Nature Integrity Methodology for Biodiversity Conservation and Restoration

Version 1.2

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Acronyms and abbreviations

BCP	Biodiversity Conservation Project
BRP	Biodiversity Restoration Project
CBCP	Cercarbono's Biodiversity Certification Programme
CBD	Convention on Biological Diversity
Ccomp	Compositional component
COP	Conference of the Parties
Cstr	Structural Component
ECS	Ecosystem Condition Score
MRV	Monitoring, Reporting and Verification
MSA	Mean Species Abundance
NIM	Nature Integrity Methodology
PDF	Potentially Disappeared Fraction of species
PMP	Project Management Plan
RE	Reference Ecosystem
VBC	Voluntary Biodiversity Credits

Terms and definitions

The terms and definitions contained in the document ***Terms and Definitions*** of the ***Cercarbono's Biodiversity Certification Programme***, available in www.cercarbono.com, section: Documents, shall apply.

For the purposes of this methodology, the following terms apply:

Accreditation / Crediting period: time interval during which verified biodiversity outcomes may be converted into issued units under this methodology.

Baseline / Baseline scenario: documented, evidence-based counterfactual describing the most plausible trajectory for the eligible area in the absence of the project.

Biodiversity Conservation Project (BCP): project implemented in an ecosystem that retains demonstrable biodiversity and ecological value and is exposed to credible threats or risk of deterioration. Its primary objective is to protect those existing values and maintain, at a minimum, the ecological condition documented at project time zero.

Biodiversity Restoration Project (BRP): project whose primary objective is to restore degraded ecosystems to improve biodiversity and ecosystem function, using a reference condition as the ecological target.

Buffer / Technical reserve: margin (financial or activity-based) established to manage reversal and permanence risk.

Ccomp (Compositional component): mean condition of at least four representative biological groups, assessed relative to a reference condition.

Cstr (Structural component): mean condition of a complementary, non-redundant set of ecosystem-level structural indicators, assessed relative to a reference condition.

Conserved Ecosystem Area / Conservation Area: portion of the Total Project Area actively conserved and eligible for accounting under this methodology.

Crediting unit / Voluntary Biodiversity Credit (VBC): standardized unit representing biodiversity outcomes, calculated using project Integrity (I), operationalized as project ECS for conservation, or change in ECS (ΔECS) for restoration, together with eligible area and time.

Degraded Ecosystem Area: polygon(s) within the Total Project Area that meet criteria for demonstrable degradation and restoration feasibility.

ΔECS (Delta Ecosystem Condition Score): change in project ECS between consecutive verification points; used to quantify restoration gains.

Ecosystem Condition Score (ECS): dimensionless score from 0 to 1 that combines the Compositional component (Ccomp) and structural component (Cstr) to express ecosystem condition relative to a reference condition.

Eligible area(s): polygon(s) within the Total Project Area where activities are implemented and outcomes are eligible for accounting under this methodology.

Grouped project: single PMP that aggregates multiple instances (sites/landholders) under a unified Monitoring, Reporting and Verification (MRV); each instance must individually meet eligibility, safeguard and methodological criteria.

Leakage: unintended net negative or positive effects outside project boundaries resulting from project activities; must be identified, monitored and managed.

Non-eligible area(s): portions of the Total Project Area excluded from accounting (e.g., permanently converted lands, buildings, settlements, areas reserved for other programs without consent).

Permanence: expectation and measures ensuring biodiversity outcomes are sustained over the accreditation/crediting period, including mitigation, contingency plans, buffers and legal instruments.

Project Ecosystem Condition Score (ECSproj): area-weighted mean of ecosystem-level ECS values across the eligible project area.

Project Management Plan (PMP): project document that includes the indicators, methods, schedules, QA/QC procedures and responsibilities required to support MRV and verification.

Project start date: date when the first direct on-the-ground action occurs that initiates biodiversity outcomes attributable to the project.

Reconstructed reference condition: reference condition established from reliable historical, ecological or spatial evidence when no suitable physical Reference Ecosystem can be identified or accessed, in accordance with **Section 3.1**.

Reference condition: ecological benchmark used for ECS normalization. For conservation, it is the fixed time-zero condition of the same eligible ecosystem; for restoration, it is the ecological target derived from a physical Reference condition or, where allowed under **Section 3.1**, an approved reconstructed reference condition.

Reference Ecosystem (RE): physical internal or external ecosystem used to establish the reference condition for a restoration project.

Restoration feasibility: technical justification demonstrating the degraded site can recover within the project timeframe (e.g., propagule sources, hydrology, manageable threats).

Results period: period during which biodiversity outcomes attributable to project activities are monitored and verified.

Risk / Risk management: identification, assessment and mitigation/contingency of biophysical, socio-economic and operational threats that could affect project outcomes or issued units.

Stacking / overlapping claims: concurrent claims of biodiversity or other environmental credits on the same area; explicit consent and formal arrangements are required to allow stacking.

Introduction

The accelerating biodiversity crisis, driven by habitat destruction, climate change, and other anthropogenic pressures, demands a coordinated response grounded in solid evidence and measurable actions. Understanding and quantifying the web of life that sustains the planet is essential for designing, implementing, and evaluating effective conservation and restoration strategies. In this context, the development of reliable biodiversity crediting models emerges as a key tool to mobilize resources, incentivize sustainable investments, and generate verifiable positive impacts on ecosystems.

Within the framework of the Kunming-Montreal summit and the Conference of the Parties (COP) of the Convention on Biological Diversity (CBD), these topics have gained greater relevance, reaffirming the international commitment to biodiversity protection and the need to promote economic mechanisms that integrate conservation into development policies. Implementing such models also requires robust methodologies to measure, verify, and report progress in a transparent manner, thereby contributing to the achievement of global commitments and strengthening environmental governance.

Accordingly, the methodology is designed to be practical, scalable, precise and repeatable, and to support reliable and comparable baselines through documented, methodologically consistent reference conditions.

The Nature Integrity Methodology (NIM) is applicable to projects that may include conservation areas and restoration areas, or both within a common spatial boundary, providing a basis for the issuance of voluntary biodiversity credits. Where both occur, conserved habitats and restoration areas may operate as complementary components. They are assessed and credited under their respective rules; the resulting credits are not equivalent or fungible. It follows the ***Cercarbono's Biodiversity Certification Programme Protocol*** as a robust framework, in its innovative phase. This methodology distinguishes two categories of biodiversity credit that measure fundamentally different things and are not equivalent or comparable. Conservation credits reflect the maintenance of the biological and structural condition of an entire eligible ecosystem relative to its own documented time-zero state, and represent the mitigation of an objective, documented — though not separately quantified — risk of deterioration. Restoration credits reflect only the incremental ecological gain achieved during a given verification interval, relative to an approved reference condition. Because they quantify different things — a sustained condition versus an incremental gain — conservation and restoration credits are issued as distinct, non-fungible classes, as detailed in **Section 7.5** (Biodiversity credit calculation).

1 Principles

The principles provide the foundation for issuing high integrity credits under the Cercarbono Biodiversity Certification Programme (CBCP). They are intended to ensure that certified initiatives deliver positive, verifiable biodiversity outcomes. Accordingly, all Biodiversity Restoration Projects (BRP) and Biodiversity Conservation Projects (BCP) must demonstrate compliance with these principles — including nature-orientation, additionality, local-to-global alignment, long-term outcomes, prioritisation of on-the-ground actions, community-based approaches and transparency — as established in the ***Cercarbono's Biodiversity Certification Programme Protocol*** (version 1.1.1). Compliance with these principles must be documented in the Project Management Plan (PMP) and supported by auditable evidence throughout validation and verification.

2 Objective and application field

The main objective is to provide a framework for assessing maintenance and change in ecosystem condition through standardized, practical, transparent and repeatable measurements of biological composition and habitat structure.

2.1 Scope

The Convention on Biological Diversity, as the main international agreement for biodiversity conservation, establishes ambitious objectives aimed at mitigating biodiversity loss and restoring degraded ecosystems. The Kunming-Montreal Global Biodiversity Framework, adopted in 2022, represents a significant milestone in this effort, outlining specific goals for the protection and restoration of biodiversity at a global scale.

The NIM has been designed to support the achievement of the CBD objectives and the Kunming-Montreal Global Biodiversity Framework. It is proposed as a solution to drive biodiversity-enhancing projects such as **Biodiversity Conservation Projects (BCP)** and **Biodiversity Restoration Projects (BRP)**, and incorporate standardized measurement dimensions to monitor project progress and quantify biodiversity gains, providing a reference framework for:

- **Methodology for biodiversity monitoring indicators:** enable the generation of consistent and standardized ecosystem-condition values.
- **Quantifying progress toward restoration goals:** the methodology measures restoration success as change in ecosystem condition. Ecosystem services may be assessed separately where relevant, but they are not directly quantified by the ECS.
- **Tracking the impact of conservation activities:** the methodology facilitates the monitoring of biodiversity over time, evaluating the effectiveness of nature positive interventions.
- **Supporting decision-making:** the methodology provides valuable data and information that support informed decision-making in biodiversity management and land-use planning.

The NIM is aligned with the CBCP eligible Conservation Activities, where applicable activities are established and enumerated for each nature positive outcome situation.

For an effective planning and implementation of biodiversity projects, it is essential to identify the core activity from the list of CBCP eligible activities. Also, the project may include additional eligible activities that align with CBCP certification guidelines.

For the proposed eligible activities, projects must meet the specific conditions to be considered within the CBCP, where a detailed condition for each activity is mentioned and should be followed.

This methodology applies to biodiversity conservation and ecosystem restoration projects within the defined native-ecosystem scope.

The NIM methodology is based on:

- **Emphasis on measurement:** the methodology uses state-of-nature outcome indicators to calculate ecosystem condition. Pressure, response and governance indicators are recorded separately to support attribution, adaptive management and safeguards; they are not automatically included in the ECS.
- **Alignment with standards and reporting frameworks:** where an approved crosswalk is available, project data may support disclosure against relevant frameworks such as the Kunming-Montreal Global Biodiversity Framework, TNFD or GRI. Such disclosure is supplementary and does not replace the requirements of this methodology.
- **Scientific robustness:** the NIM is grounded in validated ecological principles, data analysis, and scientifically verified modelling.
- **Scalability and cost-efficiency:** the methodology allows the integration of remote analysis with strategic fieldwork to enable the effective monitoring of large-scale areas with an optimal cost-benefit ratio.
- **Adaptability:** the methodology can be applied across different ecosystem types and measurement technologies within the defined conservation and restoration scope, including native ecosystems located within productive landscapes (e.g., forest remnants, riparian corridors or wetlands embedded within an agricultural or silvopastoral matrix). Improvements to agricultural or other productive activities themselves are outside the scope of this methodology.

Ecosystem condition is assessed through evidence on composition, structure and function. The following are examples of relevant evidence dimensions:

Functional component: characterized by the variety and relative abundance of functional groups (pollinators, dispersers, predators, decomposers, among others) that play critical ecological roles in maintaining ecosystem processes.

Structural component: referring to the physical complexity of the ecosystem, including canopy stratification, understory cover and composition, patch connectivity, and spatial heterogeneity.

Taxonomic component: richness and relative abundance of species, with special emphasis on endemic, threatened, or keystone species.

2.2 Technical and programme compliance

The following regulatory and technical framework documents of the Cercarbono's Biodiversity Certification Programme, in their current versions, are complementary and essential for the application of this methodology:

- Cercarbono's Biodiversity Certification Programme Protocol.
- Cercarbono's Biodiversity Certification Programme Procedures.
- Terms and Definitions of the Cercarbono's Biodiversity Certification Programme.
- Guidelines for mapping presentation and analysis (cartography, GIS and geospatial products).
- Safeguarding Principles and Procedures of the Cercarbono Certification Programme.

2.3 Compliance with applicable legal provisions

Within the scope of this methodology, BRP and BCP must identify, consider and fully comply with all applicable legal, regulatory and policy requirements at national, sub-national and local levels, as well as relevant social, environmental and technological obligations. Compliance must be supported by robust, auditable evidence.

BRP/BCP proponents shall adopt and implement the current ***Safeguarding Principles and Procedures of Cercarbono Certification Programme***, integrating these requirements into project design, implementation and monitoring.

Prior to commencement of field activities, the BRP/BCP proponent must demonstrate that intervention areas hold all required authorizations, permits, licenses and environmental management plans demanded by the competent jurisdiction, and that all legal and regulatory obligations related to the proposed interventions and applied technologies are met.
Where project outcomes are linked to nationally-recognized commitments or registries (for example, official national records of conservation actions or biodiversity-related contributions), relevant results shall be registered in the appropriate national systems, where applicable, and reported in a manner consistent with international Monitoring, Reporting and Verification (MRV) standards.

3 Eligibility and inclusion requirement

The methodology applies to biodiversity conservation and ecosystem restoration in native terrestrial and aquatic ecosystems. Biodiversity credits for agricultural or other productive activities themselves are outside the scope of this methodology.
The reference condition is the ecological condition used as the benchmark for comparison under this methodology.

For **Biodiversity Conservation Projects**, the reference condition is the documented condition of the same eligible ecosystem at project time zero. It is fixed at project start and remains the benchmark for subsequent assessments; it is not an external reference site. This reference condition is not required to be optimal or pristine: it is the static baseline documented at time zero, and the minimum condition the project must maintain. Accordingly, there is no minimum ecological condition threshold for an area to enter as a Biodiversity Conservation Project: eligibility depends on meeting the three conditions in **Section 3.1** (a)–(c) — demonstrable value, documented threat, and viability of maintenance — not on how close that documented condition is to an intact or pristine state. The 0.9 threshold established in **Section 7.5** applies solely as an ongoing performance requirement after project entry (evidence of significant degradation), and is not a condition of area eligibility.

For **Biodiversity Restoration Projects**, the reference condition represents the ecological target to be achieved. It is normally derived from an internal or external Reference Ecosystem that is ecologically comparable to the ecosystem being restored, demonstrably functioning and supported by sufficient ecological evidence.

