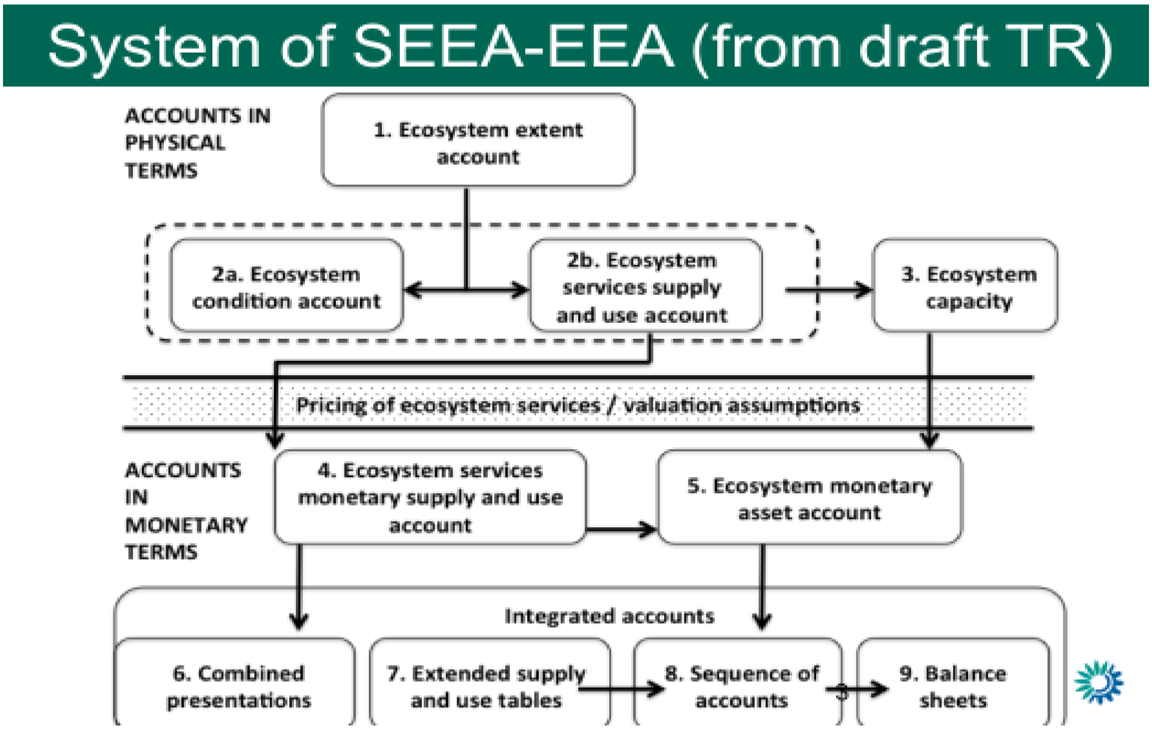
Background material for KIP INCA proposal for EU-level account on ecosystem condition

Based on paper prepared by EEA as input to discussion at KIP INCA workshop on 25-26 April 2016; revised and updated in January 2017

The Ecosystem Condition Account is a central component in SEEA-EEA and aims to track the 'condition' of ecosystems in a way that shows the improvement or deterioration in key ecological characteristics specific to individual (or groups of) ecosystems. Together with the ecosystem extent account the condition account is also considered critical input for estimating the ecosystem services supply account (see figure below). This document summarises the current EEA proposal of options for implementing these accounts at EU level in a 2017 and 2020+ timeframe. These methodological proposals have been discussed at a KIP INCA workshop in April 2016 and feedback received during that expert meeting is now integrated into this paper. This material is documented by EEA as input to the forthcoming discussions on identifying ecosystem condition parameters for EU level work on ecosystem assessment and accounting.



