

DEFINING SPECIFIC PROTECTION GOALS

Let's the fun begin!



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Umwelt
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Amt
Für Mensch und Umwelt



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Define SPGs for each combination of Ecosystem Service/Key driver

Based on the example for aquatic organisms.....

- ▶ GROUP 1 - Plants
- ▶ GROUP 2 – Bees & other pollinators
- ▶ GROUP 3 – Non-target arthropods
- ▶ GROUP 4 – In-soil organisms (in-field)
- ▶ GROUP 5 – In-soil organisms (off-field)

Each group should be composed from persons with different background (industry, regulatory agencies, academia)



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STEP 1 – Determine the most important ecosystem service(s) where “your” organism group plays a key role (is a “key driver”)

STEP 2 – Using the “5 dimensions approach” define the SPG for each ecosystem service for your organism group



Tipos de Serviços de Ecossistema

- **Provisão** (produtos obtidos dos ecossistemas): comida, fibra, combustível, recursos genéticos, recursos ornamentais, recursos medicinais naturais, água





Tipos de Serviços de Ecossistema

- **Regulação** (benefícios derivados da regulação de processos do ecossistema): **polinização, dispersão de sementes, regulação de pragas e doenças, regulação do clima, água, qualidade do ar, erosão, riscos naturais, resistência a espécies invasoras, herbivoria, purificação da água/tratamento de resíduos**



Tipos de Serviços de Ecossistema

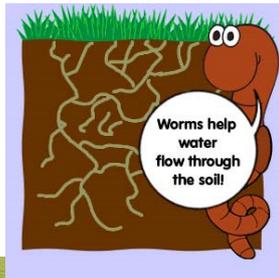
- **Culturais:** Valores espirituais e religiosos, valores estéticos, recreio e ecoturismo, sistemas educativos, herança cultural





Tipos de Serviços de Ecossistema

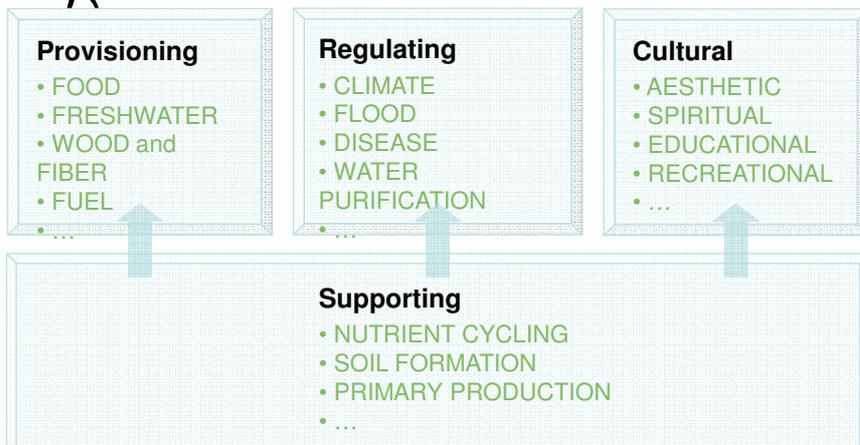
- **Suporte** (necessários para o provisionamento dos restantes serviços – benefícios indirectos ou escala temporal alargada): **produção primária, fotossíntese, provisão de habitat, formação e retenção do solo, reciclagem de nutrientes, ciclo da água**



Serviços ou Funções ?



Types of Ecosystem Services





SE...como são providenciados ?

Faber & Van Wensem (2011) Science of Total Environment

Ecological requirement	Ecosystem service (clustered)					
	Soil fertility	Adaptability, resilience	Buffer and reaction function	Biodiversity and habitat provision	Disease suppression and pest resistance	Physical structure
Functional biodiversity	X	X	X	X	X	
Structural biodiversity, species richness	X	X	X	X	X	
Ecosystem productivity	X	X		X	X	
Organic matter fragmentation, mineralisation	X		X	X		
Soil properties (pH, CEC, aggregates, pore space, WHC, etc.)	X		X	X		X
Nutrient cycling (supply, availability, assimilation, immobilisation)	X		X	X		
Autonomic development (nature)	X	X		X		
Soil organic matter build-up and maintenance	X		X		X	X
Carbon sequestration	X		X	X		
Greenhouse gases	X		X	X		
Groundwater supply and quality	X		X	X		X
Genetic variation and storage of genes		X	X	X	X	
Natural attenuation		X	X	X		
Adaptability, flexibility for use		X				
Air quality amelioration			X			
Water transport and storage			X	X		X
Landscape diversity				X		X
Soil archive (archaeological, geological)						X

- **Requisitos do Ecossistema:** estruturas ou processos necessários para a provisão dos serviços do ecossistema (ESP – Ecosystem service providers)
- Os RE necessitam de **níveis mínimos em termos qualitativos e quantitativos** de forma a que o ecossistema funcione "correctamente" para poderem providenciar os SE (SPU – service providing units)



Define SPGs for each combination of Ecosystem Service/Key driver

Ecol. entity: ind. – (meta)population – functional gr – community – ecosystem

Attribute: behav. – surv. – repro/growth – abund/biom – process – biodiv

Magnitude: no effect – small effect – medium effect – large effect

Temporal scale: days – weeks – months – seasons – years

Spatial scale: meters – field – edge of field – watershed/landscape

Degree of certainty: high



What are these 5 dimensions ?

- **The ecological entity** (level of biological organization) of the key driver that is to be protected (e.g. individual birds, populations of earthworms).
- **The attribute(s)** or characteristic(s) of that entity that must be protected such as behaviour, survival, reproduction/growth, population density, processes (e.g. primary productivity, grazing efficiency, nutrient cycling) and biodiversity.
- **The magnitude of effect** that can be tolerated for the attributes to be measured (biological scale), which may include decreases and increases due to indirect effects.
- **The temporal scale** of effect that can be tolerated for the attributes to be measured in terms of duration of the effect, frequency of effects, and interval between effects (within and across years).
- **The spatial scale of the effect**, i.e. maximum area over which an effect exceeding the critical level can be tolerated in terms of the distance from the site of application where the effect can be observed and the spatial configuration and extent of affected sites in the landscape.
- **The degree of certainty** required that the effects will not exceed the specified levels.



Organism group: Ecosystem Service:

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