ANNEX 1 Natural Capital Asset Check Proposed Approach

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Introduction

This is the first elaborated version of the asset check approach being developed through a scoping study for Defra and the UKNEA follow-on WP1. Any comments on this are welcome and should be sent to the project manager, Ian Dickie: ian@eftec.co.uk

This proposed approach lays out a series of questions, the answers to which form the analysis in, and aim to provide conclusions from, a natural capital asset check.

The working definition of a 'natural capital asset check' is:

'An assessment of the current and future performance of natural capital assets, with performance measured in terms of their ability to support human well-being.'

Thus, the purpose of a natural capital asset check is to assess how changes in a natural capital asset affect human wellbeing. It incorporates concepts of integrity, performance, red flags and sustainability.

It is organised through a series of questions about the asset, set out under the following 5 steps:

1. The asset.

2. Integrity of the asset.

3. Performance of the asset.

4. Asset criticalities.

5. Asset check.

A summary table of these 5 steps is set out in the first section of the document but should be completed last.

The questions are set out under each step in coloured boxes. The boxes include guidance on *answering the questions in italics* that can be overwritten as the asset check is completed. There is some duplication in use of the evidence for different purposes, often as a result of the same evidence being a proxy to answer different questions (e.g. in question D on ecosystem services and H on ecosystem functions). In these cases answers may be cross-referred to previous responses.

Uncertainty in evidence can be described using the following scale, adopted from the UKNEA:

Well established: high agreement based on significant evidence
Established but incomplete evidence: high agreement based on limited evidence
Competing explanations: low agreement, albeit with significant evidence
Speculative: low agreement based on limited evidence

Summary

A summary of the asset check should reflect the uncertainties in the evidence available, conclusions on integrity and sustainability of the natural capital asset, and future sustainability of the asset is assessed in terms of whether it is expected to deliver the target performance, and the presence of red flags. Where these issues are quantified relevant data should be included.

Table: Summary of natural capital asset check

Asset	Trends in natural asset integrity	Target performance	Criticalities	Sustainability of performance	Red Flags	Uncertainties/ Evidence gaps
Questions A & B	*Question I*	*Question M*	*Key issues from part 4, particularly questions Q and R*	*Question Y*	*Question Z*	

1. Natural Capital Asset

It is useful to define these parameters for the analysis clearly at the outset. If a subset of a natural asset is being checked (e.g. peat bogs in Scotland are a subset of all peat bogs in the UK), then this can affect availability of data and interpretation of results.

Our approach in the scoping study for Defra assumes that an asset needs to have some physical measurement, and defines natural capital assets as:

…stock that can be managed or protected in order to have a positive economic or social value.

However, in further work looking at the definition of natural capital we have defined it as:

'…the configuration of natural resources and ecological processes, that contribute through their existence and/or in some combination, to human welfare'

Question	Guidance on Answer
A. Define Natural Capital asset being checked	*Specify natural capital asset, e.g. habitat type and/or ecosystem services (e.g. peat bogs, carbon sequestration in woodland, all carbon sequestration in habitats)*
B. What is the spatial scale for which the asset check is being conducted	*UK, England/ Scotland/ Wales, Regional, County, Local?*

C. Define the timescale for the asset check.	*Take into account rate of change in asset, decision-making timescales, and timescales over which services from the asset can change. Past timescales should avoid reference to historical periods (>50 years) unless they are relevant to decision-making. Different timescales may be appropriate for different services from a natural capital asset.*
D. What are the main ecosystem services the asset provides?	*List main ecosystem services the asset provides (or contributes to providing)*

2. Integrity of Natural Capital Asset

Together, extent and condition reflect the integrity of the stock of natural capital, which produces flows of ecosystem services.