The following pages describe key aspects to consider in developing ecosystem condition accounts for Europe. The main condition parameters to be tested in pilot EU accounts for ecosystem condition per MAES ecosystem types are still to be decided and will be reviewed in the context of the MAES review possible ecosystem condition parameters per ecosystem type. This document summarises:

a) The available methodological guidance (SEEA-EEA and 'MAES' reports),
b) the evaluation of potential condition parameters against a first selection of criteria,
c) A proposal for approach and structure of the proposed condition account, and
d) How to derive an overall value or index for ecosystem condition per ecosystem type.

a) Review of available methodological guidance (SEEA-EEA and 'MAES' reports):

Ecosystem 'condition' is a concept that can be interpreted in many different ways. One interpretation is 'state of' or 'richness' of biodiversity. However, ecosystem 'condition' also relates to other parameters that are linked to essential ecosystem processes, such as nutrient cycling or photosynthesis. An important question to ask, therefore, is how individual condition parameters relate to specific ecosystem characteristics and/or ecosystem processes. The most important condition parameters to be analysed may therefore change with the aspect or function of a specific ecosystem to be tracked.

The SEEA EEA handbook and the related draft technical recommendations leave substantial space for interpretation and experimentation in this regard. Table 4.4 in the SEEA EEA handbook suggests five aspects of condition that could be considered (vegetation, biodiversity, soil, water, carbon) in an example for a condition account for a single ecosystem unit. If one wants to cover more ecosystem units (or types) then more parameters may become relevant and the draft technical recommendations suggest that there are a number of approaches that could be considered for developing ecosystem condition accounts (top-down as well as bottom-up). Altogether the SEEA-EEA documents provide useful reference but leave it to the user to decide which approach to choose for a given context.

Given the scope for experimentation provided by SEEA-EEA and the need to develop an approach on ecosystem condition that is suited to the European ecological and land use context the analytical frame developed under the MAES ecosystem assessment work becomes the next obvious starting point. The third MAES report ('Mapping and assessing the condition of Europe's ecosystems: progress and challenges', 2016) discusses the question of how to assess ecosystem condition in its chapter 4. The MAES report suggests that ecosystem condition can be assessed via two approaches: indirectly via an analysis of pressures acting on ecosystems and directly by tracking habitat condition, biodiversity and environmental quality[1].

Table 4.1 in the third MAES report provides an overview of the main pressure causing ecosystem change (habitat change, climate change, 'overexploitation' (unsustainable land or water use or management), invasive alien species, and pollution and nutrient enrichment). This list provides a useful background for reviewing potential ecosystem condition parameters to be considered and is a reminder that pressures can be good proxy for changes in ecosystem condition. While it does not suggest specific quantifiable parameters that could be taken as measures for ecosystem condition it is helpful in identifying the types of change to be tracked via such parameters. Section 4.1 discusses some of the indicators that could be used to measure the level and direction of different pressures on terrestrial and marine ecosystems.

Section 4.2 discusses data availability and methodology for a direct assessment of ecosystem condition. The initial data review focuses on reporting by Member States under the Birds and Habitats Directives, the Water Framework Directive and the Marine Strategy Framework Directive as well as the use of earth observation data for assessing vegetation productivity and phenology. The subsequent methodological section points out that:

- Indicators for the 'health' (i.e. condition) of ecosystems do not always fully address the multi-functionality of ecosystems,
- Habitat quality indicates condition for species but not necessarily for other ecosystem functions,

[1] The second MAES report also provides a first review of indicators to assess the condition and biodiversity of ecosystems in Table 3 – see the annex to this document for a copy of that table.

- Structural components of ecosystems can be useful indirect indicators of ecosystem condition, e.g. tree age class distribution or amount of dead wood in forests,
- Information on the physico-chemical condition of ecosystems is often lacking, and
- Chemical condition of freshwater and marine ecosystems and the physical condition of river and sea beds are important indicators for habitat quality and biodiversity and also address other important ecosystem functions (e.g. carbon sequestration).

This review of condition parameters is helpful in pointing to candidate parameters to include in a draft account of ecosystem condition. It does not, however, discuss critical condition parameters ecosystem by ecosystem, so additional analytical and ecological reference needs to be employed for a complete evaluation of potential condition parameters for European ecosystems.

b) Initial evaluation of condition parameters against a first selection of criteria

The following tables present a first evaluation of possible condition parameters with a focus on policy relevance and technical feasibility; table 1 reviews the situation of potential condition parameters in a 2017 timeframe, table 2 reflects on possible developments in a 2020 timeframe. Both explore parameters that were pre-selected on the basis of a prior review of potential condition parameters at EEA. Please note that this selection is considered a consolidated methodological proposal but open to further review.

