SD VISta

SDVM002

NATURE FRAMEWORK

VERRA

In collaboration with

THE BIODIVERSITY CONSULTANCY

Version 1.0

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ABOUT VERRA

Verra sets the world's leading standards for climate action and sustainable development. We build standards for activities as diverse as reducing deforestation, improving agricultural practices, addressing plastic waste, and achieving gender equality. We manage programs to certify that these activities achieve measurable high-integrity outcomes. We work with governments, businesses, and civil society to advance the use of these standards, including through the development of markets. Everything we do is in service of increasingly ambitious climate and sustainable development goals, and an accelerated transition to a sustainable future.

Verra's certification programs include the Verified Carbon Standard (VCS) Program and its Jurisdictional and Nested REDD+ (JNR) framework, the Climate, Community & Biodiversity Standards (CCBS) Program, the Sustainable Development Verified Impact Standard (SD VISta) Program, and the Plastic Waste Reduction Program.

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1 INTRODUCTION

This section introduces stakeholders to Verra's Sustainable Development Verified Impact Standard (SD VISta) Nature Framework. Subsequently, this document refers to the SD VISta Nature Framework as the Nature Framework.

Requirements in the Nature Framework are expressed in the following language:

- "Must" indicates an enforceable requirement.
- "May" indicates a permissible option.
- "Should" indicates a (non-mandatory) recommendation.

1.1 Goal

The goal of the Nature Framework is to certify and incentivize widespread investment in measurable positive biodiversity outcomes[1] benefiting nature and people. A positive biodiversity outcome is an increase in the amount and/or quality of biodiversity relative to a baseline, resulting from the effective management of conservation and restoration projects.

Nature Credits generated under the Nature Framework represent positive investments in nature and must not be used for offsetting (Box 1).

Box 1. Difference between Nature Credits and Biodiversity Offsets[2]

Biodiversity offsets are measurable conservation outcomes from actions designed to compensate for significant residual negative biodiversity impacts identified after appropriate avoidance, minimization, and on-site rehabilitation measures have occurred in the mitigation hierarchy.[3]

Offsets typically need to generate equivalent biodiversity values to those that are lost. Since biodiversity is place-specific and not fungible globally, offsetting schemes are almost always local and often regulatory-based.

In contrast, Nature Credits are an economic instrument for financing positive biodiversity outcomes. They are generated independently and are likely to be spatially or temporally distant from the negative impacts of companies' value chains. Therefore, use of Nature Credits to offset new, attributable negative business impacts on biodiversity is inappropriate because Nature Credits are unlikely to generate ecologically equivalent values to those damaged by business activity.

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[1] The Biodiversity Credit Alliance defines a "biodiversity outcome" as the measured difference between the scenarios with project activities and without project activities. As the difference is measured, this implies that the credit represents an outcome that has already been demonstrated. Available at: https://www.biodiversitycreditalliance.org/wp-content/uploads/2024/05/Definition-of-a-Biodiversity-Credit-Rev-220524.pdf

[2] The Biodiversity Consultancy (2022). Available at: https://www.thebiodiversityconsultancy.com/fileadmin/uploads/tbc/Documents/Resources/Exploring_design_principles_for_high_integrity_and_scalable_voluntary_biodiversity_credits_The_Biodiversity_Consultancy__1_.pdf

[3] BBOP (2012). Available at: https://www.forest-trends.org/wp-content/uploads/imported/BBOP_Standard_on_Biodiversity_Offsets_1_Feb_2013.pdf

The value proposition for Nature Credits

Verra's Nature Credits provide companies and other interested parties with a verified way to support high-quality projects, Indigenous Peoples, and local communities while addressing impacts and dependencies on nature by derisking value chains. This allows buyers to demonstrate their commitment to and act beyond the biodiversity mitigation hierarchy and contribute to a nature-positive world.[4]

1.2 Guiding Principles for Nature Framework Development

The guiding principles below provide the basis on which Verra developed the Nature Framework to certify Nature Credits representing real, measurable, and verified positive biodiversity outcomes. These principles are not to be confused with safeguards for project design and implementation.

Integrity

Develop robust requirements that:

- deliver positive biodiversity outcomes benefiting nature and people;
- drive finance to nature conservation and restoration activities that can help meet the Kunming-Montreal Global Biodiversity Framework (GBF)[5] goals and targets;
- enable expert technical assessment of quantification elements and the dynamic adjustment of crediting baselines;
- are the foundation for credible claims about positive investments in nature;
- can be independently verified by third parties; and
- ensure comprehensive and appropriate project and unit information is publicly disclosed.

Equity

Respect and safeguard the rights of local land and rights holders and stakeholders, especially Indigenous Peoples and local communities, and take into account their cultural values of nature.

Quality

Credit activities that result in additional, positive, measurable, and durable biodiversity outcomes supported by scientific evidence, based on conservative calculations.

Scalability

Design the framework to be applicable across geographies, ecosystems, and activity types. A globally applicable framework broadens the potential market and finance flows to nature-positive activities.

[4] Pollination (2024). Available at: https://pollinationgroup.com/global-perspectives/state-of-voluntary-biodiversity-credit-markets/
[5] UNEP (2022). Available at: https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf

Practicality

Ensure project activities result in positive outcomes within their respective timeframes while avoiding unnecessary entry barriers for project proponents, particularly Indigenous Peoples and local communities.

Participation and collaboration

Motivate and integrate meaningful and informed engagement with customary rights holders and stakeholders throughout the development process, including:

- Indigenous Peoples and local communities as stewards of nature and biodiversity;
- market participants, such as project proponents, potential buyers, intermediaries, academics, and international organizations; and
- related global initiatives seeking to ensure a nature-positive future.

Consistency

Enable standardization and meaningful comparisons across biodiversity outcomes while recognizing relevant differences in biodiversity across ecosystems and geographies.

Innovation

Help drive finance to high-quality biodiversity outcomes while acknowledging that:

- the biodiversity credit market is nascent and the science that will enable scaling and standardization is constantly evolving, and
- requirements are built on existing best practices and recent scientific literature and will be refined over time.

1.3 Relationship between SD VISta and the Nature Framework

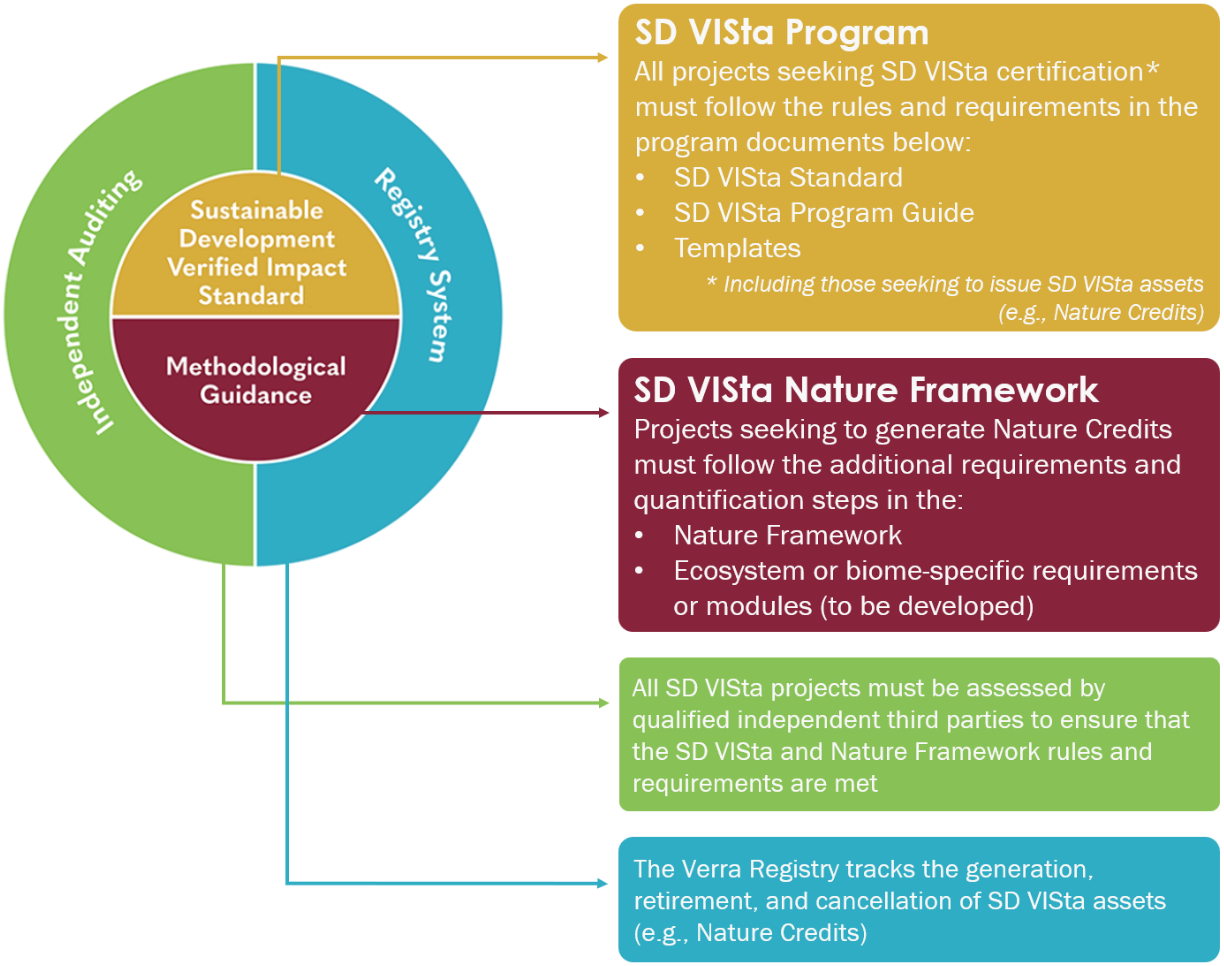
Verra's Nature Framework is an SD VISta asset methodology. Projects seeking to issue Nature Credits must comply with SD VISta rules and requirements,[6] and the Nature Framework criteria (Figure 1).

To ease the understanding, use, and interoperability of the Nature Framework with SD VISta, Verra has consolidated all of the necessary SD VISta project design and monitoring requirements into the Nature Framework. This includes:

- Causal chain analysis
- Social and environmental safeguards using a risk-based approach
- Considerations for grouped projects

[6] SD VISta Program rules and requirements can be found in the most recent versions of the *SD VISta Standard* and *SD VISta Program Guide*.

Figure 1. Relationship between SD VISta and the Nature Framework



2 SUMMARY DESCRIPTION

2.1 Methodology Description (Scope)

The Nature Framework provides the basis for project design and implementation, and the quantification of positive biodiversity outcomes. Its scope:

- includes all activities related to conservation, restoration, and sustainable management of biodiversity.
- excludes greenhouse gas emission reductions and carbon dioxide removals quantification.

Participation is voluntary and based on objective criteria. The Nature Framework is not discriminatory to project proponents, jurisdictional proponents, validation/verification bodies (VVBs), or Nature Credit buyers, sellers, or brokers that comply with SD VISta and the Nature Framework rules and requirements.

SD VISta project design and monitoring requirements have been consolidated into the Nature Framework to make it more user-friendly. However, Nature Framework project proponents and VVBs must still follow the SD VISta Program's procedural rules and requirements, such as the project cycle (*SD VISta Program Guide, v1.0,* Section 3) and project assessment (*SD VISta Standard, v1.0,* Section 5).

The Nature Framework includes three concepts that Verra plans to include in future updates to its other programs:

- A risk-based approach to implementing social and environmental safeguard requirements (see Sections 5.6 and 6)
- Connecting a project's safeguards risk assessment with the sustainable development context using a causal chain analysis to assess positive and negative impacts on people, their prosperity, and the planet, and ensure all risks are mitigated (see Section 5.8)
- Introducing adaptive management requirements aligned with the monitoring of safeguard risks to ensure the effectiveness of mitigation measures (see Section 5.11)

Acknowledging that project implementation is dynamic and context-dependent, the aim is to enable quicker response to risks and threats within projects based on their risk mitigation measures, while ensuring risks and their mitigation measures are adequately documented and assessed by VVBs.

Limitations and further development of version 1.0

The *Nature Framework, v1.0* is designed to be generally applicable to all project contexts and aims, based on existing best practices and scientific literature. This section explains the limitations of this version and how Verra plans to further develop the Nature Framework as the biodiversity credit market matures.

In the nascent biodiversity credit market, global data and methods for biodiversity measurement and impact evaluation are rapidly evolving, but gaps still exist. The approaches outlined in the *Nature Framework, v1.0* have not yet been tested on real-world Nature Framework projects. Further testing is necessary to refine and tailor the approaches outlined in the *Nature Framework, v1.0* as more data and advances in methodological approaches become available. Technical elements for further development or refinement include:

- Requirements for specific biomes or ecosystems (in the Nature Framework or modules), which technical experts will continue to develop under Verra's coordination, according to market needs and the needs of local and Indigenous communities of projects
- Methodological approaches that require more data than currently readily available or methods that have not been tested in the NF project context (e.g., top-down ecoregional crediting baselines, reference values, Condition indicator selection, or monitoring)
- Tools necessary for a project's first credit issuance (e.g., leakage)

Verra will continue to develop tools (e.g., a structured framework based on questionnaires and decision trees) that enable projects to easily identify their safeguard-related risks following a stepwise approach, and design, implement, and dynamically monitor mitigation measures.

Nature stewardship certificates

Verra is continuing to explore nature stewardship certificates, a nature unit that aims to recognize historically well-managed ecosystems of high ecological integrity that require financial investment to maintain their integrity. A public consultation with more details will be announced following the publication of the *Nature Framework, v1.0*.

2.2 Nature Credit – Asset Description

A Nature Credit is an area-based unit that represents the quantification of a change in nature states. It can be easily communicated, with clear links to global goals for nature (e.g., 30×30) and other GBF targets, and correlates with the level of biodiversity impact that a project has.

Table 1. Asset description

Nature Credits	
Asset description	A Nature Credit represents one percent of net biodiversity outcomes, measured in quality hectares (Qha), generated during a monitoring period as a result of the project intervention.
Unit	Quality hectares (Qha)
Sustainable Development Goals	SDG 14, SDG 15
Assets may be used for offsetting	No (see Box 1 and Section 9)

Nature Credits generated under the Nature Framework reflect three dimensions of the state of nature: Biodiversity Extent, Condition, and Significance (Figure 2):

- **Extent**: The physical area, defined by ecosystem type and measured in hectares, in which project activities take place and across which biodiversity outcomes are measured
- **Condition**: The quality of an ecosystem within the project Extent, measured in terms of its abiotic and biotic characteristics
- **Significance**: The importance of the biodiversity in the project Extent for contributing to conservation aims related to GBF goals and targets

The three dimensions are reflected in the unit as follows:

- **Extent × Condition** combine to produce a weighted unit, equivalent to quality hectares (Qha). Changes in the ecosystem Extent and Condition calculated in Qha determines the number of Nature Credits generated.

  A unit based on Extent × Condition facilitates quantifying changes in nature states, helps differentiate project contexts, and aligns with many existing and emerging accounting frameworks, such as the Taskforce on Nature-related Financial Disclosures.

- **Significance** represents separate characteristics for differentiation among projects and their resulting Nature Credits, but is not incorporated into calculations of the number of Nature Credits generated.

  Significance enables the identification of various biodiversity aspects that may be relevant for a project, depending on its context, focus, and buyer or investor priorities.[7]

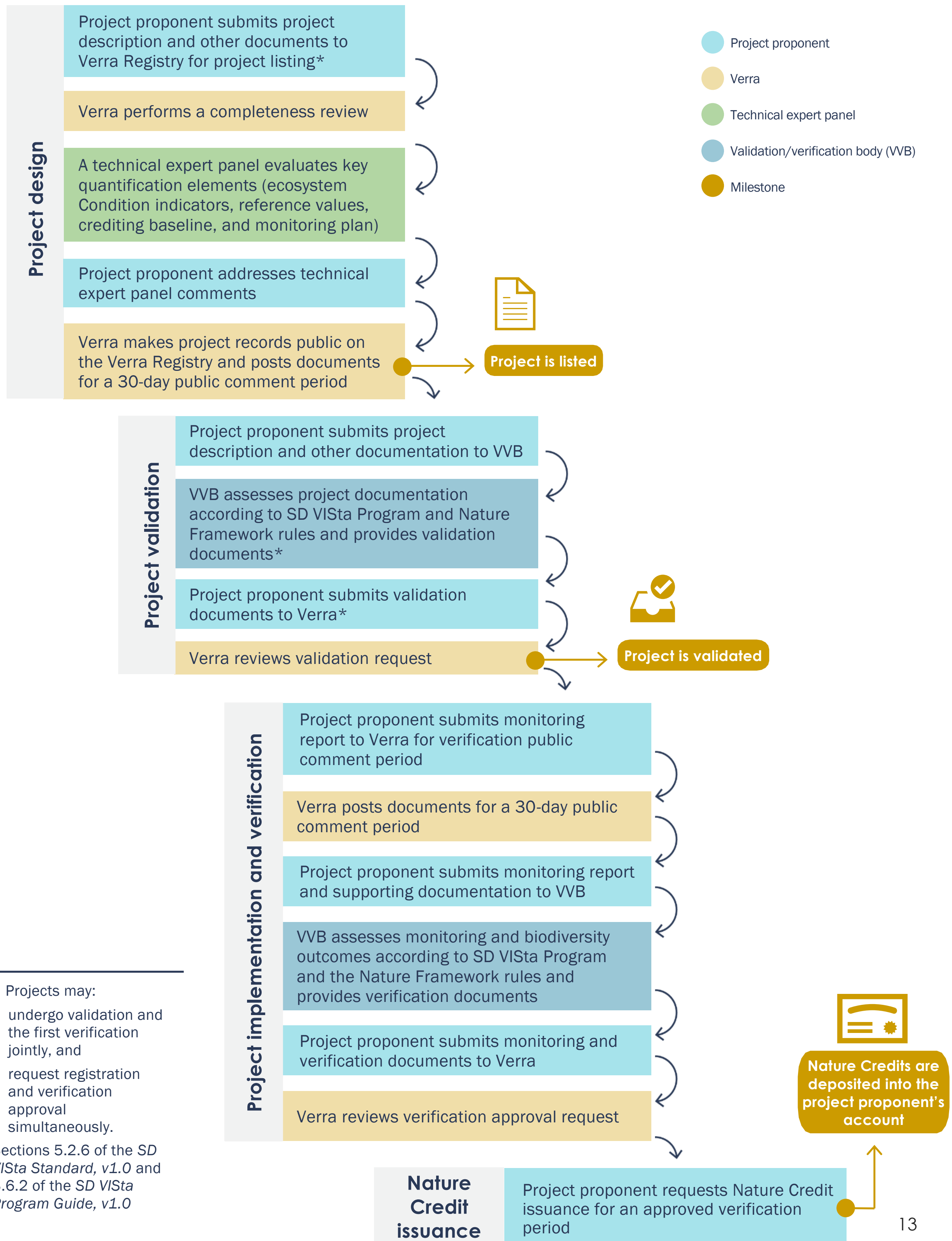
Figure 2. Dimensions of biodiversity

Section 7 explains the relevant concepts and requirements for measuring and reporting each dimension.

[7] For instance, whether a project contributes to preserving highly intact ecosystems, restoring degraded ecosystems, conserving under-represented biodiversity, or reducing species extinctions

2.3 Project Cycle

Figure 3. Nature Framework project cycle



* Projects may:

- undergo validation and the first verification jointly, and
- request registration and verification approval simultaneously.

Sections 5.2.6 of the *SD VISta Standard, v1.0* and 3.6.2 of the *SD VISta Program Guide, v1.0*

3 DEFINITIONS

Adaptive management

A systematic approach to natural resource management that integrates learning and adaptation in an ongoing iterative process

Area-adjusted Condition

The area (measured in hectares) of a given ecosystem type in the project Extent at year *x*, multiplied by its Condition value at year *x*, and expressed in quality hectares (Qha)

Armed personnel

Individuals employed to provide security services, who are authorized to carry and use firearms or other weapons

Baseline scenario

A narrative description including a qualitative justification of 1) the sustainable development context (i.e., the socioeconomic and environmental conditions at the project start within the project boundary for the stakeholders identified, and 2) the without-project scenario, representing the events and/or circumstances most likely to occur in the absence of the project activity

Benefit-sharing mechanism

The intentional transfer of monetary and non-monetary incentives (e.g., goods, services, or other benefits) to stakeholders and stakeholder groups to generate results; funded by revenues derived from those results[8]

Benefits for people, their prosperity, and the planet

Positive impacts delivered by the project during its lifetime on people, their prosperity, and the planet. These benefits should be defined and/or affirmed as part of a stakeholder consultation process. Examples of benefits include:

- For people: alleviation of poverty and hunger and enhancements to dignity, equality, or a healthy environment
- For people's prosperity: improvements in livelihoods or economic, social, and technological advances in harmony with nature
- For the planet: protection of the planet from degradation by maintenance or enhancement of natural resources and ecosystem services

[8] World Bank (2019). Available at: https://documents1.worldbank.org/curated/fr/824641572985831195/pdf/Benefit-Sharing-at-Scale-Good-Practices-for-Results-Based-Land-Use-Programs.pdf

Biodiversity or nature program

A formal or organized program, system, methodology, or arrangement for the recognition of activities leading to biodiversity outcomes and/or the crediting or issuance of instruments representing or acknowledging biodiversity outcomes. Examples of a biodiversity or nature program include but are not limited to, any form of biodiversity or nature crediting mechanism that issues biodiversity or nature credits or offsets, such as international and independent programs (e.g., Plan Vivo Nature, Terrasos, Colombia's Habitat Banks, New South Wales Biodiversity Offsets Scheme).

Biodiversity Significance (Significance)

The importance of biodiversity in the project Extent for contributing to conservation aims related to the Kunming-Montreal Global Biodiversity Framework (GBF) goals and targets. It is independent of the calculation of Nature Credits.

Biome

A distinct ecological region characterized by its climate, major biological community, and dominant vegetation (e.g., tropical rainforest, grassland, marine coral reef)[9]

Causal chain

A conceptual diagram tracing the process by which an activity leads to positive and negative, direct or indirect, and intended or unintended impact(s) through a series of interlinked logical and sequential stages of cause-and-effect relationships

Child labor

The employment of children (i.e., younger than the legal age minimum) in any form of work that deprives them of their childhood, potential, and dignity and that is harmful to their physical and mental development[10]

Composition

A component of ecosystem Condition that describes the variety, quantity, abundance, and evenness of living organisms

Condition at project start

The area-adjusted Condition (measured in Qha) of all ecosystems within the project Extent at project start, measured by the project proponent

Confounding

Where the relationship between project activities and the measured indicator(s) is affected by the presence of other influential variables. Confounding variables can introduce biases which, if not considered, can make it difficult to infer causal relationships and measure impacts accurately.

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[9] Definition adapted from *The New IUCN Global Ecosystem Typology*. Available at: https://global-ecosystems.org/page/typology

[10] ILO Conventions No. 138 (Minimum Age Convention) and No. 182 (Worst Forms of Child Labour Convention)

Country ecoregion component (CEC)

The portion of an ecoregion within a country, recognizing that jurisdictional boundaries are also relevant to available datasets and conservation policies. Identified by overlaying the ecologically determined ecoregion[11] with the relevant jurisdictional boundaries (e.g., Albertine Rift montane forests (Burundi), Albertine Rift montane forests (Rwanda), Albertine Rift montane forests (Uganda)).

Covariates

Variables that may influence biodiversity outcomes at the project level (e.g., human-induced pressures on nature). Covariates are used in calculating Nature Framework crediting baselines.

Crediting baseline

The projected change in ecosystem Condition in the absence of the project intervention, which is used in the quantification of the project's impact and the consequent number of credits generated

Critically endangered species

A species facing an extremely high risk of extinction in the wild, as defined by the criteria of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species[12]

Cultural site

A place of great significance to community members due to its role in the community's ancestral experience, traditions, culture, spiritual life, or identity of their people

Customary rights holder

Holder of a legitimate customary right to lands, territories, and resource usage

Customary rights to lands, territories, and resources

Patterns of long-standing use of community lands, territories, and resources in accordance with Indigenous Peoples' and local communities' customary laws, values, customs, and traditions, including seasonal or cyclical use, rather than formal legal title to lands, territories, and resources issued by the state[13]

Data layer

A spatially explicit dataset providing the values of a measure or metric, or other relevant spatial information (e.g., the World Terrestrial Ecosystems map, the Species Range Rarity map)

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[11] Following Dinerstein et al. (2017). Available at: https://doi.org/10.1093/biosci/bix014
[12] IUCN (2001). Available at: https://www.iucnredlist.org
[13] Definition adapted from World Bank (2005). Available at: https://ppfdocuments.azureedge.net/1570.pdf

Direct observation

The physical collection of data (i.e., measurement) on-site, whether by the project proponent (e.g., for Condition indicators per the project's monitoring plan) or by external parties (e.g., via third-party remote sensing)

Double claiming

Any situation in which the same biodiversity outcome is credited or claimed by more than one entity toward separate nature-positive targets to derisk value chains or sustain dependencies on nature

Double counting

Any situation in which the same biodiversity outcome is counted, claimed, or credited more than once. It includes double issuance, double use, and double claiming.

Double issuance

Any situation in which the same biodiversity outcome is credited by two or more projects, or through two or more biodiversity or nature programs. It includes where the same biodiversity outcome issued as a Nature Credit under the SD VISta Program is also credited under another biodiversity or nature program, and such credits have not been canceled under the other biodiversity or nature program.

Double use

Any situation in which a biodiversity outcome is further sold, transferred, retired, used, or canceled after having already been retired or used

Due diligence

The process of investigating and evaluating potential risks and impacts of project activities and their implementation to ensure compliance with legal, ethical, and financial standards[14]

Durability

The ability of a project to ensure that biodiversity outcomes on which credits are based are likely to endure for an extended period without being reversed

Ecoregion[15]

Relatively large areas of land or water with distinct assemblage(s) of natural communities that share a majority of species, ecological dynamics, and environmental conditions. Ecoregions are generally geographically specific at a finer scale than biomes (e.g., Albertine Rift montane forests).[16]

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[14] OHCHR (2011). Available at: https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf
[15] Definition adapted from IPBES (n.d.). Available at: https://www.ipbes.net/glossary-tag/ecoregion
[16] Olson et al. (2001). Available at: https://doi.org/https://doi.org/10.1641/0006-3568(2001)051[0933:TEOTWA]2.0.CO;2

Ecosystem

A dynamic complex of plants, animals, and micro-organisms interacting with one another and with their non-living environment and functioning as a unit[17]

Ecosystem Condition (Condition)

The quality of an ecosystem within a defined spatial unit (i.e., the project Extent), measured in terms of its abiotic and biotic characteristics referring to both flora and fauna. Condition encompasses all taxonomic groups (e.g., flora, fauna, fungi, bacteria) and includes four simplified components: composition, structure, function, and pressures.

Ecosystem conversion

Elimination or diminution of natural ecosystem integrity caused by changes in land and/or water use or by pollutants. Conversion may include land clearing; replacement of natural vegetation (e.g., by crops or tree plantations, through vegetation clearing); permanent flooding (e.g., by a reservoir); drainage, dredging, filling, or channeling wetlands; surface mining; and other activities which negatively impact natural ecosystem integrity.

Ecosystem functional group

A group of related ecosystems within a biome that share common ecological drivers, which in turn promote similar biotic traits characterizing the group[18]

Ecosystem health

The state (i.e., Condition) of an ecosystem wherein its characteristic dynamic attributes are expressed within the normal ranges of activity relative to its ecological stage of development[19]

Ecosystem type

A classification of ecosystems based on their distinct composition, structure, ecological processes, and function

Edge effect

The phenomenon that occurs when sample sites located near the boundary between ecosystem types differ systematically in structure and composition from sample sites located far from the boundary between ecosystem types

Endangered species

A species facing a very high risk of extinction in the wild, as defined by the criteria of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species[20]

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[17] Definition adapted from CBD (1992). Available at: https://www.cbd.int/doc/legal/cbd-en.pdf
[18] Definition adapted from *The New IUCN Global Ecosystem Typology*. Available at: https://global-ecosystems.org/page/typology
[19] Definition adapted from IPBES (2018). https://www.ipbes.net/assessment-reports/asia-pacific
[20] IUCN (2001). Available at: https://www.iucnredlist.org

Extent

The physical area, defined by ecosystem type and measured in hectares, in which project activities take place and across which biodiversity outcomes are measured. The project Extent may contain more than one discrete area within the project boundary. Extent is the equivalent of the project area for VCS Program purposes.

Forced labor

Any work forcefully carried out by a person who has not offered themselves voluntarily, often as a result of human trafficking, deception, intimidation, force, or other forms of coercion for the purpose of exploitation, usually receiving little to no pay[21]

Free, Prior, and Informed Consent (FPIC)

A safeguard to protect the rights of Indigenous Peoples and local communities, particularly relating to decision-making processes that affect their lands, territories, and resources. To satisfy the meaning of FPIC, the agreement of the affected community must be obtained:

1) without coercion,
2) before any irreversible action is taken, and
3) after the community is provided with accurate and culturally appropriate information about the nature, scope, and potential impacts of the proposal.

Function

A component of ecosystem Condition that describes the ecological processes and flux of energy and materials through the ecosystem[22]

Gender equality

The equal rights, responsibilities, and opportunities of people, regardless of gender

Global Biodiversity Framework (GBF)

The Kunming-Montreal Global Biodiversity Framework (GBF) sets forth global goals and targets to realize a world living in harmony with nature. The GBF's key elements are four overarching goals to achieve by 2050 and twenty-three targets to reach by 2030.[23]

Grid cell

The spatial unit in a matrix used for geographic information system (GIS) data mapping. Also referred to as a pixel in a raster data layer.

[21] ILO Conventions No. 29 (Forced Labour Convention) and No. 105 (Abolition of Forced Labour Convention)
[22] Definition adapted from IPBES (n.d.). https://www.ipbes.net/glossary-tag/ecosystem-function
[23] Definition adapted from CBD (2024). Available at: https://www.cbd.int/gbf

Grievance redress procedure

A formalized way to receive, assess, and resolve complaints or grievances raised by stakeholders, ensuring that their concerns are addressed in a fair, timely, and transparent manner[24]

Harassment

Unwanted, uninvited, and unwelcome words and/or behavior that threatens, intimidates, or demeans a person, causing nuisance, alarm, or substantial emotional distress without any legitimate purpose[25]

Historical coverage

The temporal span of a dataset covering the period prior to project start. For Nature Framework crediting baselines, historical coverage includes at least three observations (i.e., data points) at distinct moments in time encompassing a five-year timespan, for at least ten years prior to the project start date).

Human rights

The fundamental rights and freedoms to which all humans are entitled. These rights affirm that all individuals are born free and equal in dignity and rights, regardless of race, color, sex, language, religion, political or other opinion, national or social origin, property, birth, or status. They include the right to life, liberty, and personal security, and protect against slavery, torture, and inhumane treatment. Additionally, everyone is equal before the law and entitled to equal protection and an effective remedy for violations of their fundamental rights.[26]

Human trafficking

The process through which individuals are placed or maintained in an exploitative situation for economic gain. This can include recruitment, transportation, transfer, harboring, or receipt of an individual by means of threat, force, or any other form of coercion.