The physical Reference Ecosystem does not need to be pristine. However, selection of a less-than-intact reference must not lower the ecological ambition of the project merely because higher-integrity examples are locally absent. The PMP must document the search and selection process, justify ecological comparability, explain any known limitations of the selected reference, and demonstrate that the resulting reference condition represents a credible restoration target for the relevant native ecosystem rather than simply the best condition currently available within a degraded landscape.

Where no suitable physical Reference Ecosystem can be identified or accessed, a reconstructed reference condition may be established using reliable historical, ecological or spatial evidence in accordance with **Section 3.1**.

3.1 Area eligibility

The area eligibility criteria are used to determine the areas of the project implementation for BCP and BRP. Eligible activities for each situation must follow the CBCP Scope and eligible activities section.

For **Biodiversity Conservation Projects** the area must meet the following criteria:

(a) **Demonstrable conservation value:** the area must show documented biodiversity and ecological value at project time zero (e.g., species records, habitat structure, satellite imagery, land-use records or technical reports). The evidence period and method must be specified in the PMP, justified by ecosystem dynamics and relevant land-use history, and applied consistently within the project.

(b) **Documented threat or risk of deterioration:** credible local or regional evidence of pressures or risk factors that could plausibly degrade the ecosystem absent the project. Relevant threats include deforestation, high-severity non-natural fires, land-use conversion pressure, overgrazing, hydrological alterations, unsustainable offtake (of animal species, trees or other natural resources), invasive species at ecologically-damaging densities, or planned infrastructure.

(c) **Viability of maintaining those values through project actions:** technical justification that the planned protection or stewardship actions can plausibly maintain, at a minimum, the ecological condition documented at project time zero. Measured improvement in ecological condition beyond time zero is not precluded, though it does not generate additional conservation credits under this methodology (see **Section 7.5**).

Where the primary objective is to recover ecological values that have already been lost, toward a higher ecological condition — rather than to protect and maintain values that are currently present — the area must be treated under the restoration pathway rather than as a Biodiversity Conservation Project.

This determination must be based on the evidence documented under criterion (a), not solely on the proponent's stated intent. Where that evidence shows that the values or ecological functions to be credited are largely absent or substantially diminished at project time zero — such that achieving a materially higher ecological condition, rather than maintaining an existing one, is the realistic and intended outcome of the proposed actions — the area does not qualify as a Biodiversity Conservation Project and must be assessed under the restoration pathway.

Ecosystem-specific conservation eligibility criteria

The ecosystem types described below (native forests, grasslands and savannas, wetlands, mangroves, and marine ecosystems) are illustrative examples and do not constitute an exhaustive list. Biodiversity Conservation Projects may be developed in other native ecosystem types (e.g., deserts and xeric shrublands, tundra, freshwater/riverine systems, caves and subterranean habitats) provided the proponent defines and documents, in the PMP, ecosystem-specific eligibility criteria equivalent in rigor to those below.

1. For Native forests

- **Eligible:** native forest remnants or stands with demonstrable ecological and biodiversity value (canopy structure, regeneration, presence of key taxa), exposed to a documented threat or risk of deterioration.
- **Required evidence:** permanent plot data or comparable surveys showing ecological condition and population trends, together with evidence of threat or risk of deterioration; connectivity assessment.
- **Exclusions:** active conversion to other land uses and non-native and monoculture plantations.

2. For Grasslands and savannas

- **Eligible:** native grasslands and savannas with demonstrable ecological and biodiversity value (natural fire/grazing regimes or managed equivalents sustaining native composition), exposed to a documented threat or risk of deterioration.
- **Required evidence:** vegetation composition and cover demonstrating the ecological value of native communities, together with evidence of threat or risk of deterioration; documentation of grazing regimes where applicable.
- **Exclusions:** intensively managed pasture/agricultural grasslands lacking verifiable measures to sustain native ecosystem values.

3. For Wetlands

- **Eligible:** wetlands (peatlands, marshes, swamps, floodplains) with demonstrable hydrological functioning and ecological value, exposed to a documented threat or risk of deterioration.
- **Required evidence:** documentation of hydrological and ecological functioning, together with evidence of threat or risk of deterioration.
- **Exclusions:** permanently infilled or urban/industrial conversions where no demonstrable wetland ecological value or function remains.

4. For Mangroves

- **Eligible:** intertidal mangrove systems with demonstrable stand structure and ecological value, exposed to a documented threat or risk of deterioration.
- **Required evidence:** stand inventories, salinity/tidal data and indicators of recruitment and persistence, together with evidence of threat or risk of deterioration.
- **Exclusions:** exotic mangrove plantations, whether intertidal or non-intertidal; afforestation of mangrove on naturally open intertidal ecosystems (e.g., unvegetated mudflats, sandbanks or salt marshes) that would replace an existing native ecosystem rather than restore degraded mangrove habitat; and sites with irreversible physical constraints preventing maintenance of mangrove dynamics.

5. For Marine ecosystems

- **Eligible:** subtidal and intertidal marine ecosystems (e.g., coral reefs, seagrass meadows, kelp forests, rocky reefs) with demonstrable structure and ecological value, exposed to a documented threat or risk of deterioration.
- **Required evidence:** benthic cover and community-composition surveys (in-situ or remote/acoustic sensing) showing ecological condition over the evidence period; assessment of relevant threats and risk of deterioration (e.g., destructive fishing, coastal development).
- **Exclusions:** sites subject to ongoing destructive extraction (e.g., blast/cyanide fishing, unmanaged bottom trawling) or affected by recurrent mass-mortality events (e.g., bleaching) that have eliminated the demonstrable ecological value required under criterion (a), or where the documented threat under criterion (b) cannot be credibly mitigated through the project's protection actions.

Table 1 is a reporting template to be completed in the PMP with the area (in hectares) corresponding to each category for the specific project.

Table 1. Area selection summary for Biodiversity Conservation Projects (BCP).

Eligible Area	**Baseline**	**Project**
Conservation-value ecosystem	Conservation-value ecosystem area	Conservation activities
Non-eligible areas		
Degraded ecosystems	Degraded ecosystem areas	
Buildings	Building areas	
Settlements	Settlement areas	
BCP Total Area		
Eligible area	Total eligible areas	
Non Eligible areas	Total non-eligible areas	
Total	Total eligible areas + Total non-eligible areas	

Note: all area measurement units are in hectares.

Degraded ecosystem areas identified within the Total Project Area are non-eligible for BCP accounting but may qualify for a Biodiversity Restoration Project, subject to the eligibility criteria in this Section.

For **Biodiversity Restoration Projects** the area must meet the following criteria:

The restoration area must be demonstrably degraded and present realistic potential for measurable ecological recovery through active restoration interventions. Degradation may result from past conversion, fragmentation, selective logging, overgrazing, hydrological alteration, pollution, invasive species, or other anthropogenic impacts. Areas already in a self-sustaining, non-degraded condition are not eligible for Biodiversity Restoration Projects.

Common eligibility requirements:

- The areas where Biodiversity Restoration Projects are implemented shall correspond to ecosystems that are demonstrably degraded.
- **Spatial definition:** georeferenced boundary file (shapefile/GeoJSON) and map products (current and retrospective imagery) with metadata (CRS, date, source).
- **Degradation diagnosis:** baseline assessment demonstrating degradation using quantitative indicators (e.g., canopy cover loss %, native species richness decline, soil erosion rates, altered hydrology, invasive species cover) and temporal evidence (satellite or field data showing decline over the last relevant period).
- **Restoration feasibility:** technical justification that ecological restoration is feasible within a defined timeframe (ecological potential, source populations/seed bank, hydrological recovery potential). Prevention of deliberate degradation: the degradation used to establish restoration eligibility must not have resulted from actions taken, authorized or knowingly permitted by the project proponent for the purpose of establishing or increasing eligibility for restoration credits. Where evidence indicates that degradation was deliberately induced to create or inflate a restoration claim, the area is ineligible for this methodology.

Ecosystem-specific restoration eligibility criteria

1. For Native forests (restoration)

- **Degradation evidence:** reduced canopy cover or basal area relative to reference conditions, loss of regeneration, simplified vertical structure, presence/expansion of invasive woody species, or recent conversion/clearance history.
- **Restoration potential:** availability of native propagules (seed sources, nearby intact stands), soil condition amenable to natural regeneration or enrichment planting, and feasibility of controlling relevant threats (e.g. illegal logging).
- **Restrictions:** conversion to or replacement by non-native species or monocultures; sites where soils are so degraded or contaminated that native forest recovery is infeasible within the project timeframe.

2. For Grasslands and Savannas (restoration)

- **Degradation evidence:** replacement by invasive grasses/woody encroachment, loss of native herbaceous diversity, soil compaction/erosion, altered fire/grazing regimes.
- **Restoration potential:** presence of remnant native species propagules or feasible sourcing of native seed, capacity to reinstate natural disturbance regimes (fire, grazing) or managed surrogate processes.
- **Restrictions:** areas converted to permanent intensive agriculture without feasible reconversion plan.

3. For Wetlands (restoration)

- **Degradation evidence:** drained or channelized wetlands, lowered water table, sedimentation, pollution, lost native wetland vegetation, or peatland degradation (oxidation).
- **Restoration potential:** hydrological restorability (e.g., ability to rewet, dam removal feasibility), contaminant levels within remedial capacity, and landscape connectivity for recolonization.
- **Restrictions:** permanently converted (e.g., urbanized) areas or contamination that cannot be remediated to improve ecological functioning within a reasonable timeframe.

4. For Mangroves (restoration)

- **Degradation evidence:** loss of mangrove cover, disrupted tidal/hydrological connectivity, substrate degradation, or replacement by incompatible land uses.
- **Restoration potential:** tidal/connectivity conditions that can be restored, presence of suitable substrate and propagule sources or feasible planting stock, and manageable anthropogenic pressures.
- **Restrictions:** areas with irreversible coastal modifications preventing hydrological restoration or where planting would create ecological mismatch.

5. For Marine ecosystems (restoration)

- **Degradation evidence:** loss of live cover or structural complexity (e.g., coral, seagrass, kelp) relative to reference conditions, substrate degradation, disrupted connectivity, or decline linked to destructive fishing, pollution, sedimentation, or coastal development.
- **Restoration potential:** availability of propagule sources or feasible transplant/outplanting stock, water-quality and hydrological conditions within recoverable range, and manageable anthropogenic pressures (e.g., controllable fishing pressure, sedimentation sources).
- **Restrictions:** sites with irreversible physical or hydrological alteration (e.g., permanent coastal infrastructure, altered substrate) preventing recovery, or persistent conditions (e.g., recurrent unmanaged thermal stress) that would undermine restoration success.

Other native ecosystem types not listed above (e.g., deserts and xeric shrublands, tundra, freshwater/riverine systems) are eligible for restoration provided the proponent defines equivalent ecosystem-specific criteria in the PMP — degradation evidence, restoration potential, and restrictions specific to that ecosystem type — subject to review and approval prior to validation.

Table 2 is a reporting template to be completed in the PMP with the area (in hectares) corresponding to each category for the specific project.

Table 2. Area selection summary for Biodiversity Restoration Projects (BRP).

Eligible Area	Baseline	Project
Degraded ecosystem	Degraded ecosystem area	Restoration activities
Non Eligible areas		
Stable ecosystems	Stable ecosystem areas	
Buildings	Building areas	
Settlements	Settlement areas	

BRP Total Area	
Eligible area	Total eligible areas
Non Eligible areas	Total non-elegible areas
Total	Total eligible areas + Total non-eligible areas

Note: all area measurement units are in hectares.

Stable ecosystem areas identified within the Total Project Area are non-eligible for BRP accounting but may qualify for a Biodiversity Conservation Project, subject to the eligibility criteria in this Section.

A Total Project Area may contain both a Biodiversity Conservation Project (BCP) component and a Biodiversity Restoration Project (BRP) instance, where conservation and restoration activities are implemented in different eligible areas within the same landholding. In this case, the BCP and BRP components may be documented either as two separate Projects, each with its own PMP, or, where the proponent elects to manage them jointly, as a grouped project under a single PMP in accordance with **Section 8** (Grouped projects) — provided that each component area is separately delimited, assessed, monitored and credited under its applicable BCP or BRP requirements.

3.1.1 Establishment of the reference condition for restoration projects

Where a physical Reference Ecosystem is used to establish the reference condition for a restoration project, it must meet the following criteria:

- Represent a credible, high-integrity ecological condition appropriate for the native ecosystem type being restored.
- The Reference Ecosystem should show minimal anthropogenic disturbance, functioning ecological processes and sufficient integrity to provide a credible restoration target.
- **Belong to the same ecoregion or functional ecological unit** as the project area, sharing the same biogeographical context, potential vegetation type, climatic regime, and ecosystem dynamics.
- **Preferably be located near** the project area to ensure both sites are exposed to comparable environmental conditions, especially during sampling periods.
- Be documented at selection with sufficient evidence to establish ecological condition and methodological reliability. Once approved, the reference condition functions as a fixed ecological target for the project's crediting period; it is not intended to track the ongoing condition of the physical reference site, since the object of monitoring under this methodology is the project site, not the reference site. Accordingly, localized or site-specific changes at the reference site (e.g., disturbance or management change confined to that site) do not automatically modify the approved benchmark. Where evidence indicates that broader environmental change (e.g., climate-driven shifts) affecting the reference ecosystem would equally affect the achievable ecological potential of the project site, a revision of the reference condition may be proposed, subject to technical justification and formal approval.
- Information on the legal status and site security may be documented where relevant as supporting evidence of reliability, but legal protection or long-term conservation of the

reference site is not a requirement of this methodology and is not, by itself, evidence of ecological condition.

Where no suitable physical Reference Ecosystem can be identified after a documented search, a reconstructed reference condition may be established using existing evidence. It must represent the best-supported estimate of a credible target ecological condition for the same native ecosystem type and biogeographical context, consistent with the criteria above, and must not be set at a lower level merely because higher-integrity examples are locally absent. It may combine historical time series, scientific literature, long-term inventories or monitoring datasets, remote-sensing records, and data from ecologically analogous remnants.