Table 1 reviews the policy relevance and feasibility of selected condition parameters that were chosen as they match the indicators for ecosystem condition set out in the third MAES report. The colour coding in table 1 indicates the match of the reviewed condition parameters with SEEA-EEA, 7EAP policy targets and key environmental trends highlighted in SOER 2015. Green signifies a very good match, orange stands for a partial match and red indicates no match. A similar approach applies to the feasibility criteria that review the spatial referencing of potential underpinning data ('Spatial level'), the frequency and timeline of current data sets ('Time series') as well as the reliability of underpinning data sources ('Reporting & statistics').

Data sets that are available in a spatial reference frame that matches the spatial dimension of the ecological parameter to be used are coded in green (e.g. for data that are available at water basin level for aquatic parameters or data that have a 1km^2 resolution), and with decreasing spatial match orange and red coding is used. For the criterion 'Time series' green coding signifies annual reporting, orange that a regular time series is available and red that no repeat data for comparison are currently available. The coding for 'Reporting & statistics' allocates green to data derived from official statistics and regularly reported data that link to a legal reporting obligation of Member States or regular EU level indicators, orange to data that are modelled or composed of data sets of varying quality, and red to data sets that derive from one-off exercises that are unlikely to be repeated (e.g. those resulting from research projects).

While the review exercise summarized in tables 1 and 2 aimed to be as consistent and rigorous as possible it can only provide a qualitative evaluation of the parameters tested. This is nevertheless considered a useful starting point even though further feedback is welcome.

The listed condition parameters are well understood and the colour coding and additional comments in the last column show whether the implementation of a methodological approach for including them in an EU ecosystem condition account appears promising in a 2017 perspective (green), or whether further development work is required (yellow).

Table 1: Review of potential ecosystem condition parameters in a 2017 timeframe

Condition parameter	SEEA EEA	7EAP	MAES 2016	Spatial level	Time series	Reporting and statistics	Comment
Biodiversity (Art. 17 reporting)	✓	✓	✓	Bio-geogr. region / MS) only	2007-2012, 2013-2018	✓	Important but data limits
Biodiversity (MS bird trends)	✓	✓	✓	National level only	Annual from 2000 onwards	✓	National level lacks spatial detail
Biodiversity proxy (landscape heterogeneity)	(✓)	(✓)	(✓)	(Modelled) data at 1 km^2	2000, 2006, 2012	(✓)	Indirect measure only
Nutrient pressure (N)	✓	✓	✓	By NUTS3/ MS level	2000 - 2014	✓	Limited spatial detail
Nutrient pressure (P)	✓	✓	✓	By NUTS3/ MS level	2000 - 2014	(✓)	Limited spatial detail
Soil carbon	✓	✓	(✓)	Modelled data	2000 - ?	(✓)	Uncertainty is > trend ?
Water flow/ WEI +	✓	✓	✓	By water basin	Annual from 2000 onwards	✓	Water basin is relevant scale, data available
WFD 'good ecol. Status'	(✓)	(✓)	✓	By water basin	From WFD reports: 2010, 2016	(✓)	Water basin is relevant scale, data available for some MS
Ocean pH and oxygen %	(✓)	(✓)	n/a	By major seas	2000 - 2015	(✓)	By sea only, slow change
Urban green & blue areas	n/a	(✓)	(✓)	In % of urban area	2000 - 2012	(✓)	Urban area is relevant scale

Note: **Green signifies a very good match, orange stands for a partial match and red indicates no match**

The outcome of this initial analysis of potential ecosystem condition parameters for developing condition accounts for different MAES ecosystems indicates that suitable data sets that provide a good thematic match as well as sufficient spatial and temporal detail are currently only available for some condition parameters relevant to freshwater and urban ecosystems.

Table 2 uses the same approach for exploring options for the period 2020 and beyond. It includes some assumptions for what kind of data or geo-referencing might become additionally available by that time. This means it combines qualitative assessment with assumptions about the future and hence is less reliable than table 1. However, it provides a useful first assessment of where investment in improved or new data sets would be important for improving the quality and hence also the information value of EU accounts on ecosystem condition in the medium term.