Implementation barrier

Any obstacle or challenge that hinders the successful implementation of project activities

Indicator

A measure or metric used to numerically quantify change in environmental, social, or economic aspects of the world (e.g., tree species richness, aquatic invertebrate response to improvements in water chemistry, proportion of women engaged in project activities, number of employed persons in a community)

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[24] OHCHR (2011). Available at: https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf

[25] Definition adapted from Cornell Law School (2022). Available at: https://www.law.cornell.edu/wex/harassment#:~:text=Primary%20tabs,distress%20without%20any%20legitimate%20purpose

[26] Definition adapted from OHCHR (1948). Available at: https://www.ohchr.org/en/human-rights/universal-declaration/translations/english

Indigenous Peoples[27]

They comprise:

- tribal peoples in independent countries whose social, cultural, and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations.
- peoples in independent countries who are regarded as indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural, and political institutions.

According to the United Nations, it is best to identify, rather than define, Indigenous Peoples.[28] In some countries, there may be a preference for other terms, such as tribes, first peoples/nations, aboriginals, ethnic groups, *Adivasi*, and *Janajati*. Occupational and geographic terms like hunter-gatherers, nomads, peasants, and hill people also exist and for all practical purposes can be used interchangeably with "Indigenous Peoples."[29]

Interpolation

A mathematical technique for estimating an unknown value (i.e., missing data point) between two known values. In the Nature Framework context, used to estimate the values of time-steps for which there are no observations, to fill gaps in a dataset.

Invasive species

A non-native species whose introduction and/or spread by human activity (either accidentally or intentionally) causes environmental, socio-cultural, or economic harm, or harm to human health, as set out in the Global Invasive Species Database[30] and/or in jurisdictional dataset(s) or registries which may take precedence over any global dataset.

Key characteristics of invasive species include:

- Introduced, either accidentally or intentionally, outside their natural geographic range
- Adapt easily to the new environment and reproduce quickly
- Outcompete native species, often due to a lack of natural predators
- Can cause significant ecological, economic, or human health impacts

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[27] Definition adapted from ILO Convention No. 169 (Indigenous and Tribal Peoples Convention)
[28] UN Permanent Forum on Indigenous Issues (n.d.). Available at: https://www.un.org/esa/socdev/unpfii/documents/5session_factsheet1.pdf
[29] World Bank (1998). Available at: https://chm.cbd.int/api/v2013/documents/4A27922D-31BC-EEFF-7940-DB40D6DB706B/attachments/209070/Hoda Yacoub - IK Report (1).pdf
[30] Available at: https://www.iucngisd.org/gisd/

Just transition

The fair, inclusive, and equitable process of moving towards a sustainable economy, ensuring that the needs, rights, and livelihoods of affected workers and communities are addressed and protected

Leakage

Negative or positive impacts on biodiversity outside the project area resulting from project activities

Marginalized persons, stakeholders, or groups

Individuals or groups who are unable to fully participate in social, economic, educational, or cultural life due to characteristics like ethnicity, gender, age, disability, or socioeconomic status

Metric

A mathematical combination of two or more measures (e.g., Defra Biodiversity Metric, Forest Landscape Integrity Index, Mean Species Abundance)

Mitigation hierarchy

A structured approach used to address and manage environmental and social risks associated with projects. It provides a framework to inform decision-making that prioritizes actions to avoid, minimize, restore, and compensate social and environmental impacts. The main components are, in descending order of desirability:

- Avoidance: The first step involves taking proactive measures to prevent potential impacts from occurring. This may include altering project designs or locations to eliminate risks entirely.
- Minimization: Where avoidance is not possible, the next step is to reduce the severity or extent of the impacts. This can involve implementing best practices to lessen negative effects during project execution.
- Mitigation: After minimizing impacts, efforts should be made to restore, rehabilitate, or compensate for social and environmental impacts during project implementation. This step aims to provide stakeholders with alternative livelihoods, return the ecosystem to its original state, or improve its functionality.

Mitigation plan

A strategic document that outlines specific actions and measures aimed at reducing the adverse effects of identified risks or hazards. It serves as a framework for managing imminent and potential impacts. The key aspects of a mitigation plan include proposed actions and measures in order of priority (according to the level of risk), execution details such as timelines, responsible parties, and resource allocation, and metrics for assessing progress and effectiveness, among others.

Model

A mathematical procedure for calculating values of measures and/or metrics based on relationships derived from empirical studies (e.g., Global Biodiversity Model for Policy Support (GLOBIO), Projecting Responses of Ecological Diversity in Changing Terrestrial Systems (PREDICTS))

Native species

An organism, plant, or animal that occurs naturally in a specific region or ecosystem due to natural processes, without human intervention. These species have evolved and adapted to their local environment over time. Key characteristics of native species include:

- Natural occurrence: They are found in a particular area due to natural distribution methods, such as wind or animal movement, rather than human introduction.
- Adaptation: Native species are well adapted to the ecological conditions of their habitat, which includes interactions with other local flora and fauna.
- Ecosystem role: They play a crucial role in maintaining the balance of their ecosystems, contributing to biodiversity and the overall health of the environment.

Net biodiversity outcomes

The quantified difference at the end of the monitoring period (year *t*), adjusted for leakage, between:

1) the area-adjusted Condition project impacts, and
2) the area-adjusted Condition at project start (or at the start of a subsequent monitoring period) projected to year *t* using the dynamic crediting baseline parameter.

No harm

The assurance, by following the mitigation hierarchy, that there are commensurate mitigation measures addressing the negative spillover of project activities

Non-discrimination

The equal and fair treatment of all individuals, without prejudice or exclusion based on characteristics such as race, ethnicity, gender, age, disability, sexual orientation, religion, or social status[31]

Non-target species

Species and habitats that are not subject to the quantification of biodiversity outcomes nor the primary goal of the increase in the amount or quality of biodiversity relative to a baseline but can still be positively and/or negatively impacted by project activities within and/or beyond the project Extent

Observation

A single data point or measurement

[31] ILO Convention No. 111 (Discrimination (Employment and Occupation) Convention)

Positive biodiversity outcome

An increase in the quality of biodiversity relative to a baseline, resulting from the effective management of conservation and restoration projects

Power analysis

A statistical method to determine the sampling effort needed to detect changes in an indicator at a specified level of statistical significance (typically set at $p = 0.05$)

Precautionary principle

A strategy for approaching potential risks, particularly in the context of environmental and social decision-making. It asserts that where there is a possibility of harm to the public or the environment, and scientific consensus on the issue is lacking, precautionary measures should be taken to prevent harm, even where some cause-and-effect relationships are not fully established scientifically.

Pressures

A component of ecosystem Condition that describes the scale and severity of processes threatening ecosystem health

Project biodiversity impacts (project impacts)

The quantified change in area-adjusted Condition from the start of the project, calculated at least every five years, using regularly sampled and standardized measurements of the project's Condition indicators

Project boundary

The area in which the project will have impacts on biodiversity outcomes and the sustainable development context at the project start

Project crediting period

The time period during which the project's biodiversity outcomes are eligible for issuance as Nature Credits

Project lifetime

The time period over which project activities are implemented

Project longevity

The number of years, beginning from the project start date, for which project outcomes must be monitored for durability

Project ownership

The legal right to control and operate project activities

Project proponent

The individual or organization that has overall control and responsibility for the project, or an individual or organization that together with others, each of which is also a project proponent, has overall control or responsibility for the project. The entity(s) that can demonstrate project ownership in respect of the project.

Proof of right

The document(s) demonstrating an entity's right to all and any biodiversity outcomes generated by the project during the crediting period or verification period. It is distinct from project ownership.

Property rights and property rights holders

The statutory and legitimate customary tenure, use, access, and/or management rights to lands, territories, and resources existing within the project area, and the entities that have those rights, either individually or collectively

Proxy

An indicator that is substituted for a correlated indicator that cannot be measured or that does not meet data requirements (e.g., where data for a specific project-level Condition indicator are not available for calculating crediting baselines)

Quality hectare (Qha)

A unit of ecosystem Extent multiplied by its Condition, representing area-adjusted Condition

Rare species

While not a formal category in the IUCN Red List of Threatened Species, "rare species" generally refers to species that have a limited distribution or small population size. These species may not necessarily meet the criteria for "threatened" but could be at risk due to their rarity.[32]

Raster

A matrix (i.e., grid) wherein each pixel (i.e., cell) contains spatially delimited data. A GIS data format, often produced in layers.

Realm

One of the five major biosphere components, each differing fundamentally in ecosystem organization and function (e.g., terrestrial, freshwater, marine, subterranean, atmospheric). Transitional realms occur where two or more realms meet and exhibit their own unique organization and function.[33]

[32] IUCN (2001). Available at: https://www.iucnredlist.org
[33] Definition adapted from *The New IUCN Global Ecosystem Typology*. Available at: https://global-ecosystems.org/page/typology

Reference region

A spatially and geographically defined area, typically much larger than the project Extent, from which historical and/or current data are derived to estimate future degradation in ecosystem Condition in the crediting baseline (i.e., without-project scenario). In the Nature Framework, the reference region is the country ecosystem component or the wider ecoregion.

Reference state value (reference value)

The value of a given ecosystem Condition indicator reflecting that indicator's optimal value where natural (i.e., undisturbed by human activity) ecological and evolutionary processes dominate the ecosystem

Reforestation

A type of ecological restoration focused specifically on forests via the process of replanting trees in an area where there was previously a natural forest

Regulatory surplus

Where project activities are not mandated by any law, statute, or other regulatory framework, or that such regulations are not enforced

Restoration

The process of reversing the degradation of ecosystems or habitats to regain their ecological functionality, productivity, and capacity to meet societal needs. This may include creating protected areas to allow ecosystems to recover from overexploitation.[34]

Revegetation

A type of ecological restoration focused on restoring plant cover to a degraded area via the process of replanting vegetation in an area where it has been removed

Rules of engagement

Directives that define the circumstances and limitations under which armed personnel may use force or engage in combat

Safeguards risk assessment

A qualitative evaluation of how the project interventions are most likely to change the sustainable development context within and beyond the project boundary. It allows project proponents to:

- gain an in-depth understanding of risks that the project could cause to target and non-target species, habitats, and people, and establish the respective risk levels.
- design and implement commensurate mitigation measures to avoid, minimize, or mitigate those risks.

[34] UNESCO (2023). Available at: https://oceanliteracy.unesco.org/ecosystem-restoration-regeneration-rewilding/

Sample site

A defined location within the broader sampling area at which data collection takes place

Sampling

Data collection in the field

Sampling area

The area within which monitoring for an indicator takes place. A sampling area may comprise the entire project Extent, or a subset of it, and may not necessarily be contiguous. The sampling area may be homogeneous or stratified into two or more sampling strata differentiated by distinct ecological or management characteristics.

Sampling methods

The techniques used to collect data to measure progress toward the project's goals and monitoring objectives

Sampling protocol

A detailed plan for data collection, monitoring, and management to support the quantification of biodiversity outcomes

Sampling session

A defined time period during which data collection for an indicator is carried out across all sample sites for that indicator

SD VISta asset

A unit issued by and held in the Verra Registry representing the right of an account holder in whose account the asset is recorded to trade or retire the achievement of an environmental or social benefit. Recordation of an SD VISta asset in the Verra Registry account of the holder is prima facie evidence of that holder's entitlement to that SD VISta asset.

Sensitive information

Trade secrets, financial, commercial, scientific, technical, or other information whose disclosure could reasonably be expected to result in a material financial loss or gain, prejudice the outcome of contractual or other negotiations, or otherwise damage or enrich the person or entity to which the information relates.

It could also refer to internal policy decisions, classified, financial, commercial, scientific, technical, or other information whose public disclosure could reasonably be expected to undermine or negatively affect the development and/or implementation of a program or damage national security.

Sexual harassment

Any form of unwanted verbal, non-verbal, or physical conduct of a sexual nature that occurs with the purpose or effect of violating the dignity of a person, particularly when creating an intimidating, hostile, degrading, humiliating, or offensive environment[35]

Simple random sampling

A statistical method to select representative sample sites. It involves randomly choosing a subset of sites from a larger set of potential sites, where each site has an equal probability of being selected.

Spatial heterogeneity

The variability of ecological or management contexts across the project Extent

Stakeholder

Any person or entity who can potentially affect or be affected by project activities

Stakeholder group

A subset of individual stakeholders with similar income, livelihood, well-being, and/or cultural values and whose values are different from those of other groups (e.g., marginalized, Indigenous Peoples, women, youth)

Stratified random sampling

A statistical method to select representative sample sites. It involves dividing the project Extent into relatively homogeneous subgroups (i.e., strata) based on relevant characteristics (e.g., habitat type) then applying random site selection within each stratum.

Structure

A component of ecosystem Condition that describes the physical size and form of an ecosystem's biotic, physical, and/or chemical elements

Systematic site selection

A statistical method to select representative sample sites. It involves applying a consistent spatial sampling interval (e.g., a 500 m × 500 m sampling grid) from a randomly selected starting point.

Target Condition indicator

A Condition indicator for which a proxy is substituted

Target species

Species or habitats that are subject to the quantification of biodiversity outcomes and to the primary goal of increasing the amount or quality of biodiversity relative to a baseline within the project Extent

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[35] Definition adapted from European Institute for Gender Equality (n.d.). Available at: https://eige.europa.eu/publications-resources/thesaurus/terms/1212?language_content_entity=en

Threatened species

Species at risk of extinction; those classified as vulnerable, endangered, or critically endangered on the IUCN Red List of Threatened Species[36]

Time-step

In data measurement and analysis, a specifically defined temporal interval between data points

Traditional knowledge

Knowledge, innovations, and practices of Indigenous and local communities around the world. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. It tends to be collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices, including the development of plant species and animal breeds. Traditional knowledge is mainly of a practical nature, particularly in such fields as agriculture, fisheries, health, horticulture, forestry, and environmental management in general.[37]

Validation/verification body (VVB)

An organization approved by Verra to provide validation and/or verification services in accordance with the SD VISta rules and requirements

Vulnerable species

A species facing a high risk of extinction in the wild, as defined by the criteria of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species[38]

[36] Definition adapted from IUCN (2001). Available at: https://www.iucnredlist.org
[37] UNESCO (n.d.). Available at: https://uis.unesco.org/en/glossary-term/traditional-knowledge
[38] IUCN (2001). Available at: https://www.iucnredlist.org

4 APPLICABILITY CONDITIONS

4.1 Eligible Activities

4.1.1 The Nature Framework covers all activities related to conserving and restoring biodiversity globally, including:

1) Restoration (including reforestation and revegetation)
2) Avoided conversion and degradation of ecosystems under threat of biodiversity loss
3) Activities in select productive landscape contexts (i.e., agroforestry, sustainable grasslands management, and silviculture) where those activities explicitly target improvement of the natural ecosystem's ecological Condition for both flora and fauna

4.2 Nature Credit Rights and Ownership

4.2.1 Project proponents must be able to demonstrate legal ownership or use rights of Nature Credits with proof of consent of the customary and statutory owners of the project Extent and legal compliance with appropriate state, local, and Indigenous authorities. Verra reserves the right to require a valid legal opinion to confirm proof of right and consent. Section 6.1 contains specific requirements on resource rights and tenure.

4.2.2 Project proponents must have an unconditional, undisputed, and unencumbered right to claim the benefits generated by the project.

4.2.3 Proof of right and consent from the customary and/or statutory owners must be ethically and lawfully obtained:

1) in compliance with all laws, regulations, and conventions.
2) without intimidation tactics, harassment, undue pressure, abuse of power, or other unethical behavior.

4.3 Ineligible Activities

4.3.1 The Nature Framework may not be used to generate Nature Credits for activities that:

1) convert or degrade native ecosystems (e.g., natural forests, grasslands, wetlands, high conservation value areas, critical habitats).
2) drain or degrade the hydrological functions of any ecosystem type.
3) lead to predictable reduction in, or negative impact on, any recognized critically endangered, endangered, or vulnerable species.
4) involve regenerative agriculture activities in row crop contexts.

5) involve any extension or establishment of non-native monoculture plantations.
6) produce biomass for energy purposes.
7) involve the use of genetically modified organisms.
8) involve or in any way contribute to animal trafficking.

5 NATURE FRAMEWORK PROJECT RULES AND REQUIREMENTS

5.1 Project Start Date

Concept

The project start date is when the project begins implementing activities to generate biodiversity outcomes.

Requirements

5.1.1 The project start date must be on or after 1 January 2023.

5.1.2 Projects must complete validation within five years of the project start date.

5.2 Project Crediting Period

Concept

The project crediting period is the time period during which the project's biodiversity outcomes are eligible for issuance as Nature Credits.

Requirements

5.2.1 Project activities must be implemented and monitored throughout the project crediting period.

5.2.2 The project crediting period must be at least 20 years up to a maximum of 100 years. After reaching the maximum duration, project proponents may submit a new project description.

5.2.3 When the crediting period ends, the project becomes ineligible to generate Nature Credits, unless the crediting period is renewed.[39]

5.2.4 Project proponents must have a credible and robust project management plan for managing and implementing the project over the project crediting period. See more details on the project management plan in Section 5.8.3(3).

5.2.5 Project proponents must verify their project's biodiversity outcomes at least every five years during the crediting period. Project verification may occur more frequently if desired.

Renewal of Project Crediting Period

5.2.6 Where the crediting period is shorter than the maximum of 100 years, it may be renewed up to four times without the total exceeding the maximum.

[39] See *SD VISta Standard, v1.0*, Section 4.2.8.

5.2.7 To renew the crediting period, project proponents must:[40]

1) assess in a new project description whether the original baseline scenario is still valid, following the requirements in Sections 5.7.5 to 0.

2) submit the new project description for validation, incorporating the most recent version of the Nature Framework or its replacement. Where the project cannot apply the most recent version, the project becomes ineligible.

5.2.8 The new project description must be validated to the current version of the SD VISta rules. The validation report must be issued within two years after the end of the previous crediting period.[41]

5.2.9 Project proponents must demonstrate regulatory surplus following the requirements in Section 5.9.1 and update the project description accordingly.

5.3 Project Boundary

Concept

The project boundary is the area where the project will have impacts on:

1) biodiversity outcomes, and

2) the sustainable development context at the project start (see Section 5.7).

Impacts can be positive or negative, direct or indirect (i.e., primary or secondary), and intended or unintended.

The project boundary includes:

- **Extent:** the physical area,[42] defined by ecosystem type and measured in hectares, in which project activities take place and across which biodiversity outcomes are measured. See Section 0 for details on calculation and requirements. The project's Extent may contain more than one discrete area within the project boundary. Extent is the equivalent of the project area for VCS Program purposes.

- **Area of project impacts:** the geographic area beyond the Extent where project impacts will occur. Project impacts[43] within the project boundary are identified and monitored using causal chain analysis (see Section 5.8).

[40] See *SD VISta Standard, v1.0,* Section 4.2.9.
[41] See *SD VISta Standard, v1.0,* Section 4.2.9(3).
[42] May include more than one area for grouped projects or mosaic ecosystems.
[43] As defined in *SD VISta Program Definitions, v1.0.*

Requirements

5.3.1 For the project boundary, project proponents must:

1) define the spatial and geographic delimitations at the project start and provide unique geographic identification.

2) geo-reference and provide information in digital format regarding the project's single location (e.g., geodetic coordinates) or geographic boundary (e.g., multiple geodetic coordinates or shapefile).[44]

3) provide the following information:

   a) Name of the area (including compartment numbers, local name (if any))

   b) Map(s) of the area (preferably in digital format)

   c) Total area in hectares

5.3.2 Project proponents must determine and monitor the project impacts within the project boundary as shown in Table 2, using a causal chain approach (see Section 5.8).

Note – Future versions of the Nature Framework and modules (to be developed) may include additional requirements for projects to monitor impacts in specific biomes or ecosystem contexts.

Table 2. Impacts to be determined and monitored within the project boundary

Impact on	Name of Impact	Type of Impact			How will the impact be determined and monitored?	Justification
		Primary or Secondary	Intended or Unintended	Positive or Negative*		
Planet	Biodiversity outcomes	Primary	Intended	Positive	Following the quantification steps in Section 7	The primary impact related to asset quantification
Planet	As identified by the project proponent during causal chain analysis (see Section 5.8)	Project-specific	Project-specific	Project-specific	Following the requirements in Section 5.8	SD VISta project proponents must demonstrate net positive benefits for the planet using a causal chain analysis.
People and their prosperity	As identified by the project proponent during causal chain analysis (see Section 5.8)	Project-specific	Project-specific	Project-specific	Following the requirements in Section 5.8	SD VISta project proponents must demonstrate net positive benefits for people and their prosperity using a causal chain analysis.

* Where project proponents identify negative impacts on people, their prosperity, or the planet, they must establish mitigation measures (see Section 5.8.2(3)(d)).

[44] See *SD VISta Standard, v1.0,* Section 2.1.1.

5.4 Grouped Projects[45]

Concept

Nature Framework projects may be designed as grouped projects to allow the expansion of a project activity after project validation.

Requirements

5.4.1 New project activity instances must be located in the same project boundary and share the baseline scenario with one or more of the original project activity instances.

5.4.2 Where a project proponent anticipates expanding its activity instances, the project description must set out the eligibility criteria to include new project activity instances after validation. The eligibility criteria must ensure that new project activity instances, at a minimum:

1) implement project activities in the same manner as specified in the project description.
2) meet the Nature Framework applicability conditions.
3) are subject to the same processes, assumptions, and context for:
   a) stakeholder engagement (see Section 5.5)
   b) safeguards risk assessment (see Section 5.6)
   c) baseline scenario (see Section 5.7),
   d) causal chain analysis (see Section 5.8), and
   e) additionality (see Section 5.9).
4) have similar monitoring elements (e.g., monitoring plan, management procedures, technologies, sampling criteria) to those set out in the project description.

5.4.3 When adding new project activity instances, project proponents must:

1) include sufficient technical, financial, geographic, and other relevant information in the monitoring report to demonstrate compliance with the applicable eligibility criteria and enable sampling by the VVB.
2) ensure new instances are validated against the applicable eligibility criteria at the project's next verification.

5.4.4 New project activity instances must:

1) comply with the eligibility criteria for the inclusion of new project activity instances.
2) have evidence of project ownership and rights to claim the benefits generated by the project, from the project start date until the end of the project's lifetime.

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[45] See *SD VISta Standard, v1.0,* Section 2.6 and Appendix 1.

3) have the same or a later start date than the grouped project start date.

5.4.5 Where a new project activity instance is added partway through a verification period, Nature Credits are not issued for benefits arising from the project activity instance in that verification period. Nature Credits may be issued for benefits arising from the new project activity instance during its first full verification period and all following verification periods.

5.4.6 A grouped project must be described in a single project description, including a description of the central monitoring and management system.

5.5 Stakeholder Engagement

Concept

Effectively engaging stakeholders throughout the project life cycle is the first and most important step in ensuring local ownership, relevance, and sustainability of the project. Ensuring stakeholders are protected and adequately engaged is crucial for a project's success.

This section includes requirements and guidance for identifying stakeholders, conducting consultations, and maintaining meaningful and transparent communication.

Interested stakeholders comprise any person, group of persons, or entity that has shown an interest in the project's activities or is known to have an interest in the activities but will not be materially affected by the activities. Throughout the Nature Framework, unless otherwise specified, the term stakeholder excludes interested stakeholders.[46]

Requirements

Stakeholder Identification

5.5.1 At project design, project proponents must identify all stakeholders who could potentially be affected by the project, considering the significance of user populations and how deeply affected they may be by the project.[47]

5.5.2 Project proponents must categorize stakeholders as one of these types during stakeholder identification:

1) Most impacted by project activities

2) Critical to implementation (e.g., needed for approvals, support, permits)

3) Influential in project development and success (e.g., local governments, organizations, religious leaders, other influential figures in the area)

4) Interested stakeholders, such as fence-line communities, organizations, and municipalities

[46] See *SD VISta Standard, v1.0*, Box 2.
[47] See *SD VISta Standard, v1.0*, Section 2.2.1 and Box 2.

5.5.3 Project proponents must comply with the following during stakeholder identification:

1) Use locally appropriate methods.[48]

2) Describe in the project description the process used to identify stakeholders.

3) Work with local communities, non-governmental organizations (NGOs), or other organizations to identify directly affected or interested stakeholders.

4) Indicate stakeholders with rights to resources or land, specifying:

   a) legal or customary tenure/access rights to territories and resources.

   b) the location of Indigenous Peoples, local communities, and customary rights holders likely to be impacted by the project, even if adjacent to the project boundary.[49]

   c) the location of territories and resources that stakeholders own or to which they have customary access.

5) Ensure marginalized and vulnerable stakeholders or groups are clearly identified.

6) Indicate the barriers to stakeholder engagement and how these will be addressed (e.g., illiteracy, location, connection to electricity).

Stakeholder Groups

5.5.4 Project proponents must group stakeholders and justify the grouping. A stakeholder group is composed of individual stakeholders with similar income, livelihood, well-being, and/or cultural values and whose values are different from those of other groups (e.g., marginalized, Indigenous Peoples, women, youth).[50]

5.5.5 Project proponents must ensure that all identified stakeholders are part of at least one group. An identified stakeholder may belong to more than one group.[51]

Stakeholder Consultation and Participation

5.5.6 Project proponents must conduct culturally appropriate consultations with stakeholders identified in Section 5.5.2 and ensure their active participation in decision-making processes before project activity implementation.

5.5.7 The consultation and participation processes must:

1) be voluntary and respectful of stakeholders' autonomy.

2) respect local customs, values, and institutions and provide an ongoing opportunity for vulnerable or marginalized stakeholders to self-identify.[52]

[48] See *SD VISta Standard, v1.0*, Section 2.2.1.
[49] For b) and c), see *SD VISta Standard, v1.0*, Section 2.4.1.
[50] See *SD VISta Standard, v1.0*, Box 2.
[51] See *SD VISta Standard, v1.0*, Section 2.2.1 and Box 2.
[52] See *SD VISta Standard, v1.0*, Section 2.2.5 and Box 3.

3) effectively enable all identified stakeholders to influence (i.e., provide input, evaluate impacts, raise concerns, express desires, and agree or consent to) project design, implementation, monitoring, and assessment.[53]

4) be gender and inter-generationally sensitive.[54]

5) include translations of relevant documents or engagements where necessary, particularly for vulnerable stakeholders (e.g., culturally sensitive translations of summaries that provide stakeholders with the necessary details to make informed decisions).

6) create a participatory environment where stakeholders' input is valued, and their voices are heard and respected (e.g., facilitating activities such as workshops, interviews, brainstorming sessions, and co-design exercises).

7) share information in the following manner for stakeholders to provide informed input:

    a) Timely (e.g., 30-day periods to analyze complex changes like project delays or scope adjustments, 15–30 days for minor changes like schedule adjustments, 7–14 days for minor changes like administrative updates)

    b) Culturally appropriate (i.e., adapted to fit the cultural and social norms of the stakeholders)

    c) Easily understood and transparent to ensure that stakeholders fully understand the context and implications

8) occur in mutually agreed-upon locations and through representatives designated by the groups themselves in accordance with their own procedures or preferred governance system. Where stakeholders feel the need, they may create a particular governance representation structure for the project. This structure may be similar to a decision-making council with one to three representatives from each stakeholder group selected by the community or affected stakeholders.

9) provide access to the following information, even without request:

    a) Full project description and monitoring reports as they become available

    b) Timely information before VVB site visits occur

    c) Direct and independent communication between stakeholders and VVBs

5.5.8 The consultations' content must include:

1) culturally appropriate notification of the intent to undertake the project development process.

2) discussion of the project design, implementation, monitoring, and assessment including agreement and consent from stakeholder groups to participate in the consultation.

[53] See *SD VISta Standard, v1.0*, Box 3.

[54] See *SD VISta Standard, v1.0*, Box 3 and Section 2.2.6.

3) the risks, costs, and benefits that the project may bring to stakeholders.[55]

4) information about stakeholders' human, labor, land, customary, and local rights, and how the project may impact resources.

5) information on the impact of the project on property rights.

6) information on the process and scope of validation and verification.

7) discussion of benefit sharing (see Section 5.12) and the grievance redress procedure (see Sections 5.5.16 to 5.5.21).

5.5.9 Project proponents must establish mechanisms for clear, honest, and ongoing communication (i.e., regular meetings and updates) with stakeholders to allow stakeholders to raise concerns about potential negative impacts during project implementation.

5.5.10 Project proponents must disclose stakeholders' input during project implementation differently depending on whether it triggers relevant changes to project design or implementation, as follows:

1) As a project description deviation where it triggers updates to project design, or

2) In the monitoring report, providing justification for not updating the project design

5.5.11 Project proponents must demonstrate the action(s) taken after receiving stakeholder input as part of validation, and in each subsequent verification.

5.5.12 As part of ongoing consultation throughout the project life cycle, project proponents must communicate, whenever relevant during project implementation:

1) Updated risks, costs, and benefits that the project may bring to stakeholders

2) Progress on implementation of the benefit-sharing mechanism

3) The ongoing FPIC process

4) Changes to relevant laws and regulations covering workers' rights in the host country

Monitoring

5.5.13 Project proponents must update the project's stakeholders and stakeholder groups identified in Sections 5.5.1 to 5.5.5 during the monitoring period.[56]

5.5.14 Where new stakeholders are identified, project proponents must:

1) describe and document their sustainable development context during the monitoring period.

2) include the newly identified stakeholders in the engagements described in Section 5.5.6 to 5.5.12.

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[55] See *SD VISta Standard, v1.0*, Section 2.2.6.
[56] See *SD VISta Standard, v1.0,* Section 2.2.2.

5.5.15 Project proponents must demonstrate effective consultation by providing the following details:

1) The type, format, and language of the information disclosed (e.g., examples of brochures, videos, reports, radio announcements, or other communication methods)
2) Location and dates of any meetings undertaken to date (e.g., minutes, assistance sheets, photos)
3) List of the individuals, groups, and/or organizations that participated in consultation meetings
4) Narrative report (such as minutes) of the discussed issues and main concerns raised during the meetings and how these were or will be addressed (i.e., commitments or follow-up actions stated in the meetings)

Grievance Redress Procedure

5.5.16 Project proponents must establish a grievance redress procedure to address disputes and complaints that may arise during project planning and implementation.

5.5.17 The grievance redress procedure must:

1) be accessible to all stakeholders and enable the resolution of disputes promptly and transparently.
2) include culturally appropriate and/or traditional conflict resolution methods (e.g., where culturally appropriate, informality may be used, provided this is conducted with transparency and consent of affected stakeholders).
3) include processes for receiving, hearing, responding to, and attempting to resolve grievances within a reasonable time period and incorporate a right to appeal.
4) allow grievances in various channels (e.g., email, letters, verbal, phone).
5) include a written record of the number of complaints received, how they have been addressed, how many have been resolved to the satisfaction of the complainants, which are still unresolved and require mediation, and whether any decisions have been appealed.
6) be publicly available, including documentation of disputes resolved, even without request.
7) have three stages:
    a) Project proponents attempt to amicably resolve all grievances and provide a written response in a culturally appropriate manner.
    b) If still unresolved, project proponents refer to mediation by a neutral third party.
    c) If still unresolved, project proponents refer to either i) arbitration, as allowed by the laws of the relevant jurisdiction, or ii) competent courts in the relevant jurisdiction without prejudice to a party's ability to submit the grievance to a competent supranational adjudicatory body, if any.

5.5.18 Project proponents must demonstrate that they have shared their grievance redress procedure as well as Verra's *Grievance Redress Policy*[57] with stakeholders (see Section 5.5.8(7)).

5.5.19 Project proponents must demonstrate that the grievances have been addressed (i.e., acknowledged, though not necessarily resolved) within 14–21 days.

