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How ecosystems work for us:

A view on cultural ecosystem services in the Biosphere Reserve Swabian Alb

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2005: Millenium Ecosystem Assessment



Assessment of consequences of ecosystem change
for human well-being

Addressing linkages and interdependencies
between different ecosystem services and
society



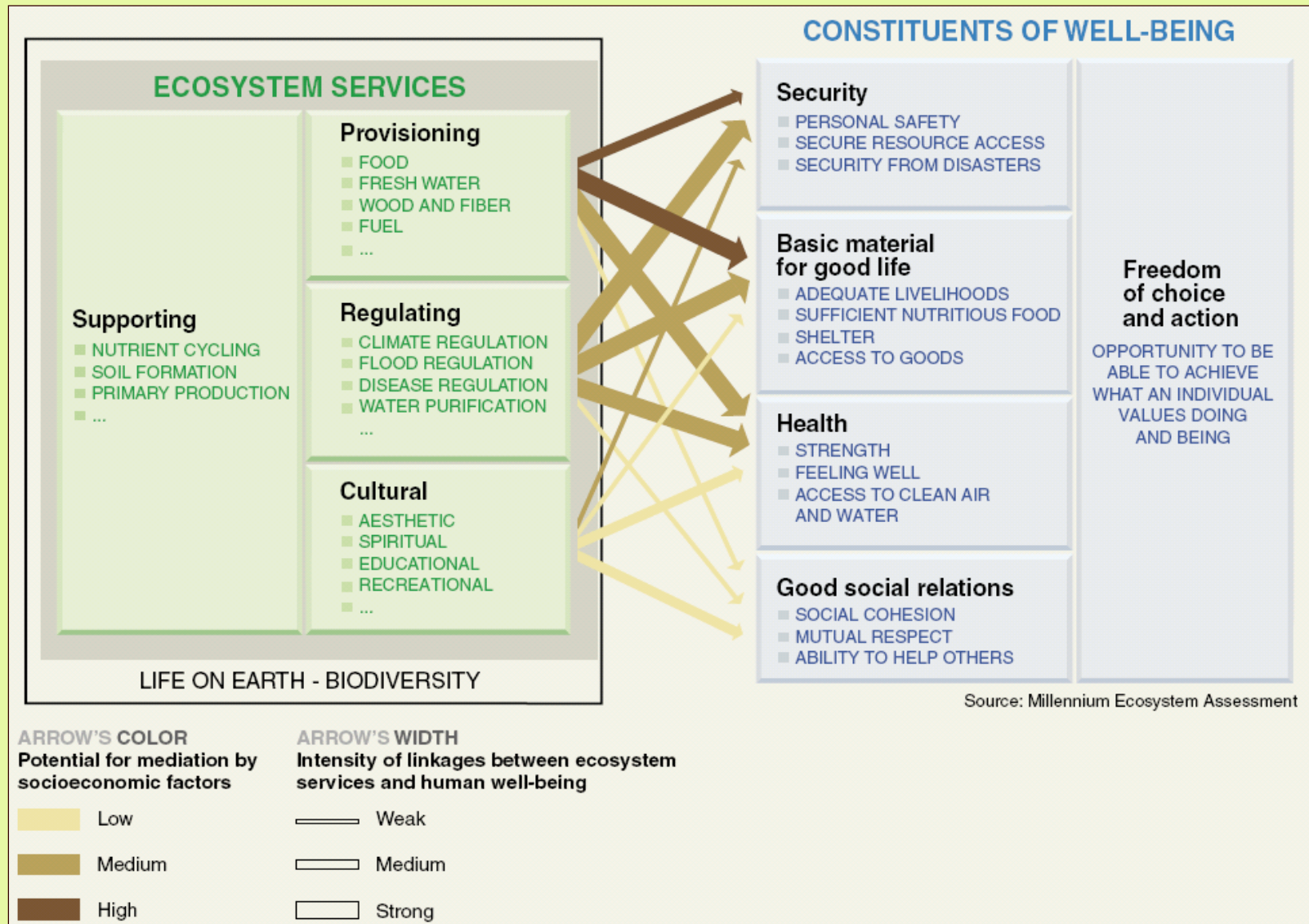
Categories of ecosystem services

“Ecosystem Services are the benefits people obtain from ecosystems.”