The PMP must identify and document all sources, justify their representativeness and temporal relevance, define indicator-specific reference values, describe reconstruction and harmonization procedures, and explicitly report assumptions and uncertainty. Only indicators for which a methodologically compatible reference value can be established may be used in ECS calculation.

Compatibility must be demonstrated with respect to indicator definition, measurement units, spatial and temporal scale, taxonomic resolution and sampling or analytical method, as applicable. Differences in sampling effort or methodology may be accepted only where they can be reliably harmonized or standardized and do not introduce material bias. The reconstructed reference condition must be approved before crediting.

3.2 Ownership

The BCP/BRP holder must demonstrate the legal capacity to implement and manage activities within the BCP/BRP areas, either as the registered owner or by presenting explicit, written authorization from the current owner or their legal representative. Such authorization must cover the relevant areas during project preparation, implementation, monitoring periods that generate biodiversity results, and any post-implementation obligations. This requirement applies to individual, public, and collective land tenure arrangements.

For privately owned land, the owner or legal holder must provide an explicit written authorization permitting the execution of the BCP/BRP activities. The spatial delimitation of the project area shall be supported by legally valid documentation of ownership or administrative control. Parties claiming participation in, rights to, or transfer of biodiversity outcomes, credits, or related benefits must provide legally binding, signed agreements that evidence the allocation and transfer of those rights among the interested parties.

The BCP/BRP must also incorporate provisions on ownership, authorization, and benefit-sharing in accordance with the current ***Safeguarding Principles and Procedures of Cercarbono Certification Programme***.

Where the project area is subject to collective, customary or Indigenous tenure, the PMP must document how affected rights-holders and local communities participate meaningfully in project governance throughout the project cycle (e.g., as partners, decision-makers or beneficiaries), and must disclose the project's governance structure, including decision-making roles and accountability arrangements. The governance structure must also take into account gender and other vulnerable groups among the affected rights-holders and local communities. Benefit-sharing arrangements must be fair, equitable and transparent, co-designed with affected rights-holders, and documented in the PMP, in accordance with the current ***Safeguarding Principles and Procedures of Cercarbono Certification Programme***, and must be reviewed periodically (at minimum at each verification interval) to confirm they remain fair and effective.

3.3 BCP and BRP general objective

3.3.1 Biodiversity Conservation Projects

The objective of the BCP shall be presented in the Project Management Plan (PMP) and must summarize the principal conservation outcomes expected from implementing protection and stewardship actions, and the principal biodiversity values to be maintained. The statement shall, at minimum, specify: the core conservation activity(ies) (e.g., legal protection, enforcement, community guardianship); the precise geographic location (coordinates and maps); the implementing parties and local stakeholders; the project execution and monitoring period; and the principal indicators of success (e.g., maintenance of population for focal species, prevention of habitat loss, persistence of ecosystem structure). The objective must also describe how the conservation action demonstrates additionality relative to baseline, commitments to permanence, and the MRV framework to be applied for independent verification. The statement must also justify how the stated objectives are expected to conserve or restore nature, and must include a theory of change linking the project's activities to the intended biodiversity outcomes, endorsed by the project's governance body.

The principal biodiversity outcome indicators shall correspond to, or be directly linked with, the biological and structural indicators selected for Ccomp and Cstr. Relevant pressure and response indicators may also be included in the PMP to track implementation, support attribution and inform adaptive management, but they are not included in the ECS calculation.

3.3.2 Biodiversity Restoration Projects

The objective of the BRP shall be described in the PMP and must succinctly state the principal ecological outcomes expected from implementing the restoration activities in relation to the approved reference condition, and the measurable biodiversity gains targeted within the project timeframe. The statement shall, at minimum, specify: the primary restoration activity(ies) to be undertaken; the geographic boundaries and coordinates of the project area; the key implementing and stakeholder actors (including landowners, local communities and partners); the period of execution and monitoring; and the principal measurable targets and associated indicators. The objective must also indicate how the proposed interventions demonstrate restoration additionality, the intended permanence of outcomes and the planned MRV approach for verification. The statement must also justify how the stated objectives are expected to conserve or restore nature, and must include a theory of change linking the project's activities to the intended biodiversity outcomes, endorsed by the project's governance body.

4 Additionality

Activities seeking certification under the Cercarbono CBCP must demonstrably satisfy the principles of additionality and permanence, in accordance with **Section 6** of the ***Cercarbono's Biodiversity Certification Programme Protocol***.

Additionality must be demonstrated through evidence that the improved biodiversity outcome would not occur in the absence of the project. Novelty, innovation or exclusive credit revenue do not by themselves demonstrate additionality.

4.1 Additionality for Biodiversity Conservation Projects

For Biodiversity Conservation Projects, additionality is demonstrated through the documented threat or risk of deterioration required under Area eligibility, **Section 3**, criterion (b). Maintaining, at minimum, the ecological condition documented at project time zero — in an eligible area exposed to that credible threat — constitutes the additional outcome attributable to the project's protection and stewardship actions.

4.2 Additionality for Biodiversity Restoration Projects

For Biodiversity Restoration Projects, additionality is demonstrated where the eligible area's demonstrable degradation, required under Area eligibility (**Section 3**), would plausibly persist or continue in the absence of active restoration intervention. The verified increase in project ECS (ΔECS) toward the approved reference condition, calculated according to Equation (8), constitutes the additional outcome attributable to the project.

4.3 Compatible income-generating activities

Compatible income-generating activities may be permitted only where they demonstrably do not compromise the conservation or restoration objective.

4.4 Stacking and bundling

Any stacking or bundling with other environmental-credit claims must use transparent spatial and outcome boundaries, documented consent and safeguards against double counting.

5 Project delimitation

Project delimitation establishes the spatial, temporal and operational boundaries that define what a biodiversity project will measure, manage and account for. Clear delimitation transforms a conceptual intervention into an auditable framework: it identifies the Total Project Area and distinguishes the portions eligible for conservation or restoration from those excluded; it assigns pathway and activity typologies.

5.1 Temporal limits

This section defines the temporal boundaries used for accounting, monitoring and verification of biodiversity outcomes for both Biodiversity Conservation Projects (BCP) and Biodiversity Restoration Projects (BRP). All dates and periods must be recorded in the Project Management Plan (PMP) and supported by the methodological justification and evidence described below.

Project start date
The date on which the first direct on-the-ground action is implemented that initiates biodiversity outcomes attributable to the project (e.g., commencement of formal protection, enforcement patrols, or the start of restoration interventions). The Project start date marks the start of result attribution in accordance with this methodology.

Results period
The period during which biodiversity outcomes attributable to project activities are monitored and may be subject to verification. The Results period encompasses the full crediting period and includes all verification intervals. Monitoring data, inventories and reports supporting issuance of biodiversity units shall reference this period.

Crediting period / Accreditation duration
The interval during which verified biodiversity outcomes may be converted into issued units under this methodology and the applicable registry rules. The accreditation period is distinct from the project's operational lifespan. The programme establishes an initial accreditation period of ten (10) years, which may be renewed multiple times through the CBCP procedures; renewals may be granted for successive ten-year terms or for shorter intervals, and may continue until the end of the project's operational lifespan. The project duration (operational lifespan), as defined by this methodology, shall be a minimum of forty (40) years to ensure permanence and adequate risk management.

Verification intervals
Outcome-monitoring and technical-review events shall occur at intervals not exceeding three (3) years (≤ 3 years) for both BCP and BRP. The Independent Panel may review reported outcomes, but this technical review does not substitute for independent third-party verification or audit where such assurance is required under the applicable CBCP, such as validation at project registration or verification prior to credit issuance. The PMP shall indicate scheduled verification dates and conditions for exceptional or interim verifications (e.g., in response to alerts of significant reversals or material project changes).

5.2 Spatial boundaries

This section sets out the spatial delimitation requirements for BCP and BRP. Spatial boundaries define the total project extent within which eligible and non-eligible areas are identified, interventions are implemented, and biodiversity outcomes are quantified and attributed. Boundaries and spatial units must be explicit, reproducible and documented in the Project Management Plan (PMP).

5.2.1 Spatial architecture and core definitions

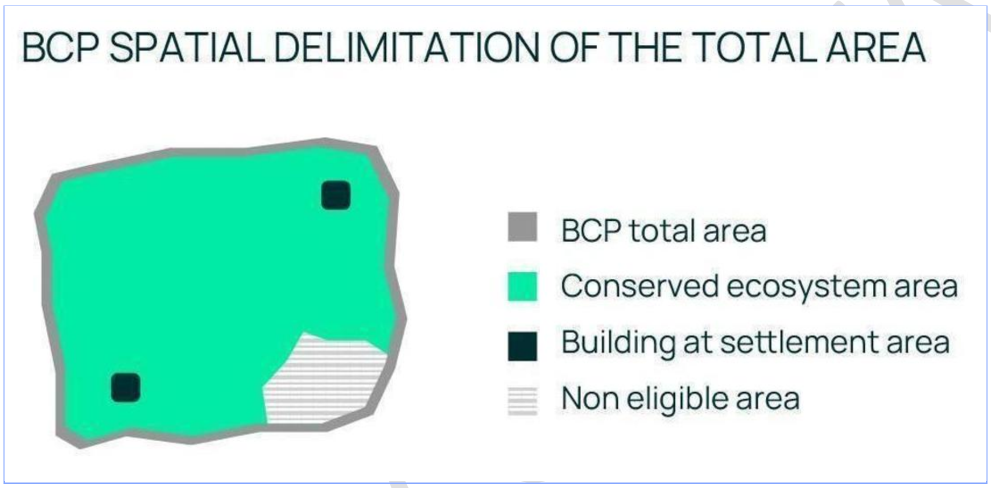
- **Project:** a Biodiversity Conservation Project (BCP), a Biodiversity Restoration Project (BRP), or a grouped project combining BCP and BRP instances under a single PMP in accordance with **Section 8** (Grouped projects). Each instance is governed independently under its respective pathway's eligibility, delimitation, monitoring and accounting rules.
- **Total project area:** the full geospatial extent (polygon) within which a Project operates. Where a Project combines BCP and BRP instances under **Section 8**, the Total Project Area encompasses all such instances, each retaining its own eligible and non-eligible areas and accounting rules. The Total Project Area is the superset that contains all eligible and non-eligible subareas and is the reference for traceability of all spatial reporting. Projects may be composed exclusively of eligible areas; in such case, non-eligible areas shall not be considered.
- **Eligible area(s):** portion(s) of the Total Project Area where project activities may be implemented and where biodiversity outcomes are eligible for accounting under this methodology. Eligible areas may be contiguous or spatially disaggregated polygons.

- **Non-eligible area(s):** portion(s) of the Total Project Area excluded from activity implementation and from biodiversity accounting (e.g., permanently converted land, areas under incompatible land uses, or other categories defined by the methodology). Therefore, excluded from VBC accounting.

A project may contain one ecosystem or several ecosystems, such as forest, grassland, wetland or marine habitat (see **Section 5.2**, Spatial boundaries, for demarcation of relevant ecosystems). In these cases, the Total Project Area must be segmented into the relevant ecosystem types, which shall be spatially identified and georeferenced in the PMP before ecosystem-specific assessment and monitoring are defined.

For Biodiversity Conservation Projects, the account area for crediting consists solely of the Conserved Ecosystem Area as depicted in the conceptual **Figure 1**.

Figure 1. Example of spatial delimitation of the total area in a Biodiversity Conservation Project (BCP).

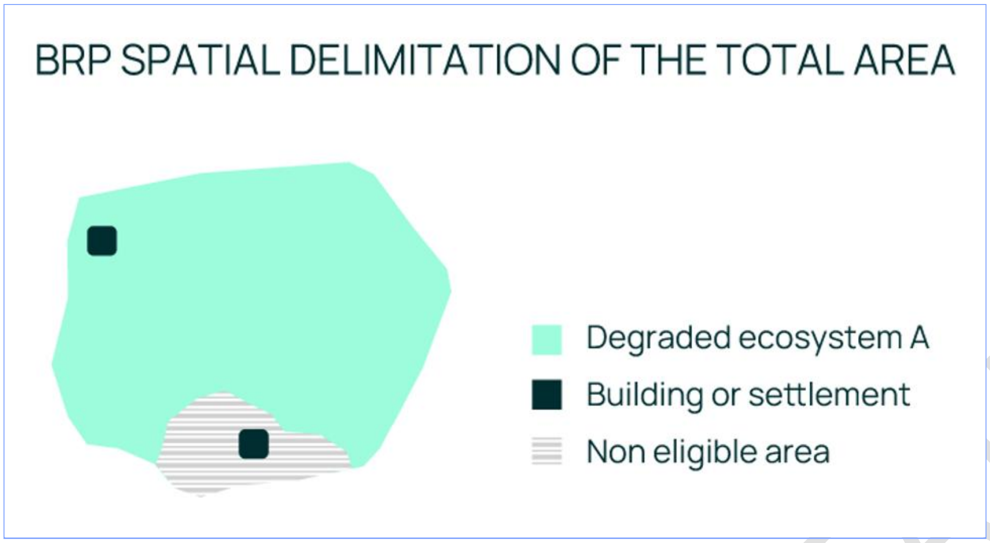


This account area shall be explicitly delimited in the PMP with georeferenced boundaries (shapefile/GeoJSON), and shall include only those polygons that: (a) meet the conservation-pathway eligibility criteria, (b) are free from incompatible land uses or legal encumbrances that would preclude long-term protection, and (c) are supported by verifiable evidence of current ecological integrity and stability (baseline surveys, permanent plots, remote-sensing imagery, or equivalent).

Areas excluded from the account area include non-eligible polygons within the Total Project Area (e.g., converted lands, active production units, or segments reserved for restoration activities), buffer zones designated solely for management operations without demonstrable biodiversity outcomes, any spatial units subject to other overlapping claims or credits, unless stacking or bundling arrangements meeting the transparency, consent and double-counting safeguards set out in **Section 4** (Additionality) are documented and provided.

For Biodiversity Restoration Projects, the account area for crediting consists solely of the Degraded Ecosystem Area as depicted in the conceptual **Figure 2**.

Figure 2. Example of spatial delimitation of the total area in a Biodiversity Restoration Project (BRP).