5.5.20 Resolution timeframe of grievances may depend on their severity and the stakeholders involved. Nonetheless, project proponents must demonstrate cooperation and proactivity to the extent possible in resolving all grievances.

5.5.21 Grievances and project responses, including any redress, must be documented and made publicly available to all stakeholders in the next monitoring report.

5.6 Safeguards Risk Assessment

Concept

A risk assessment is a qualitative evaluation of how the project interventions are most likely to change the sustainable development context within and beyond the project boundary. It allows project proponents to:

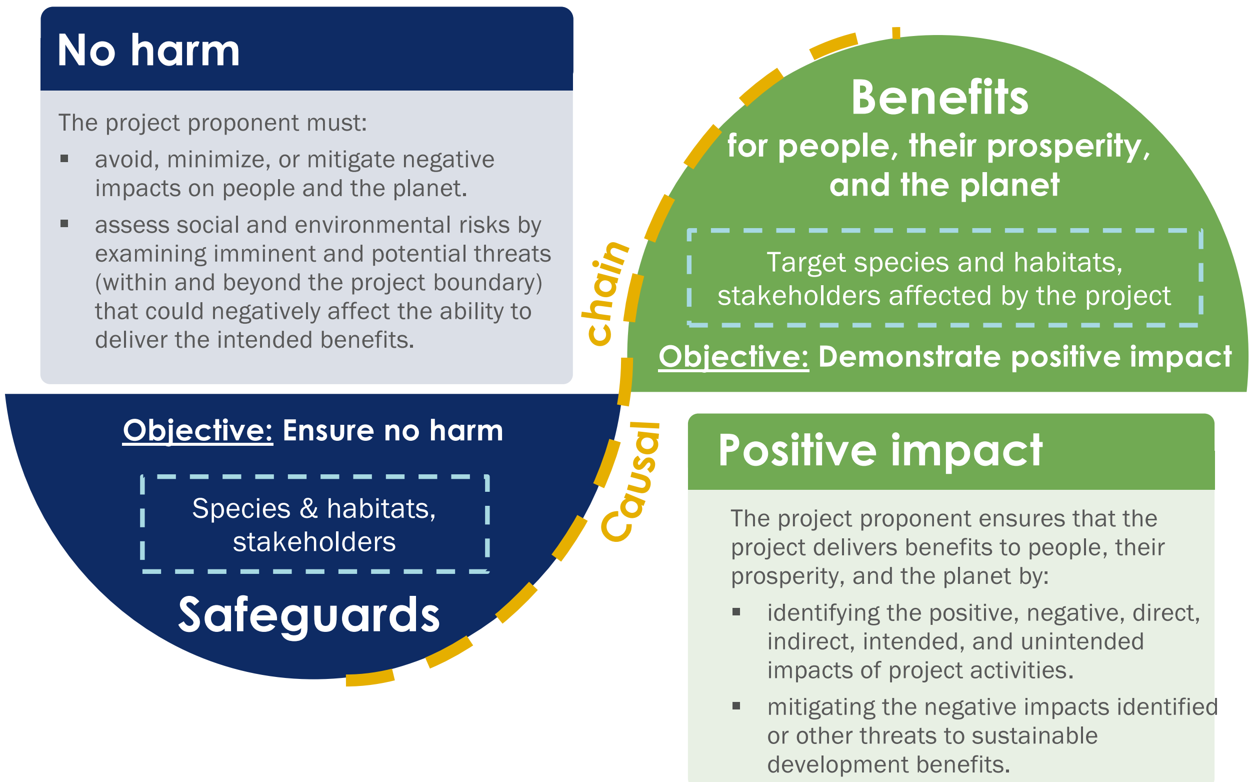
- gain an in-depth understanding of risks that the project could cause to target and non-target species, habitats, and people, and establish the respective risk levels.
- design and implement commensurate mitigation measures to avoid, minimize, or mitigate those risks.

The safeguards risk assessment must be conducted prior to quantifying biodiversity benefits and ensures compliance with all social and environmental safeguards requirements in Section 6.

The causal chain analysis connects safeguards risk assessment and mitigation measures with benefits (see Section 5.8) to ensure the project delivers net positive benefits. Figure 4 depicts how Nature Framework projects will deliver net positive benefits for people, their prosperity, and the planet.

[57] Version 1.2 available at: https://verra.org/wp-content/uploads/2023/12/Grievance-Redress-Policy-V1.2-Update-13.9.24.pdf

Figure 4. Graphic depiction of net positive benefits for people, their prosperity, and the planet in Nature Framework projects



Requirements

5.6.1 Project proponents must design the project to:[58]

1) meet sustainable development objectives appropriate for the project context.
2) generate and maintain net positive sustainable development benefits for people and their prosperity, compared to the baseline scenario within the project boundary.[59]
3) quantify positive biodiversity outcomes, compared to the crediting baseline within the project Extent over the project lifetime.

5.6.2 Project proponents must take a precautionary approach throughout the design and implementation processes to avoid negative impacts on people, their prosperity, and the planet.

5.6.3 Project proponents must conduct a risk assessment of the environmental and socioeconomic impacts of project activities to ensure net positive benefits in the project's lifetime.

5.6.4 The risk assessment must be conducted:

[58] See *SD VISta Standard, v1.0,* Sections 2.1, 3.1, and 3.2.
[59] As defined in *SD VISta Program Definitions, v1.0*.

1) to ensure compliance with all social and environmental safeguard requirements in Section 6.

2) in alignment with the information reported in the baseline scenario (see Section 5.7) and causal chain analysis (see Section 5.8). This means the risk assessment must use the same categories included in those sections and build on the information reported. Where new risk areas are identified, the categories may be expanded to include the specific risks.

3) including direct, indirect, intended, unintended, and cumulative impacts on people and their prosperity and the planet within and adjacent to the project boundary (see Section 5.3).

5.6.5 Where the risk assessment determines that the risk level of a safeguards category is high (e.g., water shortages derived from increased irrigation from project activities),[60] the project proponent must provide a quantitative assessment and a qualitative justification.

5.6.6 The risk assessment must be completed at project design and updated, as needed (e.g., recalibrating risks after applying mitigation strategies and in response to results), at every monitoring period for verification.

5.6.7 Project proponents must disclose risks identified in the risk assessment and design and implement a mitigation plan outlining mitigation measures commensurate to the magnitude of the risks, to be reported at validation and every monitoring period for verification.

5.6.8 The mitigation plan must:

1) follow the mitigation hierarchy to first avoid, then minimize, and finally mitigate each risk, in a sequential order.

2) include mitigation measures to address negative impacts resulting from project activities outside the project area.[61]

5.6.9 Where identified risks cannot be avoided, minimized, and/or mitigated due to lack of resources, external circumstances, or the nature of the risk, the project is not eligible under the Nature Framework.

5.6.10 Project proponents must continually monitor the risks identified in the project, including whether the mitigation measures in place are effectively addressing the risks.

5.6.11 In every monitoring period, project proponents must:

1) report the results of the mitigation measures applied, providing evidence of their effectiveness in addressing the risks.

2) report any changes in the project's sustainable development context that could affect the risk levels assigned to each applicable safeguards category at project start.

[60] Indicator examples are provided in the corresponding risk assessment section in the project templates.
[61] As far out of the project boundary as necessary to mitigate identified risks

3) recalibrate risk levels with the new information.

4) document any increases in the risk magnitude for any applicable safeguards category, and the mitigation measures planned or implemented to address them.

5.7 Baseline Scenario

Concept

The baseline scenario is a narrative description including a qualitative justification of:

1) the sustainable development context (i.e., socioeconomic and environmental conditions) at the project start within the project boundary (see Section 5.3) and for the stakeholders identified (see Section 5.5.2).

2) the without-project scenario, representing the events and/or circumstances most likely to occur in the absence of the project activity.[62]

Requirements

Engaging Stakeholders

5.7.1 Project proponents must meaningfully engage stakeholders, following the requirements in Section 5.5, throughout the baseline scenario assessment or reassessment detailed in this section.

Sustainable Development Context at Project Start Within the Project Boundary

5.7.2 During project design, project proponents must determine and document the sustainable development context at the project start date within the project boundary (see Section 5.3) and significant changes in the past, including at least the following categories:[63]

1) Resource rights and tenure: covering property rights, access to resources for livelihood, resource governance or ownership, uses and exploitation of natural resources, and land conflicts

2) Governance: covering critical national and local regulations, whether criminal activities or corruption are known to occur in the area, conflict dynamics (non-land related)[64]

3) Human rights: covering the conditions of local stakeholders regarding the International Bill of Human Rights and universal human rights instruments[65]

[62] See *SD VISta Standard, v1.0,* Appendix 3, AM2.1(3).
[63] See *SD VISta Standard, v1.0,* Sections 3.1.1 and 3.2.1.
[64] Including, from the United Nations Convention against Corruption, all offenses (e.g., bribery of national and foreign public officials, embezzlement by a public official) and acts carried out in support of corruption (e.g., illicit enrichment, obstruction of justice, trading in influence and concealment, money laundering, and bribery in the private sector). Available at: https://www.unodc.org/documents/brussels/UN_Convention_Against_Corruption.pdf
[65] OHCHR. Available at: https://www.ohchr.org/en/instruments-listings

4) Socioeconomic status: covering key demographics including age, gender, occupation, income, education, cultural background, main means of subsistence for the identified stakeholders, and the economic and cultural diversity within and between stakeholder groups

5) Gender equality: covering gender and other power dynamics, and marginalized groups

6) Cultural rights: covering culturally significant sites, local customs and traditions linked to such sites, and cultural heritage

7) Habitats and ecosystem services: covering climate change vulnerability, ecosystem services, fauna and flora species (alien, native, rare, threatened, invasive), existing habitats, and ecosystem conversion. To identify species, project proponents must use, in descending order of priority, local, regional, or global invasive species registries. Where such registries do not exist, project proponents may justify use of a locally applicable information source.

8) Land use and biodiversity loss drivers: covering biodiversity loss rates (e.g., deforestation rates, coral bleaches, habitat loss) and main pressures or threats (e.g., hunting, logging, agricultural expansion)

9) Pollution: whether pollution to air, water, or other natural resources exists

5.7.3 Project proponents may include other categories as needed for their specific context or circumstances.

Without-project Scenario

5.7.4 During project design, project proponents must determine the without-project scenario, and justify why it is the most likely scenario to occur in the absence of the project, following these steps:

1) Gather scientific or regulatory sources (e.g., relevant national or subnational policies or legislation and their projected changes, economic and historic trends, climate change scientific projections) to inform the scenario.

2) Provide an informed and justified estimation of the most likely scenario for each category reported in the sustainable development context at the project start within the project boundary (see Sections 5.7.2 and 5.7.3).

Baseline Scenario Reassessment

5.7.5 Project proponents must reassess the without-project scenario at least every ten years and justify and determine whether the original scenario is still valid and appropriate for the current development context.[66]

[66] See *SD VISta Standard*, *v1.0,* Sections 2.1.8 and 2.1.9.

5.7.6 The reassessment must document the current status and changes to the context, using the categories in Sections 5.7.2 and 5.7.3.

5.7.7 Where the reassessment determines that the baseline scenario is:[67]

1) still valid, project proponents must document and justify this in the monitoring report for verification.

2) no longer valid, project proponents must document and justify a new baseline scenario, following the requirements in this Section 5.7, in a new project description which must be validated.

Note – Ecosystem or biome-specific requirements or modules may establish a shorter reassessment period, where there is robust scientific justification to do so.

5.8 Causal Chain Analysis

Concept

Projects must be designed to generate and maintain benefits during their lifetime and after project activities end. This section contains sequential requirements on how project proponents must map project activities, outputs, outcomes, and impacts on people, their prosperity, and the planet.

A project activity is the intervention that alters the conditions identified in the baseline scenario (see Section 5.7) and results in positive biodiversity outcomes.

Requirements

Engaging Stakeholders

5.8.1 Project proponents must meaningfully engage stakeholders throughout the causal chain analysis detailed in this section, following the requirements in Section 5.5.

Project Activities and Causal Chain Mapping

5.8.2 During project design, project proponents must:

1) evaluate the sustainable development context at the project start (established in the baseline scenario; see Sections 5.7.2 and 5.7.3) to identify the main needs that the project will be designed to address, including those specifically related to the expected biodiversity outcomes.[68]

2) set out clearly defined sustainable development objective(s) for the project, appropriate to its context, which address the needs identified in Section 5.8.2(1), and identify each objective's contributions (i.e., linkages) to at least one SDG target.[69]

[67] See *SD VISta Standard*, *v1.0,* Section 2.1.
[68] A root cause analysis is a helpful tool to identify the needs that the project proponent wants to address and align project activities with the root causes of the issues. See *SD VISta Standard*, *v1.0,* Section 2.1.5.3.
[69] See *SD VISta Standard*, *v1.0,* Section 2.1.2.

3) describe the project's:[70]

   a) planned activities: the interventions that will alter the conditions identified in the baseline scenario, including the technologies to be employed and the resources on which they depend.

   b) expected outputs: products (tangible or intangible) delivered by the project (e.g., facilitated capacity-building sessions, improved irrigation system).

   c) expected outcomes: short to medium-term results from project activities or outputs (e.g., community cohesion, improved capacities, biodiversity enhancement).

   d) estimated impacts: the results of project activities that last beyond the project lifetime. This must include:[71]

      i) changes in stakeholders' well-being due to project activities, with documentation of activities intended to mitigate negative impacts on stakeholder groups.

      ii) changes in natural capital and ecosystem services due to project activities, with documentation of activities intended to mitigate negative impacts.

4) identify and clearly outline implementation barriers to the project activities (e.g., financial, technical, conflict-related) and threats to sustainable development benefits. Implementation barriers must:

   a) relate to the needs that the project will address and be coherent with the planned project activities (see Section 5.8.2(3)).

   b) build on the baseline scenario narrative categories (see Section 5.7).

5) map (i.e., graphically depict) the causal chain, identifying the cause-and-effect relationships with a project's activities. The causal chain must include all identified positive, negative, direct, indirect, intended, and unintended consequences.

6) have a project management plan for:

   a) managing and implementing project activities over the project crediting period.

   b) maintaining and enhancing net positive project impacts after activities finish. The plan must include mitigation measures for the threats to sustainable development benefits identified in Section 5.8.2(4).

5.8.3 Project proponents must monitor and report the following in the monitoring report:

1) Implementation of activities and assumptions in the causal chain analysis and any updates as necessary

[70] Expanded requirement from *SD VISta Standard*, *v1.0,* Section 2.1.
[71] See *SD VISta Standard*, *v1.0,* Sections 3.1.4 and 3.2.4.

2) Direct impacts depicted in the causal chain analysis for all stakeholder groups, natural capital, and ecosystem services affected by the project, including expected and actual benefits, costs, and threats[72]

3) Progress of the project management plan (see Section 5.8.2(6))

5.9 Additionality

Concept

To be eligible to issue Nature Credits, project proponents must demonstrate that project activities leading to the generation of biodiversity outcomes are additional. Additionality does not impact the number of credits or the quantification of biodiversity outcomes.

Additionality means that credits are only assigned to biodiversity outcomes that are attributable to the project intervention and would not have occurred in the absence of Nature Credit revenue.

Demonstrating additionality is relevant for Nature Credits to:

- indicate that they represent a real biodiversity outcome compared to what would have occurred in the absence of the project, increasing buyers' confidence.
- avoid cost-shifting of conservation investment by governments or other funders.

Nature Credits generated under this methodology may not be used for offsetting (see Box 1 and Section 9).

Requirements

5.9.1 Project proponents must demonstrate that:

1) regulatory surplus exists at validation. Regulatory surplus means that project activities are not mandated by any law, statute, or other regulatory framework, or that such regulations are not enforced.

2) the activities generating biodiversity outcomes depend on Nature Credit revenue or that there are barriers to accessing other sources of finance.

5.9.2 Where supplementary existing or prospective funding sources (e.g., philanthropy or carbon credits) are in place or available for project activities, project proponents must demonstrate:

1) that implementation barriers to the long-term activities and achievement of desired outcomes exist. This demonstration must be linked to the baseline scenario (see Section 5.7) and the causal chain analysis, including the implementation barriers identified (see Sections 5.8 and 5.8.2(4), respectively).

[72] See *SD VISta Standard, v1.0,* Sections 3.1.2 and 3.2.2.

2) that the new funding source from Nature Credit revenue will allow the expansion of, or increase in, project scope (i.e., activities that lead to expected biodiversity outcomes), scale, speed of implementation, or sustainability or durability (i.e., enhancing project outcomes after project activities finish or increasing the time for which they are likely to endure).

3) existing funding by providing documented evidence of records (e.g., proposals of activities, letters of commitment, agreements, financial statements, audit reports).

5.9.3 Project proponents must demonstrate that the same biodiversity outcomes are not credited by another biodiversity or nature crediting program (whatever its denomination) to prevent double counting (see detailed requirements in Section 6.9).

5.10 Durability of Biodiversity Outcomes

Concept

The project must deliver positive biodiversity outcomes compared to the crediting baseline (see Section 7.5) within the project Extent over the project lifetime.

Durability is the ability of a project to ensure that biodiversity outcomes on which credits are based are likely to endure for an extended period without being reversed.[73]

The project longevity is the number of years, beginning from the project start date, for which project outcomes must be monitored for durability.

Requirements

Durability

5.10.1 Project proponents must monitor biodiversity outcomes and account and report reversals for a minimum of a 20-year project longevity following the requirements in Section 7. Where seeking certification of the same project under both the Nature Framework and Verra's VCS Program, the minimum project longevity is 40 years.

5.10.2 At each monitoring period, project proponents must monitor the project management plan to maintain and enhance net positive project impacts, including the effectiveness of mitigation measures, after activities finish (see Sections 5.8.2(6) and 5.8.3).

Reversals

5.10.3 To account for potential reversals, project proponents must deposit 20% of the Nature Credits issued into a project-specific buffer pool. The buffer pool holds non-tradable buffer credits to cover the risks of loss of biodiversity in Nature Framework projects.

[73] The Biodiversity Credit Alliance (2024). Available at: https://www.biodiversitycreditalliance.org/wp-content/uploads/2024/05/Definition-of-a-Biodiversity-Credit-Rev-220524.pdf

5.10.4 Project proponents must cancel buffer credits to cover biodiversity known or believed to be lost. As such, Nature Credits already issued to projects that subsequently experience losses are not canceled and do not have to be "paid back."

5.11 Adaptive Management

Concept

Adaptive management is a systematic approach to natural resource management that integrates learning and adaptation in an ongoing iterative process.[74] It allows project proponents to periodically adjust project activities, management, and/or monitoring approaches in response to gathered information or data, aiming to improve project outcomes and reduce risk.

Effective adaptive management considers the project's risk mitigation plan (see Section 5.6) and integrates learnings from monitoring and input from stakeholder participatory consultation. It also identifies and considers unanticipated obstacles to project implementation, such as climate change impacts, natural disasters, and governance policy change.

Requirements

5.11.1 Project proponents may deviate from a validated project description for the following reasons:

1) In response to stakeholder input
2) To mitigate safeguard risks that arise after validation
3) To improve positive impacts or mitigate negative impacts of the project on the sustainable development context
4) To enhance biodiversity outcomes

Box 2. Questions to Consider for Effective Adaptive Management

- Are the planned management strategies being implemented?
- What positive and negative changes have taken place within the project Extent and what caused them?
- Have any of the project's identified risks and/or threats changed? Are monitoring strategies effectively tracking those risks and threats?
- Are new technologies or traditional methods able to support more cost-effective monitoring of activities, while maintaining rigor?
- How effective are the project's current management strategies and what could be improved?

[74] Williams et al. (2009). Available at: https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/TechGuide.pdf

5.11.2 Project proponents must report deviations in the following monitoring report for verification.

5.11.3 Project proponents must document project description deviations as follows.[75] Where the appropriateness of the baseline scenario, additionality, or applicability conditions of the Nature Framework (e.g., inclusion of a new project activity) is:

1) affected, describe and justify in a revised version of the project description.

2) not affected, describe and justify in all subsequent monitoring reports.

5.11.4 Project proponents must describe the deviations, including when and why they occurred, and how they affect the appropriateness of the baseline scenario or the applicability of the Nature Framework.

5.11.5 Project proponents may add a new project activity via a project description deviation only where its start date is the same as or later than the originally validated project activity (or activities).

5.12 Benefit Sharing

Concept

Benefit-sharing mechanisms establish how the revenue generated from the sale of Nature Credits is distributed among project stakeholders. These mechanisms ensure that customary rights holders, including Indigenous Peoples and local communities, workers on private land, affected neighbor communities, and any affected stakeholders are recognized and rewarded for their role as nature stewards and in the project.

Benefits may be monetary, in kind, or a combination of both, as long as they are agreed upon through participatory and good faith negotiation processes with all affected stakeholders and improve community livelihoods.

Requirements

5.12.1 Project proponents must:

1) establish a benefit-sharing mechanism with the stakeholders identified in Section 5.5.2, excluding interested stakeholders.

2) provide transparent and as accurate as possible financial information on costs and expected revenues during project design so that stakeholders have sufficient information to agree upon a benefit-sharing mechanism.

3) make the benefit-sharing agreement publicly available to all stakeholders as soon as agreed upon, in a form, manner, and language understandable by the affected stakeholders.

[75] See *SD VISta Standard*, *v1.0,* Section 2.7.

4) provide stakeholders with the project's financial records, such as financial statements, in which the gross revenue is identifiable and traceable, to evaluate ongoing appropriateness and implementation of the benefit-sharing mechanism.

5.12.2 The benefit-sharing agreement must include:

1) names of the signatories from the governance representation structure that stakeholders have self-selected (see Section 5.5.7(8)).

2) the allocation of net revenue per stakeholder group.

5.12.3 The project proponent must demonstrate that the benefit-sharing mechanism is:

1) agreed upon during stakeholder consultation prior to project start (see Section 5.5.8(7)).

2) co-created with the affected stakeholders.

3) culturally appropriate and gender and inter-generationally inclusive.

4) in compliance with applicable national rules, regulations, and international human rights laws and standards. Where these conflict, the project proponent must follow the requirements in Section 6.2.2.

5) consistent with customary rights to the extent possible.

6) transparent to the extent possible, except where the affected stakeholders wish to keep elements of the mechanism confidential, in which case the project proponent must provide a justification, agreed upon by the stakeholders, and provide the full arrangement as a commercially sensitive document.

5.12.4 In-kind benefits must not include the benefits resulting from project activities documented during causal chain analysis (see Section 5.8), including those designed to mitigate the project’s negative impacts.

6 SOCIAL AND ENVIRONMENTAL SAFEGUARDS

Concept

This section consolidates social and environmental safeguards requirements for Nature Framework projects. It builds on existing SD VISta requirements and best international practices for safeguards.

To ensure that project activities have net positive impacts on people, their prosperity, and the planet, project proponents must identify and address any negative environmental and socioeconomic impacts of project activities using a risk assessment (see Section 5.6).

6.1 Resource Rights and Tenure

Requirements

6.1.1 Project proponents must demonstrate at project start and during implementation that the project recognizes, respects, and supports rights to lands, territories, and resources, including the statutory and customary rights of Indigenous Peoples and others within communities and other stakeholders. Tenure and use of land and resources must be obtained in an ethical and lawful manner.

Respect and Recognition of Land Tenure

6.1.2 The project proponent must:

1) recognize and respect the legal or customary rights under which land is owned, used, transferred, and managed, regardless of whether a community holds any type of title to their land.
2) not encroach on private, stakeholder, community, or government property without prior consent.[76]

Land Use Consent

6.1.3 Project proponents must:

1) provide proof of consent from the customary and/or legal owners of the project area, and proof of compliance with local regulations.
2) demonstrate legal authorization and/or customary consent (where applicable) for land use and disclose any type of ownership or agreements related to the use of resources and the impact of project activities on such resources.

[76] See *SD VISta Standard*, *v1.0,* Section 2.4.2.

3) provide proof of an agreement with relevant stakeholders on the appropriate use of communal or public resources, where such resources are impacted by the project.

Displacement and Resettlement

6.1.4 Project proponents must demonstrate that project activities do not lead to involuntary removal or relocation of property rights holders from their lands or territories and do not force relocation of activities important to their culture or livelihood.

6.1.5 Where any relocation of habitation or activities is undertaken within the terms of an agreement, project proponents must demonstrate that the agreement was made with the free, prior, and informed consent of those concerned and includes provisions for just and fair compensation (see Sections 6.5.6 and 6.5.7).[77]

Conflicts Over Rights

6.1.6 Project proponents must identify:

1) any ongoing or unresolved conflicts or disputes over rights to lands, territories, and resources, and

2) any disputes that were resolved during the last 20 years where such records exist, or at least during the last 10 years.

6.1.7 Where applicable, project proponents must describe and take appropriate measures to resolve conflicts or disputes.[78]

6.1.8 Project proponents must demonstrate that they have not undertaken any activity that could prejudice the outcome of an unresolved dispute relevant to the project over lands, territories, and resources in the project boundary.

Access to Resources

6.1.9 With respect to access to resources, project proponents must:

1) ensure that communities have access to natural resources and can maintain traditional livelihoods. Any restrictions on access must be agreed upon through community consultations (see Section 5.5.6 to 5.5.12).

2) implement, to the extent possible, cost-effective measures to improve the efficiency of project use of key resources, such as water, energy, and other raw material inputs.

3) adopt, to the extent possible, measures to avoid or reduce water consumption and decrease water use over time to avoid adverse impacts on people (e.g., access to safe drinking water) and biodiversity.

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[77] Compensation should include both the financial and non-financial costs of the loss of lands (e.g., loss of culture, loss of business opportunity). See Article 10 of the *UN Declaration on the Rights of Indigenous Peoples*. Available at: https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

[78] See Principle 25.1 of FAO (2012). Available at: https://doi.org/10.4060/i2801e

4) not exacerbate water stress experienced in the area in which the project is located and should generate positive water impacts where possible.

5) avoid project activities negatively impacting the availability and reliability of energy supply to other users.

6) mitigate any possible negative impact on access to and availability of food for local communities.

No Net Degradation of Natural Resources

6.1.10 Project proponents must demonstrate no net degradation of natural resources and include measures to protect resources (e.g., soil, water bodies, energy supply) identified during the baseline scenario (see Section 5.7) from degradation, erosion, and depletion.

6.2 Governance

Requirements

6.2.1 Project proponents must demonstrate:

1) compliance with all relevant local, national, and international laws and regulations, and

2) that the necessary governance systems are in place to operate the project effectively.

Legal Compliance

6.2.2 Project proponents must:

1) ensure that implementation of project activities does not lead to violation of any applicable law, regardless of whether the law is enforced.

2) understand and comply with all applicable local/municipal, state/provincial, national, and international laws and obtain necessary approvals from relevant authorities, including state, local, and Indigenous authorities.

3) comply with both statutory and customary requirements.

6.2.3 Where national legislation and regulations contradict or are not aligned with the Nature Framework requirements, project proponents should apply the higher regulation, convention, or law (e.g., International Human Rights Conventions) to ensure a positive outcome for people and the planet.

Illegal Activities

6.2.4 Project proponents must:

1) identify any risks of actual illegal activities that could affect the project's net positive impacts (e.g., illegal logging) taking place in the project boundary and describe measures

needed and taken to reduce these activities so that project benefits are not derived from illegal activities.

2) report impacts resulting from illegal activities within the project boundary during project implementation and measures taken to mitigate these impacts.

3) present a plan to eliminate illegal activities and mitigate and manage the identified risks.

4) notify Verra within five calendar days of receiving a subpoena, summons, demand, inquiry, or other official request related to the project from any court of competent jurisdiction, or governmental or regulatory authority, including federal, state, municipal, or law enforcement agencies.

Anti-Corruption

6.2.5 Project proponents must not engage in any form of corruption, such as bribery, embezzlement, fraud, abuse of power, influence peddling, or collusion.

6.2.6 Project proponents must have policies and procedures in place to prevent, detect, and remediate corruption. Such policies and procedures must include risk assessment, mitigation, and management.[79]

6.2.7 All project staff and stakeholders must be informed of these policies and procedures, and confirm their adherence to them.

Anti-Money Laundering

6.2.8 Project proponents must ensure, to the extent possible, transparency in all financial transactions within the project and project activities.

6.2.9 Project financing must not be sourced from the proceeds of crime or otherwise constitute an offense under any applicable anti-money laundering law.

6.2.10 Policies and standard operating procedures must be in place to prevent, detect, and monitor transactions to avoid money laundering and other unethical financial practices.[80]

6.2.11 Where money laundering red flags[81] or warning signals are identified, the project proponent must address these without delay to ensure compliance with laws and SD VISta Program rules.

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[79] Project proponents may refer to the most recent version of the *Verra Anti-Corruption Compliance Policy*. Version 1 of this policy is available at: https://verra.org/wp-content/uploads/2023/09/Final-Verra-Anti-Corruption-Compliance-Policy-1.pdf

[80] Project proponents may refer to the most recent version of the *Verra Sanctions and Anti-Money Laundering Policy*. Version 1 of this policy is available at: https://verra.org/wp-content/uploads/2023/09/Final-Verra-Sanctions-and-AML-Compliance-Policy-1.pdf

[81] The *Verra Sanctions and Anti-Money Laundering Policy, v1.0* states that money laundering "red flags" can generally relate to and involve a combination of unusual or unconnected sources and recipients of funds; unusual or non-transparent transactions and instructions; unusual and suspicious behaviors and counterparties; and transactions associated with higher-risk jurisdictions, including jurisdictions subject to US, EU, or UK sanctions regimes.

Watchlists, and Blocked and Sanctioned Parties[82]

6.2.12 Project proponents must demonstrate through risk assessments that parties and entities with a material interest or substantial control over the project are not on a watchlist and are not a blocked or sanctioned party of the United Nations, European Union, or the United States.

Transparency and Traceability

6.2.13 Project proponents must:

1) keep records of project activities, including mitigation measures and their costs, and make these records publicly available, except for sensitive information that could be proven dangerous to stakeholders.

2) provide a justification for classifying information as sensitive, agreed upon by the stakeholders affected by the sensitive information.

Due Diligence

6.2.14 Project proponents must:

1) adhere to the highest ethical standards in all aspects of project implementation and management. This includes and is not limited to integrity in decision-making, prioritizing transparency and fairness, respecting diversity and inclusion, avoiding, mitigating, or managing conflicts of interest, and compliance with laws.

2) implement due diligence processes to:

   a) assess the ethical standards of partners and stakeholders.

   b) investigate and evaluate potential risks and impacts of project activities and their implementation to ensure compliance with laws and ethical, financial, and other standards within the safeguards risk assessment (see Section 5.6).[83]

3) report to Verra, mitigate, and manage sources of concern or controversial findings from the due diligence that could negatively impact the project.

Operational Expertise

6.2.15 Project proponents must demonstrate that the project has adequate human and financial resources for effective implementation. Where relevant experience is lacking, project proponents must either demonstrate how other organizations are partnered with to support the project or have a training and/or recruitment strategy to fill the gaps.

[82] Project proponents may refer to the most recent version of the *Verra Sanctions and Anti-Money Laundering Policy*.
[83] Project proponents may refer to the most recent version of the *Verra Anti-Corruption Compliance Policy*.

Emergency Preparedness and Response

6.2.16 Project proponents must develop plans, procedures, and systems to anticipate, prevent, respond to, and recover from potential emergencies or crises that could impact the project, its personnel, and stakeholders.

