

Supplementary file 2

Supplementary online materials to the paper:

Czúcz B, Keith H, Maes J, Driver A, Jackson B, Nicholson E (2020): A common typology for ecosystem characteristics and ecosystem condition variables. One Ecosystem, 2020.

Table S8: Linking the indicators used in the accounting case studies reviewed by Maes et al. (2020) to SEEA ECT classes.

- **Columns:** broad ecosystem types following Maes et al. (2012) -- **urb:** urban; **cro:** croplands; **for:** forests and woodlands; **shr:** shrublands (incl. heathland); **gra:** grasslands; **wet:** wetlands; **wat:** inland water (rivers, lakes, reservoirs); **coa:** coastal ecosystems (mangroves, estuaries, lagoons, transitional waters, beaches, sea cliffs); **mar** (marine/ open seas); and **gen:** generic, used for all (terrestrial) ecosystem types.
- **Rows:** SEEA ECT classes and tentative subclasses of variables (as identified from the accounts reviewed by Maes et al., 2020).
- **Cells:** List of case studies where one or more variables from the given family were used to characterise the given broad ecosystem type (based on Maes et al., 2020: Table 1)*.

Main groups of metrics (with examples)	gen	urb	cro	for	shr	gra	wet	wat	coa	mar
A1 Physical state characteristics										
water quantity (e.g. hydrological flow, reservoir stock, groundwater table...)	8					21		9		
A2 Chemical state characteristics										
air quality (pollutants concentrations)	8				20	20, 21				
water quality (e.g. pollutant concentrations, dissolved oxygen, turbidity)	8						20	9, 11, 12, 16	1, 5, 22	2
soil quality (e.g. nitrogen content, heavy metal content, soil carbon stock)	8, 12, 22			10, 13	20	20	11, 20			
B1 Compositional state characteristics										
birds	17		12	12, 13	12		10, 11, 12	11	12	
corals										2
fish							12	12	5	2
(macro)invertebrates						12, 20, 21		16	5	
<i>synthetic species and habitats-based indices (red-list indices, LPI, conservation status)</i>	6, 8, 12, 17, 19	14						10	5, 22	

Main groups of metrics (with examples)	gen	urb	cro	for	shr	gra	wet	wat	coa	mar
B2 Structural state characteristics										
vegetation cover (e.g. LAI, shrub cover...)	3, 8, 16			10						
biomass / carbon / timber stock	8, 12			10, 13						
litter	3									
forest age (age classes)				4, 10						
B3 Functional state characteristics										
flood risk	16			10						
fire risk	20				20	20				
NPP, biomass growth, carbon uptake	2, 8, 16			12						
C1 Landscape and seascape characteristics										
connectivity/fragmentation (barrier density, patch size, shape...)	3, 7, 8			13		21				
the presence/abundance of specific habitat (sub)types (e.g. riparian habitats, seagrass fields, forest types)		14		4, 10				9, 16	5	2
Miscellaneous										
pre-aggregated indices (e.g. ecosystem integrity, naturalness)	3, 6, 7, 15, 18	14					23**	9, 11, 12, 16	22	
accessibility (distance to ecosystems from population centres, length of trails)	12	14			20	20, 21	20	11	22	
protected areas (or other similar administrative designations -- e.g. Natura2000 (EU), SSSI (UK)...)	8			10	20	20, 21	20		22	
raw pressures (e.g. pollutant loads, habitat loss)	7								1, 5	2
management intensity (e.g. grazing)					20	20, 21				
abiotic / climatic characteristics (e.g. annual rainfall, annual number of growing days)										
certificates (e.g. blue flag (EU beaches), green flag (UK urban parks))		14							22	

* From case studies 3, 5, 6, 14, 18 and 22 some indicators were omitted due to incomplete information

** Peatlands were added to the column of wetlands (case study 23)

References

Accounting case studies (based on Maes et al., 2020)

- 1 Eigenraam, M., McCormick, F., Contreras, Z. (2016). Marine and Coastal Ecosystem Accounting: Port Phillip Bay. Report to the Commissioner for Environmental Sustainability. ISBN 978-1-76047-395-2
- 2 Australian Bureau of Statistics (2015). Information Paper: An Experimental Ecosystem Account for the Great Barrier Reef Region. <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4680.0.55.001> .