(Millennium Ecosystem Assessment, 2005)



Ecosystem services and human well-being



Ecosystem services and human well-being



Service	Sub-category	Human Use ^a	Enhanced or Degraded ^b	Notes	MA Chapter
Provisioning Services					
Food	Crops	▲	▲	Food provision has grown faster than overall population growth. Primary source of growth from increase in production per unit area but also significant expansion in cropland. Still persistent areas of low productivity and more rapid area expansion, e.g., sub-Saharan Africa and parts of Latin America.	C8.2
	Livestock	▲	▲	Significant increase in area devoted to livestock in some regions, but major source of growth has been more intensive, confined production of chicken, pigs, and cattle.	C8.2
	Capture fisheries	▼	▼	Marine fish harvest increased until the late 1980s and has been declining since then. Currently, one quarter of marine fish stocks are overexploited or significantly depleted. Freshwater capture fisheries have also declined. Human use of capture fisheries as declined because of the reduced supply, not because of reduced demand.	C18 C8.2.2 C19
Regulating Services					
Air quality regulation		▲	▼	The ability of the atmosphere to cleanse itself of pollutants has declined slightly since preindustrial times but likely not by more than 10%. The net contribution of ecosystems to this change is not known. Ecosystems are also a sink for tropospheric ozone, ammonia, NO _x , SO ₂ , particulates, and CH ₄ , but changes in these sinks were not assessed.	C13.ES
Climate regulation	Global	▲	▲	Terrestrial ecosystems were on average a net source of CO ₂ during the nineteenth and early twentieth century and became a net sink sometime around the middle of the last century. The biophysical effect of historical land cover changes (1750 to present) is net cooling on a global scale due to increased albedo, partially offsetting the warming effect of associated carbon emissions from land cover change over much of that period.	C13.ES
	Regional and local	▲	▼	Changes in land cover have affected regional and local climates both positively and negatively, but there is a preponderance of negative impacts. For example, tropical deforestation and desertification have tended to reduce local rainfall.	C13.3 C11.3

Ecosystem services and human well-being



Service	Sub-category	Human Use ^a	Enhanced or Degraded ^b	Notes	MA Chapter
Cultural Services (continued)					
Spiritual and religious values		▲	▼	There has been a decline in the numbers of sacred groves and other such protected areas. The loss of particular ecosystem attributes (sacred species or sacred forests), combined with social and economic changes, can sometimes weaken the spiritual benefits people obtain from ecosystems. On the other hand, under some circumstances (e.g., where ecosystem attributes are causing significant threats to people), the loss of some attributes may enhance spiritual appreciation for what remains.	C17.2.3
Knowledge systems		NA	NA		
Educational values		NA	NA		
Inspiration		NA	NA		
Aesthetic values		▲	▼	The demand for aesthetically pleasing natural landscapes has increased in accordance with increased urbanization. There has been a decline in quantity and quality of areas to meet this demand. A reduction in the availability of and access to natural areas for urban residents may have important detrimental effects on public health and economies.	C17.2.5
Social relations		NA	NA		
Sense of place		NA	NA		
Cultural heritage values		NA	NA		
Recreation and ecotourism		▲	+/-	The demand for recreational use of landscapes is increasing, and areas are increasingly being managed to cater for this use, to reflect changing cultural values and perceptions. However, many naturally occurring features of the landscape (e.g., coral reefs) have been degraded as resources for recreation.	C17.2.6 C19

2010: The Economics of Ecosystems and Biodiversity (TEEB)



