Concept note WS1: Methodologies and metrics

BELLONA FEEDBACK

Bellona welcomes the concept note as a good starting point, but believes further work is needed to ensure that methodologies for Nature Credits reflect ecological complexity, avoid oversimplification through aggregation, are robust across both terrestrial and marine ecosystems, and are grounded in clear, science-based and operationally feasible monitoring systems.

1. GENERAL APPROACH TO METHODOLOGY DEVELOPMENT

While existing frameworks such as the SEEA-EA and JRC provide a useful starting point, additional reflection is needed to further develop metrics and methodologies for Nature Credits. This is particularly important to avoid repeating some of the challenges observed in the CRCF, especially regarding sustainability considerations and the definition of use cases.

International experiences may also provide valuable insights. Examples include **France** (2016 *Reconquête de la Biodiversité, Nature et Paysages* law, implemented via the Caisse des Dépôts et Consignations at regional level), **the UK** (2021 Environment Act with a statutory biodiversity metric), and **Australia**.

At the same time, **sustainability criteria for Nature Credits should go beyond a carbon accounting perspective**. A broader ecological lens is needed, rather than relying solely on approaches derived from carbon removal frameworks or existing instruments such as the Nature Restoration Law and Do No Significant Harm principle.

The Qu.A.Li.T.Y. criteria under the CRCF could nevertheless serve as useful guiding principles to support the transparent design of Nature Credit methodologies.

Cost-efficiency should not be considered, as we are trying to achieve a brand-new state of the art methodology. Nature-based solutions are often context-specific, and their translation into regional and local contexts can be complex. Methodologies should therefore embed **robust, science-based MRV systems**, with accurate on-ground measurements while ensuring operability and allowing for justified but limited flexibility.

2. ECOSYSTEM CATEGORISATION AND SCOPE

Bellona supports the categorisation based on an ecosystem condition level index, including a clear distinction between **land-based and marine ecosystems**.

However, current frameworks remain predominantly focused on terrestrial systems. While the seven MAES typology includes marine and freshwater ecosystems, the supporting operational indicators, reference conditions benchmarks, and data infrastructure are significantly more developed for land-based ecosystems such as forests, grasslands and agroecosystems.

Marine and coastal ecosystems, despite covering a large share of EU territory, remain underdeveloped in the current SEEA-EA accounting frameworks. Existing classification systems (e.g. the six ECT classes) do not translate easily to marine contexts, and key concepts such as "landscape characteristics" are not directly applicable due to the fundamentally different dynamics of marine systems (e.g. ocean connectivity, transport of larvae, nutrients and species).

Similarly:

- "Biotic compositional" indicators used on land, rely on bird surveys, butterfly transects, and plant community date, which are not transferable to marine ecosystems.
- "Abiotic physical state" indicators in marine systems must capture salinity, oxygen stratification, ocean pH, which are variables absent from the current EU accounting infrastructure entirely.

This suggests that **marine ecosystems require a dedicated methodological approach**, rather than simple adaptation of terrestrial indicators.

3. METRICS AND ECOLOGICAL INTEGRITY

Baselines and outcomes should be designed to reflect ecological and biodiversity impacts in a **holistic manner**. Metrics should capture:

- biotic,
- abiotic, and
- functional and landscape-level attributes of ecosystems.

Non exhaustive metrics for land-based ecosystems:

Subcategory	**Metric**
Abiotic	Soil health (respiration rate, nutrients, non-organic components, bulk density, porosity depending on pedoclimatic conditions)
	Water retention
	Water quality (nutrients, thresholds of contaminants)
Biotic	Biodiversity (baseline-dependent)
	Habitat structure (vegetation, canopy cover, deadwood)
Ecosystem function	Pollinator activity, carbon productivity, invasive species
Climate resilience	Carbon sequestration (above and below ground)
	Number and diversity of tree species

Please note that different ecosystem typologies may require tailored metric combinations.

Accurate baseline assessments of habitat conditions are essential but can be resource intensive. Furthermore, standardised tools are often insufficient for capturing biodiversity complexity and must **use a combination of local field data, modelling approaches, proxies, and remote sensing**. Models should always be verified with field measurements and peer reviewed literature justification.

4. MONITORING APPROACHES AND LIMITATIONS OF REMOTE SENSING

The concept note highlights the potential of satellite-based data to reduce administrative costs. While this offers advantages in scalability and spatial coverage, its applicability varies significantly across ecosystems.

Satellite-based monitoring has well-documented limitations:

- Reduced usability in Arctic regions (polar night) and misclassification in snow/ice conditions,
- Unreliable signals in coastal and estuarine waters due to turbidity and phytoplankton blooms,
- Limited ability to detect underwater ecosystems (e.g. seagrass, kelp forests),
- Inability to capture key terrestrial variables such as deadwood, understory diversity, and soil fauna.

These limitations affect a substantial share of ecosystems relevant to nature restoration in Europe. Satellite data should therefore be considered as **one component of a hybrid monitoring system**, complemented by field surveys, acoustic monitoring, and eDNA sampling, rather than serving as the default primary tool for credit verification.

5. AGGREGATION RISKS AND MINIMUM THRESHOLDS

The use of aggregated indices such as the Ecosystem Condition Index (ECI) raises concerns. Combining multiple indicators into a single score may mask trade-offs and uneven ecological performance. For example, improvements in vegetation cover may offset poor soil health or low species diversity in the aggregated score, giving a misleading impression of recovery.

To address this, **minimum thresholds should be established for individual indicators as a condition for receiving credits**. In particular: if critical indicators (e.g. species composition - which are easily overlooked) fall below defined thresholds, credits should not be issued, regardless of overall index performance.

An improving overall score should therefore be **a necessary but not sufficient condition** for credit issuance.

6. BASELINES AND REFERENCE LEVELS

For heavily modified ecosystems such as farmland or semi-natural grasslands, defining baselines remains challenging. While a fully "natural" baseline may not be realistic, **alternative reference conditions (e.g. "fully functioning systems supporting biodiversity") require clearer ecological definition to be operational.**

In marine ecosystems, the challenge is even greater due to the lack of historical baselines. Data on pre-industrial ecosystem states (e.g. seagrass extent, kelp forests, fish assemblages) is often incomplete or unavailable.

Where baselines rely on modelling, historical reconstruction or proxy data, **uncertainties should be explicitly acknowledged** and reflected in credit validation and valuation.

7. BIODIVERSITY COMPLETENESS: SPECIES AND GENETIC DIMENSIONS

Current approaches such as the ECI focus on ecosystem condition but do not capture **species rarity, distinctiveness, or irreplaceability**.

As a result:

- ecosystems with very different ecological value may receive similar scores,
- unique or endemic biodiversity may be undervalued,
- financial flows may be directed towards ecosystems that are easier to restore rather than those that are most critical to protect.

This issue is particularly pronounced in marine ecosystems. To address this, methodologies should integrate metrics for **species distinctiveness**, and indicators of **site irreplaceability**, from the outset, rather than as a later addition.