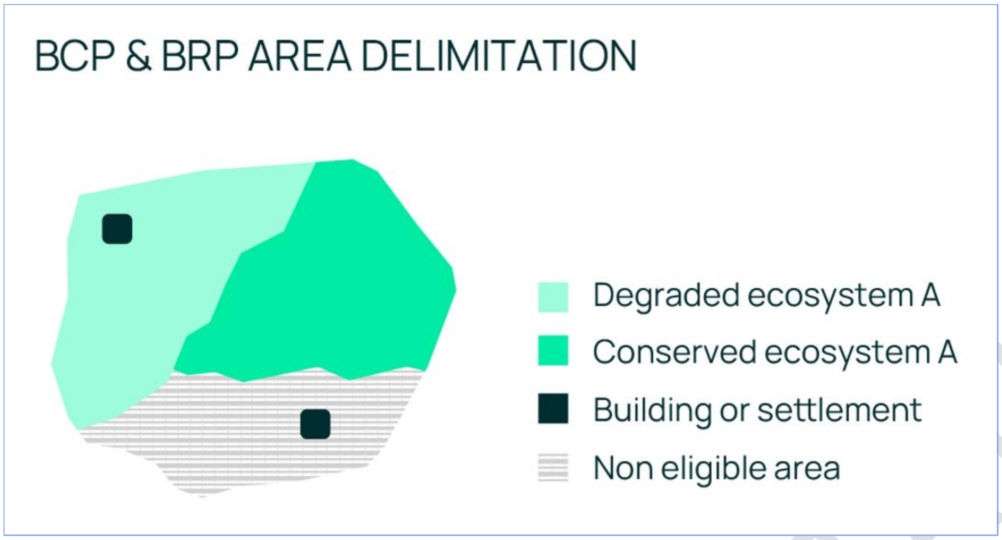


This account area shall be explicitly delimited in the PMP with georeferenced boundaries (shapefile/GeoJSON), and shall include only those polygons that: (a) meet the BRP eligibility criteria (demonstrable degradation and demonstrable feasibility of ecological restoration), (b) are not subject to irreversible physical or legal constraints that would preclude successful restoration within the project timeframe, and (c) are supported by verifiable baseline evidence of degradation and restoration potential (field surveys, remote-sensing time series, soil/hydrology assessments, or equivalent).

Areas excluded from the account area include non-eligible polygons within the Total Project Area (e.g., intact conserved habitat reserved for protection rather than restoration, permanently converted lands or active industrial uses, and segments already allocated to other crediting programs without documented consent), operational buffer zones without demonstrable restoration outcomes, any spatial units subject to other overlapping claims or credits, unless stacking or bundling arrangements meeting the transparency, consent and double-counting safeguards set out in **Section 4** (Additionality) are documented and provided.

A Biodiversity Conservation Project (BCP) area and a Biodiversity Restoration Project (BRP) area may be spatially contiguous, as illustrated below in **Figure 3**, each delimited, assessed and credited independently under its respective pathway's eligibility, delimitation and accounting rules.

Figure 3. Example of spatial delimitation of the total area in a Biodiversity Restoration Project and Biodiversity Conservation Projects.



Although the two areas may be spatially adjacent, each remains subject to its own eligibility, delimitation and accounting rules, and the resulting credits are not equivalent or fungible. Where a BCP and a BRP are implemented by the same proponent over contiguous or adjacent land, they may be documented either as two separate Projects, each with its own PMP, or, where the proponent elects to manage them jointly, as a grouped project under a single PMP in accordance with **Section 8** (Grouped projects) — provided that each area is separately delimited, assessed, monitored and credited under its applicable BCP or BRP requirements.

6 Baseline scenario

The baseline scenario is a documented narrative that explains, in plain terms and with supporting evidence, what is the situation at the start of the project and what is plausibly expected to occur in the project's eligible area in the absence of the proposed biodiversity intervention.

For conservation projects the baseline typically represents the most credible trajectory of loss or degradation (e.g., continued conversion, increased pressure); for restoration projects it represents the likely path of a degraded site without active restoration or management (persistence of degradation or slow natural recovery). For conservation projects, this trajectory must be demonstrated with local or regional evidence (e.g., historical land-use change rates in comparable unprotected areas, documented deforestation or degradation fronts, regional pressure indicators).

The baseline must be a documented qualitative counterfactual grounded in the best available evidence, including historical observations, remote sensing, plot data and relevant social and regulatory context. This qualitative approach is a deliberate methodological choice: because conservation credits are issued against the maintenance of the Ecosystem Condition Score rather than against an avoided-loss volume, a quantitative loss trajectory is not required to establish additionality or to size the baseline. Because this methodology does not calculate avoided-loss credits, a quantitative projected loss trajectory is not required unless a programme rule specifically requires it (e.g., a future CBCP or registry requirement for disclosure or cross-checking against other environmental-credit claims on the same area). The baseline shall be adjusted conservatively when uncertainty is present.

6.1 Proposed procedure

1. **Define the spatial scope and stratification:** delimit the Eligible Area (see **Section 5.2**, Spatial boundaries) and set strata (cover type, ecological units, region).
2. **Identify plausible counterfactuals:** at minimum, consider (a) continuation of pre-project conditions (BAU) and (b) scenario without market incentives; include other relevant alternatives.
3. **Gather evidence:** compile historical trends (recommended ≥10 years when available), satellite imagery, plot inventories, socioeconomic and regulatory information. Where historical trend data of less than 10 years, lower spatial/temporal resolution, or from non-comparable areas is used, the PMP must justify why the available data remains appropriate and must apply a conservative adjustment to offset the added uncertainty.
4. **Select the most realistic and conservative baseline:** justify the choice with contextual evidence and policy/regulatory analysis.
5. **Document and disclose:** record methods, data sources, assumptions, sensitivity analyses and measures to avoid double counting.

7 Project scenario outcomes

The project scenario reports ecosystem-condition outcomes relative to the applicable reference. Two independent components are assessed for each ecosystem: a compositional component from selected species groups and a structural component from a complementary ecosystem-level set of habitat indicators. They are combined only after both components have been calculated.

7.1 Ecosystem Condition Score

7.1.1 General structure

The Ecosystem Condition Score (ECS) is a dimensionless measure from 0 to 1 that expresses the condition of an assessed ecosystem relative to its documented reference condition. The biological and structural components and the ecosystem-level score are calculated in Equations (1) to (6); the project-level ECS is calculated according to Equation (7). ECS assessments are subject to the verification intervals established in **Section 5.1** (Temporal limits), whereby an Independent Panel reviews reported outcomes at intervals not exceeding three (3) years (≤ 3 years).

ECS follows an ecosystem-condition framing in which species composition and habitat structure are distinct but complementary dimensions. The biological and structural branches are assessed separately; ecological relationships between organisms and habitat guide indicator selection and interpretation.

For **BCP**, the reference condition is the documented condition of the same ecosystem at project time zero and remains fixed for all subsequent calculations. For **BRP**, the reference condition is the ecological target derived from the approved physical Reference Ecosystem or, where permitted under **Section 3.1**, a reconstructed reference condition.

Figure 4. Conceptual formulation of the Ecosystem Condition Score (ECS) for conservation projects using a static time-zero reference.

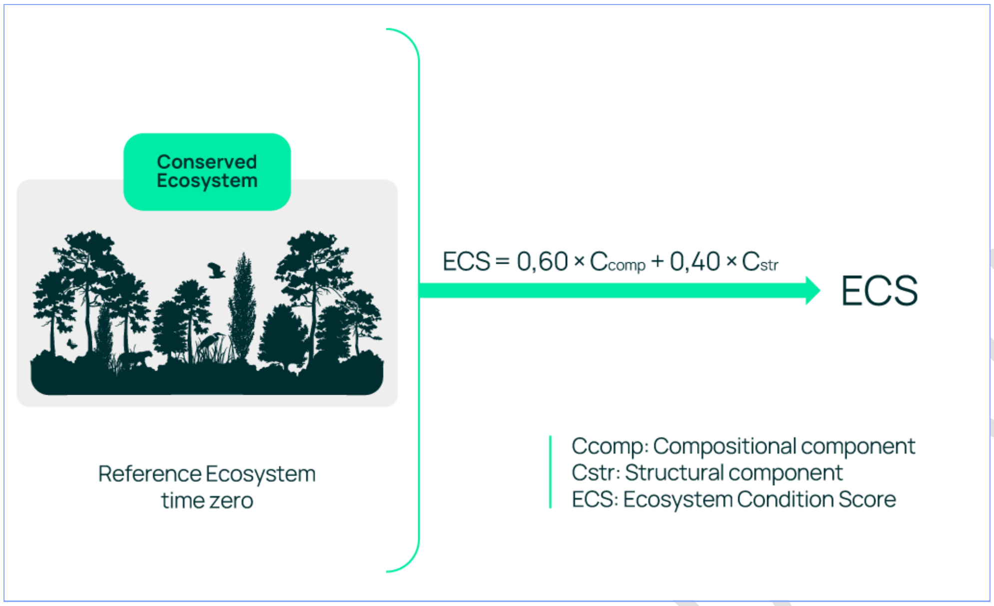
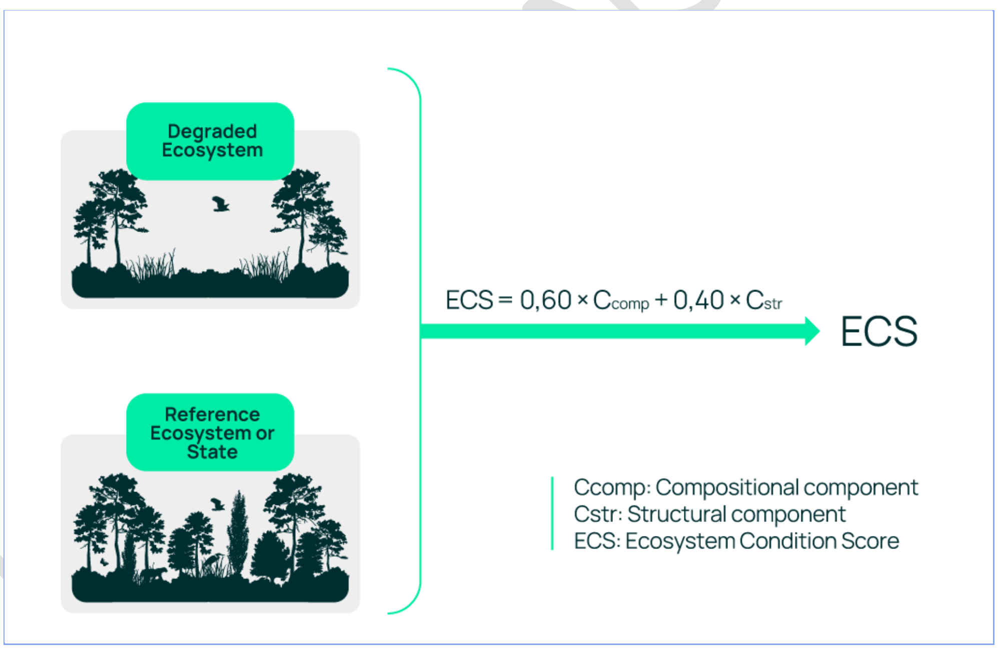


Figure 5. Conceptual formulation of the Ecosystem Condition Score (ECS) for restoration projects using an approved Reference Ecosystem.



The biological groups and structural indicators used to assess each ecosystem may differ among ecosystems within the same project, according to their ecological characteristics, target biodiversity features, project-specific objectives and relevant threats. Indicator sets and assessment methods must be documented in the PMP before monitoring results are evaluated, including evidence that the indicators are representative of the target biodiversity features and responsive to the planned project activities. They must remain consistent throughout the assessment period unless a formally approved methodological change is justified.

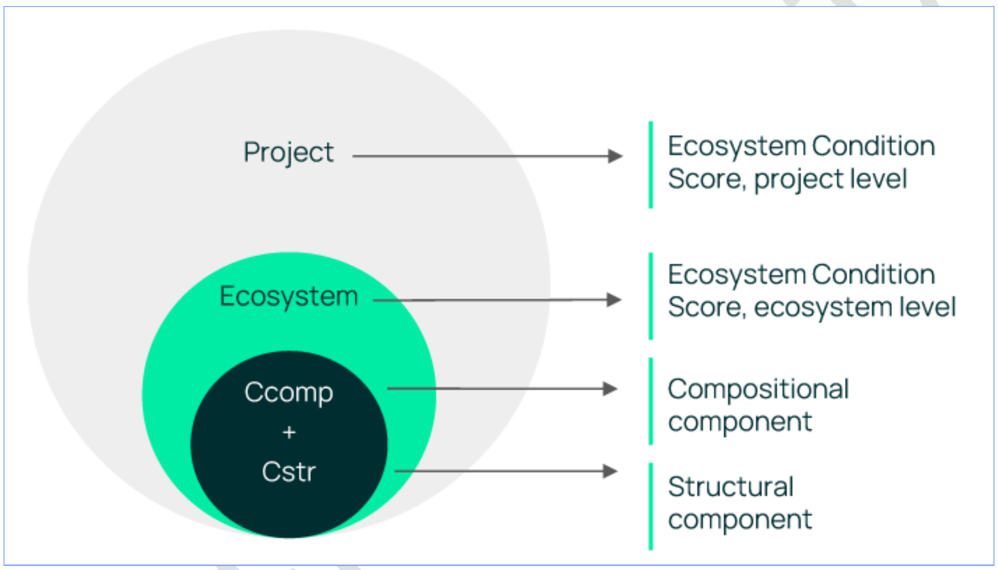
The analytical hierarchy has three levels:

Component level. For each ecosystem, at least four representative biological groups are assessed using Mean Species Abundance (MSA) or, where use of only presence/absence data is defensible, Potentially Disappeared Fraction of species (PDF).
A separate ecosystem-level structural set is assessed against the same approved reference condition.

Ecosystem level. For each ecosystem, the biological scores are averaged to obtain Ccomp and the structural scores are averaged to obtain Cstr. The Ecosystem Condition Score is then calculated according to Equation (6).