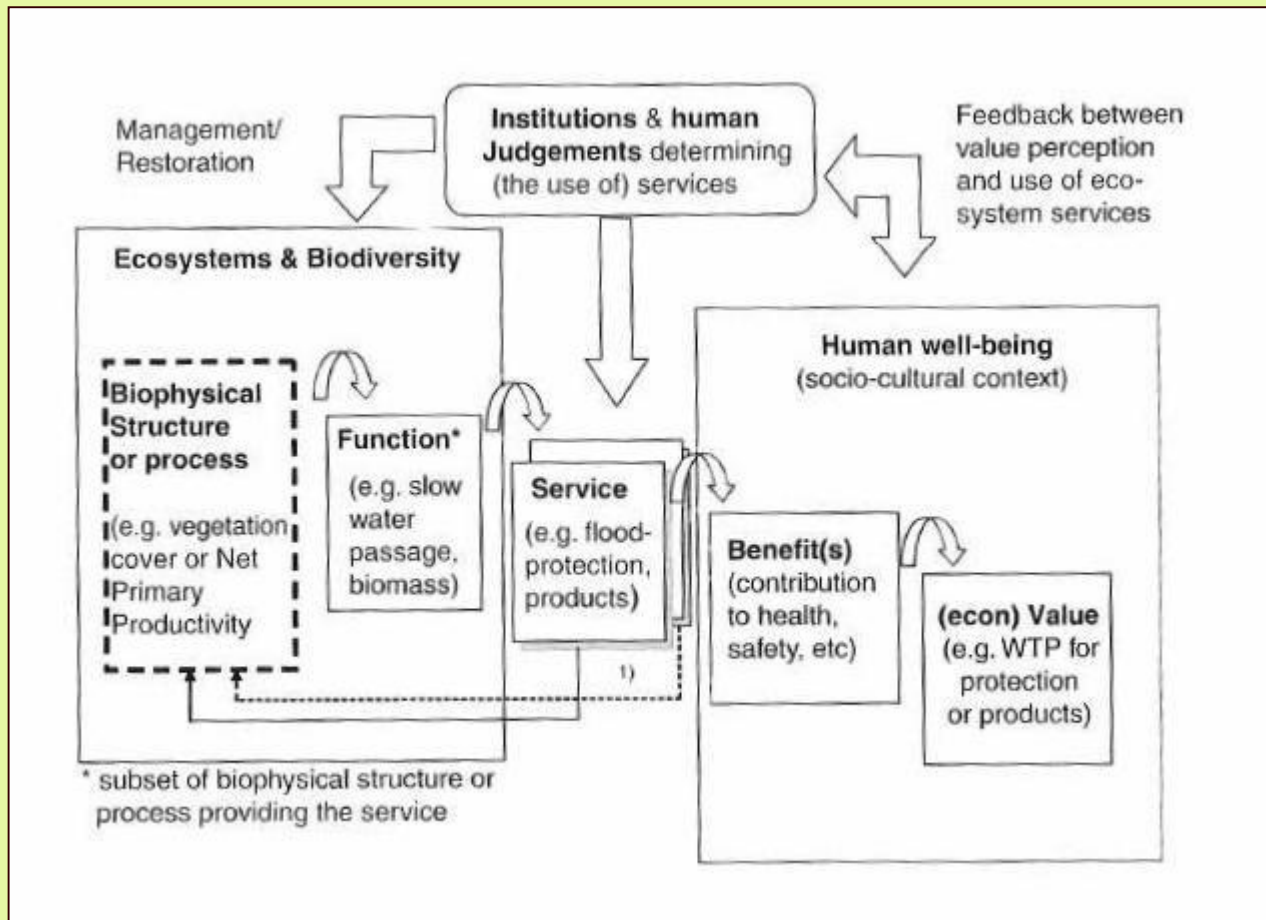
Aim:

- Estimating the economic value of global ecosystem services
- Calculating the economic cost of ecosystem degradation
- Calculating the cost of inactivity or „business-as-usual“

2010: The Economics of Ecosystems and Biodiversity (TEEB)



Analytical framework:



TEEB (2010): The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations

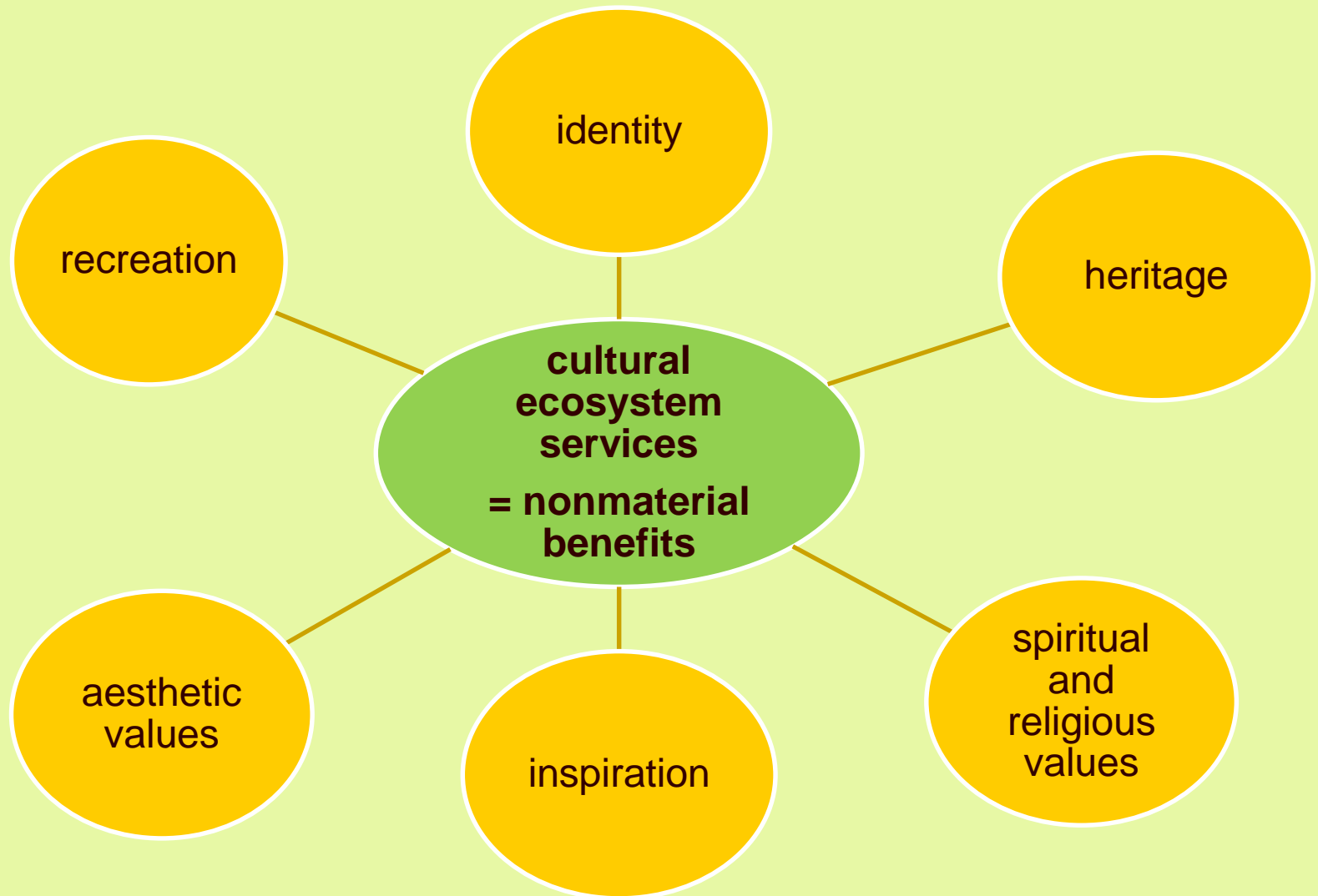
2010: The Economics of Ecosystems and Biodiversity (TEEB)



Protected areas in TEEB:

- Over 120000 protected areas worldwide produce ES worth between 4,4 and 5,2 billion US\$ per year.
- Necessary investments: ~ 45 billion US\$,
- value of such a system would sum up to ~ 5.000 billion US\$
- **Cost-benefit ratio about 1:100**