6.3 Human Rights

Requirements

Upholding and Respecting Human Rights

6.3.1 Project proponents must uphold and respect human rights during project design and implementation as defined in the International Bill of Human Rights and universal human rights instruments.[84]

Non-discrimination

6.3.2 Project proponents must ensure no entity implicated in project design or implementation is involved in any form of discrimination, bullying, intimidation, or harassment, including of a sexual nature, with special attention to vulnerable and marginalized people, women, and children.

Gender Equality

6.3.3 Project proponents must provide equal opportunities and fair treatment for all genders in project design and implementation.

6.3.4 Project proponents must avoid reinforcing gender-based discrimination or violence.

Inclusion of Marginalized Groups

6.3.5 Project proponents must include marginalized and vulnerable groups in project planning and implementation. Special efforts must be made to protect and benefit these stakeholders.

Accessibility

6.3.6 Project proponents must provide access to resources, opportunities, and decision-making processes for everyone, including people with disabilities. This includes making communication and project sites accessible.

Application of International Law

6.3.7 Project proponents must hold all persons, institutions, and entities (public and private) accountable to laws that are publicly promulgated, equally enforced, and independently adjudicated. Where there is a conflict between national and international laws, the project proponent must adhere to international law to the extent that it provides greater protection for human rights. Sections 6.3, 6.4, and 6.5 must comply with this principle.

[84] OHCHR. Available at: https://www.ohchr.org/en/instruments-listings

6.4 Labor Rights and Work Conditions

Requirements

6.4.1 Project proponents must:

1) demonstrate in the project description and monitoring reports that their project meets or exceeds all applicable laws and/or regulations covering worker rights.

2) take measures to inform workers about their rights and document these rights in the project description and monitoring reports.

Fair Wages and Employment Conditions

6.4.2 Project proponents must provide fair living wages and recognize legal working hours.

Equal Opportunities

6.4.3 Project proponents must provide:

1) equal employment opportunities for all, regardless of gender, disabilities, and other characteristics.

2) equal pay for equal work, and any wage differences must be based only on capacity and experience.

3) equal opportunity to fill all work positions (including management) where the job criteria are met.

4) members of local communities with a fair chance to fill positions for which they can be trained.

Prohibition of Forced and Child Labor, and Human Trafficking

6.4.4 Project proponents must prohibit the use of forced labor, child labor, modern slavery, or victims of human trafficking and protect all staff and contracted workers employed by third parties in project design and implementation.

Health and Safety

6.4.5 Project proponents must:

1) take measures to protect the health and safety of workers and local communities.

2) comprehensively assess situations and occupations that might arise through project implementation and pose a substantial risk to the safety of workers and other stakeholders.

3) proactively address potential health risks.

4) inform workers and stakeholders involved in carrying out project activities of risks and explain how to mitigate them.

5) provide all the necessary equipment required for project activities and keep a record of equipment distributed to employees.

6) where worker or stakeholder safety cannot be guaranteed, demonstrate in the project description and monitoring reports how the risks are mitigated using best work practices in line with workers' and other stakeholders' culture and customary practices.

Training and Capacity Building

6.4.6 Project proponents must:

1) provide orientation, training, and capacity-building programs to workers and stakeholders involved in carrying out project activities, giving special attention to marginalized and vulnerable groups.

2) provide prioritization in local orientation and training with the objective of building locally useful skills and knowledge to increase local participation in project implementation. These capacity-building efforts should target a wide range of people from among the stakeholders.

3) ensure that training is passed on to new workers where there is staff turnover, so that local capacity is not lost.

4) provide any necessary training for the use of equipment required in project implementation.

Armed Personnel

6.4.7 Where project activities involve armed personnel, project proponents must:

1) define the specific duties and limitations of armed personnel, focusing on protection rather than offensive or aggressive actions. The use and deployment of weapons and equipment must be appropriate and proportionate to the threat level. The threat level must be identified and recorded in the mitigation plan to ensure it is commensurate with the deployment need.

2) clearly define the rules of engagement for armed personnel within the project boundary. These rules must specify when and how arms may be used, ensuring that actions are justified and necessary in order to protect local communities, project staff, and biodiversity outcomes.

3) train armed personnel in the responsible use of force, including techniques for de-escalating potentially violent situations.

4) conduct thorough background checks and vetting of all armed personnel to ensure they do not have a history of human rights abuses, criminal activity, or other concerning behavior.

5) ensure that all armed personnel meet specific qualification standards, including physical fitness, psychological stability, and relevant experience.

6) ensure weapons equipment is in compliance with local laws and regulations.

Just Transition

6.4.8 Where project activities impact employment by changing from one employment sector to another, project proponents must:

1) develop a transition plan for employees affected by project activities, including severance packages, early retirement options, job-seeking support, and training programs for new employment opportunities.

2) establish a compensation plan for external dependents, such as short-term consultants and local businesses affected by the project activities. Compensation must be fair and negotiated in good faith.

3) provide training and support to affected employees, equipping them with new skills and capacities to participate in project activities.

6.5 Indigenous Peoples and Cultural Heritage

Requirements

6.5.1 Project proponents must demonstrate and qualitatively justify, in project design and implementation, that project activities recognize, respect, protect, and strengthen the distinct and differentiated rights of Indigenous Peoples.

Self-determination and Rights

6.5.2 Project proponents must respect Indigenous Peoples' rights, including but not limited to their rights to self-determination, their lands, resources, and territories, traditional livelihoods, and cultures. In case of conflict between national and international law requirements relating to self-determination and rights, the law which provides greater protections and rights relating to self-determination prevails.

6.5.3 Project proponents must avoid implementing activities that may undermine or inadvertently weaken Indigenous Peoples' collective rights to own, use, develop, and control the lands, territories, and resources that they have traditionally owned, occupied, or otherwise used or acquired, including lands and territories for which they do not possess title.[85]

Cultural Rights and Heritage

6.5.4 Project proponents must:

1) respect and preserve cultural practices, languages, and heritage of Indigenous Peoples.

2) not harm or disrespect cultural heritage within the project boundary.

[85] UNDP (2021). Available at: https://ses-toolkit.info.undp.org/sites/g/files/zskgke446/files/2023-03/UNDP%20Social%20and%20Environmental%20Standards_2019%20UPDATE_rev%202023.pdf

3) obtain consent and inform Indigenous Peoples of their rights where the project impacts in any form their cultural heritage. The information must include the scope of the project activities and any potential consequences to Indigenous Peoples' heritage. Examples of cultural heritage include the use of traditional knowledge, practices, methods, or cosmovision. A mitigation plan must be developed and agreed upon with the community where necessary.

4) protect culturally significant sites and respect local customs and traditions.

5) to the extent possible, include Indigenous Peoples and local communities' traditional knowledge and cultural heritage in project design and implementation. Where traditional knowledge is included, project proponents must demonstrate that a framework is in place to address the intellectual property rights of Indigenous Peoples and local communities.

6.5.5 Project activities must not harm or damage cultural sites within the project boundary.

Full, Effective, and Meaningful Participation and FPIC

6.5.6 Project proponents must:

1) ensure the meaningful, effective, and informed participation of Indigenous Peoples in all matters at the earliest stage of project design and iteratively throughout implementation, respecting Indigenous Peoples' cultural and social structures, local customs, values, institutions, gender, and inter-generational sensitivity. (See Sections 5.5.6 to 5.5.12 for guidance.)

2) obtain free, prior, and informed consent (FPIC) (see Box 3) on any matters that may affect, positively or negatively, Indigenous Peoples' rights and interests, lands, territories (whether titled or untitled to the people in question), resources, traditional livelihoods, and/or tangible and intangible cultural heritage.[86]

3) obtain full consent prior to using any traditional knowledge in the project.

6.5.7 During project design and implementation, project proponents must ensure that FPIC is:

1) an iterative process that cannot be completed in a single meeting;

2) achieved through continuous dialogue, information sharing, and the building of trust and cooperation over time;

3) designed to protect rights specific to Indigenous Peoples; and

4) applied to local communities whose members identify less strongly as Indigenous, but who maintain distinct identities and cultures linked to lands they have occupied or used for generations (e.g., tribes).[87]

[86] Ibid.
[87] The Nature Conservancy (n.d.). Available at: https://www.tnchumanrightsguide.org/module-2-free-prior-informed-consent/#notes

Box 3. Free, Prior, and Informed Consent (FPIC)

Free: means no coercion, intimidation, manipulation, threat, or bribery.

Prior: means sufficiently in advance of any authorization or commencement of activities and respecting the time requirements of any decision-making processes.

Informed: means that information is provided that covers (at least) the following aspects:

- The nature, size, pace, reversibility, and scope of any proposed project or activity
- The reason(s) or purpose of the project and/or activity
- The duration of the above
- The locality of areas that will be affected
- A preliminary assessment of the likely economic, social, cultural, and environmental impact, including potential risks and fair and equitable benefit sharing in a context that respects the precautionary principle
- Personnel likely to be involved in the execution of the proposed project (including Indigenous Peoples, private sector staff, research institutions, government employees, and others)
- Procedures that the project may entail

Consent: means that there is the option of withholding consent and that the parties have reasonably understood that option at any point. Consent is an ongoing principle.

6.6 Habitats and Ecosystem Services

Requirements

6.6.1 Project proponents must demonstrate and qualitatively justify in the safeguards risk assessment, at project design and during implementation, that the project:

1) avoids exacerbating the impacts of climate change on biodiversity, including natural and anthropogenic impacts (e.g., soil erosion, droughts, floods).
2) avoids predictable and expected increases in greenhouse gas emissions.
3) maintains or enhances ecosystem services and functions over the project lifetime.
4) avoids negative impacts on terrestrial, freshwater, coastal, and marine biodiversity according to the project's specific context.
5) avoids negatively impacting identified threatened species[88] (i.e., critically endangered, endangered, and vulnerable).
6) implements measures to avoid intentionally and unintentionally introducing any alien, non-native, or invasive species into the project boundary.

[88] The term "species" is used here as comprehensive of flora and fauna.

7) implements activities that prevent the expansion and growth of alien, non-native, or invasive species that may threaten target species, habitats, or people.

8) does not use any species that threaten the existence of any rare or threatened species.

9) avoids planting or introducing non-native species, except for justified purposes, including improvements in ecosystem health or services, climate adaptation, and resiliency. In these cases, the project proponent must justify the selection and demonstrate that the species does not pose any environmental risk or threat.

10) does not adversely impact and, to the extent possible, does protect, maintain, or enhance habitats for rare and threatened species (i.e., critically endangered, endangered, and vulnerable).

11) does not adversely impact areas needed for habitat connectivity.

Ecosystem Conversion

6.6.2 Where restoring an ecosystem, project activities must occur in an area demonstrated to have been in a state of degradation for at least 10 years prior to the project start date. Where the degradation occurred within 10 years prior to the project start, project proponents must demonstrate whether the degradation was caused by a natural disturbance and that it was not caused by the project proponent or a related person or entity.

Restoration

6.6.3 Where the project activity restores degraded ecosystems, activities must restore a native ecosystem type represented in the same ecoregion as the project, unless the project proponent demonstrates that species needed for restoration must be non-native for resiliency and adaptation purposes.

6.7 Animal Welfare

Requirements

6.7.1 For projects that include activities related to the housing and management of animals, project proponents must demonstrate and qualitatively justify in the safeguards risk assessment, at project design and during implementation, that appropriate measures are adopted to:

1) where relevant, promote animal welfare and control for potential invasiveness or escape of production species (e.g., measures are in place to protect animals in captivity and animals used for project activities in productive landscape contexts are properly taken care of, considering culturally appropriate practices).

2) ensure that the project boundary is free from animal trafficking.

6.8 Pollution

Requirements

6.8.1 For projects that implement activities involving the release of pollutants, agrochemicals, waste, and/or hazardous waste, project proponents must demonstrate and qualitatively justify in the safeguards risk assessment, at project design and during implementation, that the project:

1) avoids, minimizes, and mitigates any impacts caused by pollutants in terms of:
    a) emissions to air,
    b) discharges to water or soil,
    c) noise and vibration,
    d) waste generation, and
    e) the release of hazardous materials and chemical pesticides and fertilizers.
2) avoids the spread of pollutants and where avoidance is not feasible, minimizes the scale of their release. This requirement applies to all types of contamination due to routine or non-routine circumstances and whether impacts are local, regional, and/or transboundary.
3) avoids the release of agrochemicals (e.g., fertilizers, fungicides, herbicides, pesticides) to the environment.
4) prioritizes chemical pesticides that are low in human toxicity and have minimal effects on target and non-target species, and the environment. The project proponent must ensure that pesticides used are legally allowed in the host country, have been manufactured by an entity currently licensed by relevant regulatory agencies, have been packaged in safe containers that are clearly labeled for safe and proper use, and are stored and used according to national standards.
5) avoids contaminating any water body with any pollutant. In cases of accidental contamination, project proponents must:
    a) report it:
        i) in the next monitoring report,
        ii) to local authorities, and
        iii) to affected people.
    b) implement monitoring measures for water quality and quantity parameters immediately after the incident.
6) avoids the generation and release of hazardous and non-hazardous waste materials related to project activities. Where unavoidable, project proponents must reduce the generation of waste, and recover and reuse it to promote healthy communities and the

environment. In cases where waste cannot be recovered or reused, project proponents must treat, destroy, or dispose of it according to local regulations or, in the absence of local regulations, in alignment with international best practices.

7) adopts environmentally sound disposal measures for hazardous waste and avoids its transboundary movement. In cases where hazardous waste disposal is conducted by third parties, the project must use contractors licensed by the relevant government regulatory agencies and obtain chain of custody documentation to the final destination. Where the project cannot meet these requirements, project proponents must reduce hazardous waste sent to such sites and consider alternative disposal options, including the possibility of developing their own recovery or disposal facilities at the project site.

6.9 Double Counting, Double Claiming, and Participation under Other Biodiversity or Nature Programs

Concept

To maintain environmental integrity, biodiversity outcomes generated by a project are not double counted or double sold. Double counting includes double issuance, double claiming, and double use (see Section 3 for the full definitions of these terms). This section contains requirements to prevent double issuance. Project proponents and all Verra Registry account holders commit to not double-sell Nature Credits through acceptance of the *Verra Registry - Terms of Use* (ToU).

To avoid double counting within or across biodiversity or nature programs, projects are not eligible to seek registration under the SD VISta Program if they are registered and active under another biodiversity or nature program. The term biodiversity or nature program covers biodiversity or nature crediting programs, as defined further in Section 3.

Requirements

No Double Issuance

6.9.1 Project proponents must not seek credits for the same biodiversity outcomes under the SD VISta Program and another biodiversity or nature program.

6.9.2 Where project proponents have received or are seeking credits for biodiversity outcomes from a project activity under the SD VISta Program and another biodiversity or nature program, the following information about the other program must be provided to the validation/verification body and Verra:

1) Name and contact information of program administrator

2) Details of participation under the program

3) Details of the vintage period(s), volume(s), serial number(s), and all other relevant identification information for biodiversity outcomes included

4) Evidence that the same biodiversity outcomes seeking credit under the SD VISta Program have not been and will not be counted, used, or credited under the other program, or evidence confirming the cancellation and non-use of credits issued under the other program. Such evidence may include:

   i) A signed letter from the program administrator stating that the same biodiversity outcomes have not and will not be otherwise counted, used, or credited under the other program;

   ii) A signed letter from the program administrator confirming the cancellation and non-use of other biodiversity or nature program credits for the same biodiversity outcomes seeking credit under the SD VISta Program; or

   iii) Links to the official public program registry or project page demonstrating non-issuance or cancellation of credits.

6.9.3 Biodiversity outcomes issued as Nature Credits must not be double claimed.

7 QUANTIFICATION OF BIODIVERSITY OUTCOMES

7.1 Summary of Quantification Steps

Figure 5. Summary of required quantification steps (indicated by numbered circles)

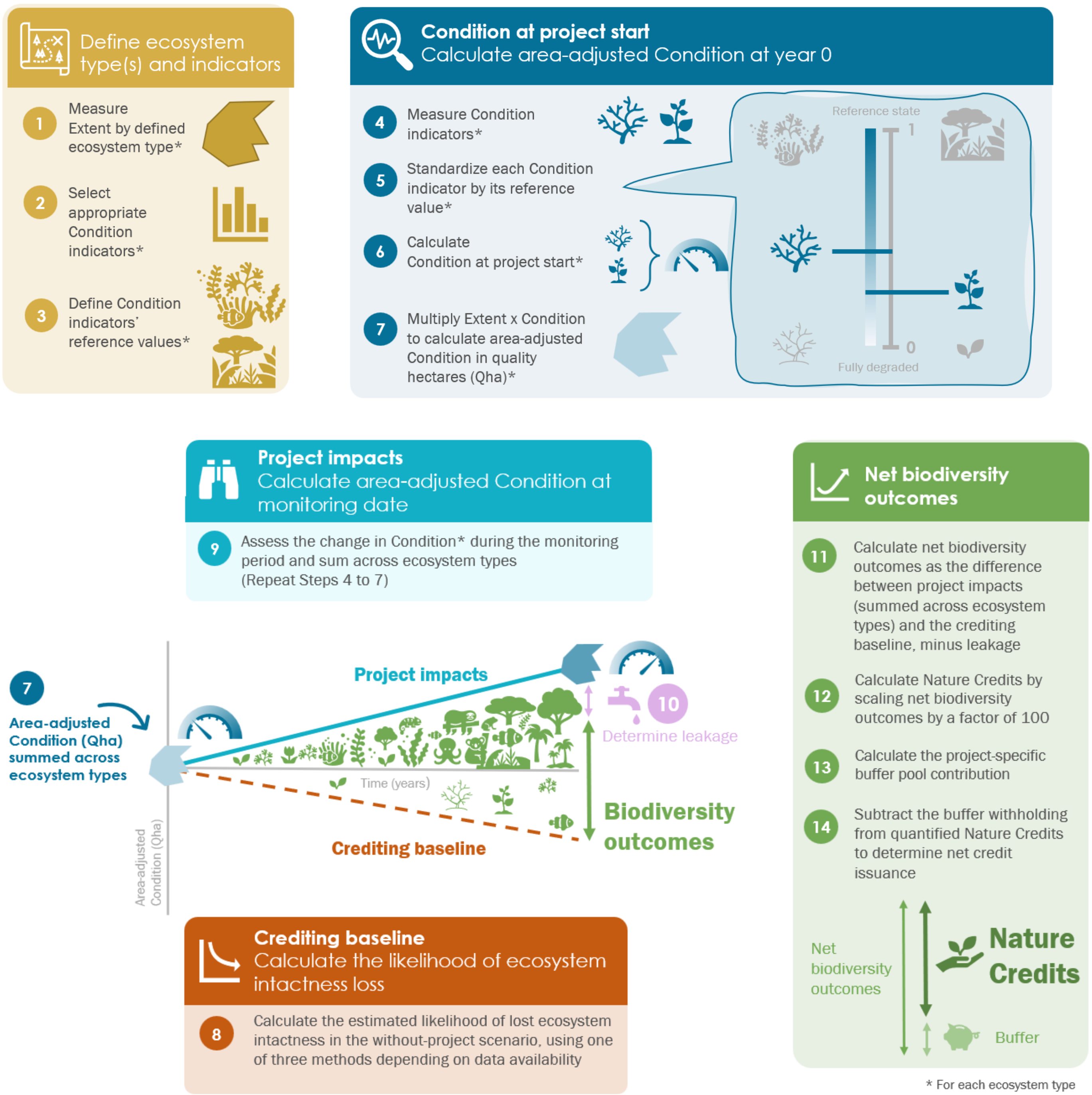

Table 3. Summary of required steps for quantifying net biodiversity outcomes

Quantification of	Step	Action	Document section	Detail
Extent[a]	Step 1	Define ecosystem type(s) and measure their area at project start (year 0)	7.2	• Extent is the physical area, defined by ecosystem type and measured in hectares (ha), in which project activities take place and across which biodiversity outcomes are measured.
Condition[a]	Step 2	Select Condition indicators for each ecosystem type in the project Extent	7.3	• Condition is the quality of an ecosystem within a defined spatial unit measured in terms of its abiotic and biotic characteristics. • Condition has four simplified components: composition, structure, function, and pressures. • Indicators must be relevant to ecosystem integrity and linked to the project's activities. • A minimum of two structure and three composition indicators are required.
	Step 3	Define reference values for selected Condition indicators		• The Condition reference state is where natural ecological and evolutionary processes shape the ecosystem structure, composition, and function. • The reference state value reflects an indicator's optimal value in a scenario of minimal to no human disturbance. • Three approaches to setting reference values are provided with supporting guidance.
Condition at Project Start (Year 0)[a]	Step 4	Measure Condition indicators at project start (year 0)	7.4	• Following the required sampling protocol and monitoring plan (Section 8.2)
	Step 5	Standardize Condition indicators by Condition reference values		• Each selected Condition indicator (Step 2) is divided by its reference value (Step 3) to produce a standardized value from 0 (fully degraded) to 1 (fully intact).
	Step 6	Calculate Condition at project start (year 0)		• Structure and composition indicators are averaged separately, and then combined, using the arithmetic mean.
	Step 7	Calculate area-adjusted Condition at project start (year 0)		• Area-adjusted Condition is the ecosystem Extent (ha) multiplied by its average Condition value (Step 6). • It has units of "quality hectares" (Qha) and must be calculated for each ecosystem in the Extent.

Quantification of	Step	Action	Document section	Detail
Crediting Baseline[a]	Step 8	Calculate the project crediting baseline	7.5	• The crediting baseline reflects the likelihood of loss of ecosystem intactness (i.e., Condition) in the absence of the project intervention. • Three pragmatic methods, dependent on data availability, are provided: matched control method, habitat conversion risk method, and ecoregional rate of change method. • The crediting baseline is calculated using data for the country ecoregion component. • Crediting baselines are dynamic at verification; the dynamic crediting baseline is then used as the estimated baseline for the next monitoring period.
Project Biodiversity Impacts	Step 9	Monitor project impacts (i.e., change in project Condition during the monitoring period)[b]	7.6	• Repeat Step 4 to Step 7 using regularly sampled and standardized Condition indicator measurements for each ecosystem type. • Monitoring requirements (Section 8.2) are supported by guidance. • The final panel of Condition measurements is used as the starting Condition for the next monitoring period.
Leakage[a]	Step 10	Quantify negative and positive impacts on biodiversity outside the Extent resulting from project activities[b]		• Identify and take measures to mitigate potential impacts. • Quantify unmitigated negative impacts (i.e., leakage) to be deducted from the project's net biodiversity outcomes.
Net Biodiversity Outcomes	Step 11	Calculate net biodiversity outcomes using measured project impacts, the crediting baseline, and leakage[b]		• Calculated for each ecosystem type in the project Extent and summed.
Nature Credits	Step 12	Calculate Nature Credits resulting from project activities[b]		• Net biodiversity outcomes (Step 11) are multiplied by a scaling factor of 100.
Buffer Contribution	Step 13	Determine the quantity of Nature Credits held in a project-specific buffer pool[b]		• Calculate total buffer withholding, equivalent to 20% of the Nature Credits generated (Step 12).

Quantification of	Step	Action	Document section	Detail
Net Nature Credits Issuance	Step 14	Calculate net Nature Credits that may be issued for the monitoring period[b]		• The buffer contribution (Step 13) is deducted from the Nature Credits (Step 12).

[a] Biome- or ecosystem-specific modules may include different requirements.

[b] Must be quantified for each distinct monitoring period.

7.2 Extent

Concept

Extent is the physical area, defined by ecosystem type and measured in hectares, in which project activities take place and across which biodiversity outcomes are measured.

For freshwater and marine projects, Extent refers to the planar surface area, rather than volume.

The project's Extent may contain more than one discrete area within the project boundary. Extent is the equivalent of the project area for VCS Program purposes.

Extent does not include built infrastructure. It also does not include human settlements, water bodies, and/or agricultural lands where such areas are not directly targeted by project activities and monitored for project outcomes. However, such areas may be included in the project boundary where they are within the project's sphere of influence (see Section 5.3).

Requirements

Step 1. Define ecosystem type(s) and measure their area, individually and in total, in the Extent at project start

7.2.1 Project proponents must:

1) define all ecosystem types in the project Extent using the IUCN Global Ecosystem Typology and classify types by Level 3 (i.e., functional group).[89]

2) where distinct conservation and productive (i.e., agricultural) land uses occur in the same ecosystem within the project Extent, stratify those area(s) accordingly for each ecosystem.

3) measure and report the project Extent in hectares in total and by individual ecosystem type (or by stratified land use per ecosystem type, where applicable).

Note – Ecosystem or biome-specific requirements or modules (to be developed) may require the use of more detailed ecosystem classifications.

[89] Keith et al. (2020). Available at: https://doi.org/10.2305/IUCN.CH.2020.13.en

7.3 Ecosystem Condition

Condition Indicators

Concept

Ecosystem Condition (also referred to as Condition) is the quality of an ecosystem within a defined spatial unit (i.e., the project Extent), measured in terms of its abiotic and biotic characteristics. In the Nature Framework, Condition encompasses all taxonomic groups (e.g., flora, fauna, fungi, bacteria) and includes the four main components in Table 4.

Table 4. Components of Condition summarized and simplified from the UN SEEA 2021[90]

Component	Description	Example indicators
Composition	The variety, quantity, abundance, and evenness of living organisms	Species richness of characteristic biota, abundance of keystone species subject to hunting
Structure	The physical size and form of an ecosystem's biotic physical and/or chemical elements	Total biomass, canopy cover, water chemistry
Function	The ecological processes and flux of energy and materials through the ecosystem	Net primary productivity, rate of leaf litter decomposition
Pressures	The scale and severity of processes threatening ecosystem health	Invasive species, fishing or hunting pressure, land-use change

Condition indicators show natural fluctuations (i.e., are intrinsically stochastic), and depending on the chosen metric, they may capture different rates of change in Condition.

Where indicators are relevant, well-chosen, and well-measured, monitoring multiple indicators reduces uncertainty and supports a more accurate reflection of ecosystem change over time. The Nature Framework requires project proponents to monitor a minimum number of Condition indicators, yet provides flexibility to select those that are locally appropriate.

Project proponents can refer to the Technical Annex (Section 10) for additional information and guidance on selecting, measuring, and monitoring Condition indicators.

[90] UN Committee of Experts on Environmental-Economic Accounting (2021). Available at: https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf

Requirements

Step 2. Select Condition indicators

7.3.1 Project proponents must measure and monitor composition and structure components of Condition, for both flora and fauna, using appropriate indicators for each ecosystem type within the project Extent.

7.3.2 Project proponents must justify the Condition indicators' suitability for the ecosystem and the project context.

7.3.3 Project proponents must monitor at least the minimum number of Condition indicators per ecosystem type outlined in Table 5.

Table 5. Minimum number of required indicators per Condition component and ecosystem type

Condition Component	Requirement for measurement	Minimum number of indicators required
Composition	Required	3
Structure	Required	2
Function	Not required	-
Pressure	Not required	-

7.3.4 Selected Condition indicators must:

1) be relevant to and positively correlated with ecosystem integrity and the project activities.

2) be responsive to the identified pressures on biodiversity (see Section 5.7.2) in the project Extent at relevant temporal and spatial scales and align with changes in Condition in response to such pressures.

3) not reflect negative impacts on ecosystem health, such that as the indicator value increases the overall ecosystem Condition decreases.[91]

4) measure distinct elements of composition and structure, so that each individual indicator:

   a) provides additional information to the other indicators, and

   b) is independent of the other indicators' underlying ecological features.[92]

[91] For example, an increase in an indicator measuring the richness and abundance of invasive or non-native species would cause ecosystem Condition to decrease.
[92] For example, in high-latitude ecosystems, canopy height and aboveground biomass are strongly influenced by the presence of large trees and are closely correlated, so they do not provide distinct and independent information on Condition (Cunliffe et al., 2020). Available at: https://doi.org/10.1088/1748-9326/aba470

5) for composition, be phylogenetically independent from each other (i.e., not including multiple composition indicators from within the same order of vertebrates or family of plants or invertebrates).[93]

6) be responsive to change within the monitoring period and over the project lifetime.

7) be robustly measurable using acceptable methods, as evidenced by scientific literature or national biodiversity monitoring schemes.

8) be justified by adequate information source(s) supporting their selection.

9) be verifiable by an independent third party.

7.3.5 Project proponents may add new indicators to the monitoring plan at verification, provided such an addition adheres to the requirements in Section 5.11.

7.3.6 Project proponents must not remove any selected indicators from the monitoring plan over the project lifetime.

Productive Landscapes

7.3.7 For Condition indicators in productive landscape projects, project proponents must:

1) conduct a preliminary analysis to understand how the project's agricultural practices may impact potential composition and structure indicators.

2) select composition indicators that reflect presence and abundance of species that are characteristic of the intact natural ecosystem.

3) not select composition indicators that:

   a) reflect species that are tolerant of productive management practices where such tolerance is not representative of their natural state or behavior in an intact ecosystem (e.g., taxa tolerant of pesticides or that thrive unusually in productive landscapes).

   b) use cultivated biodiversity measures for composition indicators (e.g., diversity of crops planted, variety of livestock reared, crop yields).

4) select structure indicators appropriate for and reflective of the natural habitat. A measure of cultivated species for one structure indicator is acceptable.

5) not select structure indicators that give strong positive or negative weight to structural characteristics resulting from agricultural management (e.g., the removal of understory trees to make space for planting).

[93] For example, a project proponent may measure bats (order: Chiroptera) as a composition indicator but must not measure both bat sub-orders Megachiroptera and Microchiroptera as two separate composition indicators, or may measure ants (family: Formicidae) as a single composition indicator but must not measure multiple sub-families of ants as separate composition indicators.

Grouped Projects

7.3.8 For grouped projects, where new instances differ in ecosystem(s) type from existing instance(s), the project proponent must select a new set of Condition indicators appropriate for the ecosystem context in the new instance.

Box 4. Good Practice Guidance on Selection of Condition Indicators

Selected Condition indicators should:

- be as representative as possible of ecosystem Condition.
- be supported by evidence about their response to different levels of project-relevant pressures.
- be cost-effective to measure.
- be drawn from widely used biodiversity datasets relevant to the region and the ecosystem.
- have broad consensus on reference values for the project context, ideally being widely measured across the ecoregion.

Condition indicators should not be chosen because they are easy to measure (e.g., monitoring only easily observable species instead of those critical to ecosystem function that are harder to monitor). Projects' Condition indicators should also not be disproportionately sensitive to restoration or conservation activities when compared to ecosystem health in general (e.g., measuring only pioneer species in a restoration project).

Appropriate sources of information for selecting Condition indicators are:

- published records relating to the relevant ecoregion and/or ecosystem from peer-reviewed scientific journals.
- regional biodiversity assessments, such as those used for identifying characteristic native biota (e.g., IUCN Red List of Ecosystems database).
- national government biodiversity datasets.[94]
- databases of biodiversity metrics.
- expert consultation.

The Technical Annex (Section 10) provides:

- additional information on selecting Condition indicators.
- supporting guidance for selecting indicators for productive landscape contexts and tropical forest ecosystems.

Ecosystem or biome-specific requirements or modules (to be developed) may include more detailed Condition indicator requirements.

[94] For example, the Queensland Herbarium

Reference Values

Concept

The Condition reference state is where natural ecological and evolutionary processes dominate the structure, composition, and function of the ecosystem.[95] The reference value of a Condition indicator reflects its optimal value in a scenario of minimal to no human disturbance.

The Nature Framework's reference value requirements focus on generalized, high-level requirements, particularly addressing scenarios where reference values are difficult to set (e.g., unstudied areas without data, ecosystems that will never return to pristine Condition).