Project level. Where more than one ecosystem is present, the project ECS is the area-weighted mean of the ecosystem-level ECS values according to Equation (7).

Figure 6. Conceptual analysis scales and interrelation.



7.1.2 Minimum requirements per ecosystem

The following minimum requirements apply to every ecosystem included in the account area:

- Include at least four representative biological groups. The set must cover complementary ecological roles, trophic positions, habitats or response times and must not rely only on closely related taxa or on groups expected to respond identically. The minimum of four biological groups is intended to provide representation across complementary ecological dimensions while reducing dependence on the response of any single taxonomic or functional group.
- Use MSA for a biological group when reliable, comparable abundance data are available. Use 1 − PDF only where presence/absence data are the defensible (i.e., feasible; MSA is generally preferred where feasible) basis of assessment. The choice is fixed in the PMP before monitoring results are examined.

- Select an ecosystem-level structural set that represents complementary spatial scales and dimensions of habitat condition, avoids redundancy, and is appropriate to the conservation or restoration context.
- For a physical Reference Ecosystem, project and reference datasets must be methodologically comparable in survey extent, timing, effort, detectability treatment, taxonomic resolution and sampling sufficiency. Species-accumulation, coverage-based or equivalent diagnostics must demonstrate sufficiency for each biological group. For a reconstructed reference condition, the evidence, comparability, harmonization and uncertainty requirements of **Section 3.1** apply.

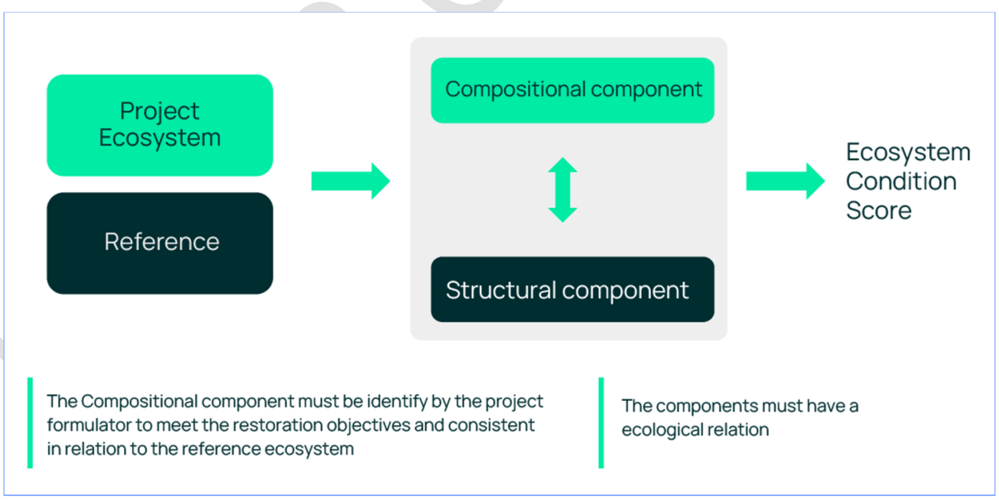
7.2 Components and indicators of ecosystem condition

Each selected indicator belongs to one of two independent branches. Ccomp represents the condition of the selected biological groups, while Cstr represents structural condition at ecosystem level. Their ecological relationships guide selection and interpretation but do not create biological-structural pairs in the calculation. Each indicator is counted once within its own component.

The first step is to identify every ecosystem to be conserved or restored and to approve its corresponding reference condition, following the eligibility and reference rules of this methodology.

For each ecosystem, the PMP must define a balanced biological set and a complementary structural set, supported by ecological evidence, feasibility and expected precision.
The calculation prevents double weighting of structural variables. A structural indicator is included once in Cstr even if it helps explain the response of several biological groups. Likewise, each biological group contributes once to Ccomp.

Figure 7. Conceptual architecture of the Ecosystem Condition Score with independent biological and structural components.



Component values range from 0 to 1. A value of 1 indicates that the selected attributes meet or exceed the approved reference condition; values below 1 indicate an increasing departure from that benchmark. Values exceeding reference are capped at 1 before aggregation.

7.2.1 Compositional component (Ccomp)

Ccomp is based on at least four biologically representative groups. Groups may be taxonomic, functional or ecological assemblages, for example vascular plants, birds, mammals, pollinating insects, soil macroinvertebrates, fish, fungi or soil microbiota. The selected set must be ecologically balanced and feasible to measure with comparable precision in project and reference areas.

Mean Species Abundance (MSA) is the preferred biological-group score where abundance, density, encounter rate or percentage cover can be estimated reliably and is calculated according to Equation (1). For each native reference species, divide its value in the assessed ecosystem by its value in the reference condition, cap that ratio at 1, and average the ratios. A species absent from the assessed ecosystem receives 0; a species absent from the reference set is excluded (Alkemade *et al.*, 2009; Schipper *et al.*, 2020).

$$MSA = \frac{1}{N_{ref}} \sum_{s=1}^{N_{ref}} min\left(\frac{A_s}{A_{s,ref}}, 1\right) \qquad \text{Equation (1)}$$

Equation (1) is calculated separately for each biological group, ecosystem and verification. N_{ref} is the number of native species in the reference set; s identifies a species; A_s is its measured abundance in the assessed ecosystem; and $A_{s,ref}$ is its value in the reference condition. The abundance unit and sampling effort must be identical in both datasets. Group, ecosystem and time labels are retained in reporting tables but omitted from the equation for readability.

Where reliable relative abundance measures cannot be obtained, the alternative score is the proportion of native reference species detected in the assessed ecosystem, expressed as 1 - PDF and calculated according to Equation (2). PDF is the Potentially Disappeared Fraction of the reference species set. The complement is used so that higher values always mean better condition.

$$1 - PDF = \frac{N_{shared}}{N_{ref}} \qquad \text{Equation (2)}$$

In Equation (2), N_{shared} is the number of native reference species detected in both the assessed and reference samples, and N_{ref} is the number of native reference species in the reference set. MSA is generally more sensitive because abundance can decline before local disappearance; 1 - PDF is less sensitive but practical where it is defensible to use only incidence data (Verones *et al.*, 2020; Kuipers *et al.*, 2025).

Richness, abundance, Shannon diversity, community-similarity indices and other measures may be reported for interpretation or quality control, but they do not replace MSA or 1 − PDF in the ECS calculation. The method selected for each biological group remains fixed through the project unless a formally approved methodological change preserves the full time series.

Sampling sufficiency must be demonstrated using species accumulation curves, sample coverage or an equivalent diagnostic appropriate to the group. Where a physical Reference Ecosystem is used, project and reference surveys must have comparable area, season, effort, detectability treatment and taxonomic resolution. Where a reconstructed reference condition is used, sampling sufficiency applies to the assessed ecosystem and reference comparability follows **Section 3.1**.

7.2.2 Structural component and attributes (Cstr)

The Cstr is a single ecosystem-level component constructed from a strategically selected set of structural indicators. It is independent of the number and identity of biological groups chosen for Ccomp. Structural indicators may still be ecologically related to those groups, but no indicator is assigned to a particular group for calculation.

Indicator selection is ecosystem-specific and evidence-based. The set must represent complementary dimensions and spatial scales of habitat condition, remain feasible to monitor throughout the project, and minimize redundancy. Structural variables are not required to be identical across ecosystems; they may differ where justified by ecosystem characteristics, project objectives and relevant threats, while the same transparent calculation architecture is retained.

For forests, as an illustrative rather than prescriptive example, a defensible structural set may combine habitat amount, functional connectivity and internal stand structure. Examples include Percentage of Landscape (PLAND), representing the percentage of the analysis landscape occupied by the focal habitat class, for habitat amount; Probability of Connectivity (PC) for a justified focal organism or guild; and one or more non-redundant stand attributes such as basal area, vertical complexity or coarse woody debris. Several fragmentation metrics that express essentially the same signal must not be included together merely to increase weight.

Landscape amount and configuration. Indicators at this scale quantify the amount, interior condition, aggregation or connectivity of habitat within a predefined analysis extent. Pixel size, habitat classification, extent, edge rule, resistance model and dispersal assumptions must be fixed before time zero and applied consistently through monitoring. For physical reference sites, equivalent definitions and analytical procedures are required; reconstructed reference conditions follow the comparability provisions of **Section 3.1**.

Stand or local structure. Indicators at this scale describe live and dead habitat structure within plots, transects or remote-sensing units. In forests, examples include canopy cover, basal area, vertical complexity and coarse woody debris. Vertical structure represents the distribution of vegetation through height strata and may be quantified through vegetation-height distributions, foliage-height diversity, canopy-height variation or validated LiDAR metrics. It is a structural indicator in its own right and is not repeated inside any biological-group score. Thresholds, plot design, minimum diameters and measurement technology must remain fixed through monitoring and, for physical reference sites, be methodologically equivalent in assessed and reference data. Reconstructed references follow **Section 3.1**.

- For freshwater, wetland, marine and coastal ecosystems, structural indicators must describe the relevant habitat-forming biota and physical configuration, such as hydroperiod, flow, channel or shoreline complexity, substrate, reef or benthic complexity, depth variation and connectivity. Canopy, basal area and deadwood apply only where ecologically meaningful. In these ecosystems, physical and chemical characteristics, including water-quality parameters such as nitrogen and phosphorus, turbidity, dissolved oxygen and salinity, may be key structural attributes where ecologically relevant.
- If a defensible structural set cannot be specified for an ecosystem within this general framework, crediting must wait for approval of an ecosystem-specific module.

Conservation projects should prioritize slowly formed attributes characteristic of mature ecosystems and sensitive to structural simplification, such as large-tree structure, vertical complexity, interior habitat and coarse woody debris. Restoration projects should use a fixed set that captures complementary stages of recovery, for example early cover, intermediate woody accumulation and slower development of vertical or deadwood structure. The indicators are not rotated after observing performance.

The examples in **Table 3** illustrate balanced biological and structural sets. They are not mandatory combinations. The PMP must justify the final set for each ecosystem and identify indicators excluded because of redundancy, non-monotonic response or insufficient reference data.

Table 3. Examples of Biological Components and their possible structural parameters.

Biological Components	Possible Structural Parameters
— Terrestrial —	
Birds	Vertical stratification, % tree cover, cavity density
Pollinating insects	Floral richness, native herbaceous cover, edge length
Vascular plants	% dominant native species, total cover, contagion index
Soil fungi	% leaf litter, plant biomass, microenvironmental heterogeneity
Small mammals	Patch connectivity, shelter density, understory cover
— Freshwater / Wetland —	
Wetland/freshwater macroinvertebrates	Vegetation cover, hydroperiod stability, water column depth variability
Waterbirds	Open water–vegetation interspersion, shoreline/edge length, water level fluctuation
— Marine-coastal —	
Corals / reef-building organisms	Substrate rugosity, live coral cover (%), structural complexity index
Seagrasses	Shoot density, canopy height, patch/meadow connectivity
Macroalgae	% cover, canopy height, understory complexity
Benthic macroinvertebrates	Substrate heterogeneity, sediment composition, habitat patchiness
Fish (reef/demersal)	Habitat structural complexity, refuge/shelter density, connectivity between habitat patches
Plankton (phyto- and zooplankton)	Water column stratification, turbidity/light penetration, nutrient and productivity gradients

Marine mammals	Habitat/range connectivity, prey availability proxies, disturbance/noise level indicators
Mangrove-associated fauna	Root/pneumatophore density, canopy cover, tidal/hydrological connectivity

These examples cover terrestrial, freshwater, wetland, marine and coastal contexts. Structural attributes should be selected according to the ecology of the Biological Components, whether terrestrial, freshwater or marine-coastal. This means there must be a demonstrable ecological relationship between the biological component and the structural component; ecological relationships between biological groups and habitat structure support indicator selection and interpretation, but do not create pairwise scores or cause a structural indicator to be counted more than once.

7.3 Calculation of the Ecosystem Condition Score

7.3.1 Calculation of the Compositional component (Ccomp)

For every ecosystem and verification, calculate one approved biological-group score B_i using Equation (1), with MSA as the preferred approach whenever reliable abundance data can be obtained, or Equation (2) when 1 − PDF is the defensible basis. The Compositional component is the arithmetic mean of those group scores (Equation (3)).

$$C_{comp} = \frac{1}{n} \sum_{i=1}^{n} B_i \qquad \text{Equation (3)}$$

In Equation (3), Ccomp is the Compositional component; B_i is the score of biological group i; and n is the number of valid biological groups. The minimum is n = 4. Equal weights prevent a group from receiving more influence merely because it has more submetrics.

Ccomp ranges from 0 to 1 and is interpreted relative to the approved reference condition. In conservation, each current biological group is compared with the static time-zero condition of the same ecosystem. In restoration, each group is compared with the approved restoration reference condition.

7.3.2 Calculation of the Structural component (Cstr)

Each structural indicator is first converted to a dimensionless, reference-normalized score using Equation (4). Indicators must be selected or transformed so that higher values consistently indicate movement toward the reference condition.

$$S_j = min\left(\frac{X_j}{X_{j,ref}}, 1\right) \qquad \text{Equation (4)}$$

In Equation (4), S_j is the normalized score of structural indicator j; X_j is its value in the assessed ecosystem; and $X_{j,ref}$ is its value in the approved reference condition. The ratio is capped at 1. For an inverse or non-monotonic indicator, the ecological transformation and bounds must be validated and fixed in the PMP before time zero; pressure variables (as distinguished from state-of-nature outcome indicators; see **Section 2**, Scope) are not inserted into Cstr merely by reversing their sign.

After normalization, the structural component is the arithmetic mean of the complementary, non-redundant structural scores (Equation (5)):

$$C_{str} = \frac{1}{m} \sum_{j=1}^{m} S_j \qquad \text{Equation (5)}$$

In Equation (5), Cstr is the structural component; S_j is the normalized score of structural indicator j; and m is the number of valid, non-redundant structural indicators. Every selected indicator is counted once, regardless of how many biological groups it helps to interpret.