Table 2: Review of potential ecosystem condition parameters in a 2020 perspective:

Condition parameter	SEEA EEA	7EAP	MAES 2016	Spatial level	Time series	Reporting &statistics	Comment
Biodiversity (Art. 17 reporting)	√	√	√	Bio-geogr. region / MS	2007-12, 2012-18	√	*Comparability will improve but spatial resolution limits use*
Biodiversity (EBCC micro data)	√	√	√	Good geo-reference	Annual from 2000	√	*A rich data set potent'y available for 12-15 MS, needs deal with EBCC*
Biodiversity proxy (landscape heterogeneity)	(√)	(√)	(√)	(Modelled) data at 1km²	2000 - 6 2012, 2018	(√)	*More suited due to model improvement & HRL data layers – but still a proxy*
Nutrient pressure (N)	√	√	√	By water basin (?)	2000 – 2018 (?)	(√)	*Better spatialisation due to better models & data (?)*
Nutrient pressure (P)	√	√	√	By water basin (?)	2000 - 2018 (?)	(√)	*Improvements expected but more challenging than for N*
Soil carbon	√	√	(√)	Modelled & point data	2000 - 2018 (?)	(√)	*Improved due to LULUCF and/or LUCAS (?)*
Water flow/WEI+	√	√	√	By water basin	2000 - 2018 (?)	√	*Further improvement is expected*
WFD 'good ecological status'	√	√	√	By water basin	WFD reports: 2010, 2016	√	*Data from 2nd reporting period will be complete*
Ocean pH, oxygen % & sea surface temperature	(√)	(√)	√	By major seas	2000 – 201(9)	(√)	*Important factors, but slow change may prevent impact in overall index*
Green urban area	-	(√)	√	In km ² as % of urban area	2006 - 2018	√	Copernicus HRL Imperviousness layer (2006-2009-2012-2015-2018)
Urban blue areas	-	(√)	(√)	In km ² as % of urban area	2006 - 2018	√	Copernicus HRL Imperviousness layer (2006-2009-2012-2015-2018)
Degree of soil sealing	-	(√)	√	% of urban area	2006 - 2018	√	Derived from the HRL Imperviousness layer (2006-2009-2012-2015-2018)

Note: **Green signifies a very good match, orange stands for a partial match and red indicates no match**

c) Proposal for approach and structure of the proposed condition account

The previous section has explored the policy match, data foundations and perspectives for implementing different ecosystem condition parameters at EU level. This section sets out how different condition parameters could be allocated to the range of ecosystem types identified in the MAES analytical approach and how one could construct an overall EU ecosystem condition account.

The proposal has been developed on a number of premises:

I) The condition parameters chosen should match critical pressures on, and fundamental changes in, ecosystem condition identified in recent MAES work [*see tables 1 and 2*].

II) As far as feasible condition parameters should be chosen that are applicable and comparable across all MAES ecosystem types, for example indicators related to biodiversity.

III) Where appropriate or necessary ecosystem-specific condition parameters were included.

IV) The overall number of condition parameters per ecosystem type should not be too high (e.g. in the range of 3 – 5) to avoid complicating the construction and calculation of the overall account too much.

V) The condition parameters finally chosen should ideally be underpinned by data sets that allow a reliable quantitative analysis of trends at suitable spatial and temporal scale [*see tables 1 and 2 for related analysis*].

Table 3 shows the allocation of condition parameters grouped into six different aspects of ecosystem condition across the nine different MAES ecosystem types plus three marine ecosystem types.

Table 3: Relevance of ecosystem condition aspects for MAES and marine ecosystem types

MAES Ecosystems/ Condition theme	Urban	Crop-land	Grass-land	Woodland and forest	Heathland and shrub	Sparsely vegetated land	Inland wet-lands	Rivers and lakes	Marine inlets & transit. waters	Coast-al area	Shelf	Open Ocean
Biodiversity	(✓)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nutrient pressure	(✓)	✓	✓	(✓)	(✓)	(✓)	✓	✓	✓	✓	✓	✓
Soil status related	-	✓	✓	✓	(✓)	(✓)	-	-	-	-	-	-
Freshwater related	-	-	-	-	-	-	-	✓	✓	✓	✓	✓
Marine related	-	-	-	-	-	-	-	-	(✓)	✓	✓	✓
Urban related	✓	-	-	-	-	-	-	-	-	-	-	-

The condition parameters related to biodiversity and nutrient pressure are crosscutting, whereas those relating to soil status, freshwater, marine and urban ecosystems are ecosystem specific. This is due to the fact that biodiversity status and nutrient pressure are important condition parameters for all ecosystem types whereas the other aspects are by their nature only relevant to those ecosystems that they relate to.

