IUCN | National Committee United Kingdom

Peatland Programme

PEATLAND CODE

Woodland Carbon CO_2de®

Biodiversity Credits

Metric Selection and Development White Paper

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Purpose statement

This document updates stakeholders about the development of a biodiversity crediting approach that could potentially be applied under the Peatland and Woodland Carbon Codes. This document was used at an earlier stage for feedback on the specific metrics to be used in biodiversity baselining and monitoring. It is included in the public consultation to provide background information on the proposed metrics.

Introduction

In December 2023, the Woodland Carbon Code and Peatland Code (WCC/PC) began work on a methodology to allow projects to either quantify the biodiversity benefit of their project or potentially to produce both voluntary carbon and biodiversity credits. The voluntary biodiversity market is still quite young and the WCC/PC both need to protect their reputations as high integrity standards. Therefore, the approach was to research existing frameworks for biodiversity crediting to confirm their scientific integrity, compatibility with the WCC/PC, and early market adoption.

From this review of the market-leading measurement frameworks (as of early 2024), the Operation Wallacea methodology was selected as the underlying framework to trial for the WCC/PC Biodiversity Methodology. This method has been used domestically and internationally, and other market leaders in carbon and biodiversity have based their standard on the same methodology. The methodology is open source and is based on an idea akin to the Consumer Price Index. The idea is that, because biodiversity is too complex to reduce to a single metric, a biodiversity unit will have to be a combined multi-metric, which combines a range of biodiversity indicators to generate combined average values. A credit is defined as a 1% increase in combined values (the multi-metric), per hectare. The multi-metric requires a mix of structural (e.g. habitat condition, spatial complexity) and taxonomic (e.g. birds, insects) metrics.

Below is a link to the specific methods for calculation within the Operation Wallacea methodology:

Methodology for awarding biodiversity credits (wallaceatrust.org)

Modifications to the Operation Wallacea Method for the WCC/PC

The methodology, like many existing global biodiversity crediting frameworks, is flexible in its metrics to be applicable across different contexts. This flexibility, however, has been cited as a potential critique of the methodology. For example, how would a buyer compare two biodiversity credits from the same standard when the actual metrics could be completely different?

Therefore, we are exploring the possibility of using the overall accreditation methodology of Operation Wallacea, but with a more standardised, prescriptive list of metrics for sites. We believe this is achievable because the WCC/PC only focuses on a much smaller set of ecosystems (only UK woodlands and peatlands), and as such, we can be confident that a specific list of metrics will be suitable for capturing all key indicators in this limited range. This would also potentially produce a better credit for a novel market, as both buyers and sellers would know exactly what was represented in a credit, and credits within the standard could be easily compared between projects. The aim would be to have a mix of three to six metrics for peatlands and woodlands, with a preference for the lowest number of metrics that can accurately encapsulate a site's biodiversity uplift.

The risk of standardisation, however, is that if the selected metrics within the code are not effective enough to capture biodiversity uplift on a site, or miss a key indicator, then the codes are at risk of accusations of greenwashing or producing low-integrity biodiversity credits. The reason for this document is to analyse the metrics proposed below to ensure that they would accurately measure habitat uplift on a site. Additionally, we are seeking feedback on how to best structure the collection of metrics to be both scientifically robust and accessible to project developers and landowners.

Clarifications

Aims

This document is looking at metrics (e.g. soil invertebrates, birds, different types of structural metrics), not at the importance of specific indicators (e.g. the value of hen harriers versus golden eagles, or how to appropriately weight tree mixes in highland versus lowland sites). This document is also not aimed at developing a definitive list of methods (e.g. bioacoustics versus point counts versus transects) for each metric. These are conversations that are ongoing within the codes. **The scope of this document is to ensure that the mix of metrics we are selecting will appropriately capture the overall biodiversity trends of a site and not lead to perverse outcomes or greenwashing accusations.**

Voluntary biodiversity credits and Biodiversity Net Gain

England has recently implemented Biodiversity Net Gain, which is a statutory approach to valuing biodiversity uplift on a site. This would be considered a compliance market, because developers are legally required to generate or purchase credits based on their activity.

Because these credits are required by law, the units do not pass the legal additionality tests within the WCC/PC additionality criteria. Most voluntary credits have a higher threshold for data needs than that required in calculating biodiversity net gain units. As such, a voluntary biodiversity credit that only uses the net gain metric is at risk of being considered low integrity when compared to the rest of the market. However, the net gain metric can potentially work as a structural metric and is discussed in that context below.