7.3.3 Calculation of the Ecosystem Condition Score for Ecosystems

Equation (6) integrates the two independently calculated components using the fixed weights established by this methodology:

$$ECS_{eco} = 0.60\, C_{comp} + 0.40\, C_{str} \qquad \text{Equation (6)}$$

In Equation (6), ECS_{eco} is the Ecosystem Condition Score for the ecosystem being assessed; Ccomp is its mean biological condition; and Cstr is its mean structural condition. The biological branch receives 60% and the structural branch 40%. These weights are fixed and are not adjusted after observing project results.

The two branches are combined only at ecosystem level. Neither branch is subdivided into biological–structural pairs, and each selected indicator is counted once in its own component.

7.3.4 Calculation of the Ecosystem Condition Score for the Project

Where the project contains more than one ecosystem, calculate the project-level score as the area-weighted mean of ecosystem ECS values (Equation (7)):

$$ECS_{proj} = \sum_{e=1}^{q} \frac{A_e}{A_{tot}} \times ECS_{eco,e} \qquad \text{Equation (7)}$$

In Equation (7), ECS_{proj} is the project Ecosystem Condition Score; $ECS_{eco,e}$ is the score of ecosystem e; A_e is the eligible area occupied by ecosystem e; A_{tot} is the total eligible project area; A_e/A_{tot} is therefore the proportion of the total eligible project area occupied by ecosystem e; and q is the number of ecosystems. The area proportions across all ecosystems sum to 1. Ecosystem and verification labels are retained in reporting tables but omitted from the equation for readability.

The project score ranges from 0 to 1. Ecosystem-level results, Ccomp, Cstr and every underlying indicator must also remain visible in reporting so that aggregation does not conceal deterioration in a particular ecosystem or component.

7.4 Quantification of the Biodiversity Restoration Project scenario

Restoration projects use the same Ccomp, Cstr, ecosystem ECS and project ECS equations. The difference lies in the reference and credited outcome. The approved restoration reference supplies the target abundance, incidence and structural values, while time zero records the initial condition of the restoration area. Equation (8) expresses the verified change in project condition between consecutive verification points.

$$\Delta ECS_{proj,t} = ECS_{proj,t} - ECS_{proj,t-1} \qquad \text{Equation (8)}$$

In Equation (8), $\Delta ECS_{proj,t}$ is the verified gain in project condition during verification interval t; $ECS_{proj,t}$ is the project score at the current verification; and $ECS_{proj,t-1}$ is the score at the preceding verification, with time zero serving as the preceding point for the first interval. Positive values indicate recovery toward the reference condition. Negative or zero values do not constitute a restoration gain.

The biological and structural indicator sets remain fixed across the restoration trajectory. They should be selected at project design to include responses expected at early, intermediate and late stages so that short-term saturation of one indicator does not require opportunistic replacement.

7.5 Biodiversity credit calculation

This section translates verified Ecosystem Condition Score (ECS) results into Voluntary Biodiversity Credits (VBCs) under the applicable CBCP requirements.

A VBC represents a verified biodiversity outcome calculated from the appropriate ECS result, eligible project area and verified time interval.

ECS is the condition measure used in VBC calculation. It ranges from 0 to 1, with 1 indicating that the selected attributes meet or exceed the approved reference condition before aggregation.

This methodology calculates conservation credits from the verified project ECS and restoration credits from the verified increase in project ECS between consecutive verification points. The biological and structural evidence remains reportable alongside the resulting credit calculation.

Conservation and restoration credits shall be issued and reported as distinct credit classes. This methodology provides no conversion factor, no claim of equivalence and no market valuation between those classes.

In Biodiversity Conservation Projects, VBCs are calculated with Equation (9):

$$VBC_{cons} = I \times A \times T \qquad \text{Equation (9)}$$

Where:

VBC_{cons} = Voluntary Biodiversity Credits calculated for conservation during the verified period.

I = project Integrity at verification t, operationalized in this methodology as $ECS_{proj,t}$ (the area-weighted Project Ecosystem Condition Score at verification t).

A = eligible account area in hectares.

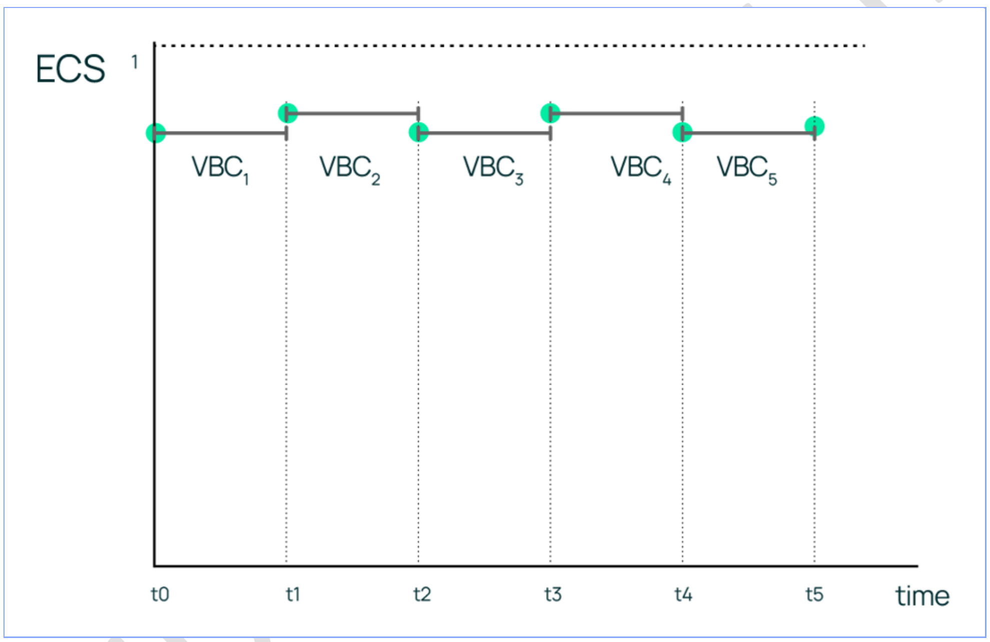
T = verified time interval in months prescribed by the CBCP.

For Biodiversity Conservation Projects, the reference condition is the documented condition of the project area at time zero. It is static and is not re-measured or recalculated at later verification events. By construction, $ECS_{proj,0}$ = 1 because the project and time-zero reference condition are identical at project start.

At each verification, project Integrity (I) is represented by the measured $ECS_{proj,t}$ and is used directly in Equation (9). Because every biological and structural score is capped at 1 before aggregation, $ECS_{proj,t}$ and therefore I cannot exceed 1. Component and ecosystem results remain reportable even when project Integrity is used for crediting.

Where the measured project ECS falls below 0.9 at any verification event, this is evidence of significant degradation. No conservation credits are issued for that verification interval; the deficit is recorded, and the project proponent must trigger the risk identification and management procedures in **Section 9** before credit issuance can resume. This 0.9 threshold is adopted as an initial conservative value. Because the Mean Species Abundance calculation caps each species-level ratio at 1 (Equation 1), natural fluctuations in species abundance can only reduce, and never increase, the resulting score — meaning Ccomp may register below 1 even in a stable, undegraded ecosystem. The threshold, and any associated tolerance allowance, shall be periodically reviewed as empirical evidence accumulates across ecosystem types and long-term monitoring datasets. This methodology does not issue negative VBCs. A decline is recorded and triggers management; no VBCs are issued for an affected interval where the condition threshold or other applicable requirements are not met.

Figure 8. Conceptual issuance of Voluntary Biodiversity Credits (VBC) based on ECS in conservation projects.



For Biodiversity Restoration Projects, the verified gain is the change in project ECS during each verification interval, as defined in Equation (8). VBCs are calculated with Equation (10):

$$VBC_{rest} = \Delta I \times A \times T \qquad \text{Equation (10)}$$

Where:

VBC_{rest} = Voluntary Biodiversity Credits calculated for restoration during the verified period.

ΔI = verified change in project Integrity during verification interval t, operationalized in this methodology as $\Delta ECS_{proj,t}$ (the verified change in the Project Ecosystem Condition Score defined in Equation (8)).

A = eligible account area in hectares.

T = verified time interval in months prescribed by the CBCP.

For restoration projects, the verified change in project Integrity (ΔI) is represented by $\Delta ECS_{proj,t}$ calculated between consecutive verification points according to Equation (8), and is used in Equation (10).

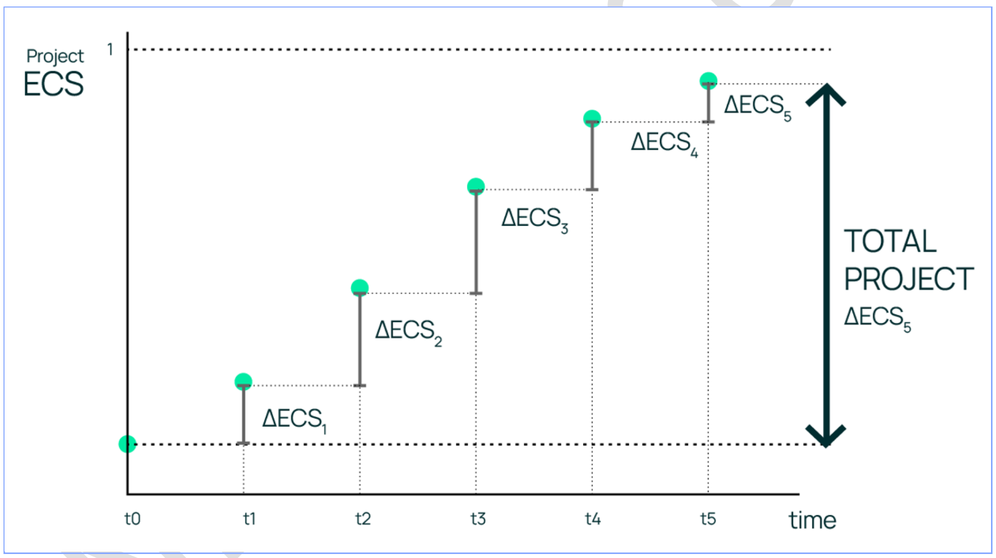
Measuring project ECS over time allows the biological and structural recovery trajectory to be tracked transparently. The verified interval gain is calculated with Equation (8), and restoration credits are calculated with Equation (10); all underlying component and ecosystem scores remain available for diagnosis and verification.

For example:
ECS at Time 0 = 0.22
ECS at Time 1 = 0.38

Between Time 0 and Time 1, project ECS increased from 0.22 to 0.38. Therefore, for the first verification interval and according to Equation (8), $\Delta ECS_{proj,1} = 0.38 - 0.22 = 0.16$.

The verified gain ΔI, represented by $\Delta ECS_{proj,t}$, is entered in Equation (10) together with eligible area and time, as illustrated in **Figure 9**.

Figure 9. Conceptual issuance of Voluntary Biodiversity Credits (VBC) based on ECS in restoration projects.



Once the restored ecosystem reaches an ECS of 0.9 or above and this condition is sustained over two consecutive verification intervals, the project may transition to conservation crediting in accordance with the applicable Cercarbono requirements. Credit issuance then changes from restoration credits based on ΔECS to conservation credits based on ECS.
For conservation projects, ECS must remain stable throughout the project, whether the project began as conservation or transitioned from restoration.

Stability shall be assessed statistically rather than as a requirement for an unchanging value, in recognition of the natural fluctuation inherent to ecological systems. A conservation project shall be considered stable where the measured ECS at each verification event remains within a defined tolerance band around the reference value (ECS ≥ 0.9, per the degradation threshold established above), and no consistent declining trend is detected across consecutive verification intervals. The PMP must document the criterion and method used to assess trend and stability — including how measurement uncertainty is accounted for — though this methodology does not mandate a specific statistical estimator or decision rule.

Trend analysis shall account for measurement uncertainty associated with the indicators and methods used (see **Section 14**, Information management). Where a declining trend is detected — whether or not the 0.9 threshold has yet been crossed — this shall trigger the risk identification and management procedures established in **Section 9**.
Stability, as defined here, is assessed solely as an ongoing performance requirement after project entry; it is not a condition of area eligibility (see **Section 3.1**).

At each verification, the underlying biological and structural results shall remain available alongside the ECS to support interpretation, risk management and audit.

The methodology considers and encourages associative efforts where conservation and restoration projects in the same area or same ecosystem are proposed. Credits issued under each pathway are calculated independently and are not equivalent or fungible. For comparable eligible areas and time periods, conservation credits will generally be substantially larger in volume than restoration credits — often by an order of magnitude or more — since conservation credits are calculated from a sustained condition value (I, typically close to 1), while restoration credits are calculated from an incremental gain (ΔI, typically a small fraction of 1). This difference reflects the distinct nature of what each credit class represents (see Introduction) and must not be interpreted as an indication of relative project quality or effort.

The ECS time series shows whether an ecosystem maintains or recovers biological and structural condition relative to its reference. A restoration project may transition only after the condition threshold and stability requirements above have been met.

Figure 10. Illustrative ecosystem-condition trajectories for restoration and conservation projects.

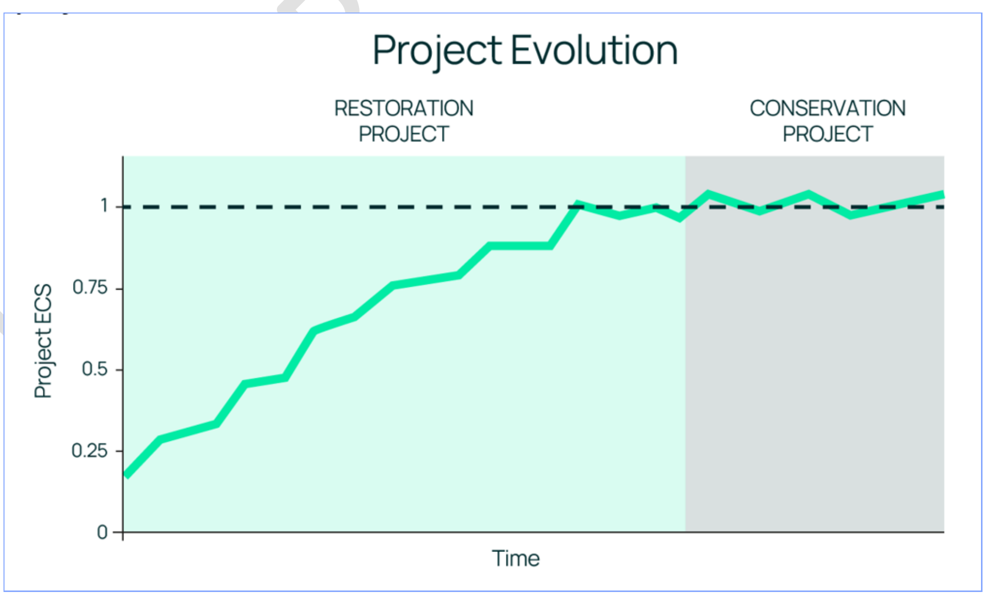


Figure 10 is illustrative only: a restoration project may transition to conservation crediting only after meeting the stated condition and stability requirements; no universal recovery trajectory or timetable is assumed.