- 3 Eigenraam, M., Chua, J., Hasker, J. (2013). Environmental-Economic Accounting: Victorian Experimental Ecosystem Accounts, Version 1.0. Department of Sustainability and Environment, State of Victoria.
- 4 Keith, H., Vardon, M., Stein, J., Stein, J., Lindenmayer, D. (2017). Experimental Ecosystem Accounts for the Central Highlands of Victoria (A scientific article is available as Keith, H., Vardon, M., Stein, J.A., Stein, J.L., Lindenmayer, D., 2017. Ecosystem accounts define explicit and spatial trade-offs for managing natural resources. *Nature Ecology & Evolution* 1, 1683-1692.)
- 5 Wentworth Group (2016). Accounting for Nature- A scientific method for constructing environmental asset condition accounts. ISBN: 978-0-9944577-3-8
- 6 Varcoe, T., Betts O'Shea, H., Contreras, Z. (2015). Valuing Victoria's Parks Accounting for ecosystems and valuing their benefits: Report of first phase findings.
- 7 Statistics Canada Environment Accounts and Statistics Division (2013). Human Activity and the Environment. Measuring ecosystem goods and services in Canada.
- 8 Lof, M. P. Bogaart, L. Hein, R. de Jong and S. Schenau (2019). The SEEA-EEA ecosystem condition account for the Netherlands, Statistics Netherlands and Wageningen University, The Hague; Wageningen, the Netherlands. 88pp.
- 9 Nel, J.L., Driver, A. (2015). National River Ecosystem Accounts for South Africa. Discussion document for Advancing SEEA Experimental Ecosystem Accounting Project. South African National Biodiversity Institute, Pretoria
- 10 Eftec (2015). Developing UK Natural Capital Accounts: Woodland Ecosystem Accounts. Report prepared for the Department for Environment, Food and Rural Affairs (Defra), March 2015.
- 11 Khan, J., Din, F. (2015). UK Natural Capital – Freshwater Ecosystem Assets and Services Accounts. Office for National Statistics
- 12 White, C., Dunscombe, R., Dvarskas, A., Eves, C., Finisdore, J., Kieboom, E., Maclean, I., Obst, C., Rowcroft, P. & Silcock, P. (2015). 'Developing ecosystem accounts for protected areas in England and Scotland: Main Report', Department for Food, Environment & Rural Affairs/The Scottish Government
- 13 Forest Enterprise England (2017). Natural capital accounts. Forestry Commission England
- 14 Office for National Statistics (2018). UK natural capital: ecosystem accounts for urban areas Initial natural capital accounts containing information about green space in urban areas. Statistical Bulletin
- 15 Thackway, R., Lesslie, R. (2005). Vegetation Assets, States and Transitions (VAST): Accounting for vegetation condition in the Australian landscape. BRS Technical Report, Bureau of Rural Sciences, Canberra
- 16 Smith, B., Summers, D., Vardon, M. (2017). Environmental-Economic Accounting for ACT State of the Environment Reporting – Proof of Concept. Office of the Commissioner for Sustainability and the Environment.
- 17 UNEP-WCMC (2017). Developing Ecosystem Condition Accounts for the EU and Member States

- 18 Driver, A., Nel, J.L., Smith, J., Daniels, F., Poole, C.J., Jewitt, D., Escott, B.J. (2015). Land and ecosystem accounting in KwaZulu-Natal, South Africa. Discussion document for Advancing SEEA Experimental Ecosystem Accounting Project. South African National Biodiversity Institute, Pretoria
- 19 UNEP-WCMC & IDEEA (2017). Experimental Ecosystem Accounts for Uganda. Cambridge, UK.
- 20 Office for National Statistics (2017). UK natural capital: developing UK mountain, moorland and heathland ecosystem accounts.
- 21 Office for National Statistics (2018). UK natural capital: developing semi-natural grassland ecosystem accounts
- 22 Office for National Statistics (2016). Scoping UK coastal margin ecosystem accounts
- 23 Dickie I, Evans C, Smyth MA (2015). Scoping the Natural Capital Accounts for Peatland, work package 3 of Report NR0165 for Defra

Other references

- Maes J, Teller A, Erhard M, Liqueste C, Braat L, Berry P, ..., Bidoglio G (2013) Mapping and Assessment of Ecosystems and their Services. An analytical framework for ecosystem assessments under action 5 of the EU biodiversity strategy to 2020. Publications office of the European Union, Luxembourg. URL: http://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/MAESWorkingPaper2013.pdf
- Maes, J., Driver, A., Czúcz, B., Keith, H., Jackson, B., Nicholson, E., & Dasoo, M. (2020). A review of ecosystem condition accounts: Lessons learned and options for further development. *One Ecosystem*, 5, e53485.