Cultural ecosystem services



Signs of non-material benefits



sitting benches



Signs of non-material benefits



hiking and cycling guides and trails

Signs of non-material benefits



recreational
facilities



Signs of non-material benefits



gardening for subsistence, hunting



Signs of non-material benefits



memories, commemoration, history



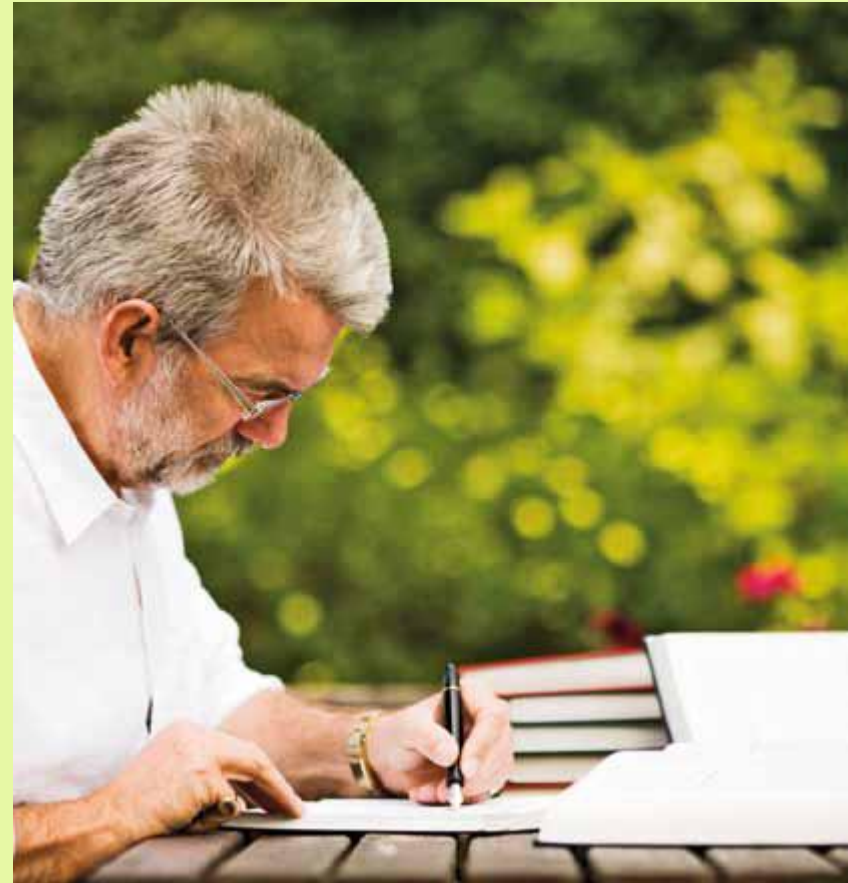
Short story contest Swabian Alb: „BIOSPHERE. Describe your Alb!“



initiated by the biosphere
reserve management team
Swabian Alb, winter 2010/11

questions:

- What is special about the Swabian Alb (yesterday, today and tomorrow)?
- Which places are special?
- How are the people of the Swabian Alb?
- How will life be in the Swabian Alb region in the year 2020?