Accessibility and limitation of the voluntary biodiversity market

Voluntary biodiversity credits must walk a fine line. The methodology must be robust enough to be accepted by the ecological community yet must be cost effective and accessible for project developers to implement. They need to be easily understood by buyers and the data must be collected in a way that third party validation is feasible and robust. It is important to consider the multiple stakeholders in this market during development of a monitoring, reporting and verification methodology. A full site assessment which may completely capture the overall biodiversity of a site is not cost or time effective for this market. Therefore, we must select the indicators that best tell the story of habitat uplift, acknowledging that some functional groups or habitat features will not be included in calculations.

We will also not be including any metrics that could be proxies for biodiversity but are direct measurements of other ecosystem services. For example, although water quality may be useful in understanding peatland ecosystem integrity, it is a measurement of the ecosystem service of water regulation, not the stock of natural capital represented in biodiversity. A metric like this introduces two risks. First, it dilutes the meaning of a biodiversity credit by introducing non-biodiversity proxies. Additionally, as nature markets mature, new ecosystem service “credits” or “units” will arise, especially in response to new financial disclosure frameworks. If our biodiversity credits included water quality, and a woodland or peatland water credit became operationalised, then projects would not be able to pursue both types of credits, as it would be considered double counting.

What makes a good metric

There are programmatic and project-level considerations for metric selection. Having a defined list of metrics would provide clarity and consistency on which metrics are applicable within specific systems. Once a focused list of metrics is developed, we can then develop reference expectations for assigning scoring ranks for each metric. When considering the suitability of metrics to include, the following methodological considerations for indicator (metric) selection are recommended, based on Czúcz et al. (2021) and David et al. (2021):

- Indicators should be applicable and assessable at the appropriate scale (both temporal and spatial).
- Indicators should be sensitive and responsive to changes in condition within woodland and/or peatlands in the UK, i.e., there should be sufficient discriminatory power to distinguish differences within and among assessment sites.
- When combined, the set of indicators should minimize redundancy – indicators should provide different information on condition than other indicators.
- Indicators should be understandable and translatable.
- Methods should be repeatable and precise, i.e., can be applied consistently across independent assessment efforts conducted by different parties.
- Indicators should be able to be calibrated to reflect subtle but important differences in condition or track changes in condition over time (e.g., there is a need to consider limitations of datasets and/or data resolution).
- Efficiency – consider cost and difficulty in data collection and analysis approach (e.g., skills and knowledge needed to collect and analyse data, cost of equipment and training).
- Data collection to inform metrics should be verifiable/auditable.

Proposed peatland metrics

Taxonomic metrics

Plant abundance and diversity:

Rationale – Plants underpin all other biodiversity, as they are the foundation of the food web. Additionally, the diversity of niche habitats in peatlands can be expressed through vegetation diversity, in a way that is easier to quantify than microtopography.

Bird abundance and diversity:

Rationale – Bird diversity can be an indicator of trophic complexity in peatlands, as they tend to be the apex predators in UK peatlands. Bird diversity can give some insight into the variable niches available in a landscape. The reference libraries and conservation priorities of birds in the UK are robust.

Insect abundance and diversity:

Rationale – Global ecosystems and food chains depend on insect biodiversity. Additionally, insects represent a large amount of the animal biomass in peatland ecosystems.

Structural metrics

DEFRA Biodiversity Net Gain Metric (or future Scottish equivalent):

Rationale – This metric is already standardised for the English or UK context and can be used to measure a percent uplift in biodiversity at a project scale. Additionally, most buyers will be more familiar with this metric than others.

Note that the BNG calculation process will have to be slightly modified for this application, to remove calculations that are relevant to spatial planning, but might lead to skewed results when looking purely at biodiversity.

Richard Lindsay's Peatland Condition Matrix:

Rationale – The matrix is designed to look at habitat condition across peatlands while taking into consideration plant distribution across microtopography. It can be converted to a 0-100 scale, making it easy to understand uplift and is able to be implemented by people with varying levels of expertise.

Community Similarity Index:

Rationale – In the process of peatland rewetting, sometimes there can be a loss of the generalist biodiversity can that live in drained peat. This metric will be sure to prioritise peatland-specific biodiversity in uplift calculations. The functional groups and keystone species from the taxonomic data will be compared to the composition of a theoretical pristine habitat. If sufficient reference libraries exist, this would be able to be calculated from the taxonomic metrics and not require additional data.