Question	Guidance on Answer	Trends			
		Past trend	Current trend	Future Trend	Summary of Trends (see key*)
E. What is the extent of the natural capital asset?	*Can be area, volume, number*	*Describe/ quantify trend*	*Describe/ quantify trend*	*Describe expected future trend*	*Insert symbol*
F. What is the condition of the natural capital asset?	*Can be measured through different ecological data, e.g. conservation status, age structure, or proxies such as ecosystem processes*	*Describe/ quantify trend*	*Describe/ quantify trend*	*Describe expected future trend*	*Insert symbol*
Uncertainties/ Evidence gaps	*Give level of uncertainty in analysis* for D, E and F, and reasons for this.* ** Use Uncertainty scale described in introduction.*				

Key for trends	↑	increasing	↓	decreasing
	↔	evidence shows no trend	O	no evidence
	↑↓	both increasing and decreasing	(this could reflect ambiguous evidence and/or spatially differing trends)	

Question		Guidance on Answer
G. Drivers of changes in extent and condition *(Note there may be different drivers of changes in stock and changes in condition)*	List policy drivers	*Policy drivers*
		Importance of policy drivers
	List biophysical drivers	*Biophysical Drivers*
		Importance of biophysical drivers
	List socio-economic & other drivers	*Socio-economic & other drivers*
		Importance of socio-economic and other drivers
H. What are the asset's main ecosystem functions?		*List important ecosystem functions (or supporting and intermediate ecosystem services) that support the main final services from the asset. Supporting and intermediate services are defined in the UKNEA.* *Note that supporting and intermediate services may originate from other assets that co-produce final services.*
I. Integrity Test: Is the ability of the asset to support ecosystem services being maintained?		*Give details for different services (if relevant), consider the trends under questions E and F and the services from question D.* *If no, what are drivers of decline (see question G)?*

Non-essential supporting information that can be useful for decision-makers includes:

- are the ecosystem services provided by the asset rival (i.e. consumption or use by one individual reduces the availability for others) or non-rival (i.e. consumption or use by one individual does not reduce the availability for others) goods?

- are the ecosystem services provided by the asset market (i.e. are they bought and sold in a market) or non-market (i.e. there is no market in which they are bought and sold) goods?

- some main final services may rely on supporting and intermediate services from natural capital assets not considered in the asset check. Links to the

status of these other assets may be an important factor for the asset check. It may be possible to consider their status/trend/management within the asset check, but where the links become complex, such analysis may not be feasible. However, these interdependencies should be noted; furthermore the natural capital underpinning the final services in question may justify a separate asset check.

3. Performance of Natural Capital Asset

In this context 'performance' is fitness to carry out the role which is required of a capital asset. This is regarded as useful because defining the target performance of natural capital assets captures both the current and future quantity and quality of an asset. Human 'requirements' include basic human needs, but also reflect infinite wants, so the definition of performance is usually subjective.

A NCAC can help distinguish between policy targets which relate to the state of the natural capital asset (e.g. Water Framework Directive targets) and goals in terms of the performance of services (e.g. there are targets for atmospheric greenhouse gas concentrations, but not for the state biotic natural capital in terms of its capacity to store carbon i.e. we don't have a target for carbon storage in natural habitats).

Question	Guidance on Answer
J. Is there a measure of the current output of ecosystem services from the asset?	*Either a direct measure of levels of ecosystem services (see question D), or an indication of this based on the amount of the asset (stock) and its ability to provide the service (condition) (see question I)*
K. What goods and benefits do these ecosystem services support?	*Ecosystem services, goods and benefits are defined in the UKNEA: services support the provision of goods to people, for who they have economic, health and/or shared social values.*
L. What evidence exists on the monetary evidence on the value of some/all of these services?	*Valuation of evidence is useful to understand the order of magnitude of the value of ecosystem services and of the impacts of changes in levels of services. Interpretation of valuation evidence can be time-consuming where complex evidence needs to be reviewed from the literature. Best use of available valuation evidence may use value transfer (see guidelines at: http://archive.defra.gov.uk/environment/policy/natural-environ/using/valuation/documents/summary-steps.pdf) and effort should be proportionate to the importance of the evidence.*

M. What is the target performance from the asset?	Summarise performance: the role that capital performs in providing beneficial services - see below for guidance on definition	
Uncertainties/Evidence gaps	Give level of uncertainty* in answer to M and reasons for this. * Use Uncertainty scale described in introduction.	
Defining performance: Answering these questions can help define performance, but not all questions can be answered for all assets	What policy targets are there for the asset?	(e.g. maximum sustainable yield for fish stocks, global concentrations of GHG)
	What is the trend in the main services the asset provides?	See question d for services, and UKNEA synthesis report Figure 5 for trends.
	What types of goods are supported by the asset?	(e.g. food, drinking water, pollution control) See UKNEA synthesis report Figure 10 for terminology
	Who benefits from the goods?	Identify the number and location of beneficiaries
	What wellbeing results from the goods?	Use measures of the levels and trends in wellbeing supported by the asset
N. Are any future changes in target performance expected?	How is target performance expected to change? Consider exogenous factors like those associated with the drivers under question F, and the asset's role in climate change adaptation.	
O. Can future target performance be defined?	What is the target level of future performance of the asset? What are the drivers of this (see question G).	