The approach chosen results in three or four broad ecosystem condition aspects that are considered relevant for each individual MAES and marine ecosystem type. These require some further differentiation to develop clearly identified and measurable parameters for ecosystem condition which will increase the final number of condition parameters per each ecosystem type. As illustration, Table 4 proposes a concrete final choice of condition parameters for the ecosystem types 'Cropland', 'Woodland and forest' and 'Rivers and lakes'.

The condition parameters for the last ecosystem type would be derived from reporting under the EU Water Framework Directive (WFD) and hence combine a number of underpinning measures of good ecological status for each of three listed condition components. The characteristics of the ecosystem types 'Cropland' and 'Woodland and forest' are similar in the sense that both are managed ecosystems where nutrient flows and soil carbon drive productivity but also influence strongly influence ecosystem condition. Biodiversity as a cross-cutting condition parameter is represented by several potential sub-metrics for each of these ecosystem types – but the methodological basis is well-developed for only two of those (reporting and EBCC data).

Table 4: Initial selection of ecosystem-specific condition parameters for three MAES types

Year/ account	Cropland						Woodland and forest					Rivers and lakes		
Condition parameters	Biodiversity			Nutrient pressures		Soil carbon	Biodiversity		Nutrient pressures		Soil carbon	Good ecological status (WFD)		
	Reporting	EBCC data	Proxy for landscape	N	P		Report-ing	EBCC data	N	P		Biological	Hydro-logical	Chemical

The section above shows the overall approach for allocating ecosystem condition parameters to MAES and marine ecosystem types in a coherent way. This still needs to be completed for all ecosystem types. In that context three considerations appear particularly relevant:

- Are these the most important ecosystem condition parameters to be considered?
- Are there additional ecosystem condition parameters that should be included?
- How many condition parameters should be covered / can be understood?

Another important question is how to derive an overall measure for ecosystem condition from the combination of different condition parameters for each of the 12 MAES and marine ecosystem types. This is discussed in the following section.

d) Deriving an overall value or index for ecosystem condition per ecosystem type

One key purpose for setting up an account on ecosystem condition is to be able to derive an overall quantifiable measure of the state of ecosystem condition over time. Such an account might cover just an individual ecosystem unit, a group of ecosystems or a wider geographical area which may include many different ecosystem types and units. This brings up the question how to derive one value for changes in ecosystem condition per ecosystem unit?

The key aspect here is how to combine trends for different ecosystem condition parameters in one overall number per ecosystem unit. In doing so the individual condition parameters could be given a different weighting to recognize their real or perceived relative importance. However, EEA staff consider it doubtful that it is possible to determine whether any given ecosystem condition is more important than others and why (at least as a general rule). This issue may also have inspired the WFD rule of 'one out, all out' in assigning quality classes to different water bodies.

An insight from agricultural research is also helpful in this context: 'Liebig's law' describes how different production factors contribute to agricultural crop output. This states that it is always the minimum factor (whether water, nutrients, pest levels etc.) that determines overall crop yield. For example, without sufficient rain there will not be a good yield however much fertilizers one might apply. In the context of ecosystem functioning (and a crop field is an ecosystem in its own right) one can probably assume that a similar relationship between the different ecosystem conditions applies.

All the above makes it seem appropriate to assign equal weighting to the different ecosystem conditions when combining their individual trends in one overall value per ecosystem. However, there are two options for deriving this final value (see below). Table 4 provides an illustration of these potential approaches in developing combined condition trends per MAES ecosystem type.