Requirements

Step 3. Define reference values for the selected Condition indicators

7.3.9 Project proponents must:

1) conduct a thorough and documented inventory of all available information and data sources for setting reference values for the project's selected Condition indicators.
2) set reference values for each selected Condition indicator based on measurements or estimates relating to the same ecosystem type within the same ecoregion.
3) set reference values conservatively (i.e., apply precautionary assumptions in estimates and use the maximum value where more than one measurement or estimate is available). Where multiple measurements are available, project proponents must demonstrate that they have selected the most conservative value.
4) state and justify each Condition indicator's reference value and the source from which it was derived (including details of any reference sites) in the project description.
5) follow the requirements in Sections 8.2.2 to 8.2.7 when collecting reference value data in reference sites.
6) demonstrate that reference value measurements or estimates from external sources are based on data collected using contemporary good-practice methods.
7) where measurement methods have evolved and significantly improved in accuracy during the monitoring period, update reference values accordingly at verification and document this following the requirements in Section 5.11.

7.3.10 Project proponents must use one of the approaches provided in Sections 7.3.13–7.3.24 to set reference values, and may use more than one, depending on the Condition indicator and the available data.

[95] UN Committee of Experts on Environmental-Economic Accounting (2021). Available at: https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf

7.3.11 Where the project proponent demonstrates that they cannot set a reference value for a given indicator because none of the provided approaches are feasible (i.e., reference site measurement cannot be conducted by the project proponent, suitable reference sites cannot be found, the project proponent does not have the capacity to apply statistical approaches, and/or there is no contemporary or historical data available), the reference value for that indicator must be conservatively set to the highest justifiable value (e.g., 1 or 100% for the highest possible number of species for that taxa).

Note – Ecosystem or biome-specific modules (to be developed) may provide more detailed requirements or guidance for estimating Condition reference values.

Productive Landscapes

7.3.12 For productive landscape contexts, project proponents must base Condition indicator reference values on intact natural habitat in the undisturbed ecosystem, even where restoring intact natural habitat is not a project aim.

Box 5. Good Practice Guidance on Condition Reference Values

Condition reference values can be estimated from a range of sources, which may include:

- direct observation from one or more reference sites (physical locations) where primary data are collected to define the reference value.
- historical data (observed or reconstructed).
- modeled ecological data.
- published records from a peer-reviewed scientific journal.
- information in assessments for the IUCN Red List of Ecosystems.
- published records informed by expert consultation, including the name and contact details of the expert who provided the refined estimate.
- national government biodiversity datasets.

Approach 1: Reference Sites

7.3.13 The reference site approach is appropriate and feasible for, and may be used for, projects:

1) that contain undisturbed or minimally disturbed areas within their Extent.
2) where suitably comparable reference sites are available for assessment (i.e., belonging to the same ecosystem functional group[96] and located within the same ecoregion[97]).

[96] Keith et al. (2020). Available at: https://doi.org/10.2305/IUCN.CH.2020.13.en
[97] Dinerstein et al. (2017). Available at: https://doi.org/10.1093/biosci/bix014

3) where relevant recent historical measurements for such sites are available. This may include measurements of minimally disturbed sites in the previous 50 years, even if the sites are now disturbed.

4) in well-studied ecosystems with an evidenced understanding of the essential attributes for maintaining resilience and ecological integrity over time.

7.3.14 Project proponents may set Condition indicator reference values using measurements from reference sites where these sites are located in ecosystems with stable or resilient ecological states and/or that exhibit minimal human disturbance.[98]

7.3.15 Reference sites may be located within or outside of the project Extent.

7.3.16 Project proponents may derive reference values from the previous 50 years or based on new measurements collected by the project proponent.

7.3.17 Project proponents using reference sites must demonstrate that:

1) reference sites were or are located in an intact or minimally disturbed ecosystem at the time of measurement (whether from a historical source or by the project proponent).

2) reference sites were or are suitably comparable to the project Extent (i.e., from the same ecosystem functional group and located within the same country ecoregion component).

3) measurements of reference values were collected at no less than 200 m from habitat edges.

4) where key ecological processes are monitored with a given Condition indicator, sampling for measuring that indicator's reference value has a sufficiently long timeline to capture such processes (i.e., multiple measurements across the relevant timespan).[99]

7.3.18 Project proponents collecting measurements in reference sites to set reference values must:

1) demonstrate that the methods used are similar or comparable to those proposed for monitoring the given Condition indicator within the project Extent. Where the methods differ, the project proponent must explain and justify use of a different method.

2) describe and justify the data collection methods, following the requirements in Sections 8.2.2 to 8.2.7.

7.3.19 Project proponents using historical measurements captured by a third party must provide science-based justification demonstrating that data were collected with methods similar or comparable to those proposed for monitoring the given Condition indicator within the project Extent. Where the methods differ, the project proponent must explain and justify use of the historical measurement.

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[98] Keith et al. (2020). Available at: https://doi.org/10.3897/oneeco.5.e58216

[99] For example, indicators based on species with annual generation timelines may require multi-annual measurements. For long-lived species, measurement across multiple generations may not be feasible within the project's required timeframes (Oro and Martínez-Abraín, 2023). Available at: https://doi.org/10.1016/j.biocon.2023.110258

Box 6. Good Practice Guidance on Reference Sites

To increase robustness in the selection of reference sites, project proponents should:

- use resources like conservation area databases or protected area inventories and draw on expert and/or traditional knowledge to help identify appropriate reference sites.
    - Experts may include but are not limited to scientists and researchers in relevant fields; conservation practitioners; environmental managers; volunteer experts managing relevant biological recording schemes and societies; policymakers with specialized knowledge relevant to the project Extent and the fields of ecology and biodiversity.
    - Traditional knowledge may include but is not limited to knowledge of Indigenous and local communities with long-standing connections to particular ecosystems; knowledge passed down orally through generations; direct observations and experiences of natural resource users such as hunters, fishers, and gatherers.
- source measurements from more than one reference site, where possible. Given natural ecological variation and likely uncertainties about reference site histories and intactness, measurements drawn from several reference sites (and use of the maximum measured value for each Condition indicator) will promote greater confidence in reference value robustness.
- where relevant, ensure that the sampling design for reference values has a sufficiently large spatial and temporal window to capture focal ecological processes. This should be based on knowledge about the processes (e.g., coral reef calcification rates, forest tree recruitment rates) and the life histories of species concerned.
- use data sources that are publicly available in a well-maintained repository (e.g., Zenodo, Data Dryad) and have undergone scientific peer review.

Approach 2: Statistical

7.3.20 Predictive empirical models may be used to set reference values where suitable reference sites are unavailable. Other statistical approaches may be used where predictive models cannot be applied due to limited data availability.

7.3.21 The statistical approach is appropriate and feasible for, and may be applied to:

1) scenarios with available information that defensibly relates a given Condition indicator in the relevant ecosystem type to causal factors (e.g., intensity of disturbance) so that empirical model(s) can be constructed to predict the indicator's value in an intact ecosystem.
2) scenarios where predictive modeling is not feasible, but other statistical approaches based on current data can be applied to estimate relevant reference values.[100]

[100] For example, using regional species lists and mathematical species-area relationships to estimate species richness in a defined area of an intact ecosystem or using canopy height-climate relationships in a region to estimate potential canopy height

7.3.22 Where using statistical approaches (i.e., predictive empirical models or other statistical methods) to estimate reference values, project proponents must:

1) clearly explain the rationale and provide scientific justification for the chosen approach.
2) document and justify all data sources and their suitability for predictive modeling or other statistical methods.
3) describe the model and statistical uncertainties, how they were quantified, and the steps taken to minimize them.
4) where the underlying methodology is updated, or new relevant data and/or more robust techniques become available, update the modeled reference state or statistical analysis.
5) demonstrate adoption of conservative estimates (the top end of 90% confidence intervals for the mean is recommended) for reference values.

Approach 3: Historical Reference State

7.3.23 Where suitable reference sites or site information are not available, and it is not possible to infer reference values using statistical approaches, project proponents may set reference values using non-contemporary historical information (i.e., more than 50 years in the past).

7.3.24 Where setting reference values using non-contemporary historical information, project proponents must:

1) demonstrate that neither the reference site nor the statistical approach can be used, by documenting the methods used to search for relevant sources and datasets and justifying why any sources or datasets available were unsuitable.
2) report the details of searches (e.g., search criteria used in databases such as Scopus or Web of Science) and the sources explored (e.g., peer-reviewed literature, museum archives, government reports) when analyzing available data sources to obtain information on the historical reference state.
3) document how relevant historical, paleoecological, and ecological knowledge was consulted and used to interpret the evidence.

Box 7. Good Practice Guidance on Historical Reference State

To increase robustness in the selection of historical reference sites, project proponents should:

- consider working with specialist experts with a deep knowledge of the historical context of the period and/or local landscape or ecosystem context to avoid misinterpreting historical reference states where very old written sources (e.g., prior to 1800) or archaeological observations are used.[101]
- incorporate paleo-ecological techniques (e.g., ancient environmental DNA, fossil record) to quantitatively estimate the historic ecological state.

[101] Bergès and Dupouey (2021). Available at: https://doi.org/10.1111/jvs.12846

7.4 Condition at Project Start

7.4.1 To be conservative in all subsequent quantification steps, project proponents must round values downward to three decimal points in each calculation, except for the calculation of Nature Credits in Step 12 to Step 14, for which values must be rounded downward to a whole number.

7.4.2 For projects setting historical start dates (see Section 5.1) where Condition at project start was not measured in alignment with the Nature Framework's requirements, project proponents may use the alternative approach outlined in Section 8.2.9.

Note – Ecosystem or biome-specific requirements or modules (to be developed) may contain different requirements or guidance for quantifying biodiversity outcomes.

Step 4. Measure Condition indicators at project start (year 0)

7.4.3 Project proponents must include a comprehensive monitoring plan in the project description (see Section 8.1). A detailed sampling protocol for the project's selected Condition indicators (Section 8.2) is an essential part of the monitoring plan and must outline where, how, and how often the indicators will be measured at project start and over the project lifetime.

7.4.4 Project proponents must measure and report the value of each Condition indicator at project start (for each ecosystem type and/or stratified land use type, where applicable) in the project Extent and include an assessment of statistical uncertainty.

7.4.5 For grouped projects, project proponents must measure and report the values of the Condition indicators selected for each new instance at the time the instance is added.

Step 5. Standardize Condition indicators by reference value at project start (year 0)

7.4.6 Project proponents must standardize each Condition indicator's measurement by its reference value following the requirements in Section 7.4.7.

7.4.7 Each Condition indicator's measured value (obtained in Step 4) must be divided by its respective Condition reference value (Step 3) to produce a standardized value between 0 and 1, where 0 represents an entirely degraded ecosystem and 1 represents the optimal reference value, per the following:

1) For indicators that increase with improvement to a value of 1 with complete ecosystem intactness (e.g., biomass, species abundance, richness of ecosystem specialist species), standardization is calculated by dividing the measured Condition value (Step 4) by the reference Condition value (Step 3):

$$SI_0 = \frac{I_0}{Rv}$$

Where:

SI_0 Standardized Condition indicator value at project start (year 0)

I_0 Condition indicator value at project start (year 0) (Step 4)

Rv Reference value of Condition indicator (Step 3)

2) For indicators that may decrease with improvement (e.g., algae in coral reefs), standardization requires defining an additional threshold reference level representing a Condition value of 0 for the indicator. Where thresholds are uncertain, they should be set conservatively low to avoid overestimating Condition improvements.

$$SI_0 = \frac{T - I_0}{T - Rv}$$

Where:

SI_0 Standardized Condition indicator value at project start (year 0)

T Threshold value for indicator (equating to Condition value of 0)

I_0 Condition indicator value at project start (year 0) (Step 4)

Rv Reference value of Condition indicator (Step 3)

Step 6. Calculate Condition at project start (year 0)

7.4.8 Condition at project start must be calculated by first determining the arithmetic mean for each set of combined standardized composition and structure Condition indicators (Step 5) and then calculating their aggregated mean as follows:

$$C_0 = \frac{\left(\frac{St_1 + St_2 + \cdots St_n}{n}\right) + \left(\frac{Cm_1 + Cm_2 + \cdots Cm_n}{n}\right)}{2}$$

Where:

C_0 Condition at project start (year 0)

St Standardized structure indicator at project start (year 0) (calculated as SI_0 in Step 5)

Cm Standardized composition indicator at project start (year 0) (calculated as SI_0 in Step 5)

n Total number of structure or composition indicators

Step 7. Calculate area-adjusted Condition at project start (year 0)

7.4.9 Area-adjusted Condition is the project's aggregated mean Condition at project start (Step 6) multiplied by its ecosystem Extent in hectares. Area-adjusted Condition is measured in "quality hectares" (Qha).[102] Project proponents must calculate the area-adjusted Condition at project start for each ecosystem type in the project Extent as follows:

$$Ca_0 = E_0 \times C_0$$

[102] A hectare of fully intact ecosystem has an area-adjusted Condition of 1 Qha, as do ten hectares of an ecosystem with an average Condition value of 0.1.

Where:

Ca_0 Area-adjusted Condition at project start (in Qha) (year 0)

E_0 Extent in hectares at project start (year 0) (Step 1)

C_0 Condition at project start (year 0) (Step 6)

7.4.10 Where the project Extent encompasses multiple ecosystem types, project proponents must sum the area-adjusted Condition (Qha) values for all ecosystem types.

7.5 Crediting Baseline

Concept

The Nature Framework quantifies biodiversity outcomes relative to an estimation of what would have happened in the without-project scenario (i.e., the crediting baseline). The crediting baseline reflects the likelihood of loss of ecosystem intactness (i.e., decrease in ecosystem Extent, Condition, or both) in the absence of the project intervention. Depending on the level of data available, project proponents must apply one of three approaches to calculating the project's crediting baseline (Figure 6). All three methods address the technical challenge of estimating what would have happened in the absence of the project intervention, but each has its own set of distinct requirements, uncertainties, and limitations.

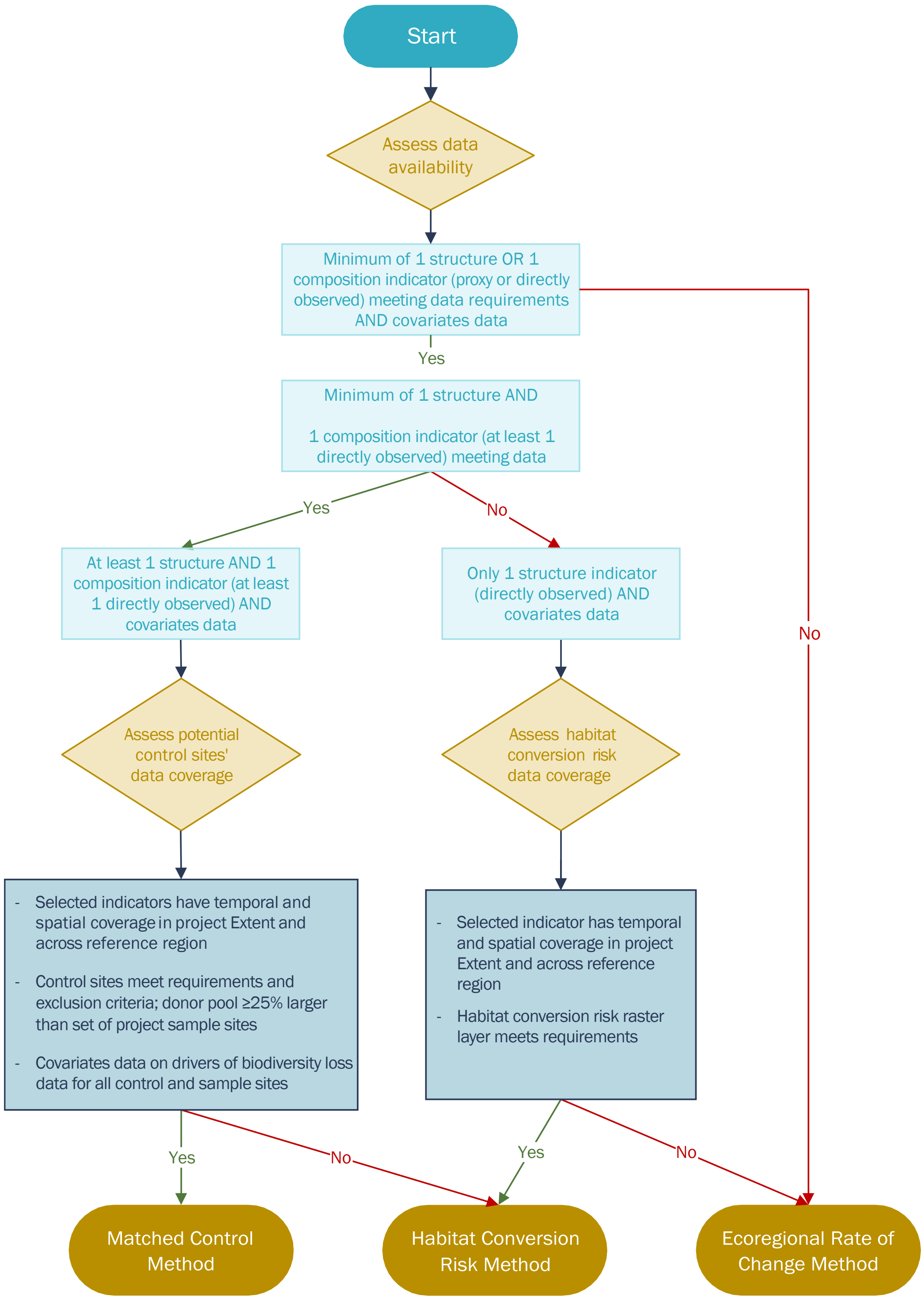
The Nature Framework's three methods for setting crediting baselines, listed in order of decreasing data intensity, are:

1) the matched control method, which uses ecosystem Condition observations (i.e., data) collected from control sites outside the project Extent;
2) the habitat conversion risk method, which uses historical observations of habitat conversion in and around the project Extent; and
3) the ecoregional rate of change method, which uses historical change in Condition indicators in the wider country ecoregion component.

Box 8. Summary Steps for Setting Crediting Baselines

1) Determine the project's reference region (i.e., country ecoregion component) and map the project Extent within it.
2) Assess the spatial and temporal coverage of available datasets for the project's selected Condition indicators and potential proxy indicators, where relevant, in the project Extent and across the reference region.
3) Based on data availability and using the decision tree tool in Figure 6, choose the most appropriate crediting baseline method.
4) Calculate the estimated crediting baseline following the chosen method's stepwise requirements.
5) At verification, calculate the dynamic crediting baseline.

Figure 6. Decision tree tool for choosing an appropriate crediting baseline method based on data availability and method requirements



Requirements

Step 8. Calculate the project crediting baseline

Project proponents must follow the core requirements outlined in this section and use the decision tree tool in Figure 6 to determine the most appropriate crediting baseline method based on data and resource availability.

7.5.1 Project proponents must determine the project's reference region by overlaying the ecoregions found in Dinerstein et al. (2017) with national jurisdictional boundaries, and mapping the project Extent within the relevant ecoregion.

7.5.2 Project proponents must:

1) conduct and document a thorough search and inventory of all available data sources for the project's selected Condition indicators and other relevant indicators reflecting identified threats to biodiversity within the reference region that could be used for estimating the crediting baseline.

2) where gaps in such available data exist, demonstrate that a reasonable attempt was made to:

   a) collect the data needed (i.e., via direct observation) to fill those gaps. Where the project proponent is unable to collect the data themselves, this must be explained and justified.

   b) acquire from credible external sources the data needed by documenting the search methods and detailed criteria used.

7.5.3 Where it is demonstrated that data are not available and/or fail to meet the crediting baseline method data requirements and a proxy indicator is substituted for a given Condition indicator to estimate the crediting baseline, project proponents must demonstrate:

1) the relationship between the target Condition indicator (i.e., the Condition indicator monitored in the project Extent) and the proxy indicator proposed for substitution using at least one of the following methods:

   a) Statistical tests that do not assume linearity (e.g., Spearman's rank correlation, Kendall's tau) to reflect the relationship between the proxy indicator and the target Condition indicator based on a correlation coefficient of at least 0.7 with statistical significance of $p \leq 0.05$. This may be derived from unpublished data analyses or based on published scientific literature.

   b) Scientific evidence supporting the proxy indicator's suitability for approximating the target Condition indicator (i.e., demonstrating the proxy indicator's response to pressures on biodiversity in the same direction and magnitude as the target Condition indicator)

2) that any proxy indicators used are not duplicative of other directly observed indicators used in the crediting baseline (e.g., a directly observed structure indicator must not also be used as a proxy for a composition indicator).

7.5.4 Data sourced for use in the crediting baseline must meet the following criteria, unless the chosen crediting baseline method stipulates otherwise:

1) Temporal criteria:

a) Historical coverage for the prior 10 years

b) At least three data points encompassing a 5-year time span

c) No exclusion of available historical or future data releases for specific years without adequate justification

2) Spatial criteria:

a) Coverage across the project's reference region

b) Resolution of no more than 300 m^2 to adequately characterize patterns of Condition change

c) Use of random sampling techniques, where required by the method

3) Planned update criteria:

a) Data must be updated (i.e., new datasets released or direct observation ongoing) during the monitoring period to facilitate dynamic adjustment at verification, as required by the method.

7.5.5 Where data are sourced from third parties (e.g., remote-sensing data products, public or institutional databases, scientific research) the data must be:

1) scientifically validated through peer-reviewed published literature, or

2) created by a highly credible source (i.e., an organization or group of experts with a demonstrated record of successfully producing peer-reviewed evidence) with preference for publicly accessible over proprietary sources.

Wherever possible, national or regional level data must be used, in lieu of global datasets.

7.5.6 Project proponents must transparently document all data and methods used for setting crediting baselines to enable validation or verification, including recording all calculation steps involved and, where applicable, the complete software code used (e.g., R, Python, Excel VBA).

7.5.7 Where required by the method, project proponents must apply the following exclusion criteria to remove from the reference region any area(s):

1) not in the same country ecoregion component as the project Extent.

2) less than 10 km or more than 500 km from the boundary of the project Extent.

3) in which conservation interventions are taking place (e.g., under protected area designation).

4) in which any other projects under nature, biodiversity, or carbon crediting programs are taking place, regardless of standard or methodology.

5) with publicly announced and/or approved plans for urban, industrial, extractive, or other land use-converting development (e.g., housing development, industrial or energy production, mining activities, agriculture).

6) with prescribed burning or other fire management activities.

7.5.8 During the project lifetime, project proponents must not alter:

1) the location and/or boundaries of any sites sampled or otherwise identified for use in calculating the crediting baseline.

2) the set of Condition indicators (including any proxies) or the crediting baseline method used, except under the following circumstances:

a) The project proponent periodically conducts an inventory of newly available data and discovers relevant, previously unavailable data(sets) that better align with the project's selected Condition indicators and/or drivers of biodiversity loss. Such new data may be integrated into the crediting baseline calculation for the subsequent monitoring period, provided they meet the data requirements, and the change complies with the Nature Framework's adaptive management requirements (Section 5.11) for project deviations.

Newly available data meet the requirements for applying a more data-intensive crediting baseline method per the decision tree tool (Figure 6) (i.e., moving up the data availability hierarchy from the ecoregional method to the habitat conversion risk method or from the latter to the matched control method). The project proponent may use the more data-intensive method for the subsequent monitoring period and must move up to the most data-intensive method possible at baseline reassessment every ten years.

7.5.9 Where the estimated (at validation) and/or dynamic crediting baseline (at verification) produces a value less than −0.01 (i.e., reflecting a projected decline in ecosystem Condition of more than 1% per year), the project proponent must provide a detailed explanation justifying the calculated value and clearly demonstrating its basis with reference to observed rates of change in historical habitat conversion over the prior 10 years.

Box 9. Best Practice Guidance for Calculating Crediting Baselines

Project proponents should design the sampling protocol for the project Extent to align with the matched control method's requirements, where feasible. This will support transitioning to that method later as data are collected over the project lifetime.

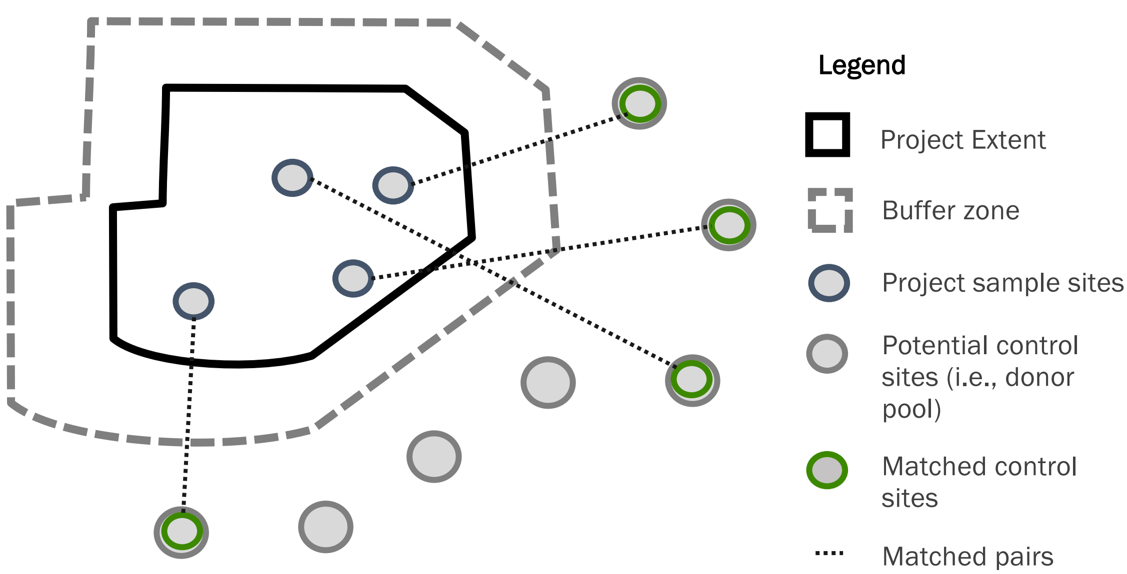
Project proponents should refer to Section 10 for additional information on setting crediting baselines.

Matched Control Method

Concept

A matched control method refers to a suite of statistical techniques for selecting control sites from a reference region that excludes the project Extent and pairing (i.e., matching) them with monitored sample sites within the project Extent (see Figure 7). Matching is based on the similarity of historical Condition indicators and other observable site characteristics (i.e., covariates). In the matched control method, the crediting baseline is estimated at validation using historical data, then a dynamic baseline is calculated at verification by measuring the change in control sites' ecosystem Condition over the monitoring period.

Figure 7. Schematic diagram illustrating the matched control method for calculating the crediting baseline



Project proponents should apply this method when:

- the method's data requirements are met, including the required temporal and spatial coverage (Section 7.5.4).
- the project proponent has the capacity to monitor the required data throughout the project's crediting period.
- the project proponent can identify suitable control sites in the reference region and secure the necessary approvals and access permissions to collect data from them.

Requirements

7.5.10 Project proponents using the matched control method for calculating the crediting baseline must follow the stepwise requirements outlined in Section A1.1.

7.5.11 Project proponents using the matched control method must calculate the dynamic crediting baseline at each verification following the procedure outlined in Step M11 in Section A1.1.

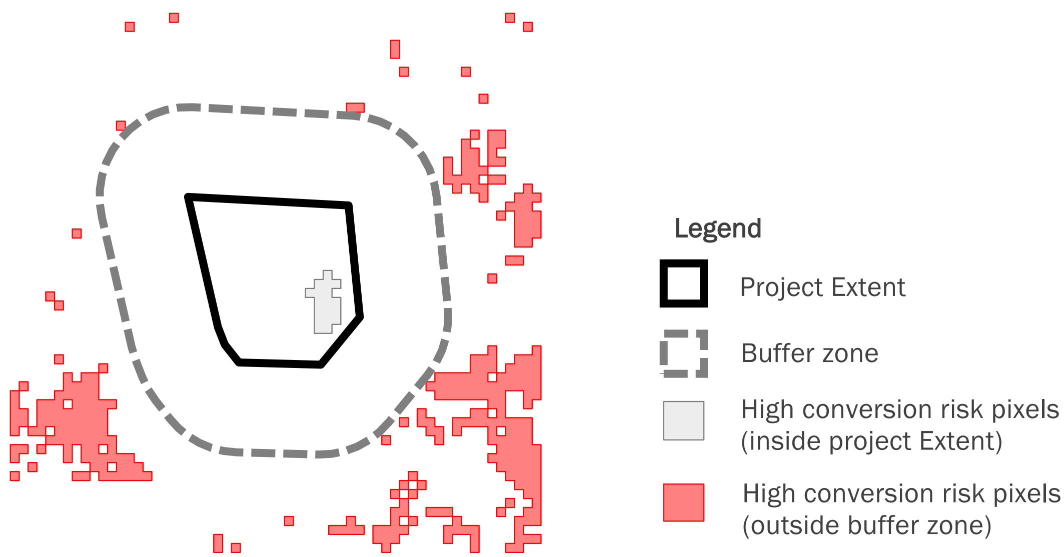
Habitat Conversion Risk Method

Concept

The habitat conversion risk method uses the estimated probability of future habitat conversion to calculate a crediting baseline. In this method, spatially explicit probabilities of future habitat conversion are modeled using historical habitat conversion rates and predictors of habitat loss. Within the project's reference region, areas with a high risk of future conversion (i.e., where the probability of conversion exceeds a defined threshold) are identified and mapped. The crediting baseline is calculated using a weighting based on the project Extent's overlap with high-risk conversion areas, such that the greater the overlap and the greater the probable decline in Condition, the more negative the crediting baseline's slope.

The habitat conversion risk method gives project proponents an alternative for calculating the crediting baseline where the matched control method cannot be implemented due to lack of available data, because suitable control sites cannot be found, or because control sites cannot be effectively monitored. The habitat conversion risk method develops an estimated rate of habitat conversion risk without relying on control sites. This method's limitations are that important confounding factors cannot be isolated when estimating project outcomes, and the crediting baseline is based on a predicted rate of conversion and not on direct observations.

Figure 8. Schematic diagram illustrating the habitat conversion risk method for calculating the crediting baseline



Project proponents should use the habitat conversion risk method when:

- they demonstrate that they are unable to implement the matched control method because they cannot meet the data requirements and/or do not have the necessary resources;
- habitat conversion has been a major driver of biodiversity loss in the reference region for at least the prior 10 years and is deemed to be a threat to the Condition components that the project aims to conserve or restore; and
- the structure indicators measured within the project Extent are responsive to habitat conversion.

Requirements

7.5.12 Project proponents using the habitat conversion risk method for calculating the crediting baseline must follow the stepwise requirements outlined in Section A1.2.