Non-essential supporting information that can be useful for decision-makers includes:

- Has target performance changed over time? If so how?

- Distributional issues: what is the distribution of the beneficiaries of the goods supported by the ecosystem services from the asset?

- Do the goods provided by the ecosystem services from the asset have use and/or non-use values?

4. Natural Capital Asset Criticalities

Note that these answers may be very different for different spatial scales, so Question B gives important context, and appropriate scale of analysis may need to be reconsidered.

Question	Guidance on Answer
P. What is the trajectory of change for the asset?	*Specify if any linear or non-linear changes are known or anticipated (see trends from questions E and F)*
Q. Are there any standards or agreed limits of change to the asset?	*Specify if there are any relevant standards or limits for the condition of the asset (e.g. adult spawning stock biomass for fish) or the services from it (e.g. fish landing quota).*
R. Are there likely to be any threshold effects?	*State knowledge of any thresholds – thresholds can include where the integrity of an asset declines in a non-linear way, where the influence of feedbacks on an asset change, or where the ability of an asset to recover declines.*
S. What is the reversibility of changes to the asset?	*Can changes to the asset be reversed? (e.g. can the asset, and its functions, be restored or recreated?)*
T. What is the cumulative effect of impacts on the asset?	*What patterns of impacts result from past, current and future trends and drivers (see questions D, E and F)?*
U. What risks are associated with current trends in the asset integrity?	*Identify risks of significant detrimental impacts: see answers to questions O, and relate this to answers to questions Q – T.*
V. What substitutes exist for the main ecosystem services from the asset?	*For the services identified in G, are substitutes available? If so what supplies are available or potentially available?*

Uncertainties/Evidence gaps	*Give level of uncertainty* in analysis and reasons for this.* ** Use Uncertainty scale described in introduction.*

Non-essential supporting information that can be useful for decision-makers includes:

- What is the level of investment needed in the natural capital to maintain it above the limits/thresholds identified above?

- What are the distributional (social group/intergenerational) implications of the criticality identified?

- For question U, define on what basis the substitute(s) are identified (e.g. which ecosystem services the substitute provides).

5. Natural Capital Asset Criticalities

Question	Guidance on Answer
W. Tradeoffs?	*If one or more of the asset's key ecosystem services (see question D) are increased, does this lead to reductions in other services?*
X. Synergies?	*If one or more of the asset's key ecosystem services (see question D) are increased, does this lead to increases in other services?*
Uncertainties/Evidence gaps	*Give level of uncertainty* in analysis and reasons for this.* ** Use Uncertainty scale described in introduction.*
Y. Sustainability test: is the asset currently able to give the target performance?	*Compare integrity in question I and performance in question M.*
If yes - will this performance be sustained into the future?	*Relate changes from question P and criticalities from Q and R to future changes identified in questions N and O.* *Give timescale – from question C.*
If no – state why?	*Is this because target performance is unrealistic, or because integrity of asset is compromised, or both?*
Z. Red flags?	*This is a warning if future target performance is at risk, for example because:* *- the asset is underperforming (see question Y) and continuing to decline (see Question P), or* *- there is prospect of collapse (a limit or threshold – see questions Q and R) which could be irrecoverable (i.e. being irreversible, see question S, and with no substitute, see question U)*
Uncertainties/Evidence gaps	*Give level of uncertainty* in analysis and reasons for this.* *Use Uncertainty scale described in introduction.*

Reporting

If a formal report write-up of the asset check is required, it is suggested the information above is presented under these summary heading:

- o State of the asset (extent, condition)

- o Drivers/threats to asset

- o Services

- o Drivers influencing future services

- o Future services from the asset

- o Natural asset integrity test

- o Current and future target asset performance

- o Synergies

- o Thresholds

- o Cumulative impacts

- o Reversibility

- o Uncertainties (missing information)

- o Sustainability test.