Table 4: Options for deriving an overall measure for ecosystem condition parameters for individual ecosystem types – an illustration for three ecosystem types

Year/ account	Open Sea			Year/ account	Woodland and forest			Rivers and lakes		
Condition parameters	Biodiversity	Nutrient pressures	Soil carbon	Condition parameters	Biodiversity	Nutrient pressures	Soil carbon	Good ecological status (WFD)		
	Reporting / EBCC data / Proxy for landscape	N / P				N / P		Biological	Hydro-logical	Chemical
2000	100	100	100	2000	100	100	100	100	100	100
2006	98	98	99	2006	103	98	90	101	99	99
2012	102	99	103	2012	100	98	94	100	97	101
Accounting result 2000 – 2012 per parameter	102	101	103	Accounting result 2000 – 2012 per parameter	100	102	94	100	97	101
Evolution of parameters for 2000 – 2012	+2.0 %	+1.0%	+3.0%	Evolution of parameters for 2000 – 2012	0.0%	+2.0	-6.0%	0.0%	-3.0%	+1.0%
		+2.0				-1.33			-0.67	
Potential simplification	↑	–	↑	Potential simplificatio n	–	↓	↓	–	↓	–
Alternative summing up	Strong positive trend				Strong negative trend			Moderate negative trend		

There are two principal options for developing an overall index for ecosystem condition per ecosystem type. The first one would be a simple arithmetic mean for the values of all ecosystem condition parameter per ecosystem type (equally weighted) – the values in row 8 above ['Evolution of..'] shows an example for that approach. This would seem appropriate in the case of condition parameters that link to the same condition aspects, such as biodiversity in the example above.

In case option 1 does not appear appropriate, whether due to conceptual concerns or the uncertainty in the quantitative measurement of individual condition parameters, a qualitative summing up is also feasible. This option is shown in rows 9 ['Potential simplification'] and 10 ['Alternative..'] and involves grading the strength of trends in ecosystem parameters in five categories from strong positive trend over neutral to strong negative trend (as the approach used in this example). These categories would be identified on the basis of thresholds that are defined in terms of deviation from the baseline (no trend); for example a trend could be called strongly positive or negative if it deviates 2% or more from a no-change baseline. Moderate trends could be defined as changes of between 0.5 – 2.0% up or down. These could be represented by colour-coded arrows that could be counted to derive an overall qualitative trend for ecosystem condition.

Finally, a further significant step for developing an overall ecosystem condition accounts could be to develop an overall index for trends in ecosystem condition. This becomes relevant when 'condition' is measured via various parameters and needs to cover various ecosystems. First ideas exist for that issue but these are not presented in this document as they require further development.

e) Summary of feedback received on EEA proposals at KIP INCA workshop in April 2016

The KIP INCA workshop in April 2016 covered both ecosystem extent and ecosystem condition. As substantial time has passed since the workshop and this document aims to summarise the current methodological thinking only summary outcomes from the workshop are recorded below. The initial background material for the workshop as well as Powerpoint presentations are available on request.

To generate feedback on the 2016 methodological proposal (which is nearly identical to what is presented in this paper) the participants were asked to respond to key questions in world café table sessions. These questions and a summary of the responses to them from the three world café table groups are presented below. Overall, the workshop generated very useful feedback to take into account in the further development of EU ecosystem condition accounts.

1) Does the general approach presented above appear convincing?
   - ➔ Yes, it does; but please review the cross-cutting condition parameters again, e.g. should soil carbon be one of them?

2) Are these the most important ecosystem condition parameters to be considered?
   - ➔ The parameters presented seem to cover the most important ecosystem condition parameters. However, please review them again in the light of EU environmental legislation beyond the core biodiversity-related instruments, e.g. in the context of proposals for developing a circular economy or the bio-economy.

3) Are there additional ecosystem condition parameters that should be included?
   - ➔ Please look again at how soil carbon is represented and do also consider invasive species as well as pollution from waste. An important aspect would also seem to be the question of productivity (in relation to different ecosystem service flows) and how to measure 'degradation' [which needs to be defined in relation to a baseline / target level).

4) How many condition parameters should be covered / can be understood in one account per ecosystem (type)? What are in your view key ecosystems or ecological trends to analyse in more depth?

➔ The proposal to use 3 -5 condition parameters per ecosystem type was generally supported. One participant suggested that it is important to understand which are the most neglected ecosystem condition parameters. However, there was general agreement that work should focus first on the most feasible condition parameters and then move on to the important ecosystems or condition parameters (with 'importance' having to be defined).

