A bottom-up practitioner-derived set of Essential Variables for Protected Area management.

Supplement C. Example of survey 2018 on EV status in PAs

Example of the survey sent in 2018 to PA managers and EcoPotential scientists working on Protected Areas, inventorying the data availability and status for the Essential Variables (EVs).

Explanation giving to the last column of the survey: You thus need not to valuate the usefulness or importance of the variable/proxy, because we all agreed that it are very important variables, yet if you could/would use this specific variable/proxy to measure the situation in your PA, how good or bad would then the score be?

1 = is very bad, i.e. the actual situation is very far from the desired situation, e.g. the environmental situation is at some parts highly impacted or even degraded, or an unacceptable socio-economic situation is created that impacts negatively the quality of the PA,

2 = still far from the desired situation but there is some hope for improvement,

3 = not good and not bad, i.e. almost acceptable but improvement can/should be made,

4 = good and almost, but not completely, the desired situation,

5 = very good, i.e. the desired situation (optimal reference level))

	Variable	Examples / Synonyms	Indicators / proxies (to perform concrete measurements)	Do you have in your PA data for this variable and proxy	If yes, for which specific variable/proxy you have data	If you would valuate the situation or the quality in your PA by means of this variable how would the score for your PA then be (see explanation) 1 = very bad 2 = bad 3 = not good/not bad 4 = good 5 = very good
				Yes / No	Type of variable/proxy	Fill in a 1, 2, 3, 4 or 5
	Ecosystem Functions					
EF	**Habitat Suitability**	Habitat availability, Feeding and breeding grounds, Ecotypes	Habitat classification (e.g. EUNIS), Carrying capacity			
	Biodiversity	Biodiversity status, Biodiversity changes, Endemism, Protected species	Shannon Index (H), Diversity Index			
	Population Dynamics	Recruitment, Seed dispersal, Predation, Reproduction, Pollination, Succession, Grazing	Vegetation cover changes, Population structure (age, sexes)			
	Primary Production	UNESCO World Heritage	Chlorophyll a, Net primary production			
	Land- and Sea Scape		Habitat heterogeneity (EUNIS)			

	Hydrodynamics	Currents, Water flow, Water regulation, Water retention	Snow depth & water content,Flow velocity, Tidal amplitude, Flood duration				
	Gene Pool	Genetic resources	Genetic diversity				
	Climate Dynamics	Change of microclimate	Land or Sea Surface Temperature, Air temperature, Relative humidity				
	Weather	Temperature, Evaporation	Precipitation, Cloud cover, Wind speed, Air temperature, Snow depth				
	Element Cycling	Biogeochemical cycling, Hydro-geo-eco processes	Nutrient budgets in soil, Mineralisation rates C,N, Element budgets				
	Ecosystem services						
ES	**Leisure Activities**	Recreation and tourism, Birdwatching	Number tourists + tourist days, Number of pleasure crafts				
	Education and Research		Number of educational visits, Funding (on basis of GNP), Number of scientific projects, articles, studies				
	Habitat for Feeding and Breeding		Number of offspring of indicator species, Breeding success of indicator species, Suitable habitat for indicator species				
	Charismatic Landscape	Aesthetic values, Cultural heritage, Iconic landscapes	Density of charismatic landscape elements, Percentage of undisturbed view, Perception by inhabitants / visitors				
	Biodiversity Conservation	Protection of species, Habitat and genetic resources	(Change in) Indicator species, Historical biodiversity index (HBI)				
	Charismatic Species		Number of charismatic species				
	Spiritual significance		Number of locations of spiritual significance				
	Animals of Economic Use	Aquaculture, Bait, Beekeeping, Cattle, Fishing, Shellfish	Livestock biomass				
	Climate Regulation	(incl. Carbon sequestration)	Oceanic carbon sink, Terrestrial carbon sink, Surface/Air temperature, Relative humidity, Light intensity, Windspeed				

Threats							
Threats	**Over-exploitation**	(Intensive agriculture, Overfishing, Too high tourist density)	Percentage fish below reproductive size, Fishing and harvesting above MSY, Reduction of adult size, Desertification, Number of visitors above desired amount				
	Disturbance	Anthropogenic disturbance, Off-road vehicles, Transport	Landscape disturbance, Noise disturbance (in ocean or at land), Number of dams, Number of vehicles, Soil sealing, Number of pleasure crafts				
	Tourism	Recreational activities	Number of visitors, Money spent by visitors, Spatial patterns of visitors, Crowd photos analysis				
	Change in species	Species loss, Successional stagnation, Aging of wild stocks, Food competition with cultured species, Prey decline	Species community composition				
	Bad management	Inappropriate water management	Quotum and harvest above MSY, Disproportional influence of stakeholders, Mismatch perception degree of corruption and political stability in PA vs country				
	Exotic species	Invading species	Invasive species				
	Habitat loss	Habitat fragmentation, Loss of connectivity, Forest decay, Reduction of salt-marshes	Reduction in habitat amount, Habitat fragmentation, Accessible habitat (connectivity), Number, size and isolation of patches				
	Change in land use	Abandonment of farming, Decrease of crops, Urbanisation, Harbour Extension	Detrimental land use/cover change, Rate of urbanisation				