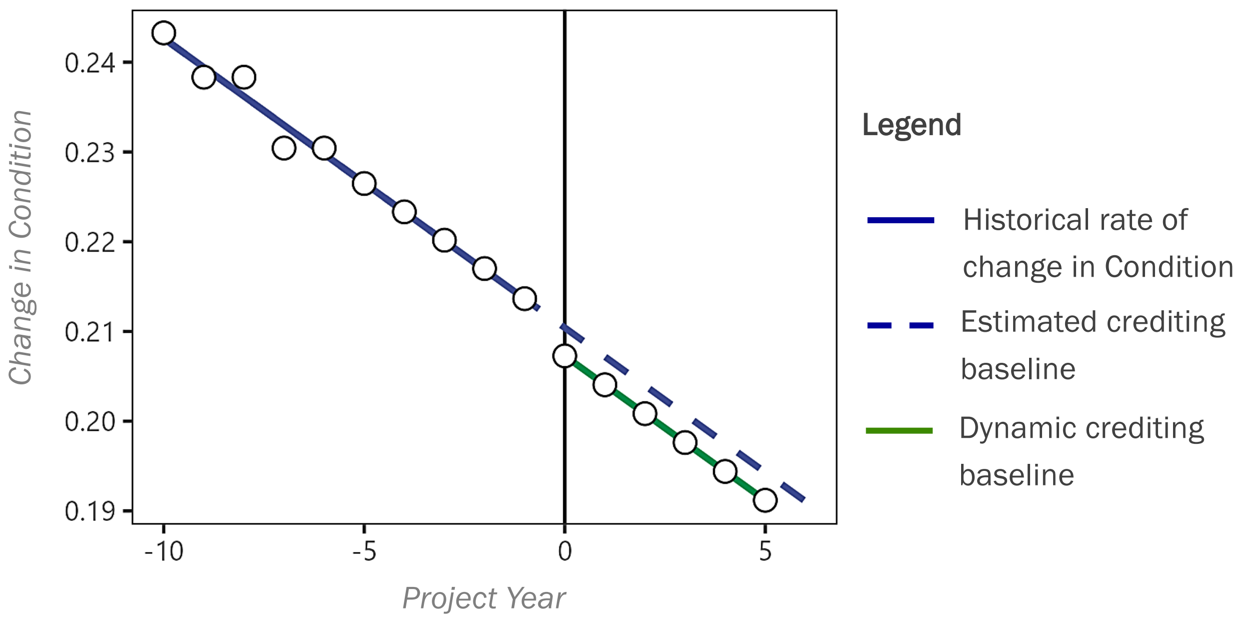
7.5.13 Project proponents using the habitat conversion risk method must calculate the dynamic crediting baseline at each verification following the procedure outlined in Step H12 in Section A1.2.

Ecoregional Rate of Change Method

Concept

The ecoregional rate of change method calculates a crediting baseline using a simple statistic reflecting the estimated rate of change in ecosystem Condition across a reference region for a given ecoregional Condition indicator.

Figure 9. Schematic diagram illustrating the ecoregional rate of change method for calculating the crediting baseline



Requirements

7.5.14 Project proponents must not use the ecoregional rate of change method where they have sufficient data and resources to implement the matched control method or the habitat conversion risk method and one of those methods is deemed more appropriate based on the inventory of available data and resources.

7.5.15 Project proponents using the ecoregional rate of change method for calculating the crediting baseline must follow the stepwise requirements outlined in Section A1.3.

7.5.16 Project proponents using the ecoregional rate of change method must calculate the dynamic crediting baseline at each verification following the procedure outlined in Step E7 in Section A1.3.

7.6 Project Biodiversity Impacts

Project biodiversity impacts (from here on referred to as project impacts) are calculated by measuring the change in area-adjusted Condition from the start of the project (Step 7) at least every five years, using the regularly sampled and standardized measurements for the project's selected Condition indicators (Step 2 and 3).

Step 9. Monitor project impacts

7.6.1 Project proponents must monitor the Condition of each ecosystem in the project Extent throughout the project lifetime and submit monitoring reports for verification at least once every five years (see Section 5.2.5).

7.6.2 In grouped project scenarios, project proponents must measure and monitor each instance's distinct Condition starting from the date on which the instance is added.

7.6.3 During the monitoring period, project proponents must repeat Step 4 to Step 7 to calculate project impacts for each temporal sampling interval (Ca_t for year *t*) in the monitoring period using that interval's set of Condition indicator measurements (i.e., the complete panel of Condition indicator data) and replacing all references to year 0 in the equations with year *t*.

7.6.4 At the end of the monitoring period, the calculated project impacts for each sampling interval (Ca_t produced in Section 7.6.3) must be combined using the arithmetic mean to produce a final area-adjusted Condition for project outcomes for verification. For example, a project verifying at the beginning of year 5 after annual Condition indicator sampling would have four panels of sampling data that must be combined as follows:

$$Ca_5 = \frac{Ca_1 + Ca_2 + Ca_3 + Ca_4}{4}$$

Leakage

Leakage represents negative or positive impacts on biodiversity outside the project boundary resulting from project activities.

Step 10. Determine leakage

7.6.5 Project proponents must use the Nature Framework leakage tool to:

1) identify potential negative or positive impacts on biodiversity that the project activities are expected to cause outside the project Extent.

2) describe the measures needed and taken to mitigate the negative impacts on biodiversity outside the project Extent.

3) quantify unmitigated negative leakage or determine positive leakage.

7.6.6 Project proponents must deduct the calculated negative leakage from the biodiversity outcomes generated by the project (see Step 11) to determine net biodiversity outcomes for crediting. Where the calculated leakage is positive, it is not deducted from the biodiversity outcomes generated by the project.

Note – Ecosystem or biome-specific modules may require specific tools or different approaches to leakage.

Net Biodiversity Outcomes

Step 11. Calculate net biodiversity outcomes

7.6.7 Net biodiversity outcomes must be quantified for each distinct monitoring period. Net biodiversity outcomes represent the quantified difference, at the end of the monitoring period (year *t*) between the following, adjusted for leakage (Step 10):

1) the area-adjusted Condition project impact (Step 9), and

2) the area-adjusted Condition at project start (year 0; Step 7) projected to year *t* using the dynamic crediting baseline parameter *B* (Step 8).

7.6.8 For each ecosystem type in the project Extent, project proponents must calculate the net biodiversity outcomes (in Qha) as follows (and as illustrated in Figure 10):

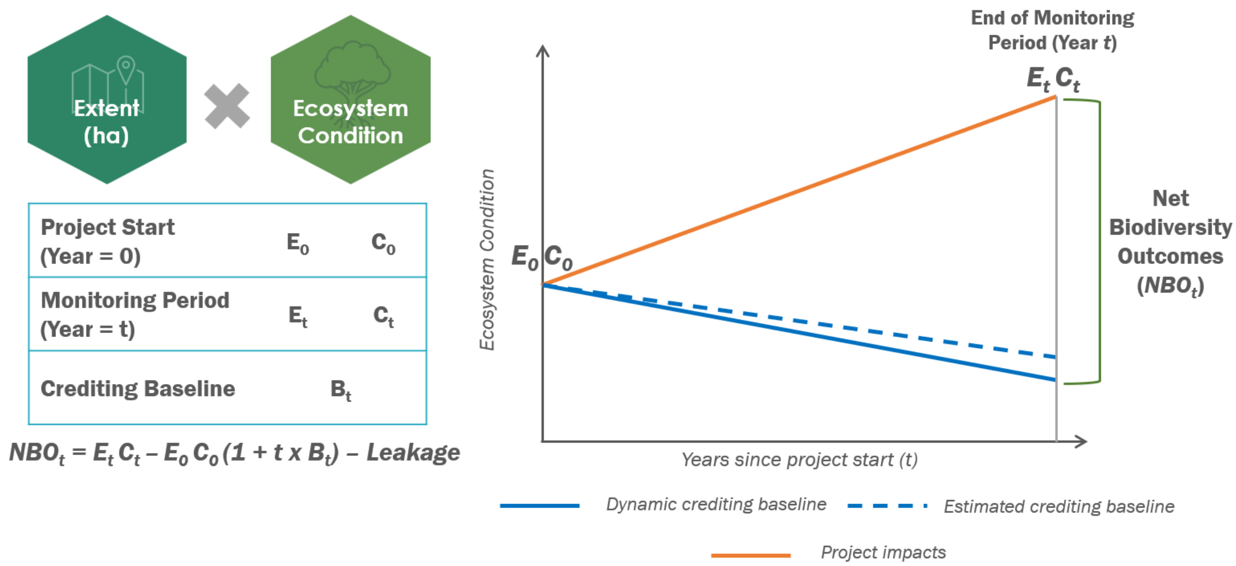
$$NBO_t = (E_t \times C_t) - \left[(E_0 \times C_0) \times \left(1 + (t \times B_t)\right)\right] - L_t$$

Where:

NBO_t	Net biodiversity outcomes at end of monitoring period (year *t*) (in Qha)
E_t	Extent in hectares at end of monitoring period (year *t*) (Step 9)
C_t	Condition at end of monitoring period (year *t*) (Step 9)
E_0	Extent in hectares at project start (year 0) (Step 1)
C_0	Condition at project start (year 0) (Step 6)
t	Number of years from project start (or from the previous verification date)
B_t	Dynamic crediting baseline parameter (Step 8) at end of monitoring period (year *t*)
L_t	Leakage at end of monitoring period (year *t*) (Step 10)

7.6.9 In grouped project scenarios, each instance has its own distinct Condition at project start. Therefore, project proponents must independently quantify project impacts for each instance (i.e., Step 4 to Step 7) in parallel with the project's other existing instance(s) and then aggregate the total quantified impacts as per Step 9.

Figure 10. Quantifying net biodiversity outcomes for each monitoring period



Step 12. Calculate Nature Credits resulting from project activities

7.6.10 Nature Credits are calculated based on the project's net biodiversity outcomes. The number of Nature Credits resulting from project activities in each monitoring period is calculated by multiplying the net biodiversity outcomes (Step 11) by a scaling factor of 100, as follows:

$$NC_t = NBO_t \times 100$$

Where:

NC_t Nature Credits generated at end of monitoring period (year *t*)

NBO_t Net biodiversity outcomes (Step 11) at end of monitoring period (year *t*)

Step 13. Calculate project-specific buffer pool contribution

7.6.11 Once Nature Credits have been calculated for the monitoring period, project proponents must determine the quantity to be held in the project-specific buffer pool. Project proponents must multiply the Nature Credits calculated in Step 12 by the standard 20% deduction (see Section 5.10.3) to determine the total buffer withholding.

$$Buffer_t = NC_t \times 0.2$$

Where:

$Buffer_t$ Total buffer withholding for monitoring period (year *t*)

NC_t Nature Credits generated at end of monitoring period (year *t*) (Step 12)

Step 14. Calculate net Nature Credits issuance

7.6.12 To calculate the net number of Nature Credits that may be issued for the monitoring period, project proponents must deduct the buffer withholding from the Nature Credits calculated in Step 12:

$$NNC_t = NC_t - Buffer_t$$

Where:

NNC_t Net Nature Credits that may be issued at end of monitoring period (year t)

NC_t Nature Credits generated at end of monitoring period (year t)

$Buffer_t$ Total buffer withholding for monitoring period (year t) (Step 13)

7.6.13 In order to avoid double-counting of biodiversity outcomes, project proponents must calculate Nature Credits for each distinct monitoring period per the following:

1) Repeat Step 4 to Step 7 to calculate area-adjusted Condition at year t (i.e., the first year of the new monitoring period), replacing all references to project start and year 0 in those steps and formulas with year t. Project proponents must use the last panel of Condition indicator measurements collected prior to the new monitoring period for calculating area-adjusted Condition at year t.

2) The dynamic crediting baseline parameter generated in Step 8 at the end of the prior monitoring period must be used as the estimated crediting baseline for the subsequent monitoring period.

3) Monitoring project outcomes (Step 9) must consistently follow the project's sampling protocol across all monitoring periods.

4) Leakage (Step 10) and buffer withholding (Step 13) must also be calculated for each monitoring period.

5) For each instance in a grouped project, the calculation steps above must be followed for each distinct monitoring period.

7.7 Biodiversity Significance

Concept

Biodiversity Significance is the importance of biodiversity in the project Extent for contributing to conservation aims related to GBF goals and targets. Significance is independent of the calculation of Nature Credits.

Biodiversity and how people relate to and interact with it is highly complex and variable between ecosystems and geographies. The Nature Framework is designed to be globally applicable and enable standardization and meaningful comparisons across biodiversity outcomes. However, projects and their resulting Nature Credits can be differentiated based on various project characteristics (e.g., activity type, ecosystem, location).

Significance:

- reflects a project's potential contribution to specified GBF targets.
- provides buyers with additional information to identify projects that are aligned with their corporate nature or biodiversity targets or strategies.

Nature Framework projects may demonstrate different contributions to Significance, depending on the associated GBF target (Table 6).

Requirements

7.7.1 Project proponents must qualitatively describe and justify their project's contributions to at least two of the GBF targets 1 through 4, using a data source. The data source may be selected from those listed in Table 6 or may be suggested with justification by the project proponent.

7.7.2 Project proponents may qualitatively describe and justify additional project contributions related to other GBF targets (e.g., those of interest to prospective buyers). In this case, project proponents must provide the GBF target, the project contribution, and the data source used for qualitative assessment and justification.

Table 6. GBF targets and potential project contributions to report significance

GBF target[103]	Project contribution	Non-exhaustive list of potential data sources
Target 1 Ensure that all areas are under participatory, integrated, and biodiversity-inclusive spatial planning and/or effective management processes addressing land- and sea-use change, to bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030, while respecting the rights of Indigenous Peoples and local communities.	Preserving highly intact ecosystems	Ecoregion Intactness Index[104] Marine Human Pressures Index[105]
Target 2 Ensure that by 2030 at least 30% of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity, and connectivity.	Restoring degraded ecosystems	Ecoregion Intactness Index
Target 3 Ensure and enable that by 2030 at least 30% of terrestrial and inland water areas, and of marine and coastal areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected, and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing Indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes, and the ocean, while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes, recognizing and respecting the rights of Indigenous Peoples and local communities, including over their traditional territories.	Conserving under-represented biodiversity	World Database on Protected Areas (WDPA)[106]
Target 4 Ensure urgent management actions to halt human induced extinction of known threatened species and for the recovery and conservation of species, in particular threatened species, to significantly reduce extinction risk, as well as to maintain and restore the genetic diversity within and between populations of native, wild, and domesticated species to maintain their adaptive potential, including through in-situ and ex-situ conservation and sustainable management practices, and effectively manage human-wildlife interactions to minimize human-wildlife conflict for coexistence.	Reducing species extinctions	Terrestrial STAR[107] Marine STAR[108]

[103] CBD (n.d.). Available at: https://www.cbd.int/gbf/targets
[104] Beyer et al. (2020). Available at: https://doi.org/10.1111/conl.12692
[105] Halpern et al. (2015). Available at: https://doi.org/10.1038/ncomms8615
[106] UNEP WCMC and IUCN (2009). Available at: https://www.protectedplanet.net/en/thematic-areas/wdpa?tab=WDPA
[107] Mair et al. (2021). Available at: https://doi.org/10.1038/s41559-021-01432-0
[108] Turner et al. (2024). Available at: https://doi.org/10.1038/s44183-023-00040-8

8 MONITORING

Concept

This section contains the requirements for monitoring the impacts of project activities on people, their prosperity, and the planet, including the biodiversity outcomes that generate Nature Credits.

A monitoring period is a defined time period over which project activities are implemented, and corresponding impacts are quantified and reported.

8.1 Monitoring Periods and Plan

Requirements

8.1.1 A project's monitoring periods must:[109]

1) not overlap with previous periods already verified.

2) be contiguous, with no time gaps between them.

8.1.2 Projects concurrently using the VCS Program must align their monitoring periods and verifications after their second Nature Framework verification. Monitoring period alignment may occur earlier if desired.[110]

8.1.3 Project proponents must provide and implement a monitoring plan for the project and its impacts,[111] covering monitoring activities, methods, frequency, roles, and responsibilities for:

1) safeguards risks and sustainable development benefits, and

2) biodiversity outcomes (see Section 8.2).

Description of the Monitoring Plan

8.1.4 Project proponents must:

1) establish and apply quality management procedures to manage information and data.

2) establish written procedures (e.g., standard operating procedures) for each measurement task, outlining the techniques, timing, data capture and storage processes, responsibility, and record location requirements.

8.1.5 Project proponents must follow these record-keeping and data management practices:

1) Monitor and record all required parameters listed in Section 8.2 during the crediting period.

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[109] See *SD VISta Standard, v1.0,* Section 2.5.1.
[110] See *SD VISta Standard, v1.0,* Section 2.5.2.
[111] See *SD VISta Standard*, *v1.0,* Sections 3.1.3 and 3.2.3.

2) Establish, implement, and maintain a monitoring plan and centralized information management system that includes criteria and procedures for obtaining, recording, compiling, analyzing, and storing the data, parameters, and other information important for quantifying and reporting biodiversity outcomes.

3) For biodiversity monitoring data, this must include defined, standardized data capture formats, such as digital forms for data entry with integrated validation tools (e.g., defined drop-down menus, embedded formulas).

4) Record and electronically store:

    a) the values of primary parameters for each measurement interval, and

    b) any processed or derived datasets (i.e., created by the project proponent or sourced from third parties) used in the quantification steps.

5) Archive electronically and store all data collected as part of monitoring in a secure and retrievable manner for at least two years after the end of the project crediting period.

8.1.6 Project proponents must design and apply quality assurance / quality control procedures to increase confidence that all measurements captured, data recorded, and subsequent calculations made have been done correctly. These include, but are not limited to:

1) training all monitoring personnel to ensure that requirements are carried out in accordance with the monitoring plan;

2) data collection, capture, and handling measures;

3) checking input data for typical errors, including inconsistent physical units and unit conversion errors;

4) detecting typographical errors caused by data transcription from one document to another, and missing data for specific time periods or physical units;

5) use of version control for all electronic files to ensure consistency;

6) physical protection of monitoring equipment (e.g., sealed meters and data loggers);

7) physical protection of records of monitored data (e.g., hard copy and electronic records);

8) assigning an individual to check data integrity on a regular basis (e.g., manual assessment, comparing redundant metered data, and detection of outstanding data/records);

9) comparing current estimates with previous estimates to validate assumptions; and

10) performing recalculations to ensure that no mathematical errors have been made.

8.2 Monitoring Biodiversity Outcomes

Concept

The requirements in this section focus on data collection in the field to support project proponents' rigorous measurement of ecosystem Condition. This includes sampling within the project Extent and data collection for setting reference values and crediting baselines.

A sampling protocol is a detailed plan for data collection, monitoring, and management to support the quantification of biodiversity outcomes.

Requirements

8.2.1 Project proponents must:

1) include a sampling protocol in the monitoring plan (see Section 8.1.3).
2) monitor the selected indicators of ecosystem Condition during each monitoring period.
3) consistently implement the sampling protocol to support the integrity of biodiversity outcomes.
4) evaluate the sampling protocol at the end of each monitoring period. Where the evaluation determines that the protocol requires refinement based on field testing, project proponents must refine or update the protocol following the adaptive management requirements (see Section 5.11).

Box 10. Good Practice Guidance for Monitoring Biodiversity Outcomes

Given the diversity of ecosystems and project contexts, project proponents should seek input from expert ecologists and statisticians (where these competencies are not represented in the project team) and consult published guidance for biodiversity monitoring in relevant ecosystem types. This document section also includes good practice guidance to help project proponents design their monitoring plan.

Spatial Scale and Sampling Areas

Concept

A sampling area is the area within which monitoring for a Condition indicator takes place. A sampling area may comprise the entire project Extent, or a subset of it, and does not necessarily have to be contiguous. The sampling area may be homogeneous or stratified into two or more sampling strata differentiated by distinct ecological or management characteristics.

Requirements

8.2.2 Project proponents must:

1) select sample spatial areas that are representative of the project's entire Extent, including project activities and intended impacts reflected in the project's causal chain analysis (see Section 5.8.2(3)).

2) determine and justify the appropriate spatial scale and sampling area(s) for each Condition indicator monitored, considering the indicator's characteristics, ecological requirements, and behavior using peer-reviewed literature, published datasets, and/or exploratory field surveys within the project context.

3) define sampling strata for each sampling area where stratification is relevant to the project Extent (e.g., different ecosystem or land use types), noting that a representative sample is required for each stratum based on its distinct ecological and/or management characteristics.

Box 11. Good Practice Guidance for Spatial Scale and Sampling Areas

To help determine the appropriate spatial scale for monitoring, project proponents should:

- use available tools, including published species distribution models and habitat maps and/or GIS software for creating species and habitat maps using available data; and
- conduct additional biodiversity surveys, where needed.

The spatial scale and defined sampling area for monitoring should also consider the distribution and behavior of the landscape feature(s) being monitored to measure a given Condition indicator, including target species or species communities. For example, depending on the indicator being measured, the sampling area might comprise:

- a single location and sample site (e.g., for bats roosting in one large congregation);
- a set of locations where suitable habitat occurs for a species with specialist habitat requirements;
- an ecosystem type within the project Extent (e.g., for a rare but widely dispersed tree species); and/or
- the entire project Extent (e.g., for a structure indicator such as canopy cover).

Sample Sites

Concept

A sample site is a defined location within the broader sampling area where data collection takes place.

Selecting suitably representative sample sites within the project Extent reduces potential measurement biases[112] (e.g., habitat or management heterogeneity, edge effects).

Requirements

8.2.3 Project proponents must:

1) select a set of sample sites representative of ecosystem Condition within the project Extent, using appropriate methods (i.e., simple random or systematic sampling) to account for potential spatial heterogeneity across the sampling area or each sampling stratum.[113] Where relevant, sample sites must be representative of each defined sampling stratum within the project Extent.
2) scale the number of sample sites in each sampling stratum according to that stratum's relative proportion in the project Extent (e.g., if a stratum's relative proportion in the project Extent is 50% and the project proponent is selecting 10 sample sites in total, then 5 sites must be in that stratum).
3) assign each sample site a unique reference code, record its GPS coordinates and total hectares, and map the site's spatial dimensions.
4) record the distance of each sample site from habitat edges (in km) to allow for assessment of potential edge effects on the measured value of Condition indicators.

Sampling Frequency

Concept

Sampling frequency refers to how often field data are collected (i.e., the sampling interval). Given the resulting increase in accuracy, project proponents should sample as frequently as possible while considering the additional resources required. This will help ensure that data collection is both fit-for-purpose and feasible over the long term.[114]

Different Condition indicators may require different monitoring frequencies, depending on their intrinsic level of fluctuation and/or seasonality. For instance, structural indicators (e.g., tree density, canopy cover) often show gradual, incremental change with limited fluctuation between years or seasons so more frequent monitoring is unlikely to improve measurement accuracy. Other indicators (e.g., populations of target species) may show natural and potentially large variations from year to year so

[112] Boyle et al. (2024). Available at: https://doi.org/10.1016/j.ecolind.2023.111510
[113] Buckland and Johnston (2017). Available at: https://doi.org/10.1016/j.biocon.2017.07.034
[114] Schmeller et al. (2017). Available at: https://doi.org/10.1007/s10531-017-1388-7

more frequent monitoring is necessary to track population trends. In seasonal ecosystems, some species or taxon groups may be more present or detectable at certain times of the year.

Data collection for each Condition indicator must be undertaken at the appropriate interval(s) and/or season(s). It is recommended that all Condition indicators are sampled annually in order to assess each indicator, and overall ecosystem Condition, on the basis of multiple annual measurements. This promotes confidence in Condition indicators' quantified change over time while also helping to account for the inherent stochastic change (i.e., natural fluctuation) in ecosystem Condition.

Requirements

8.2.4 Project proponents must establish a sampling frequency appropriate to temporal variations in the selected Condition indicators, justified with consideration of:

1) key periods for sampling based on species' life cycles and ecological events (e.g., migratory species should be monitored during the period when they are present in the project Extent);
2) greater sampling frequency for species and/or habitats that are naturally very dynamic; and
3) seasonal access to sample sites, where relevant.

8.2.5 The established sampling frequency must be implemented consistently over the project lifetime.

8.2.6 In productive landscape contexts, project proponents must establish a sampling frequency appropriate to temporal variation in the selected Condition indicators in terms of seasonality, management practices, and crop cycles (e.g., flowering, harvest, planting) that may affect the presence and/or behavior of target species.

Sampling Effort

Concept

Sampling effort refers to the number of sites sampled and the intensity of sampling at each site (i.e., the amount of time or other resources, such as the number of camera traps, used to collect data) in a given data collection session.

Together with sampling frequency, sampling effort affects whether monitoring can detect signal (i.e., real change) from noise (i.e., spatial or temporal variation and measurement errors). Sampling effort influences whether and how accurately the presence, abundance, and/or other characteristics of a given Condition indicator can be captured during the sampling session. The total number of sites sampled (i.e., statistical power) affects the ability of monitoring to capture real change in Condition indicators and may differ from one indicator to another. For example, more sites and more time and resources per site are necessary for monitoring rare and elusive fauna compared to monitoring common and easily detected species.

However, project proponents should consider potential diminishing returns with increased sampling effort and resource trade-offs between the number of sample sites and the sampling intensity.

Ultimately, sampling effort will vary according to the type of indicator, the ecoregional context, and available resources, so project proponents should explore available best practice guidelines to inform sampling effort (e.g., tree sampling per the Atlantic Rainforest Restoration Pact in Brazil[115]).

Requirements

8.2.7 Project proponents must:

1) apply statistical power analysis based on plausible scenarios for spatial or temporal variation and measurement error to determine an appropriate number of sampling locations.

2) describe the time and resources allocated for sampling at all individual sites and justify their adequacy for the measurement being captured (i.e., that they are expected, under typical circumstances, to detect the biodiversity feature being monitored and to accurately capture its characteristics).

Sampling Methods

Concept

Sampling methods are the techniques used to collect monitoring data. They must be based on evidenced approaches, appropriate for the Condition indicators being measured, and consistently implemented to ensure that the data collected are accurate and reliable. Maintaining consistency in sampling methods over time ensures data comparability and increases confidence in observed trends.

Requirements

8.2.8 Project proponents must identify a sampling method for each Condition indicator monitored and justify that each sampling method is:

1) suitable for detecting changes in the ecosystem feature(s) measured for a given Condition indicator (e.g., camera traps are suitable for assessing the relative abundance of rare and elusive mammals not easily detected with transect walks); and

2) credible (i.e., has been previously tested and recommended in the scientific or conservation practice literature).

[115] Ribeiro de Moura et al. (2022). Available at: https://doi.org/10.1007/s42965-021-00194-x
Viani et al. (2013). Available at: https://www.pactomataatlantica.org.br/wp-content/uploads/2021/05/protocolo-de-monitoramento-pt.pdf

Box 12. Good Practice Guidance for Sampling Methods

In selecting and implementing sampling methods, project proponents should:

- consult methodological guides, training manuals, and/or pilot studies to help identify the most appropriate sampling methods for their chosen indicators.
- wherever possible, follow or adapt scientifically validated, widely applied sampling protocols.
- understand potential measurement errors and biases inherent to each sampling method and take steps to minimize them to the degree possible.
- account for differences in species detectability across various habitat types (e.g., between forests and agricultural lands) by collecting relevant data (e.g., detection distance) and adjusting estimates through suitable statistical methods.[116]

Alternative Approach to Measuring Condition for Historical Start Dates

Concept

All projects must measure ecosystem Condition at the project start. Some projects may have been implementing biodiversity-positive activities prior to the launch of the Nature Framework. Therefore, project proponents may wish to set a historical start date (i.e., between 1 January 2023 and 29 October 2024). However, such projects may not have had the explicit goal of monitoring biodiversity outcomes at project inception. In these cases, the required Nature Framework indicators may not have been measured to establish ecosystem Condition at project start.

Where ecosystem Condition was not measured in the project Extent at the historical project start date, an alternative approach may be taken:

- Using proxy sites that defensibly represent the project's starting Condition, and
- Measuring in proxy sites all required Condition indicators selected for the Nature Framework project in accordance with monitoring requirements (Section 8.2).

Requirements

8.2.9 In this alternative approach, project proponents must demonstrate that:

1) proxy sites are paired on a one-to-one basis with sample sites monitored in the project Extent (i.e., each proxy site must be paired with a respective sample site).
2) paired proxy sites are located:
   a) within the Nature Framework project boundary,
   b) outside of the project Extent, and

[116] Pan-European Common Bird Monitoring Scheme (n.d.). Available at: https://pecbms.info/methods/pecbms-methods/1-national-species-indices-and-trends/1-1-counting-birds/detectability/

c) at least 2 km from the respective paired sample site.

8.2.10 Project proponents must justify each proxy site's comparability to the Nature Framework project's landscape-scale context in terms of ecosystem functional group(s), ecosystem structure and composition, underlying pressures on biodiversity, land use, and socioeconomic context.

8.2.11 The Condition indicators, and the methods and techniques used to monitor them, must be the same in proxy sites as in sample sites.

8.2.12 In grouped project scenarios, this alternative approach is only allowable for the first project instance. All future instances must adhere to the Nature Framework's monitoring requirements for measuring Condition at project start.

9 COMMUNICATIONS AND CLAIMS

Concept

This section sets out requirements to ensure that the application and use of claims related to Nature Framework projects and Nature Credits are easy, correct, and truthful. The aim is to avoid misleading claims and uses that could damage the integrity, credibility, and reputation of the market mechanism, the Nature Framework, the SD VISta Program, Verra, or Verra's stakeholders.

This section applies to proponents of projects that have ever been listed, validated, or verified using the Nature Framework, intermediaries/marketers in the biodiversity/nature credit market, buyers of Nature Credits, VVBs approved under the SD VISta Program, academic and research institutions, and the media.

9.1 Claims about Projects Using the Nature Framework and Nature Credits

Requirements

9.1.1 Oral or written claims about projects listed, validated, and/or verified under SD VISta and using the Nature Framework must be:

1) accurate with regards to the estimated or verified biodiversity benefits, and the resulting Nature Credits.
2) specific about:
    a) the phase of the project cycle and the status of the benefits: whether they are estimated at project listing or validation, or quantified at project verification (see Section 2.3).
    b) the version of the Nature Framework with which the benefits are estimated or verified.
3) clear, transparent, and understandable to the intended audience (e.g., discuss what listing, validation, or verification implies where the audience is expected to be unfamiliar with the Nature Framework).
4) made in good faith.

9.1.2 Authors of such claims must ensure that statements regarding the Nature Framework are used only for the project and activities specifically described in the project documents that have been listed, validated, or verified. Table 7 lists requirements for claims related to projects and Nature Credits.

Table 7. Claim requirements

Subject of Claim and Requirements	Example Wording
Listed project, not yet validated 9.1.3 Claims of listed projects not yet validated must refer only to the **submission of a project description** and **estimated benefits.**	The project description is listed in the Verra Registry, which means that: • it has undergone a completeness check by Verra and an evaluation of the quantification elements by a technical expert panel. • Verra has posted the project documentation for a 30-day public comment period. • project design still needs to be validated by an independent assessor. • the number of Nature Credits generated will be determined at verification, scheduled to start in [estimated date for monitoring report submission for verification, maximum five years after the project start date]. The project's start date is [project start date] and it will generate an estimated [number of estimated quality hectares] quality hectares over [crediting period] years. The project's ID in the Verra Registry is [number of project ID] from the project proponent [name of project proponent].
Validated project, not yet verified 9.1.4 Claims of validated projects not yet verified must refer only to the **quality of project design** and **estimated benefits.**	The project's design is validated to the SD VISta Nature Framework, which means that: • it has undergone a completeness check by Verra, an evaluation of the quantification elements by a technical expert panel, a 30-day public comment period, and a design validation by an independent third-party assessor concluding that the design follows the Nature Framework requirements. • the number of Nature Credits generated will be determined after verification, scheduled to start in [estimated date for monitoring report submission for verification, maximum five years after the project start date]. The project's start date is [project start date] and it will generate an estimated [number of estimated quality hectares (Qha) at project design] quality hectares representing the anticipated biodiversity outcomes over [crediting period] years. The project's ID in the Verra Registry is [number of project ID] from the project proponent [name of project proponent].

