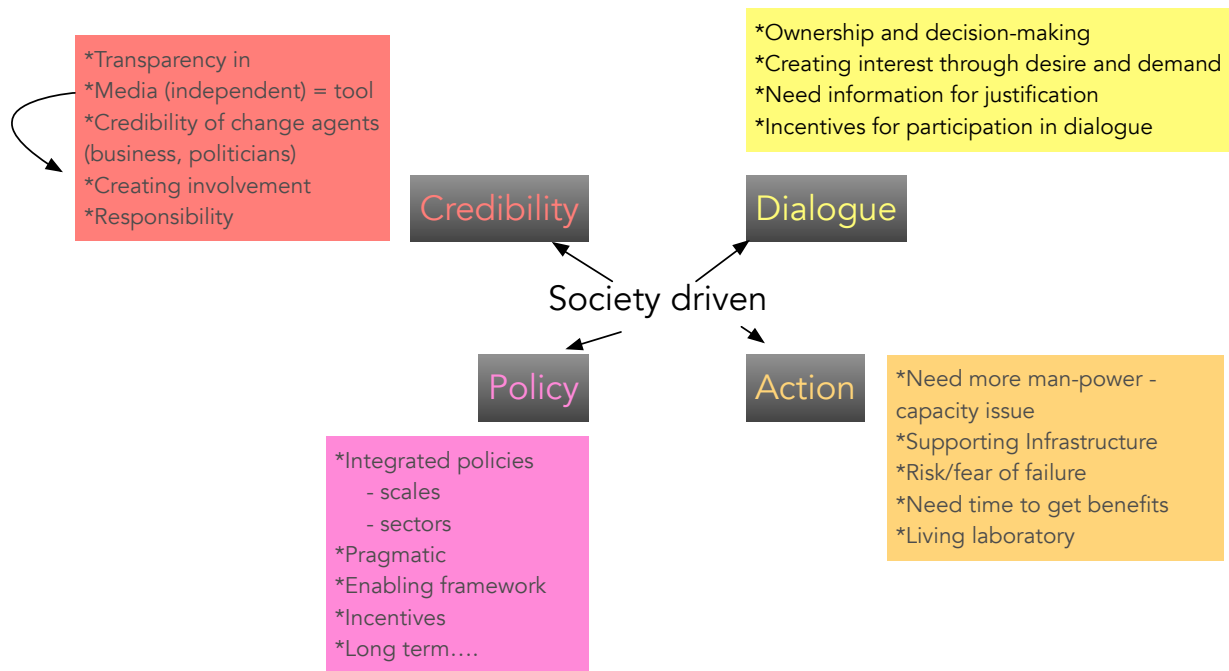
System Distinctions

- **Transboundary dynamics:** river > sea; island > sea; coastal edge | sea
- **Different ecological baselines** re mitigation, conservation, governance
- **Seagrasses:** marine rhizomatous, sub-tropical, high carbon low biodiv
- **Coastal dunes:** terrestrial rhizomatous, low carbon, low biodiversity
- **Marine nearshore:** estuarine-marine, temperate, high prod, carbon, soft-rocky
- **River corridors:** freshwater habitats, temperate, high productivity



Disconnect between knowledge & decision-making, scales, contexts, beneficiaries PRACTICE





•James Paterson,
Genevieve Patenaude
and WP2 members

•University of Edinburgh



Scope and rationale

- **To develop a standardised methodology (Blueprint Protocol) for the reporting of the OPERAs exemplars, thereby providing a systematic reporting protocol across the practice module*
- *The OPERAs Blueprint Protocol aims to standardise the:*
 - *comparison;*
 - *evaluation; and,*
 - *synthesis of the exemplars.*
 - *The blueprint will include additional attributes as new knowledge and insight is gained throughout the project.*
 - *Close interaction with the exemplars will be used to test the robustness of the protocol and to facilitate improvements.*

**Task 2.3, sub-task 2.3.1 OPERAs DoW*

Scope and rationale

- *The initial review* of existing ES/NC assessment protocols highlighted key contributions as well as gaps with respect to attributes necessary to operationalise the ES/NC concepts.*

**OPERAs Milestone 2.1: Review of existing ES/NC assessment protocols
by: Heera Lee, Carsten F. Dormann, Anne-Christine Mupepele, Stefan Schmidt,
Ralf Seppelt, Martin Volk, Sven Lautenbach*

Knowledge gaps concentrate on exemplars that:

- Focus on services such as biochemical products and medicinal resources, genetic material, ornamental species but also for soil formation, and spiritual and artistic inspiration.
- Include scenarios, not only current state (ensure consideration for demand as well as supply side)
- Involve tropical countries, especially Africa, which are underrepresented... A more even spread of studies desirable.