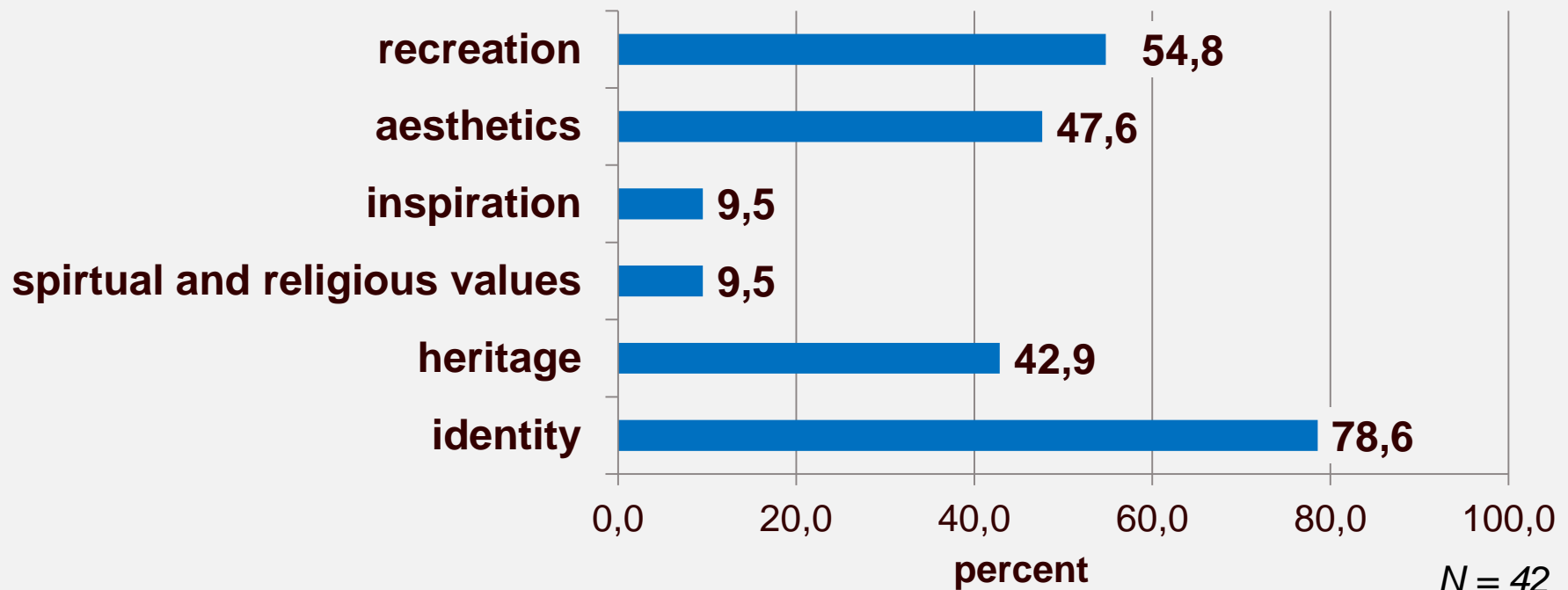


Short story contest: results

- 42 stories were submitted
- all except 3 address cultural ecosystem services, most of them exclusively

Cultural ecosystem services addressed by stories

(in % of total number of stories)



J. Stockmayer:

Der Weg nach oben / The way up



„At this stage my thoughts are still muddled. While walking they arrange themselves and find their meaning.”

“When looking at the world from above, I see the land below me from a different perspective. The places I left, everything that lies behind me is dwarfed and multifaceted. What is mine is only a small part of a larger whole.”

“I have to get back down. But I will take the silence along with me.”

Other examples

- sitting bench as a meeting point for three generations of the family and their friends (*M. Heller: Rietheimer Bänke*)
- beauty of the rural landscape as a source of creative power (*I. Jaiser: Ode an mein Dorf*)
- homeland / „Heimat“ as a prerequisite for happiness and mental health (*T. Pappelau: Heimat*)

Conclusions

- ecosystems provide a broad array of different services to us
 - acknowledgement, assessement and economic valuation only for some of these ecosystem services
 - especially cultural ecosystem services tend to be overlooked, but are of great importance particularly in cultural landscapes
 - ‚measuring‘ and calculating the value of some ecosystem services will always remain unsatisfactory
- important to raise public awareness for less visible services and call attention to synergies and trade-offs with other services
- biosphere reserves and other parks as advocates and drivers of this integrated perspective on ecosystems



Thank you!

Ecosystem services in a biosphere reserve (Example)



Ecosystem service	Forestry		Arable (intensive)		Aquaculture		Open Cast Mining	
	Use	Effect	Use	Effect	Use	Effect	Use	Effect
Provisioning Services								
Food and Fibre		0	Medium	++	High	++		0
Wood (material prod.)	High	++		0		0		0
Biomass (energy prod.)	High	++	High	++		0	High	--
Drinking Water		-		--		-		--
Genetic Resources	Medium	-	Medium	-		+		-
Regulation Services								
Climate Regulation	Medium	++	Medium	-		+		--
Soil Erosion Regulation		-	Medium	--		0	Medium	--
Water regulation		+	Medium	0	High	+	High	--
Water Purification		0		--	High	-		--
Pollination	Medium	0	High	-		0		--
Cultural Services								
Recreation		-		--		++		--
Education		+		0		+		0
Social Relations		+	Medium	+	Medium	+		--
"Heimat"	Medium	0		0	High	++	High	--
Cultural Heritage	Medium	0	Medium	-	High	++	High	--

Risks of economic valuation of ecosystem services



- Trade-offs: Maximizing one ES can lead to the degradation of others
- Conservation and development of ES does not necessarily help conserve cultural landscapes or biodiversity
- Not all ES are marketable
- Dependency on demand
- Short-term vs. long-term services
- Ethical issues:
 - Non-economic reasons for conservation?
 - Ownership issues?
 - Justice: “paying off the bad actors”?
- S

Scientific Agenda



- How to translate **landscape characteristics** into ecosystem services?
- How to **define, classify, quantify** and **evaluate** ecosystem services?
- How to identify and analyse **trade-offs** in ecosystem service consumption over space and time?
- How to **visualize** and **communicate** ecosystem services?
- How to integrate ecosystem services in **landscape planning and management**?
- Which **instruments** can be used to foster the provision of ecosystem services?