Proposed woodland metrics

Taxonomic metrics

Plant abundance and diversity:

Rationale – Plants underpin all other biodiversity, as they are the foundation of the food web. This metric is also important to understand how the forest matures, specifically when considering new woodland creation as the Woodland Carbon Code does.

Bird abundance and diversity:

Rationale – Bird diversity can give some insight into the variable niches available in a landscape. Many endangered species expected to benefit from new woodland creation are birds. The reference libraries and conservation priorities of birds in the UK are robust.

Insect abundance and diversity:

Rationale – Global ecosystems and food chains depend on insect biodiversity. It is a sensitive metric to changes in habitat.

Structural metrics

DEFRA BNG Metric (or future Scottish equivalent), or Woodland Ecological Condition Tool:

Rationale – The Defra BNG metric for woodlands is based on the woodland ecological condition tool. It includes several different components of woodland structure and habitat condition as it relates to forest ecosystems. From our market research, it appears that some sites are interested in collecting baselined data for both compliance and voluntary markets and will decide which market to sell their units in after both markets mature. However, it can potentially be more affordable for sites to simply complete the Woodland

Ecological Condition tool following the national forest inventory methodology. Because these metrics are so similar, they can potentially be interchangeable.

Note that the BNG calculation process will have to be slightly modified for this application, to remove calculations that are relevant to spatial planning, but might lead to skewed results when looking purely at biodiversity.

NFI Woodland Ecological Condition - Forest Research

Community Similarity Index:

Rationale – In the process of new woodland creation, there can potentially be lost biodiversity that existed in open habitats prior to tree planting. This metric will be sure to prioritise woodland-specific biodiversity in uplift calculations. If sufficient reference libraries exist, this would be able to be calculated from the taxonomic metrics and not require additional data.

Metrics under consideration

For woodlands and peatlands

Soil eDNA:

Rationale – Soil underpins all ecosystems. In terms of woodlands, shifts in soil fungi are great indicators of the maturity of the forest. Soil eDNA can also be used to monitor insect populations, and there is potential for mammal monitoring, all in the same metric. Additionally, Forest Research is currently working on eDNA soil sampling across UK woodlands in a variety of locations, habitat conditions, and forest ages. Once this research is complete, this would be a massive reference library for a standardised metric. A soil sample from a woodland could be compared to the reference library, and an effective scale of woodland condition can be developed that is sensitive and UK-specific.

In terms of peatlands, the WaterLANDS project in Ireland is looking to perform eDNA sampling across peatlands to collect a standardised metric for peatland soil health. For both woodlands and peatlands, soil biology continues to transform for decades after restoration, which makes it a strong indicator of ecosystem maturity, from a biodiversity perspective.

Why it is still under consideration – The reference libraries are not yet complete for woodlands or peatlands. It can be tricky to quantify positive or negative indicators in soil samples, as the results are often in functional groups instead of specific species. Although the price of eDNA sampling is expected to go down, it is still somewhat costly given that, without reference libraries, it can be a challenging metric to work with. Additionally, given the role peatlands play in hydrology, they could potentially capture and accumulate DNA fragments from the entire watershed. Although a watershed scale metric may be helpful, it introduces uncertainty when quantifying biodiversity on a project scale.

Connectivity:

Rationale – Connectivity is an easy metric to calculate and is commonly used across a range of biodiversity and ecosystem integrity metrics.

Why it is still under consideration – Connectivity is strongly influenced by the site’s surroundings, which are out of the control of the project developer or landowner who is generating biodiversity credits. If, for example, a site adjacent to a new woodland was adversely impacted, that site could potentially have a significant reduction or reversal of biodiversity credits, despite excellent land management within the project boundary. Although it is a well-accepted structural metric for landscape-scale ecological integrity, it may not translate well to project-level biodiversity monitoring.

Unique circumstances to consider

Temperate rainforest

The temperate rainforests in the UK are a unique form of woodland and may need a modified set of metrics. The following metrics have been considered for these unique habitats.

Lichen and mosses as a taxonomic metric:

Rationale – Diversity of mosses and lichens are primarily what separates wet woodland from temperate rainforests (in terms of biodiversity). Although slow to colonize a new site, these communities can continue to change and mature for over 100 years, thereby providing a metric that will continue to develop for longer time periods.

Why it is still under consideration – The methods for assessing a site's moss and lichen diversity are few, and automated or cost-effective methods are still in development. Additionally, the pool of experts who could accurately assess this metric is very small.