Subject of Claim and Requirements	Example Wording
Verified project 9.1.5 Claims of verified projects must refer to the most recent verification period and achieved outcomes.	The project's design is verified to the SD VISta Nature Framework for the period of [verification period], which means that: • it has undergone a completeness check by Verra, an evaluation of the quantification elements by a technical expert panel, and a design validation by an independent third-party assessor. • Verra has posted the project documentation for a 30-day public comment period. • it has been implemented following the Nature Framework requirements and its results from [monitoring period start date] to [monitoring period end date] were verified by an independent third-party assessor. The project's start date is [project start date] and it will generate an estimated [number of estimated quality hectares at project design] quality hectares over [crediting period] years. The project activities resulted in net biodiversity outcomes from [uplift and/or avoided loss] of [number of Qha verified] quality hectares from [monitoring period start date] to [monitoring period end date]. Nature Credits are calculated by multiplying the net biodiversity outcomes by 100. The project's ID in the Verra Registry is [number of project ID] from the project proponent [name of project proponent].
Nature Credits 9.1.6 Claims about Nature Credits must specify the verification period and credit characteristics.	The [number of Nature Credits] Nature Credits were verified using the SD VISta Nature Framework for conserving and/or restoring biodiversity. Each Nature Credit represents 1% of net biodiversity outcomes, measured in Qha, generated from [verification period start date] to [verification period end date] as a result of the project intervention. The project's ID in the Verra Registry is [number of project ID] from the project proponent [name of project proponent].
Nature Credits from projects that also generate VCUs 9.1.7 Claims about Nature Credits from projects that also generate VCUs must follow the requirements in Section 9.1.6 and	The [number of Nature Credits] Nature Credits were verified using the SD VISta Nature Framework for conserving and/or restoring biodiversity. Each Nature Credit represents 1% of net biodiversity outcomes, measured in Qha, generated from [verification period start date] to

Subject of Claim and Requirements	Example Wording
transparently disclose that the project also generates VCUs.	[verification period end date] as a result of the project intervention. The project's ID in the Verra Registry is [number of project ID] from the project proponent [name of project proponent]. This project also generates VCUs under Verra's VCS Program. Nature Credits fulfill the Nature Framework requirements, including additionality and safeguards to ensure benefits are not double-counted.

9.1.8 Project proponents preparing for or undergoing validation may refer to the SD VISta Nature Framework by name for stakeholder consultation.

9.1.9 Penalization for the misrepresentation of a project's status or Nature Credits is a freeze on Nature Credit issuances and future verifications until the misrepresentation is rectified.

9.1.10 Any stakeholder may report suspected misrepresented claims following the most recent version of the *Verra Grievance Redress Policy*.[117]

9.2 Best Practices for Nature Credit End Users

9.2.1 End users of Nature Credits making public claims about their purchase are required to adhere to Section 9.1 and must publicly report (e.g., in corporate sustainability reports) their Nature Credit purchases and retirement dates.

9.2.2 To avoid making misleading statements about the use of Nature Credits, end users must communicate transparently about the context in which those credits are used. For example, a business might state the following:

> "We have taken X, Y, and Z steps to address our impacts on nature, from prevention to transformational actions to reduce the drivers of biodiversity loss. Beyond that commitment, we have purchased Nature Credits certified by an independent third-party auditor to the SD VISta Nature Framework to derisk our value chain and sustain our dependencies on nature. These Nature Credits represent the increase in biodiversity outcomes of [number of Qha verified] quality hectares from [verification period start date] to [verification period end date], which would not have occurred without the project intervention. We will continue to invest both within and beyond our value chain until nature is visibly and measurably on the path of recovery toward a nature-positive world."

9.2.3 The penalty for an end user's misrepresentation of Nature Credits is that all account activity is stopped for the account in which the Nature Credits are held.

[117] Version 1.2 of this policy is available at: https://verra.org/wp-content/uploads/2023/12/Grievance-Redress-Policy-V1.2-Update-13.9.24.pdf

10 TECHNICAL ANNEX

This section includes additional context, rationale, and technical details to give readers a more in-depth understanding of the proposed quantification approach described in Section 7.

10.1 Ecosystem Classification Using the IUCN Global Ecosystem Typology

Identifying the ecosystem(s) encompassed in the project Extent is a crucial step for Nature Framework projects because it defines the selection of Condition indicators and reference values and directly informs monitoring plan design.

There are many reasonable ways to divide the world's ecosystem variability into distinct ecosystem types. Some are currently in development (e.g., the Global EcoSystems (GlobES) approach[118] which is based on remote sensing and aligns with the IUCN Red List of Species Habitat Classification[119]) but do not yet include biogeographic elements. Other existing typologies are narrower in scope, focusing on specific biological components (e.g., the Holdridge Life Zone Classification System[120] focused on plants), specific realms (e.g., the terrestrial focus of the Global Map of Terrestrial Habitat Types[121] and the World Climate Regions and World Ecosystems[122]), or distinct geographic areas (e.g., Europe's EUNIS[123]). Further information on ecosystem typologies can be found in Keith et al. (2022).[124] These existing typologies may be quicker and easier to map, but they are also less ecologically informed.

The IUCN Global Ecosystem Typology (GET) is used in the Nature Framework based on the following rationale:

- It is global and covers all realms (i.e., terrestrial, freshwater, marine, and subterranean).
- It is a widely used ecosystem classification system employed for:
  - natural capital and ecosystem accounting (e.g., UN System of Environmental-Economic Accounts[125]),
  - ecosystem management and conservation, including Key Biodiversity Areas identification and protection planning,
  - ecosystem mapping, forming the basis of the upcoming Global Ecosystem Atlas,[126] and

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[118] The GlobES Data Cube (n.d.). Available at: https://www.globesdata.org/
[119] IUCN (2001). Available at: https://www.iucnredlist.org/resources/habitat-classification-scheme
[120] Leemans (1992). Global Holdridge Life Zone Classifications. IIASA. Available at: https://resources.unep-wcmc.org/products/31d5e80482834f6ba6ee51a2813b82e7
[121] Jung et al. (2020). Available at: https://doi.org/10.1038/s41597-020-00599-8
[122] Sayre et al. (2020). Available at: https://doi.org/10.1016/j.gecco.2019.e00860
[123] European Environment Agency (2024). Available at: https://eunis.eea.europa.eu/
[124] Available at: https://doi.org/10.1038/s41586-022-05318-4
[125] United Nations Committee of Experts on Environmental-Economic Accounting (2021). Available at: https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf
[126] Group on Earth Observations (n.d.). Available at: https://earthobservations.org/solutions/incubators/global-ecosystems-atlas

  - ecosystem risk assessments (e.g., IUCN Red List of Ecosystems[127]).

- It enables project proponents to benefit from expert risk assessment for ecosystem collapse and related threats, as well as clearly link activities and outcomes to progress towards global biodiversity goals and targets (e.g., Kunming-Montreal Global Biodiversity Framework,[128] United Nations Sustainable Development Goals).

- Its use in the Nature Framework, and the subsequent data generated from it, will also support future global biodiversity assessments, given that previous assessments have used more limited ecosystem typologies (e.g., Convention on Biological Diversity Global Biodiversity Outlook 5,[129] IPBES Global Assessment[130]).

Using fine-level classifications such as the IUCN GET is ecologically necessary. For example, while tropical forests are commonly treated as one ecosystem type, they are further sub-divided into four types (i.e., montane rainforests, lowland rainforests, heath forests, and dry forests) largely driven by differences in water deficit and temperature.[131] Each type has a unique structure and functioning and faces different threats, so the relevant pressures and Condition indicators for monitoring may differ.

However, in practice, only a small proportion of the many ecosystems of IUCN GET will be relevant to most Nature Framework projects. A few of the GET's functional groups are quite widespread and many projects will be found in those ecosystems (e.g., GET T1.1: tropical/sub-tropical lowland rainforests). Others are relatively restricted in range (e.g., GET T6.5: tropical alpine grasslands and herbfields) so it is less likely that projects will be in those ecosystems. To further illustrate, the marine realm has a total of 24 functional groups in the GET, but few marine projects are likely to focus on GET M3 (deep sea floors biome) given the practical challenges of operating in such remote ecosystems. Most marine projects will focus interventions on more easily accessible functional groups, such as GET M1.3 (photic coral reefs) or GET M1.1 (seagrass meadows).

10.2 Selection and Measurement of Condition Indicators

Measuring ecosystem Condition is crucial for evaluating the success of conservation and restoration efforts. Condition refers to the composition, structure, and function of natural environments and accounts for various ecological processes. To comprehensively assess Condition, multiple indicators must be used to holistically capture key aspects such as species diversity, structural complexity, and carbon storage. Monitoring a variety of appropriate indicators provides a multi-faceted picture of how well ecosystems are functioning over time compared to their intact natural reference states. This approach promotes a more accurate and nuanced understanding of ecosystems' biotic and abiotic components, helps to track improvements in ecosystem health, and guides adaptive management actions.

[127] IUCN (2001). Available at: https://www.iucnredlist.org/resources/habitat-classification-scheme
[128] Nicholson et al. (2024). Available at: https://doi.org/10.1038/s41559-023-02320-5
[129] Secretariat of the Convention on Biological Diversity (2020). Available at: https://www.cbd.int/gbo5
[130] IPBES (2019). Available at: https://doi.org/10.5281/ZENODO.3553579
[131] Keith et al. (2022). Available at: https://doi.org/10.1038/s41586-022-05318-4

Monitoring biodiversity relies on several key indicators, including species diversity, functional diversity, and phylogenetic diversity. Species diversity is the foundational component of biodiversity, typically assessed within a specific taxonomic group by evaluating the number of species and their relative abundances.[132] Functional diversity encompasses the physical and behavioral traits of species, which help sustain ecosystem processes and functions.[133] Different species traits can buffer against environmental change, making functional diversity crucial for maintaining ecosystem functionality and adaptability. Phylogenetic diversity measures the total amount of evolutionary history within a community of species, capturing the depth of evolutionary relationships.[134] It is particularly valuable for identifying conservation priorities by highlighting species that represent unique evolutionary lineages and which may be irreplaceable if lost.

When used together, these indicators provide a holistic view of biodiversity: species diversity reflects the variety of life forms, phylogenetic diversity reveals evolutionary relationships, and functional diversity emphasizes the ecological roles that species play.[135] This comprehensive approach facilitates the design of robust conservation strategies by identifying key species and functions that require protection to maintain ecosystem health and resilience. Moreover, these indicators are essential for ensuring continued provision of critical ecosystem services (e.g., pollination, water purification, carbon sequestration).

It is important to note that high species diversity does not necessarily translate to high functional or phylogenetic diversity. In many ecological communities, the loss of certain species may not immediately impact ecosystem processes yet may lead to irreversible degradation of ecosystem functions in the long-term.[136] While phylogenetic diversity can sometimes serve as a surrogate for functional diversity, the correlation between them varies depending on the complexity of traits included in the functional diversity measure. Research shows that phylogenetic diversity increasingly correlates with functional diversity as more traits are considered,[137] but this correlation weakens when there is variation in the rate and optima of trait evolution. Therefore, using phylogenetic diversity as a proxy for functional diversity is inadvisable, except at a very broad, general level; it is not appropriate for finer-scale, project-level assessments.

Two key issues of indicator selection are particularly relevant for Nature Framework projects: the number of indicators monitored and their appropriateness for the local ecological context. First, there is a trade-off between the cost and uncertainty of measurement in indicator selection. Indicators must be carefully selected and effectively monitored. Including more indicators is likely to increase the certainty of measured outcomes. However, it will also increase costs. Second, there can be significant variability in how Condition indicators respond to a project intervention. For example, not all taxa respond the same way to changes in land use, and some taxa are generally better and more cost-effective indicators than others in particular contexts (e.g., in the Amazon, birds and dung beetles are

[132] Chao et al. (2014). Available at: https://doi.org/10.1890/13-0133.1
[133] Petchey and Gaston (2006). Available at: https://doi.org/10.1111/j.1461-0248.2006.00924.x
[134] Faith (1992). Available at: https://doi.org/10.1016/0006-3207(92)91201-3
[135] Rurangwa et al. (2021). Available at: https://doi.org/10.1111/ddi.13364; Bełcik et al. (2020). Available at: https://doi.org/10.1038/s41598-020-76917-2
[136] Flynn et al. (2011). Available at: https://doi.org/10.1890/10-1245.1
[137] Tucker et al. (2018). Available at: https://doi.org/10.1002/ecy.2349

considered good indicator taxa as they respond consistently to degradation and are cost-effective to monitor).[138]

The selection of which taxa to monitor for composition indicators could affect the number of credits generated by a project. Therefore, composition indicators must have a demonstrable link to the broader Condition. Single-species indicators representative of only a narrow subset of species will generally not be appropriate. Future versions of the Nature Framework will provide more detailed guidance on indicator selection based on early use of the methodology.

It is also important that indicators are measured in standardized ways according to established good practice. For example, the reported species richness of a particular taxon is only meaningful if it has been measured using the appropriate techniques and expertise and with standardized sampling effort and coverage.[139] Consistent application of stratified random sampling across the full range of ecosystem types and quality within a project is also important. For instance, it would be misleading to measure Condition indicators in the most degraded parts of the project initially and in the most pristine parts later. Therefore, the Nature Framework requires projects to consistently use standardized methods for sampling and measuring Condition indicators (Section 8.2).[140]

Some biodiversity measurement error is unavoidable in the field. Error will be inherent in the techniques used, as will variability in measured values between years due to environmental and demographic fluctuations. To accurately assess overall trends, a multi-year dataset is required.

10.3 Rationale for Using Arithmetic Mean to Combine Condition Indicators

Combining Condition indicators is an essential step in summarizing complex ecological information and communicating trends in ecosystem Condition, particularly for the purposes of the Nature Framework.

The arithmetic mean (i.e., simple average) is one of the most common measures of central tendency due to its ease of estimation. However, it is sensitive to outliers so it may not represent an accurate measure of central tendency when outliers are included in the quantification. On the other hand, the geometric mean (i.e., calculated by taking the *n*th root of the product of *n* values) is less sensitive to outliers but is also less simple to estimate.

In the Nature Framework, generating an overall project-level Condition value requires a two-step averaging process to combine Condition indicators. When averaging related indicators within the components of ecosystem Condition (i.e., structure and composition), the arithmetic mean can help reduce the influence of correlated indicators. Moreover, using the simple mean prevents indicators within the same group from forcing overall quality to zero during early succession stages (e.g., for indicators measured in highly degraded areas).

[138] Gardner et al. (2008). Available at: https://doi.org/10.1111/j.1461-0248.2007.01133.x
[139] Gotelli and Colwell (2001). Available at: https://doi.org/10.1046/j.1461-0248.2001.00230.x; Chao and Jost (2012). Available at: https://doi.org/10.1890/11-1952.1
[140] Sutherland (2006). Santos and Fernandes (2021). Available at: https://doi.org/10.1007/978-3-030-53226-0

Verra explored using the geometric mean to combine structure and composition values in the Nature Framework. The proposed rationale was that the geometric mean would return zero values in situations where a Condition indicator for at least one component has a zero value, penalizing sites with poor Condition values in any other component(s). However, in practice, it is unlikely that any project would capture a zero value for one of its Condition indicators, and the arithmetic mean will also reflect poor values in one component (although not as emphatically).

If the “before” state for one Condition indicator is at or near zero and rises to a low or moderate Condition value in the “after” state, the geometric mean would enhance the measured change in Condition from “before” to “after” as compared to the arithmetic mean. This effect can be substantial for the initial improvement, but diminishes as Condition values increase. For mid-range Condition values, the arithmetic and geometric means produce very similar values, with any calculation differences likely outweighed by measurement errors. Testing with projects’ real data in worked examples corroborated this, so the simpler and easier-to-implement arithmetic mean was chosen.

10.4 Calculating the Crediting Baseline

Overall approach

Nature Credits generated as a result of project activities are based on the measured change in ecosystem Condition in the project Extent relative to an estimation of predicted Condition loss in the without-project scenario.

The data required for projects to set crediting baselines with the highest degree of confidence necessitates at least a 10-year time series of all project-measured structure and composition indicators at high spatial resolution throughout the project Extent and across comparable areas in the country ecoregion component (i.e., the portion of the wider ecoregion located within the same country as the project). At the time of the Nature Framework’s launch and despite rapid progress in biodiversity data availability, these ideal circumstances rarely, if ever, exist.

While estimating crediting baselines for biodiversity is technically challenging, the design decision for the *Nature Framework, v1.0* is based on the rationale that setting the most robust crediting baseline possible given the data limitations is better than not setting a baseline at all. Effectively “bending the curve” of biodiversity loss requires preventing future biodiversity loss and restoring already degraded biodiversity. For conservation to be effective, existing threats must be addressed before restoration and improvement can take place. Therefore, preventing future loss is a high priority. By taking into account the risk of loss of ecosystem Condition in the broader landscape in the crediting baseline, the Nature Framework provides a pathway for financing projects in parts of the world where biodiversity is threatened. Ecological guardrails are proposed to ensure that projects account for potential leakage and are credited based on real biodiversity outcomes.

The Nature Framework’s approach to crediting baselines is adapted to the distinct biodiversity context, offers three pragmatic methods based on data availability, and is generally applicable to all realms, biomes, and ecosystem types. Key considerations include:

- Changes in Condition may involve changes in ecosystem composition not necessarily reflected in ecosystem structure (e.g., pressures such as hunting or disturbance may cause the loss of key fauna species without an obvious change in flora). Advances in remote sensing mean that some Condition indicators (most often structure indicators like canopy cover and height) are likely to be available for estimating crediting baselines. Composition indicators are less amenable to remote sensing since they typically require field monitoring and are consequently not widely sampled or publicly available. However, where a composition indicator's relationship to a structure indicator is well-established, a remotely sensed structure indicator can be defensibly used as a proxy for composition.
- Recent historical changes in ecosystem intactness can often be a good predictor of future changes. However, ecoregions may also be subject to rapid transformations resulting from urbanization, agricultural expansion, infrastructure development, or the (in)direct effects of climate change. Combining historical changes with predicted future changes provides a better estimate of what is likely to happen in a given landscape's without-project scenario.
- Country ecoregion components (CECs) are convenient and appropriate spatial units for estimating crediting baselines. Using a CEC rather than an administrative (i.e., jurisdictional) unit as the project's default reference region ensures ecologically and socio-politically coherent units of assessment that share relevant jurisdictional characteristics (e.g., national management policies for conservation and biodiversity). There is broad scientific support for using ecoregions as sound biogeographical units,[141] as well as for defining and mapping terrestrial and freshwater realms and the marine shelf biome. CECs also offer the most granular spatial scale[142] at which there is consensus on ecological boundaries.

Confounding Variables in Crediting Baselines

Confounding variables are factors other than project activities that influence ecosystem Condition within and outside of the project Extent and affect how well the crediting baseline estimates change in Condition in the without-project scenario. Where a crediting baseline is derived from observed changes in Condition using sites beyond the project Extent, such as in the matched controls or habitat conversion risk methods, the Nature Framework requires project proponents to identify and integrate a set of confounding variables in the estimation process. This helps to ensure that the measured differences in Condition more accurately reflect project activities' outcomes rather than merely confounding variables' impacts on the landscape.

[141] Smith et al. (2018). Available at: https://doi.org/10.1038/s41559-018-0709-x
[142] The mean size of terrestrial CECs is 76 500 km^2.

10.5 Guidance on Condition Indicators for the Tropical-Subtropical Forests Biome

In providing ecosystem-specific guidance, consideration is given to the complex interactions among different Condition indicators, acknowledging that each has strengths and limitations that determine its best place of use.

GET T1: Tropical-Subtropical Forest Suggested Condition Indicators

Tropical-subtropical forests are a biome as per the IUCN GET classification (GET T1). For projects in this biome, Table 8 provides a non-exhaustive suite of suitable Condition indicators and Table 9 outlines some key unsuitable indicators.

In Table 8, “indicator species” refers to species whose presence and/or abundance are characteristic of a certain ecosystem state. Indicator species are often monitored to infer ecosystem Condition, where doing so is more cost-effective than measuring a suite of species composition indicators. The use of “indicator species” in the table’s text is not to be confused with the more general use of the term “Condition indicator” elsewhere in the Nature Framework.

Note that while some composition indicators may also apply to other biomes, the difference lies in the focal taxa (i.e., the species groups) that are specific to tropical forests. For recommendations on taxa that are relatively cost-effective to sample, see Gardner et al. (2008)[143] and Agosti et al. (2000).[144]

[143] Available at: https://doi.org/10.1111/j.1461-0248.2007.01133.x
[144] Available at: https://doi.org/10.5281/zenodo.11736

Table 8. Suggested indicators for tropical-subtropical forests grouped by ecosystem Condition component (i.e., composition, structure, function)

Condition Component	Indicator	Description	References	Strengths	Limitations	Priority for Monitoring
Composition	Species richness of target taxa (e.g., birds, dung beetles)	Simple species richness: Number of species present Contextual species richness: Number of species present out of a defined set of species characteristic of the target ecosystem	Keith et al. (2020)[145] UNCEEA (2021)[146]	Most intuitive measure of diversity Can be measured via relatively low-effort sampling methods (e.g., acoustic monitoring, environmental DNA).	Sensitive to sampling effort and species detectability Simple species richness can be unreliable, as it often increases with moderate disturbance and can mask the replacement of habitat-specialist species by habitat-generalists. Contextual species richness is more reliable but may not always reflect population changes in real-time and requires information on habitat preferences for the target taxa.	Recommended with the caveats to only use contextual species richness and to correct for sampling effort biases
Composition	Taxonomic diversity (expressed in Hill numbers) of target taxa (e.g., birds, dung beetles)	Diversity metric that considers species richness, evenness, and abundance within the community	Chao et al. (2014)[147] Gardner et al. (2008)[148] Kim et al. (2023)[149] TNFD (2023)[150]	Reflects ecosystem health and complexity. Sensitive to changes in the environment	Need to specify the method for estimating diversity and assessing relative abundance. Sensitive to sampling effort and species detectability May be highest in moderately disturbed (i.e., not intact) ecosystems.	Recommended where relative abundance can be assessed

145 Available at: https://doi.org/10.3897/oneeco.5.e58216
146 Available at: https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf
147 Available at: https://doi.org/10.1890/13-0133.1
148 Available at: https://doi.org/10.1111/j.1461-0248.2007.01133.x
149 Available at: https://doi.org/10.32942/X2130Z
150 Available at: https://tnfd.global/wp-content/uploads/2023/09/Guidance_on_biomes_v1.pdf?v=1695138252

Condition Component	Indicator	Description	References	Strengths	Limitations	Priority for Monitoring
	Functional trait dispersion of target taxa (e.g., birds, dung beetles)	Measures a species' traits within a community, representative of its ecological roles and processes. Combines measures of dispersion (i.e., the spread of traits within the community), evenness (i.e., how evenly distributed the traits are), and species richness.	Scheiner et al. (2017)[151]	Highlights functional roles and ecosystem processes. Can indicate ecosystem resilience.	Requires data on species' functional traits, which may not be readily available. Complex to analyze Sensitive to sampling effort and species detectability	Recommended where the number of functional traits can be assessed
	Occurrence of threatened or other priority species	Presence or absence of species on the IUCN Red List of Threatened Species or other species identified as conservation priorities (e.g., high stakeholder concern, considered to be umbrella or indicator species)	ITTO (2016)[152] Keith et al. (2020)[153]	Direct indicator of conservation value Relatively easy to assess Focusing on indicator species can reduce overall monitoring effort required.	May miss broader ecological changes. May not be a sensitive or accurate indicator of overall Condition. Requires species-specific knowledge, as some may be difficult to detect.	Use with caution, where there is strong evidence that the presence of a suite of indicator species reflects ecosystem Condition.
	Abundance of threatened or other priority species	Abundance of species on the IUCN Red List of Threatened Species or other species identified as conservation priorities (e.g., high stakeholder concern, considered to be umbrella or indicator species)	Joseph et al. (2006)[154] Keith et al. (2020)[155] Lindenmayer et al. (2020)[156]	Direct indicator of conservation value Focusing on indicator species can reduce overall monitoring effort required. Better reflection of Condition than simple presence/absence;	May miss broader ecological changes. May not be a sensitive or accurate indicator of overall ecosystem Condition. Requires species-specific knowledge.	Use with caution, where there is strong evidence that abundance of a suite of indicator species reflects ecosystem Condition.

151 Available at: https://doi.org/10.1111/2041-210X.12696
152 Available at: https://doi.org/10.24451/arbor.6591
153 Available at: https://doi.org/10.3897/oneeco.5.e58216
154 Available at: https://doi.org/10.1111/j.1523-1739.2006.00529.x
155 Available at: https://doi.org/10.3897/oneeco.5.e58216
156 Available at: https://doi.org/10.1016/j.jenvman.2020.110312

Condition Component	Indicator	Description	References	Strengths	Limitations	Priority for Monitoring
				noting that abundance provides more information on population health but requires more effort to estimate than presence/absence	Abundance may be difficult to determine for some species.	For some species, total abundance of individuals may provide less information on population health than the abundance of reproductive individuals.
Structure	Tree canopy cover	Area of ground covered by the tree canopy when viewed from above, often measured using remote sensing techniques The rate of tree canopy cover change (i.e., forest cover loss or gain) is widely used in nature-related target-setting or disclosure frameworks (e.g., TNFD).	TNFD (2023)[157] UNCEEA (2021)[158]	Indicates habitat quality, carbon storage potential, and habitat loss. Easily measurable over large areas Remote sensing data is readily available and simple to use (e.g., Global Forest Watch).	Does not capture other relevant aspects of ecosystem Condition (e.g., biomass, tree type, height, or density).	Essential
	Tree density by size class	Number of trees in different size classes per unit area, indicating age structure and forest dynamics	Keith et al. (2020)[159] Kim et al. (2023)[160]	Provides information on forest structure and regeneration. Useful for biomass estimation	Time-consuming to measure	Essential
	Vegetation vertical profile	Structural complexity of vegetation, including layers of canopy, understory, and ground cover	Liang and Wang (2020)[161]	Indicates habitat complexity and is correlated with biodiversity value.	Requires specialized expertise and/or remote sensing technology. Interpretation can be complex.	Recommended

157 Available at: https://tnfd.global/wp-content/uploads/2023/09/Guidance_on_biomes_v1.pdf?v=1695138252
158 Available at: https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf
159 Available at: https://doi.org/10.3897/oneeco.5.e58216
160 Available at: https://doi.org/10.32942/X2130Z
161 Available at: https://doi.org/10.1016/B978-0-12-815826-5.00013-1

Condition Component	Indicator	Description	References	Strengths	Limitations	Priority for Monitoring
				Can be measured with remote sensing.		
	Forest area density	Percentage of forest pixels in a 500 ha circular buffer, centered on each project site	Paillet et al. (2024)[162]	Can be measured with remote sensing.	An indicator of forest connectivity / fragmentation	Recommended
	Aboveground biomass (AGB)	Total mass of living plant material above the ground, indicating ecosystem productivity and carbon storage	ITTO (2016)[163]	Reflects carbon sequestration. Indicator of forest health	Requires precise measurement or modeling. Intensive data collection	Recommended
	Soil organic carbon (SOC)	Amount of carbon stored in the soil, indicating soil health and carbon sequestration capacity	UNCEEA (2021)[164]	Reflects soil health.	Requires laboratory analysis. Variable across space and time	Recommended
Function	Net primary productivity (NPP)	Rate at which plants convert carbon dioxide into biomass, minus the carbon lost through respiration	Kim et al. (2023)[165]	Indicates ecosystem productivity. Can be measured using remote sensing data and is easily measured over large areas.	May require specialized expertise. Link to ecosystem Condition is not as direct.	Recommended
	Leaf litter decomposition rate[166]	Rate at which fallen leaves and organic material decompose, indicating nutrient cycling and soil health	Keith et al. (2020)[167]	Reflects nutrient cycling and soil health. Can indicate changes in ecosystem processes.	Variable due to external factors (e.g., climate, microhabitats) Requires regular sampling.	Recommended

[162] Available at: https://doi.org/10.1101/2024.02.12.579875
[163] Available at: https://doi.org/10.24451/arbor.6591
[164] Available at: https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf
[165] Available at: https://doi.org/10.32942/X2130Z
[166] While leaf litter decomposition rate is strictly an indicator of function, total leaf litter volume (i.e., biomass) could be used as a suitable indicator of structure.
[167] Available at: https://doi.org/10.3897/oneeco.5.e58216

Table 9. Unsuitable and non-recommended indicators for tropical-subtropical forests grouped by Condition component (i.e., composition, structure, function)

Condition Component	Indicator	Description	References	Strengths	Limitations	Priority for Monitoring
Composition	Phylogenetic diversity of target taxa (e.g., birds, dung beetles)	The total amount of evolutionary history in a community of species	Chao et al. (2014)[168]	Captures evolutionary and genetic diversity. Can indicate the potential for evolutionary resilience.	Requires phylogenetic data. Complex to analyze Sensitive to sampling effort and species detectability Unlikely to be responsive to management actions	Not recommended
	Effective population size of target taxa (e.g., birds, dung beetles)	Number of individuals in a population contributing to the next generation	Kim et al. (2023)[169] Wang et al. (2016)[170]	Indicates genetic diversity.	Difficult to estimate Requires detailed population data.	Not recommended
Function	Belowground biomass (BGB)	Total mass of living root material, important for carbon storage and nutrient cycling	ITTO (2016)[171] Sullivan et al. (2018)[172]	Complements aboveground biomass estimates. Important for carbon budget calculations	Difficult to measure	Not recommended

[168] Available at: https://doi.org/10.1890/13-0133.1
[169] Available at: https://doi.org/10.32942/X2130Z
[170] Available at: https://doi.org/10.1038/hdy.2016.43
[171] Available at: https://doi.org/10.24451/arbor.6591
[172] Available at: https://doi.org/10.1111/2041-210X.12962

Sampling Methods for Recommended Composition Indicators

For a general overview of census techniques and specific sampling challenges in tropical forests, see *Ecological Census Techniques*[173] and *Monitoring Forest Biodiversity*.[174]

Table 10 summarizes sampling methods for recommended composition indicators with relevant comments about indicator sensitivity, which refers to how sensitive certain groups of organisms (i.e., taxa) are to changes in their environment.

Table 10. Sampling methods for recommended composition indicators for taxa in tropical-subtropical forests

Taxa	Sampling methods	References	Indicator sensitivity
Birds	Point-counts Acoustic sampling	Sutherland (2012)[175] Gardner et al. (2008)[176]	Birds are generally a cost-effective and representative indicator of tropical forest Condition. They are sensitive to changes in habitat structure, food availability, and climate. From canopy dwellers to ground foragers, they occupy various ecological niches, and their presence or absence reflects the overall state of the forest ecosystem. For instance, declines in bird populations may indicate deforestation, habitat fragmentation, or pollution. Birds are usually most effective as a Condition indicator when assessment focuses on the species subset that depends upon intact forest (e.g., tree-cavity nesters, bark-gleaning insectivores). Birds are relatively easy to monitor, making them practical for long-term studies, but their mobility can sometimes make it difficult to pinpoint specific environmental changes since birds may migrate or move to different areas if conditions become unfavorable.
Dung beetles	Baited pitfall trapping	Larsen and Forsyth (2005)[177] Mora-Aguilar et al. (2023)[178]	Dung beetles are generally a cost-effective and representative indicator of tropical forest Condition. They play a crucial role in nutrient cycling, seed dispersal, and soil aeration. Their well-being is closely tied to overall ecosystem health and function. Dung beetles are sensitive to habitat disturbance, such as deforestation, agricultural expansion, and hunting, which can drastically reduce their populations and diversity. Because they respond quickly to changes in habitat quality, dung beetles can provide early warnings of ecosystem degradation. Their relatively low mobility (compared to birds) allows for more localized assessments of forest health, but this presents limitations in reflecting broader environmental changes.