5) Do you think developing an overall index for ecosystem condition is meaningful?

➔ Opinions were divided on this point but the majority of participants seemed not to favour developing an overall index beyond the level of individual ecosystem types. The idea of an overall index was viewed more favourable, however, if it could be developed as an alternative to valuation in the context of presenting one measure or number to complement GDP. If an index is to be developed then one participant suggested identifying minimum thresholds above which quantitative trends could be recorded and below which a red warning signal would replace the quantitative value.

6) Would you have any specific suggestions for improving the draft technical proposal set out above?

➔ Only some participants commented on this question. Two suggestions related to the selection of condition parameters – these should ideally relate to state rather than pressure variables, and they should not only include parameters that link to ecosystem service supply. One further comment suggested recognising that condition parameters can essentially be of two types: those that relate to ecosystem science or modelling and aim to measure key trends (as far as these can be known), and those that have a strong policy link or communication function and are thus important in a communication perspective.

7) Do you have any other comments?

➔ Several participants expressed appreciation of the opportunity to discuss the workshop issues together with other experts from different disciplines. Thus there was encouragement for the organisation of similar expert workshops in the future and for the gathering of comparative information on national approaches to developing ecosystem accounts, incl. the choice of condition parameters.

Annex:

Extract from 2nd MAES report (2014) - Table 3. Indicators to assess condition and biodiversity of ecosystems

Mapping and Assessment of Ecosystems and their Services

Table 3. Indicators to assess condition and biodiversity of ecosystems

	Condition		Biodiversity	
	Drivers and pressures	**State**		• Art.17 assessments (Habitat and species conservation status) • Endangered species richness and red lists • Aggregated biodiversity indicators: Natural Capital Index (NCI), Biodiversity Intactness Index (BII), Mean Species Abundance (MSA), Living Planet Index (LPI)
Forest	• Deposition of air pollutants (www.emep.int) • Forest Fires (EFFIS)	• SEBI 03 & 05 Species and Habitat conservation status (Art.17 data)	• Species richness (of different taxa) (country specific) • SEBI 01 Abundance and distribution of selected species (woodland bird) SEBI 02 Red List Index for European species	
		• Forest damage indicators (EFDAC)	• Tree species richness (FISE, EFDAC)	
		• Forest pattern indicators: Forest connectivity, morphology, edge interface, forest landscape mosaic (FISE, EFDAC). • SEBI013: fragmentation and connectivity (forest, natural/semi-natural areas) (EFDAC)		
		• Soil condition (LUCAS)	• Naturalness	
		• Forest area	• SEBI 18 Deadwood	
			• Relative area of protected forest	
Cropland and grassland	• AEI 12 Intensification Extensification and CCI Farming intensity	• AEI 26: Soil quality	• AEI 22 Genetic Diversity	
	• AEI 13 Specialisation	• CCI 41: Soil Organic Matter in arable land	• AEI 25 Population trends of farmland birds and CCI 35 Farmland bird index • SEBI 02 Red List Index for European species	
	• AEI 14 Risk of land abandonment	• SEBI 03 & 05 • Species and Habitat conservation status (Art.17)	• Species richness (of different taxa) (country specific)	
	• AEI 15,16 and CCI 40: Gross Nutrients Balance		• SEBI 01 Abundance and distribution of selected species (farmland birds, grassland butterfly	
	• Assessment of pressures on species (Art.17)			
	• AEI 17 Pesticides risk (cropland only)			
	• AEI 21 and CCI 42: Soil Erosion by water (cropland only)			
Rivers and lakes	• Pollutant concentrations	• Ecological status (WFD)	• Specific indicators collected to assess ecological status[11] • SEBI 02 Red List Index for European species	
	• Modification of river system (dams per basin, ECRINS)			
	• Over-exploitation-overfishing			
Wetland	• Land take and conversion of wetlands			
	• Drought (EDO)			
Transitional waters and marine inlets		• Ecological status (WFD)		
Coastal		• Environmental status (MSFD)	• MSFD descriptors 1, 2, 3, 4 and 6 SEBI 02 Red List Index for European species	
Shelf				
Ocean				

[11] Commission Decision of 20 September 2018 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise and repealing Decision 2008/915/EC. 2018/480/EU.

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