Plantlife's Rapid Rainforest Assessment Tool as a structural metric:

Rationale – This is an accessible and simple tool to address the niches that make a site well suited for mature temperate rainforest to develop. Although less involved that the Woodland Ecological Condition Tool, it is more habitat specific.

Fens

The selected structural metrics for peatlands are specific to blanket and raised bogs. Although fens contain a significant portion of the peatland biodiversity in the UK, they are more challenging to quantify, as they have a variety of forms, structures, and taxa. The taxonomic metrics for peatlands would likely translate well, with additional consideration of the potential need for aquatic taxonomic metrics, such as aquatic invertebrates. However, the structural metrics listed above would need to be reconsidered for fens.

Forest to bog

Forest to Bog restoration not yet included in the Peatland Code but is under consideration for future versions. However, the literature suggests that significant improvement in biodiversity is possible, so we are considering the ways in which it could potentially be included in a peatland biodiversity methodology. There is a risk that the transition from forest to bog would displace some species, producing a decline in some biodiversity metrics compared to the baseline using this method. It is assumed that, if a site was historically a peat bog before it was afforested, it would be appropriate to use the community similarity index and structural metrics of peatlands, which could potentially outweigh the possible loss of existing biodiversity from the current woodland habitat.

Proposed structure of metrics within the codes

As mentioned earlier, The PC/WCC are looking at standing out within the biodiversity crediting market by having a standardised, prescriptive approach to metrics, thereby standardising what a credit really represents within our codes. Below are four potential approaches to the metrics within the code, with varying degrees of standardisation and flexibility.

Option 1 – Fully standardised

In this option, a selection of the proposed metrics will be written into the methodology as the specific metrics to be used in biodiversity calculations. There may be a formal process to request a change of a specific metric in extreme circumstances, but most projects within a code would be using similar metrics

Pros:

This makes it very clear what is included in a biodiversity credit from a given standard, potentially increasing market confidence. This process is easier for validators, as nothing bespoke needs to happen in terms of metric validation, and verification.

Cons:

If the metrics are missing a key component of habitat uplift, credit calculations may not fully represent what is happening on site. Project developers may be incentivised to only focus on the biodiversity metrics that are relevant in the code, creating a risk of perverse outcomes.

Option 2 – Mostly standardised

Two taxonomic and two to three structural metrics are standardised for each habitat. One additional taxonomic metric may be selected by the project developer. Within the project registration process, there will be a section to justify the metric selection as this additional metric should capture the unique context of the site.

Pros:

Credits would still be 80+% comparable between projects within a code, in which case credits will still be clear to buyers. The flexibility of the third taxonomic metric can be used to support specific and unique restoration activities, such as beaver or lynx reintroduction projects.

Cons:

Critiques could still say that the credits aren’t fully comparable, which dilutes the integrity of the voluntary biodiversity credit market. Increased flexibility in metrics means additional time and effort for the standards and validators during project registration, validation and verification, which could increase costs or lag times for project developers.

Option 3 – Standardised plus

The key metrics are all standardised. However, projects could include additional biodiversity data that they have collected, provided the metrics and methods were approved in the project registration process

Pros:

The core of the credit is still the same across all sites. But where a site has additional capacity for biodiversity monitoring or a specific restoration goal that may be missed by the standardised metrics (such as beaver or lynx reintroduction), they can still use the data to increase the percent uplift their site achieves.

Cons:

Critiques could still say that the credits aren't fully comparable, which dilutes the integrity of the voluntary biodiversity credit market. Increased flexibility in metrics means additional time and effort for the standards and validators during project registration, validation and verification, which could increase costs or lag times for project developers.

Option 4 – Completely flexible (directly using the Operation Wallacea Method)

During project registration, the project developers would complete a form that indicates the five metrics they are selecting (must be a mix of structural and taxonomic), and they justify why that collection of metrics is best suited to capture the overall biodiversity improvements that come from the project.

Pros:

Projects can really focus on capturing the unique context of the site they are working on. They would also be able to take advantage of existing capacity within their team (e.g. if the team already has a mycologist, they can include fungal surveys and use internal team resources, potentially reducing project cost).

Cons:

Biodiversity credits, even within the same country, region, and standard, would be seen as "comparing apples and oranges", reducing market confidence and buyer security. Individual projects could try and "game" the system by specifically choosing metrics they think they could impact at low cost. Increased paperwork and time expenditures for the standard to register projects. A significantly more complex validation and verification process, potentially increasing costs and lag times for validation.