Option 3 - Knowledge gaps concentrate on exemplars that:

- Use integrated or process-based models;
- Analyse trade-offs and offsite effects
- Provide validation, as well as uncertainty quantification

(for further info, See *MS2.3*, Sven et al. 2013)

...and of Ecosystem Services

Ecosystem Services	Wine	Central French Alps	Lower Danube	LTER Montado	Pan European	Dunes-Barcelona	Summary
Provisioning: Goods (timber, wine, crops, livestock, nutrition)	1	1	1	1	1		5
Cultural: Tourism/Recreation	1	1		1		1	4
Regulating: Carbon	1	1			1		3
Cultural: aesthetic	1	1				1	3
Biodiversity, Habitat		1	1	1			3
Provisioning: Biomass/Energy		1	1		1		3
Regulating: Flood control, Storm control, Flow regulation		1			1	1	3
Regulating: Soil protection (erosion, fertility, gravitational risks)		1	1		1		3
Regulating: Water Quality	1	1					2
Provisioning: Water supply		1			1		2
Regulating: Pollination		1			1		2
Regulating: Climate regulation		1		1			2
Cultural: recreational hunting		1		1			2
Provisioning: Water Energy		1					1
Regulating: Fire risk prevention		1					1
Regulating: air quality					1		1
Cultural: Biodiversity heritage		1					1
Cultural: Educational		1					1
Cultural: intellectual and representative interactions			1			21	1
Supporting: gene pool			1				1

The genesis stage...

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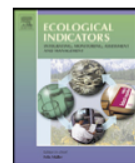


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Form follows function? Proposing a blueprint for ecosystem service assessments based on reviews and case studies

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^f School of Plant Biology, Faculty of Natural and Agricultural Sciences, University of Western Australia, Australia

The Blueprint Protocol structure					Blueprint related to exemplar practicalities	
1) Purpose and Design	2) Scope of the problemscape and concept	3) Analysis and assessment	4) Results and recommendations	5) Beyond the study: Monitoring, improvements, pitfalls		
					Exemplar Goals	Research question
						Project goals
					Exemplar Team	Please list all OPERAs members involved in this Exemplar, and indicate their role and the Work Package to which they belong.



The Blueprint Protocol structure					Blueprint related to exemplar practicalities	
1) Purpose and Design	2) Scope of the problemscape and concept	3) Analysis and assessment	4) Results and recommendations	5) Beyond the study: Monitoring, improvements, pitfalls		
					Ecosystem Services & Ecosystems in Exemplar	(Note, for consistency upfront, we have asked that terminology from CICES 2012/EEA be used in ES names. http://cices.eu). Ecosystem classification to follow standard (EUNIS?)
					Stakeholders	Description- who are they?
						How were they identified?
						How have they been engaged so far?



The Blueprint Protocol structure					Blueprint related to exemplar practicalities			
1) Purpose and Design	2) Scope of the problemscape and concept	3) Analysis and assessment	4) Results and recommendations	5) Beyond the study: Monitoring, improvements, pitfalls				
					Collaborations with other OPERAs WPs	WP3, Knowledge	What key methods are currently being used in your exemplar?	
							What data are currently being collected in your exemplar?	
							Which of the following elements from WP Knowledge are you working with?	ES/NC quantification, links between ecosystems, biodiversity and ES functions (Arne Almut, Sandra Lavorel)
								Synergies and trade off analysis between different ecosystem services / natural capital; which ES/NC types are mutually exclusive or inclusive? (Astrid v Teeffelen)
								Social Valuation of ecosystem services (Craig Bullock)
								Monetary Valuation of ecosystem services (Mark Koetze)
								Governing ES/NC, policy analysis (Lennart Olsson)



The Blueprint Protocol structure					Blueprint related to exemplar practicalities			
1) Purpose and Design	2) Scope of the problemscape and concept	3) Analysis and assessment	4) Results and recommendations	5) Beyond the study: Monitoring, improvements, pitfalls				
					Collaborations with other OPERAs WPs	WP4, Instruments	What key instruments are currently being used in your exemplar?	
							Information Tools	Our ecosystem mapping
								Stakeholder scenarios
							Decision support tools	Green product marketing
								Management Instruments



The Blueprint Protocol structure					Blueprint related to exemplar practicalities		
1) Purpose and Design	2) Scope of the problemscape and concept	3) Analysis and assessment	4) Results and recommendations	5) Beyond the study: Monitoring, improvements, pitfalls			
					Collaborations with other OPERAs WPs	WP5, Resource Hub	How are you going to use your stakeholder group in testing instruments and methods?
						WP5, Resource Hub	Would you like assistance in designing and implementing that engagement strategy?
							Where do you see needs for assistance from Prospex in stakeholder engagement?
						WP6, Outreach/dissemination	What ideas do you have at the moment for outreach and dissemination of the work in your Exemplar?



- Adaptive element of the BP - an iterative process.
- Next steps
 - Decision tree design and construction

Sub-task 2.3.3 Design of a suite of decision trees (UEDIN, UFZ, ALU, OBU, VU-IVM, PIK, LUND, VU, WCMC) - The lessons-learned database and the BluePrint Protocol will serve Decision trees will be developed to provide contextual guidance for the selection of tools and instruments, as evidenced by the exemplars and the meta-analysis.