8 Grouped projects

Grouped projects bring together multiple distinct sites, landholders, operational units, or spatially contiguous conservation and restoration areas, under a single Project Management Plan and unified MRV process for Biodiversity Conservation Projects (BCP), Biodiversity Restoration Projects (BRP), or a combination of both. Each included site or area (instance) is assigned to its applicable pathway and must individually meet national requirements and the eligibility, safeguard and methodological criteria, monitoring obligations, and crediting calculation (**Section 7.5**), applicable to that pathway.

The PMP must describe every instance separately: georeferenced boundaries, pathway assignment (BCP or BRP), area, tenure and consent status, implementing parties, start date, planned activities, baseline and targets, and the ownership of any resulting biodiversity units.

The PMP must also disclose, per instance, its governance structure, including ownership of and accountability for any resulting biodiversity credits, and whether the instance is located on or adjacent to lands of Indigenous Peoples or local communities. Monitoring, QA/QC and verification obligations apply to all instances; data and verification results must be reported per instance and may be aggregated for the grouped project.

8.1 Addition and exclusion of areas

New instances may be added to the grouped project provided each new instance satisfies all eligibility, additionality, tenure and safeguard requirements and is documented in the PMP. Additions that materially affect baseline assumptions or projections require a reassessment of the baseline, updated risk and permanence analyses, and verifier approval before any credits can be claimed for the new instance. Conversely, an instance may be withdrawn only by removing the entire instance (partial polygon withdrawals are not permitted).

Withdrawals must be recorded in a revised PMP; any previously issued units attributable to the withdrawn instance must be identified and appropriately adjusted in subsequent reporting to prevent double counting.

8.2 Update of spatial boundaries

Permanent changes to spatial boundaries (additions, removals or reclassifications) require formal amendment of the PMP and verifier approval. Minor mapping corrections that do not alter accounting outcomes may be documented without revalidation but must be recorded in the change log with supporting evidence. Any boundary update that changes the area used in baseline or crediting calculations will trigger baseline reevaluation and, where applicable, adjustments to monitoring, risk buffers and issued units to maintain integrity and traceability.

Grouped projects offer operational efficiencies for multiple owners or dispersed parcels but require clear governance, rigorous instance-level documentation and transparent reporting to ensure traceability and credibility of biodiversity outcomes.

9 Risk identification and management

Risk identification and assessment is a comprehensive process that considers potential threats to biodiversity, project integrity, and the integrity of the credits issued. In the methodology, it is recommended to conduct assessments based on the principles of adaptive management and internationally recognized methodologies for environmental risk management.

The risk assessment process should schematically include:

- ***Threat identification:*** analysis of biophysical pressures (deforestation, climate change, invasive species), socio-economic pressures (land-use conflicts, policy changes), and operational risks (failures in monitoring or financing).
- ***Probability and impact analysis:*** use of risk matrices combining the likelihood of occurrence with the magnitude of consequences on indicators such as the biological and structural component scores and the Ecosystem Condition Score (ECS).
- ***Risk prioritization:*** classification by criticality levels to guide resources toward the most impactful factors.
- ***Documentation and traceability:*** systematic recording of risks and their evolution for periodic review.

Risk management of the NIM is structured through mitigation and contingency plans that ensure project resilience against identified threats.

Mitigation strategies:

- ***Prevention:*** avoiding risk materialization through land-use planning, strengthening local capacities, and regulatory measures.
- ***Reduction:*** implementing actions that decrease either probability or impact, such as habitat restoration, diversification of funding sources, and protection of critical areas.
- ***Transfer:*** distributing risk through co-financing agreements, environmental insurance, or collaboration with strategic partners.

Contingency plans:

- Establishment of rapid response protocols for critical events (fires, pests, spills).
- Definition of responsibilities and communication chains to trigger immediate measures.
- Financial and logistical reserves to ensure continuity of essential activities.
- Enhanced monitoring mechanisms during and after the contingency to assess impacts and guide recovery.

This comprehensive approach allows not only to anticipate and respond to risks but also to incorporate lessons learned to strengthen adaptive management, ensuring that biodiversity goals and certification commitments remain valid throughout the project cycle.

10 Project leakages

It is an inherent principle that any project, regardless of scope or scale, generates leakage—unintended effects that occur outside the immediate boundaries where project activities are conducted. These externalities can be both positive and/or negative, impacting environmental, social, and economic dimensions of the surrounding ecosystem and community.

Recognizing and managing the leakage is important to ensure the sustainability and socio-ecological integrity of projects**.**

While biodiversity-focused projects can generate positive leakage — such as contributions to ecosystem resilience, habitat connectivity, and community well-being in surrounding areas — negative leakage is a material risk that must not be underestimated. This is particularly the case for Biodiversity Conservation Projects, and for Biodiversity Restoration Projects implemented on previously productive land, where project activities restrict or discontinue prior human uses (e.g., crop production, livestock grazing, timber extraction, or access to natural resources). These displaced activities may relocate to areas outside the project boundary, resulting in biodiversity loss elsewhere that offsets some or all of the project's benefits. Project proponents and developers should not assume positive leakage as a default outcome and must assess the magnitude and likelihood of both positive and negative leakage risks specific to their project's activity type and land-use context, and must document this assessment in the PMP.

In addition, even within these frameworks, unintended adverse leakage may arise due to unanticipated interactions or cascading effects. The following information should be considered as a recommendation for projects.

Where the leakage assessment above identifies a risk of material magnitude and/or likelihood, project formulators and developers must adopt a proactive, strategic approach to identifying, managing, and monitoring that leakage, beyond the project's defined operational boundaries, proportionate to the assessed risk. Where the assessed risk is low in both magnitude and likelihood, this proactive approach is recommended as good practice rather than required.

It should be recognized that leakage may occur not only locally but also through tele-coupled effects at distant locations, depending on context and value chain linkages (e.g., displaced agricultural or extractive activities relocating to other regions or countries). While project proponents will typically have limited or no control over distant leakage, this methodology acknowledges its existence and encourages proponents to consider it, where feasible, as part of the broader externalities assessment described below.

Such an approach should be embedded within the project planning, implementation, and evaluation processes, aiming to maximize beneficial outcomes while minimizing adverse impacts.

This involves a comprehensive assessment of the socio-ecological context, interdependencies, land-use dynamics, adjacent communities, and relevant value chains.

This analysis will provide the foundation for designing activities that deliberately promote positive externalities—such as ecosystem services enhancement, local employment, and community engagement—while attenuating potential negative repercussions like resource depletion, pollution, or social dislocation, including impacts arising from the displacement of pre-existing productive activities — such as crop or timber production displaced by ecosystem restoration or restricted access to natural resources as a result of conservation activities.

The development of an expanded externalities management could be considered as a component of the project's overall strategy.

Where a management plan is required under the risk-based approach above, it must incorporate, at minimum:

- **Indicators and Metrics:** defining measurable indicators to capture changes in ecosystem, resource usage, and social impacts that may result from project activities, both within and outside the project area.
- **Participatory Monitoring:** involving local communities, indigenous groups, NGOs, and other stakeholders in continuous monitoring processes, ensuring transparency, cultural appropriateness, and shared ownership of ecological and social outcomes.
- **Mitigation and Compensation Strategies:** developing contingency plans and mitigation measures to address identified negative leakage promptly and effectively, including ecosystem restoration, resource management adjustments, or socio-economic interventions.
- **Dynamic Adaptation Mechanisms:** establishing a flexible, iterative framework enabling the project to respond adaptively to evolving external impacts, incorporating stakeholder feedback and new scientific information.
- **Transparent Communication:** maintaining open, honest dissemination of monitoring results, externalities management actions, and overall project impacts to all relevant stakeholders, thereby fostering trust, collaboration, and shared responsibility.

Integrating leakage management into the project lifecycle enhances its credibility and potential for certification, ensuring that social license, ecological integrity, and long-term sustainability are maintained.

This comprehensive approach aligns with international standards and best practices for environmental and social governance, reinforcing the project's contribution to global efforts in sustainable development.

11 Monitoring plan

The Monitoring Plan documents how biodiversity outcomes and related project activities will be measured, recorded, analyzed and reported for Biodiversity Conservation and Biodiversity Restoration Projects. It ensures results are real, transparent, auditable and attributable to project actions, and aligns with applicable Cercarbono tools and guidance.

11.1 Scope and duration

- The Monitoring Plan covers all indicators, data sources, methods, schedules, responsibilities and QA/QC procedures required for the PMP, MRV and verification cycles.
- Monitoring shall be conducted regularly throughout the crediting/accreditation period. A minimum project monitoring commitment of forty (40) years is recommended to secure permanence and manage long-term risks, unless otherwise specified and approved by the verifier.

11.2 Core components (to be included in the PMP)

Monitoring purpose and objectives

- Clear statement of why monitoring is performed (e.g., to demonstrate additionality, measure biodiversity outcomes, verify permanence, track social safeguards and report SDG contributions).

Indicators and parameters

- Monitor and report all three of the following linked categories, each of which is mandatory regardless of whether it feeds into the ECS calculation: (i) ecological outcomes, including Ccomp and Cstr, that calculate ECS; (ii) pressure and response indicators for interpretation and adaptive management; and (iii) governance and social-safeguard indicators. Categories (ii) and (iii) do not enter the ECS calculation, but their monitoring, reporting and disclosure are required components of the PMP.
- For each indicator specify units, target values and baseline.
- Indicator selection and design must involve local rights-holders, including Indigenous Peoples and local communities. Subject to free, prior and informed consent (FPIC), it may incorporate Traditional Knowledge; projects on Indigenous lands, territories or waters must provide meaningful opportunities to participate in the Monitoring Plan. The Monitoring Plan must define a minimum detectable threshold of change ("meaningful change") for each principal indicator, below which a measured difference is not treated as a verified outcome.

Data types and sources

- Identify primary and secondary data used (field surveys, camera-traps, acoustic records, eDNA, remote sensing, administrative records, community monitoring).
- Specify data provenance, frequency of acquisition and any external reference datasets (including Cercarbono tools where relevant).

Methods and protocols

- Describe and provide clear rationale for sampling design, measurement methods, modelling approaches and calculation steps.
- Indicate use of remote sensing, UAVs, eDNA or other technologies and detailed calibration/validation procedures.
- Document assumptions and uncertainty treatment; state an expected or target measure of precision, such as relative margin of error or sample coverage, where relevant to detecting change; and adopt conservative choices when evidence is limited. Because this methodology aims to detect change in ecosystem condition over time, monitoring methods should prioritize measurement precision and consistency (the ability to reliably detect a real change between verifications) over absolute accuracy (how close a single estimate is to the true population value). Uncertainty and reversals in crediting conversion: the PMP must document how measurement uncertainty and potential reversals are treated when converting monitored indicator values into ECS and, subsequently, into credited units (see **Section 7.5**).

Monitoring frequency and timing

- Define monitoring frequency per indicator (e.g., annual species surveys, continuous camera-trap deployment, quarterly patrol reports, satellite change detection every 6–12 months).
- Align verification intervals with the methodology (verification ≤ 3 years).

Roles and responsibilities

- Assign responsibilities for data collection, data management, QA/QC, analysis, reporting and verification liaison (include names/roles or institutional positions). Conflicts of interest: where project proponents, including Indigenous Peoples or local communities that are beneficiaries of the credits, are involved in collecting monitoring data, their contribution must be triangulated with independent data sources and/or verified through third-party audit.
- Define authorization routes for changes to monitoring procedures or data corrections.

Data management and traceability

- Specify storage systems, file formats, metadata standards and version control procedures.
- Ensure chain-of-custody for samples and safeguard sensitive data (e.g., precise locations of threatened species).
- Reference any Cercarbono modules or registries used for data submission and public disclosure.

QA/QC and audit procedures

- Describe internal QA/QC checks, calibration routines, sample replication, data validation steps and error correction workflows.
- Provide procedures for internal audits and preparation for independent verification.

Adaptive management and corrective actions

- Define triggers (thresholds) that prompt management responses and the actions to be taken when monitoring indicates deviation from targets.
- Document how monitoring results will feed decision-making and project adjustments.
- Reporting and disclosure.
- Specify report templates, frequency (e.g., annual monitoring reports), required contents (results, methods, uncertainties, incidents, safeguard compliance) and public disclosure modalities consistent with registry policy.
- Include procedure for submission of verification reports and for maintaining archival records for the accreditation/crediting period.

11.3 Minimum documentation to be submitted with the PMP

- Monitoring Plan narrative and table of indicators.
- Sampling protocols and field datasheets.
- GIS files of spatial boundaries used for monitoring.
- Data management plan (storage location, access rules, metadata template).
- QA/QC checklist and calibration logs.
- Roles and contact list for monitoring team.

11.4 Practical guidance and conservatism

- Prioritise direct field measurements where feasible and use remote sensing or models only when supported by ground truthing.
- Where multiple data sources conflict, adopt the conservative option that does not overstate biodiversity gains.
- Ensure all methods and parameter choices are reproducible, documented and justified in the PMP.

11.5 Alignment with verification and Cercarbono tools

The Monitoring Plan must enable independent verification and be consistent with Cercarbono guidance and reporting tools (including SDG reporting procedures where applied). Verifiers will assess the Plan's adequacy during validation and subsequent verification events.

This Monitoring Plan template is intentionally concise; project-specific annexes should provide full technical protocols, sampling designs, data templates and calculations to allow reproducible implementation and verification. Third-party verification and audit under this methodology must cover both the biodiversity outcomes reported under the Monitoring Plan and compliance with the social safeguards referenced in this methodology. Auditors must have access to relevant stakeholders and to the underlying data and metadata needed to evaluate compliance and must document that this access was exercised. Auditor qualification and accreditation criteria are established under the applicable Cercarbono verification and validation rules.

12 Safeguards

The activities of the projects considered by the BCP or BRP shall not cause net harm to the social, environmental, economic, or legal aspects of the surrounding areas and/or communities where it is implemented. Therefore, shall ensure compliance with ***Safeguarding Principles and Procedures of Cercarbono Certification Programme***, which includes social and environmental safeguards to protect the people and the environment against the risks that could be posed by the implementation of Programs or Projects.

13 Stakeholder consultation

Stakeholder consultation in this methodology shall be carried out in accordance with the guidelines described in the section: ***Public consultation*** of the ***Cercarbono's Biodiversity Certification Programme Protocol*** and in the applicable reference documents. All records and results of the public consultation process shall be uploaded to the EcoRegistry platform, where they will be duly stored. Additionally, the requirements on this matter outlined in the current ***Safeguarding Principles and Procedures of Cercarbono Certification Programme*** document of the Cercarbono certification programme shall be observed.

14 Information management

Quality control is a continuous process covering the entire project life cycle. It begins at the project design stage with pre-validation of indicators, measuring techniques and calculation models, and continues during implementation through ongoing monitoring of data quality and compliance with field protocols. At the reporting and verification stage, quality control is performed through statistical and methodological review of results before submission for external verification. After credit issuance, quality control continues through random audits and monitoring of permanence commitments.

The purpose of this section is to set out minimum requirements for the receipt, control, storage and auditability of data and information used to establish baselines, conduct monitoring and support verification for BCP and BRP projects, in alignment with Cercarbono guidance and tools.

Applies to all primary and derived data used or produced by the project: field records, remote sensing products, laboratory results, models, geospatial files and associated metadata throughout the PMP, monitoring and verification lifecycle.

Principles

- Traceability: every observation, measurement and analytical product must include metadata identifying origin, date, responsible party, method and version.
- Conservatism and consistency: where data sources conflict, the technically justified conservative option shall be adopted.
- Balanced transparency: core documentation (PMP, spatial boundaries, sampling protocols, monitoring reports, verification statements) shall be publicly available per registry policy, while protecting legitimately sensitive information (e.g., precise locations of highly threatened species).
- Where information concerns Indigenous Peoples, local communities or Traditional Knowledge, access, use, publication and sharing must follow FPIC, applicable data-sovereignty principles and any agreed community data-governance arrangements. Data pertaining to the ways of life, knowledge systems, customs, lands, waters or resources of Indigenous Peoples is considered to be owned by them; its collection or use requires their free, prior and informed consent.
- Where permitted by those arrangements and by the protection of sensitive data, projects are encouraged to contribute non-sensitive biodiversity records to appropriate national or global biodiversity repositories.
- Personal data: where the project collects personal data of individuals (e.g., names, contact details, addresses) with their consent, it must be managed in accordance with applicable data-privacy law and disclosed only to the extent necessary and permitted.
- Technical responsibility: personnel performing measurements and analyses must hold appropriate qualifications and be registered or documented according to Cercarbono tools and requirements where applicable.

Minimum operational requirements

- Data quality and control.
- Documented protocols: sampling, laboratory and remote-sensing methods must be described or referenced in the PMP.
- Equipment calibration: measurement devices shall be calibrated or validated.
- Uncertainty management: sources of uncertainty must be identified and quantified when feasible; otherwise, conservative adjustments must be applied and documented.
- Storage and traceability.

- Secure repository: raw and processed data must be stored in a secure repository with version control and backups.
- Minimum metadata: each dataset must include author, date, method, spatial extent, format and quality/limitations notes.
- Chain of custody: procedures for handling physical samples and sensitive data must be documented.
- QA/QC and audits.
- Internal QA/QC: the project proponent shall implement internal checks to detect and correct errors, with documentary evidence of corrections.
- External verification: data, methods and records must be accessible to the Independent Expert Panel and to internal or external audits as required.
- Geospatial products and spatial boundaries.
- Required outputs: deliver geospatial files (shapefile, GeoPackage or GeoJSON) for Total Project Area, Eligible and Non-eligible Areas, Strata, Segments and Segment Components, with CRS and acquisition dates.
- Cartographic quality: perform basic topology and integrity checks and ensure consistency between mapped areas and PMP descriptions.
- Publication and protection of sensitive information.
- Disclosure: publish required documents in accordance with the registry's disclosure policy.
- Protection measures: withhold or restrict access to sensitive location data where disclosure would pose a risk, providing a justification in the PMP.

Information management shall follow ***Cercarbono operational guidance and tools*** and may draw on recognized quality management practices (e.g., ISO principles) as appropriate. The PMP must specify the data management tools, versions and any Cercarbono modules used.

All significant changes to protocols, spatial boundaries or data processing methods must be recorded in the PMP change log with rationale and supporting evidence for verifier review.

15 References

Alkemade, R., van Oorschot, M., Miles, L., Nellemann, C., Bakkenes, M. & ten Brink, B. (2009). GLOBIO3: A framework to investigate options for reducing global terrestrial biodiversity loss. Ecosystems, 12, 374–390. https://doi.org/10.1007/s10021-009-9229-5.

Cadotte, M. W., Carscadden, K. & Mirotchnick, N. (2011). Functional diversity and ecological processes: A conceptual framework. Journal of Applied Ecology, 48(5), 1079–1089.

CBD (Convention on Biological Diversity). (2020). Post-2020 Global Biodiversity Framework. Montreal: Secretariat of the Convention on Biological Diversity.

Cercarbono. (2024a). Cercarbono's Biodiversity Certification Programme Procedures. Version 1.0. Available at: www.cercarbono.com.

Cercarbono. (2024b). Cercarbono's Biodiversity Certification Programme Protocol. Version 1.1.1. Available at: www.cercarbono.com.

Cercarbono. (2024c). Terms and Definitions of the Cercarbono's Biodiversity Certification Programme. Version 1.0. Available at: www.cercarbono.com.

Cercarbono. (2025). Guidelines for mapping presentation and analysis. Version 1.1. Available at: www.cercarbono.com.

Cercarbono. (2026). Safeguarding Principles and Procedures of Cercarbono Certification Programme. Version 3.0. Available at: www.cercarbono.com.

Clewell, A. F. & Aronson, J. (2013). Ecological Restoration: Principles, Values, and Structure of an Emerging Profession. Washington D.C.: Island Press.

Díaz, S. *et al*. (2015). The global spectrum of plant form and function. Nature, 529, 167–171.

Díaz, S. *et al*. (2019). Pervasive human-driven decline of life on Earth points to the need for transformative change. Science, 366(6471), eaax3100.

European Commission. (2023). Corporate Sustainability Reporting Directive (CSRD). Brussels: European Union.

FAO (Food and Agriculture Organization of the United Nations). (2021). Forest and Landscape Restoration: Implementation Guidance. Rome: FAO.

GRI (Global Reporting Initiative). (2020). GRI 304: Biodiversity 2016 (Updated 2020). Amsterdam: GRI Standards.

IAPB (International Advisory Panel for Biodiversity Credits). (2023). High-Level Principles for Nature Markets. London: IAPB.

ICVCM (Integrity Council for the Voluntary Carbon Market). (2023). Core Carbon Principles and Assessment Framework. London: ICVCM.

IFC (International Finance Corporation). (2012). Performance Standards on Environmental and Social Sustainability. Washington D.C.: World Bank Group.

ILO (International Labour Organization). (2019). ILO Declaration on Fundamental Principles and Rights at Work. Geneva: ILO.

IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services). (2019). Global Assessment Report on Biodiversity and Ecosystem Services. Bonn: IPBES.

ISO (2018). ISO 31000:2018 – Risk Management – Guidelines. Geneva: International Organization for Standardization.

IUCN (International Union for Conservation of Nature). (2020). Participatory Approaches in Natural Resource Management. Gland: IUCN.

Kuipers, K. J. J., Melki, A., Morel, S. & Schipper, A. M. (2025). Relationships between mean species abundance (MSA) and potentially disappeared fraction of species (PDF) are consistent but also uncertain. Environmental and Sustainability Indicators, 26, 100652. https://doi.org/10.1016/j.indic.2025.100652

Lassauce, A., Paillet, Y., Jactel, H. & Bouget, C. (2011). Deadwood as a surrogate for forest biodiversity: Meta-analysis of correlations between deadwood volume and species richness of saproxylic organisms. Ecological Indicators, 11, 1027–1039. https://doi.org/10.1016/j.ecolind.2011.02.004

Lavorel, S. & Garnier, E. (2002). Predicting changes in community composition and ecosystem functioning from plant traits: revisiting the Holy Grail. Ecology, 83(10), 2773–2789.

Lefsky, M. A., Cohen, W. B., Parker, G. G. & Harding, D. J. (2002). Lidar remote sensing for ecosystem studies. Bio-Science, 52(1), 19–30.

Legendre, P. & Legendre, L. (2012). Numerical Ecology (3rd English ed.). Amsterdam: Elsevier.

Mace, G. M., Barrett, M., Burgess, N. D. *et al*. (2018). Aiming higher to bend the curve of biodiversity loss. Nature Sustainability, 1(9), 448–451.

Navarro, L. M. & Pereira, H. M. (2020). Monitoring biodiversity change through Essential Biodiversity Variables. Biological Conservation, 246, 108569.

Pereira, H. M. *et al*. (2013). Essential Biodiversity Variables. Science, 339(6117), 277–278.

Pettorelli, N. *et al*. (2005). Using the satellite-derived NDVI to assess ecological responses to environmental change. Trends in Ecology & Evolution, 20(9), 503–510.

Pettorelli, N. *et al*. (2011). The Normalized Difference Vegetation Index (NDVI): Unforeseen successes in animal ecology. Climate Research, 46, 15–27.

Pettorelli, N. *et al*. (2016). Satellite remote sensing for applied ecologists: opportunities and challenges. Journal of Applied Ecology, 53(4), 1120–1126.

Poorter, L. *et al*. (2021). Multidimensional tropical forest recovery. Science, 374(6573), 1370–1376.

Rech, S., Celi, L. & Toscan, E. (2021). Soil biodiversity and ecosystem services: Current status and future challenges. Applied Soil Ecology, 168, 104145.

Saura, S. & Pascual-Hortal, L. (2007). A new habitat availability index to integrate connectivity in landscape conservation planning: Comparison with existing indices and application to a case study. Landscape and Urban Planning, 83, 91–103. https://doi.org/10.1016/j.landurbplan.2007.03.005

SBTN (Science-Based Targets Network). (2022). Science-Based Targets for Nature: Initial Guidance for Business. London: SBTN.

Schipper, A. M. *et al*. (2020). Projecting terrestrial biodiversity intactness with GLOBIO 4. Global Change Biology, 26, 760–771. https://doi.org/10.1111/gcb.14848

SER (Society for Ecological Restoration). (2019). International Principles and Standards for the Practice of Ecological Restoration (2nd ed.). Washington D.C.: SER.

TNFD (Taskforce on Nature-related Financial Disclosures). (2023). TNFD v1.0 Framework: Recommendations and Guidance on Nature-Related Risk Management and Disclosure. London: TNFD.

UN (United Nations). (2007). United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). New York: United Nations.

UN (United Nations). (2020). UN Global Compact – Ten Principles. New York: United Nations.

UN (United Nations). (2021). UN Environmental and Social Safeguards. New York: United Nations.

UNDP (United Nations Development Programme). (2022). Gender Equality Strategy 2022–2025. New York: UNDP.

UNEP-WCMC. (2021). Biodiversity Indicators Partnership: Guidance on Indicators for Monitoring Progress Towards the Kunming–Montreal Global Biodiversity Framework. Cambridge: UNEP-WCMC.

UNFCCC (United Nations Framework Convention on Climate Change). (2022). A6.4 Sustainable Development Tool. Bonn: UNFCCC Secretariat.

Verones, F. *et al*. (2020). LC-IMPACT: A regionalized life cycle damage assessment method. Journal of Industrial Ecology, 24, 1201–1219. https://doi.org/10.1111/jiec.13018

Vierling, K. T., Vierling, L. A., Gould, W. A., Martinuzzi, S. & Clawges, R. M. (2008). Lidar: shedding new light on habitat characterization and modelling. Frontiers in Ecology and the Environment, 6(2), 90–98.

Wilkinson, M. D. *et al*. (2016). The FAIR Guiding Principles for scientific data management and stewardship. Scientific Data, 3, 160018.

World Bank. (2018). Environmental and Social Framework. Washington D.C.: World Bank.

World Economic Forum. (2020). The Future of Nature and Business. Geneva: WEF.

World Economic Forum. (2025). High-Level Principles to Guide the Biodiversity Credit Market. White Paper, in collaboration with the Biodiversity Credit Alliance and the International Advisory Panel on Biodiversity Credits.

Yoccoz, N. G., Nichols, J. D. & Boulinier, T. (2001). Monitoring of biological diversity in space and time. Trends in Ecology & Evolution, 16(8), 446–453.

16 Document history

Version	Date	Comments or changes
1.0	09.02.2026	Initial version.
1.1	20.08.2026	Incorporated external reviewer comments on Section 3.1 (Area eligibility): added marine ecosystem criteria and general criteria for other ecosystem types, for both BCP and BRP; clarified the rules for revising an approved reference condition; expanded Section 3.2 (Ownership) with governance and benefit-sharing provisions; clarified the stacking/bundling cross-reference in Section 5.2; added Figure 3 illustrating contiguous BCP/BRP areas; corrected figure and table numbering and updated the document index.
1.2	11.09.2026	Version for public consultation.