[173] Sutherland (2012). Available at: https://doi.org/10.1017/CBO9780511790508
[174] Gardner (2010). Available at: https://doi.org/10.4324/9781849775106
[175] Available at: https://doi.org/10.1017/CBO9780511790508
[176] Available at: https://doi.org/10.1111/j.1461-0248.2007.01133.x
[177] Available at: https://doi.org/10.1111/j.1744-7429.2005.00042.x
[178] Available at: https://doi.org/10.3389/fevo.2023.1096208

Taxa	Sampling methods	References	Indicator sensitivity
Ants	Pitfall trapping Winkler extractor	Agosti et al. (2000)[179] Leal et al. (2010)[180] Schultheiss et al. (2022)[181]	Generally a cost-effective and representative indicator of tropical forest Condition, ants have a higher global biomass than all wild birds and mammals combined. Ants play a key role in maintaining tropical forest ecosystems by aiding seed dispersal, decomposition, and invertebrate population regulation. Ants' community structure is highly sensitive to habitat alterations, such as soil compaction, changes in vegetation cover, and microclimate variation. For instance, species that specialize in foraging in undisturbed leaf litter may decline with habitat degradation, while more generalist or invasive species may thrive. The presence or absence of certain ant species or functional groups (e.g., leaf-cutters, army ants) can also reflect disturbances like deforestation, habitat fragmentation, or invasive species. Ants' presence can also reflect soil quality, moisture levels, and food resource availability, indicating broader ecological shifts. Their relatively low mobility (compared to birds) allows for more localized assessments of forest health, but this presents limitations in reflecting broader environmental changes.
Trees	Plot-based surveys (e.g., fixed-area plots, transects) Remote sensing (e.g., satellite, LiDAR, drone)	Chazdon et al. (2022)[182]	One of the most direct indicators of tropical forest Condition, trees reflect long-term changes in forest structure, biodiversity, and ecosystem services (e.g., carbon sequestration, water cycling). They provide habitat and food for a wide variety of species, so the decline in or loss of certain tree species can destabilize an entire ecosystem. Changes in tree species composition, tree density, and tree size distribution can provide insights into the degree of ecosystem disturbance or recovery, and a decline in tree diversity typically correlates with overall decline in ecosystem Condition. Trees can be measured and monitored with a wide variety of methods, many of which are well-established with long-term historical datasets.
Bats	Point-counts Acoustic sampling	Darras et al. (2021)[183] Metcalfe et al. (2023)[184] Sutherland (2012)[185]	Good indicators of habitat quality and forest structure, bats are crucial for seed dispersal, pollination, and insect population control, all of which contribute to maintaining healthy ecosystem processes. Many species are highly sensitive to habitat changes because they depend on specific niches or resources (e.g., fruit, flowers, insects) directly linked to forest quality. Declines in bat populations, especially frugivorous and nectarivorous bats, often signal habitat degradation or loss of key ecological functions. Changes in insectivorous bat populations may also reflect shifts in insect populations caused by pesticide use or deforestation. However, bats are more mobile and can be more adaptable than trees, making them slightly less direct indicators of change in localized forest Condition.

[179] Available at: https://doi.org/10.5281/zenodo.11736
[180] Available at: https://doi.org/10.1007/s10531-010-9896-8
[181] Available at: https://doi.org/10.1073/pnas.2201550119
[182] Available at: https://doi.org/10.1098/rstb.2021.0069
[183] Available at: https://doi.org/10.1002/ece3.8356
[184] Available at: https://doi.org/10.1002/jwmg.22414
[185] Available at: https://doi.org/10.1017/CBO9780511790508

10.6 Productive Landscapes Guidance

Condition Indicators for Productive Landscapes

Condition indicators and reference values for productive landscape contexts should relate to the intact natural habitat, even where project activities do not aim to restore the ecosystem to an intact state. This approach is necessary to ensure comparability with other projects using the Nature Framework. For example, including indicators that relate to species benefiting from, or tolerating, disturbance or setting reference values related to areas under production may result in Condition quantifications that overstate the gains for nature when compared to other projects.

Additional Monitoring for Productive Landscapes

By monitoring production yields and economic returns, project proponents in productive landscape contexts can better manage the potential trade-offs between biodiversity conservation and agricultural productivity. This also provides practical guidance on leakage-related risks. Where feasible, it is recommended that project proponents monitor and report as contextual metrics:

- agricultural yields (noting that yield is not to be used as a Condition indicator), and
- economic returns on productive activities.

11 KEY NATURE FRAMEWORK DESIGN OBJECTIVES

This section summarizes the overarching design elements and decisions underpinning the Nature Framework.

Biodiversity and how people relate to and interact with it is highly complex and variable among realms and geographies. This means there are inherent trade-offs in the design choices of the Nature Framework, which will have implications for both the way nature outcomes are characterized and the practicality of implementation. For transparency, Figure 11 summarizes the key design objectives and how they are implemented, with links to relevant sections for further details.

Figure 11. Summary of key Nature Framework design objectives, considerations, and decisions

1. Create a globally applicable unit representing ecosystem Condition across geographies and realms.

Design consideration	Design decision in the Nature Framework
The ecosystem concept provides a scientific basis for identifying important characteristics to measure in each context while encompassing a broad range of biodiversity.	Use of ecosystem Extent and Condition as the standard biodiversity metric underpinning Nature Credits (Section 2.2)

2. Allow for comparability across projects while accounting for a project's local context by combining standardized and flexible requirements.

Design consideration	Design decisions in the Nature Framework
Measurement of ecosystem Condition provides a recognized science-based framework that balances standardization and provides flexibility for contextualization, including local understanding of nature.	Require measurement of standard components of ecosystem Condition (i.e., composition and structure) but allow flexible selection of locally appropriate indicators within each component. Provide a robust process for Condition indicator selection and monitoring based on local context, including guardrails and guidance.

3. Minimize cost and technical complexity by balancing:

- **rigor to ensure high-integrity credits.**
- **accessibility to promote broad participation, including by Indigenous Peoples and local communities.**

Design consideration	Design decisions in the Nature Framework
There is a trade-off between the accuracy of biodiversity monitoring and the technical complexity, cost, and accessibility of projects.	Require a minimum standard of rigor, providing clear guidance on the technical elements. Provide a flexible approach to financial additionality as an entry requirement to minimize the burden on project proponents and enable access to essential credit finance.

4. Ensure Nature Credits represent real, measured, and evidence-based outcomes to promote buyers' confidence and integrity.

Design considerations	Design decisions in the Nature Framework
Buyers can have confidence in Nature Credits representing tangible, on-the-ground outcomes that clearly align with societal goals. Linking Condition measures to a desired ecosystem state (via the reference value) allows demonstrating and measuring alignment with buyers' goals. Using reference values is technically more demanding for projects but also more rigorous than measuring only a project's change compared to its starting Condition. It allows clear interpretation of outcomes and avoids distortions in credit estimates that may arise from varying baselines.	Nature Credits are based on measured evidence of achieved outcomes, not on projections. Require clearly defined end goals, using reference values to standardize the Condition indicator values. Include guardrails and best practices to support projects in selecting appropriate reference values.

5. Prioritize conservation of ecosystems at high risk of biodiversity loss by crediting restoration and avoided loss.

Design considerations	Design decision in the Nature Framework
Effectively "bending the curve" of biodiversity loss requires preventing future biodiversity loss and restoring already degraded biodiversity. For conservation to be effective, existing threats must be addressed before restoration and improvement can take place. Therefore, preventing future loss is often the highest priority. Most projects are expected to undertake combined activities, including avoided loss and restoration.	Avoided loss and restoration are eligible for crediting and incorporated in a single accounting method with equal weighting.

6. Build on the lessons learned in voluntary carbon markets.

Design considerations	Design decisions in the Nature Framework
Experience has shown that project-by-project baselines may not always be robust. Emerging jurisdictional baseline approaches are an alternative model that can promote integrity and reduce the burden on project proponents. However, there is a lack of readily available data to support Verra's development of a rigorous top-down, standardized approach.	Dynamic baselines are set by project proponents, using one of three methods, following strict criteria and guidance. Assemble a technical expert panel to assess the technical components of the biodiversity outcome quantification and minimize bias. Verra will continue exploring alternatives to establish top-down ecoregional baselines by third parties as data and science evolve.

7. Signal how projects contribute to global conservation priorities via Significance attributes.

Design consideration	Design decision in the Nature Framework
The Global Biodiversity Framework (GBF) has broad cross-sector endorsement for global priorities for nature conservation. It has multiple targets, reflecting the multiple aspects of biodiversity. Investors are likely to have preferences for different targets.	Report biodiversity Significance indicating the project's relevance to different GBF targets (Section 7.7) based on project location. Significance: • provides information points to help buyers make informed decisions aligned with their nature-positive goals and desired contribution to global goals for nature. • does not impact the number of Nature Credits generated. Verra will continue to refine Significance attributes once more data are available.

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APPENDIX 1: METHODS FOR CALCULATING THE PROJECT CREDITING BASELINE

A1.1 Matched Control Method

Apply the stepwise requirements in this section to use the matched control method for estimating the crediting baseline.

Step M1. Map project sample sites

Using the mapped reference region containing the project Extent produced in Section 7.5.1, delineate the location (spatial boundaries), and size (in hectares) of all project sample sites (defined in Section 8.2.2 and 8.2.3) and provide the relevant GPS coordinates.

Step M2. Compile a dataset for matching

Compile a dataset for matching using the following procedure.

For matching and monitoring in control and project sample sites, include at least two of the project's selected Condition indicators as follows:

1) At least one of the project's selected structure indicators and at least one of the project's selected composition indicators, both meeting the temporal and spatial requirements (Sections 7.5.4(1)–7.5.4(2))
2) Of the minimum two Condition indicators chosen, one must be based on direct observation and one may be a proxy for the target Condition indicator provided it meets the proxy requirements (Section 7.5.3).

Include sample-level estimates of these Condition indicators, at the same scale at which they were sampled, for the sample sites in the project Extent and for the potential control sites (i.e., the reference region). These estimates must:

a) encompass a period of *t* years prior to project start, with *t* being defined by the period covered in the available historical data.
b) be interpolated between available values to fill temporal (i.e., annual) gaps with transparent documentation of the data interpolation steps.

Compile a set of *N* covariates (i.e., variables that potentially influence biodiversity in the project Extent and wider ecoregion) reflecting at least three of the relevant drivers of biodiversity loss identified in the project's baseline scenario (see Section 5.7.2(8)) and other key factors (e.g., elevation, climate, distance to roads) that characterize ecosystem Condition in both the project Extent and the reference region.

Data used for the set of covariates must meet the spatial data requirements (Section 7.5.4(2)) and must show sufficient variation across the project Extent and the reference region to enable statistical matching. Covariates are not required to meet the 10-year historical data coverage (Section 7.5.4(1)(a)) and planned update (Section 7.5.4(3)) requirements where their use is adequately justified.[186]

Add direct observations collected by the project proponent in control and project sample sites sampled following an appropriate sampling protocol (see Section 8.2).

Step M3. Use systematic sampling to identify potential sample sites

Use systematic sampling to identify a set of potential sample sites in the project Extent for matching. Give each site a unique identifier and record its size (in hectares) and GPS coordinates.

The potential sample sites must:

1) represent at least 10% of the total project Extent when aggregated and measured in hectares.
2) be representatively distributed across the entire project Extent in terms of the ecosystem type(s), land use(s), and variation in Condition indicators and covariates.
3) be sufficiently and equally distant from each other to form a grid within the project Extent.

Sites missing values for the Condition indicators or the covariates must be excluded.

Step M4. Use random sampling to identify potential control sites

Use random sampling to identify a set of potential control sites (i.e., donor pool) for matching. Give each site a unique identifier and record its size (in hectares) and GPS coordinates.

The potential control sites must be at least as far from one other as the minimum distance between sample sites in the project Extent. Sites missing values for the Condition indicators or the covariates, as well as those meeting the defined exclusion criteria (Section 7.5.7), must be excluded. Additional exclusion criteria may be applied to potential control sites where such criteria are adequately defined and justified.

The donor pool must be at least 25% larger than the set of potential sample sites identified in Step M3. Otherwise, apply either or both of the following:

1) Remove some exclusion criteria to bring previously excluded potential control sites back into the donor pool, provided that the removal of a given exclusion criterion is justified, and/or
2) Review the list of covariates and remove those that have less coverage in the reference region to bring back into the donor pool sites that were previously excluded due to missing data.

[186] Covariate datasets may contain static observations (e.g., elevation) and therefore may not be updated regularly, or may only have one or two data points available. It is better to include some covariate data to capture appropriate influential factors than none at all, hence the exemption from the requirements mentioned.

Step M5. Calculate mean Condition indicators and covariates

Calculate and record the mean value, across all available time-steps in the historical period, of each Condition indicator and covariate. Calculate values for each potential control site and sample site in the project Extent.

To extract Condition indicator or covariate values from vector layers, rasterize the vector layer to pixels, maintaining its original resolution.

Step M6. Match sample sites to control sites

Match each project sample site with a potential control site using one-to-one statistical matching without replacement and a distance measure and matching method from the following:

- Distance measures: exact, Mahalanobis, propensity score, or linear propensity score
- Matching method: nearest neighbor matching or optimal matching.

Control and sample site matching must meet the following post-matching quality metrics:

1) At least 80% of the potential sample sites identified in Step M3 are paired with a control site.
2) For covariate balance, the absolute standardized mean difference (SMD) between sample sites and matched control sites is ≤0.25 across all covariates, where the SMD for covariate *x* is defined as:

$$\text{SMD of } x = \frac{\overline{X}_{PA} - \overline{X}_{M}}{\sqrt{\frac{(Var_{PA} + Var_{M})}{2}}}$$

Where:

$\overline{X}_{PA}$ and $\overline{X}_{M}$	Sample means for the set of sample sites and the set of matched control sites, respectively
Var_{PA} and Var_{M}	Sample variances for the set of sample sites and the set of matched control sites, respectively

Step M7. Standardize Condition indicators

Standardize the individual Condition indicators for each control site, each sample site, and each available time-step in the historical period, by dividing the indicator's absolute value by its reference value (Step 3 in Section 7.3) per the following formulas:

$$St_{k,i,-t} = I_{St,k,i,-t} \times \frac{1}{Rv}$$

$$Cm_{k,i,-t} = I_{Cm,k,i,-t} \times \frac{1}{Rv}$$

Where:

$St_{k,i,-t}$ Standardized structure indicator *k* for site *i* in time-step $-t$ (*t* years before project start)

$Cm_{k,i,-t}$ Standardized composition indicator *k* for site *i* in time-step $-t$

$I_{St,k,i,-t}$ Mean structure indicator value for site *i* in time-step $-t$ (Step M5)

$I_{Cm,k,i,t}$ Mean composition indicator value for site *i* in time-step $-t$ (Step M5)

Rv Reference value

Step M8. Generate a composite Condition indicator

Generate a composite Condition indicator at each available time-step in the historical period, for each sample site and each control site using the following formula:

$$C_{i,-t} = \frac{1}{2}\left(\frac{St_{1,i,-t} + St_{2,i,-t} + \cdots + St_{n_{St},i,-t}}{n_{St}} + \frac{Cm_{1,i,-t} + Cm_{2,i,-t} + \cdots + Cm_{n_{Cm},i,-t}}{n_{Cm}}\right)$$

Where:

$C_{i,-t}$ Composite Condition indicator at time-step $-t$ for control or sample site *i*

$St_{k,i,-t}$ Structure indicator *k* for site *i* in time-step $-t$ standardized by its reference value (Step M7)

$Cm_{k,i,-t}$ Composition indicator *k* for site *i* in time-step $-t$ standardized by its reference value (Step M7)

n_{St} Total number of structure indicators

n_{Cm} Total number of composition indicators

Step M9. Calculate area-adjusted composite Condition value for control sites

Calculate the area-adjusted composite Condition value for the set of control sites for each available time-step in the historical period by multiplying each control site's composite Condition indicator (Step M8) by its Extent, then calculating the arithmetic mean per the following formula:

$$\overline{C}_{-t} = \frac{(E_1 \times C_{1,-t}) + (E_2 \times C_{2,-t}) + \cdots + (E_N \times C_{N,-t})}{E_1 + E_2 + \cdots + E_N}$$

Where:

$\overline{C}_{-t}$ Area-adjusted composite Condition value for time-step $-t$

N Total number of control sites

E_i Extent of control site *i*

$C_{i,-t}$ Composite Condition indicator for control site *i* for time-step $-t$ (Step M8)

Step M10. Calculate estimated crediting baseline

Calculate the estimated crediting baseline ($\hat{B}_{pre}$) using ordinary least squares linear regression of the area-adjusted composite Condition value (Step M9) across available time-steps in the historical period per the following formula:

$$\overline{C}_{-t} = \hat{B}_{pre}t + \epsilon_{-t}$$

Where:

$\overline{C}_t$	Area-adjusted composite Condition value for time-step $-t$
$\hat{B}_{pre}$	Estimated crediting baseline at project start
t	Number of total available historical time-steps (i.e., prior to $t0$)
ϵ_{-t}	Error term minimized by solving for $\hat{B}_{pre}$ to minimize the total sum of squares

Use the estimated crediting baseline ($\hat{B}_{pre}$) as the crediting baseline parameter *B* until dynamic baseline calculation is required at verification.

Step M11. Calculate dynamic crediting baseline at verification

Calculate the dynamic crediting baseline at each verification as follows:

1) Monitor the structure and composition Condition indicators in the project sample sites and in the control sites across the monitoring period.
2) Repeat Step M7 to Step M10 using the observed monitoring data, generating the dynamic crediting baseline $\hat{B}_{post}$ in Step M10.
3) Update the value of the crediting baseline parameter *B* with the dynamic crediting baseline $\hat{B}_{post}$ (i.e., replacing the previously estimated value $\hat{B}_{pre}$) for subsequent quantification of net biodiversity outcomes.

Box 13. Best Practice Guidance for Matched Control Method

Project proponents should aim to monitor indicators in control sites in the same way (i.e., using the same frequency, techniques, effort) in which they are monitored in the project Extent.

A1.2 Habitat Conversion Risk Method

Apply the stepwise requirements in this section to use the habitat conversion risk method to calculate the crediting baseline.

Step H1. Map buffer zone around project Extent

Using the mapped reference region containing the project Extent produced in Section 7.5.1, delineate and map the spatial boundaries of a 10 km buffer zone around the project Extent.

Where the project Extent encompasses more than one country ecoregional component, assess habitat conversion risk separately for each one using the most relevant structure indicator identified per ecosystem type.

Step H2. Choose structure indicator for modeling

Choose a project structure indicator for modeling the probability of habitat conversion, justifying the indicator's appropriateness based on its relationship with (i.e., sensitivity to) habitat conversion. Confirm that the chosen indicator meets the data requirements (Sections 7.5.4–7.5.5).

Step H3. Create or source a raster of the structure indicator

Either create or source a raster data layer of the chosen structure indicator wherein the value in each pixel (i.e., grid cell) represents the predicted probability of decline in the indicator's absolute value (i.e., habitat conversion risk) during the monitoring period.

Predicted probabilities must be generated with a minimum resolution of 300 m^2 or higher to detect spatial risk patterns across the entire reference region.[187] Where probabilities are predicted at a different spatial resolution than that of the structure indicator, use techniques to re-sample the spatial probability layer to the same resolution as the structure indicator for spatial grid alignment.

Predicted probabilities must be for the same time period (i.e., number of years) as the monitoring period. Where the raster data layer of predicted probability reflects a different temporal span (e.g., probabilities predicted across 10 years and the monitoring period is 5 years), use appropriate techniques to re-scale the probabilities to the relevant number of years in the monitoring period.

The raster data layer may be spatially modeled to generate predicted probabilities of future change, using the available historical data and a set of *N* covariates (i.e., variables that potentially influence biodiversity in the project Extent). The covariates must:

1) reflect at least three of the relevant drivers of biodiversity loss identified in the baseline scenario (see Section 5.7.2(8)) and other key factors (e.g., elevation, climate, distance to roads) characterizing ecosystem Condition in both the project Extent and the reference region.
2) meet the spatial data requirements (Section 7.5.4(2)).

[187] Refer to the *forestsatrisk* package for an applied best practice methodology to generate deforestation predictions at large spatial scales (e.g., at the country ecoregional component scale) with high-resolution data (30 m^2). Available at: https://doi.org/10.21105/joss.02975

Covariates are not required to meet the 10-year historical data coverage (Section 7.5.4(1)(a)) and planned update (Section 7.5.4(3)) requirements where their use is adequately justified.[188]

Where it is infeasible to spatially model the indicator's predicted probability of habitat conversion (e.g., the project proponent cannot source spatially explicit covariate data or does not have the capacity for such modeling), the raster data layer may be sourced from credible sources of expert-generated prediction map(s) of habitat change (Section 7.5.5), where the other criteria in this step are met.

Step H4. Identify areas of high habitat conversion risk

Using the raster data layer from Step H3, identify areas of high habitat conversion risk across the entire reference region, the project Extent, and the buffer zone by assessing each pixel's risk probability and selecting pixels with a predicted probability greater than 0.3. Create a new raster layer of these pixels as follows:

$$HighRiskProb_p = \begin{cases} ConvProb_p & \text{if } ConvProb_p > 0.3 \\ 0 & \text{if } ConvProb_p \leq 0.3 \end{cases}$$

Where:

$HighRiskProb_p$ Value of the habitat conversion risk probability

$ConvProb_p$ Probability of conversion in pixel *p*

Step H5. Exclude high-risk pixels meeting exclusion criteria

Exclude any high-risk pixels across the entire reference region, the project Extent, and the buffer zone that meet the exclusion criteria in Section 7.5.7. The remaining pixels are the overall set of high-risk pixels to be used in calculating the crediting baseline. Allocation of pixels to this set must not be altered during a given monitoring period.

Step H6. Assess overlap of high-risk pixels with project Extent

Assess overlap of the set of high-risk pixels produced in Step H5 with the project Extent. Where there is no overlap (i.e., there are no high-risk pixels remaining within the Extent), the estimated crediting baseline is $\hat{B}_{pre}$= 0.

Otherwise, calculate the proportion of high-risk pixels in relation to the Extent as follows:

$$w = \frac{1}{P_{Proj}}\left(HighRisk_1 + \cdots + HighRisk_{P_{Proj}}\right)$$

[188] Covariate datasets may contain static observations (e.g., elevation) and therefore may not be updated regularly, or may only have one or two data points available. It is better to include some covariate data to capture appropriate influential factors rather than none at all, hence the exemption from the requirements mentioned.

Where:

w	Proportion of the project Extent assessed as high-risk
P_{Proj}	Total number of pixels in the project Extent (p = 1, ..., P_{Proj})
$HighRisk_p$	Binary variable indicating whether pixel p is high-risk

Step H7. Project estimated ecosystem Condition to end of monitoring period

Calculate the estimated ecosystem Condition $(\widehat{I_{p,tx}})$ projected to the end of the monitoring period for each high-risk pixel within the project Extent using the structure indicator's measured value at project start, and create a new raster layer, using the following formula:

$$\widehat{I_{p,tx}} = \overline{I_{p,t0}} \times \left(1 - HighRiskProb_p\right)$$

Where:

$\widehat{I_{p,tx}}$	Estimated absolute structure indicator value in high-risk pixel p in the project Extent after monitoring period of x years (tx)
$I_{p,t0}$	Observed absolute structure indicator value in high-risk pixel p in the project Extent at project start (i.e., year zero or $t0$)
$HighRiskProb_p$	Probability of habitat conversion for high-risk pixel p

Step H8. Calculate difference between predicted and observed values

Calculate the difference between the structure indicator's predicted and observed absolute values for each high-risk pixel in the project Extent and create a new raster layer, using the following formula:

$$\Delta\widehat{I_{p,tx}} = \widehat{I_{p,tx}} - I_{p,t0}$$

Where:

$\Delta\widehat{I_{p,tx}}$	Predicted absolute change in Condition in high-risk pixel p in the project Extent after monitoring period of x years (tx)
$\widehat{I_{p,tx}}$	Estimated absolute structure indicator value in high-risk pixel p in the project Extent after a monitoring period of x years (tx) (Step H7)
$I_{p,t0}$	Observed absolute structure indicator value in high-risk pixel p in the project Extent at project start (i.e., year zero or $t0$)

Step H9. Calculate average change in high-risk pixels

Sum the estimated high-risk pixel-level change in structure indicator values in the project Extent, then divide by the total number of high-risk pixels in the project Extent to calculate the average change, as in the following formula:

$$\Delta\overline{I_{tx}} = \frac{1}{P_{HRI}}\left(\Delta\widehat{I_{1,tx}} + \Delta\widehat{I_{2,tx}} + \cdots + \Delta\widehat{I_{P_{HRI},tx}}\ \right)$$

Where:

$\Delta\overline{I_{tx}}$ Average absolute change in structure indicator for the set of high-risk pixels in the project Extent

P_{HRI} Total number of high-risk pixels (*p*) in the project Extent (*p* = 1, ..., P_{HRI})

$\Delta\widehat{I_{p,tx}}$ Predicted absolute change in Condition in high-risk pixel *p* after monitoring period of *x* years (*tx*) (Step H8)

Step H10. Standardize the area-weighted average absolute change in structure indicator

Standardize the area-weighted, average absolute change in the structure indicator using the high-risk proportion of the project Extent and the indicator's reference value (Sections 7.3.13–7.3.24) as follows:

$$\Delta C_{pre} = \frac{\Delta\overline{I_{tx}} \times w}{Rv}$$

Where:

ΔC_{pre} Area-weighted, standardized predicted change in Condition

$\Delta\overline{I_{tx}}$ Average absolute change in structure indicator for the set of high-risk pixels in the project Extent

w Proportion of the project Extent assessed as high-risk (Step H6)

Rv Reference value for structure indicator

Step H11. Use annual predicted rate of change to estimate crediting baseline

To estimate the crediting baseline $\hat{B}_{pre}$, divide the predicted change in Condition by the total number of years in the monitoring period to produce the annual predicted rate of change, using the following formula:

$$\hat{B}_{pre} = \frac{\Delta C_{pre}}{tx}$$

Where:

$\hat{B}_{pre}$ Annual estimated rate of change (i.e., estimated crediting baseline)

ΔC_{pre} Area-weighted, standardized predicted change in Condition (Step H10)

tx Number of years in the monitoring period

Step H12. Calculate dynamic crediting baseline at verification

Calculate the dynamic crediting baseline at each verification as follows:

1) Extract the structure indicator's updated observed values at year *x* (*tx*) (i.e., the end of the monitoring period) for the overall set of high-risk pixels defined in Step H5 and create a new raster layer.

2) Calculate the difference between the structure indicator's observed values at year *x* (*tx*) (i.e., the end of the monitoring period) and at year 0 (*t*0) (i.e., project start) for the set of high-risk pixels outside of the project Extent and the buffer zone, and create a new raster layer, using the following formula:

$$\Delta I_{p,tx} = I_{p,tx} - I_{p,t0}$$

Where:

$\Delta I_{p,tx}$ Observed absolute change in structure indicator in high-risk pixel *p* outside the project Extent and buffer zone after a monitoring period of *x* years (*tx*)

$I_{p,tx}$ Observed absolute structure indicator value in high-risk pixel *p* outside the project Extent and the buffer zone at time *tx*

$I_{p,t0}$ Observed absolute structure indicator value in high-risk pixel *p* outside the project Extent and the buffer zone at time *t*0

3) Sum the observed high-risk pixel-level change in structure indicator values outside of the project Extent and the buffer zone, then divide by the total number of high-risk pixels outside of the project Extent and the buffer zone to calculate the average observed change after a monitoring period of *x* years (*tx*) for the set of high-risk pixels, using the following formula:

$$\Delta\overline{Io_{tx}} = \frac{1}{P_{HRO}}\left(\Delta I_{1,tx} + \Delta I_{2,tx} + \Delta I_{3,tx} + \cdots + \Delta I_{P_{HRO},tx}\right)$$

Where:

$\Delta\overline{Io_{tx}}$ Average absolute change in structure indicator for the high-risk pixels outside of the project Extent and buffer zone after a monitoring period of *x* years (*tx*)

$\Delta I_{p,tx}$ Observed absolute change in structure indicator in high-risk pixel *p* outside the project Extent and buffer zone after a monitoring period of *x* years (*tx*)

P_{HRO} Total number of high-risk pixels outside the project Extent and buffer zone ($p = 1, \ldots, P_{HRO}$)

4) Standardize the area-weighted, average absolute change in the structure indicator using the high-risk proportion of the project Extent (Step H6) and the indicator's reference value (Sections 7.3.13–7.3.24), as follows:

$$\Delta C_{post} = \frac{\Delta\overline{Io_{tx}} \times w}{Rv}$$

Where:

ΔC_{post} Standardized, area-weighted observed change in Condition

$\Delta\overline{Io_{tx}}$ Average absolute change in structure indicator for the high-risk pixels outside of the project Extent and buffer zone after a monitoring period of *x* years (*tx*)

w Proportion of the project Extent assessed as high-risk

Rv Reference value for structure indicator

5) Divide the area-weighted observed change in Condition at the end of the monitoring period by the total number of years in the monitoring period to produce the annual observed rate of change, using the following formula:

$$\hat{B}_{post} = \frac{\Delta C_{post}}{tx}$$

Where:

$\hat{B}_{post}$ Dynamic crediting baseline parameter

ΔC_{post} Standardized, area-weighted observed change in Condition

tx Number of years in the monitoring period

6) Adopt the dynamic crediting baseline $\hat{B}_{post}$ value as the crediting baseline parameter *B* for the quantification of net biodiversity outcomes.

Box 14. Best Practice Guidance for Habitat Conversion Risk Method

- Where remote-sensing data products are used, optimal spatial granularity is 25 m^2 pixels to best identify patterns of habitat change within the project Extent and the wider ecoregion.
- Project proponents should use predictive models that are as specific to project-measured Condition indicators as possible and should only use a generalized indicator of habitat conversion risk (e.g., deforestation probabilities) where forward projections of the Condition indicator are unavailable.

A1.3 Ecoregional Rate of Change Method

Apply the stepwise requirements in this section to use the ecoregional rate of change method to calculate the crediting baseline.

Step E1. Identify relevant ecoregion

Refer to the mapped reference region containing the project Extent produced in Section 7.5.1 to identify the relevant ecoregion.

Where the project Extent encompasses more than one country ecoregion component (CEC), the project proponent must estimate a distinct crediting baseline for each CEC within the project Extent.

Step E2. Choose Condition indicator(s) to estimate ecoregional rate of change

Choose at least one of the project's Condition indicators to estimate the ecoregional rate of change. Confirm that the chosen indicator meets the temporal and spatial data requirements (Section 7.5.4(1)–(2)) and that it will be updated at the reference region level at least once during the monitoring period, either through ongoing direct observation or via planned data release(s).

Where none of the project's Condition indicators meet the temporal and spatial data requirements:

1) demonstrate that a reasonable attempt was made to search for datasets for those indicators and explain why the requirements cannot be met per Section 7.5.2.
2) choose a suitable proxy for the ecoregional Condition indicator, justify its appropriateness, and confirm that it meets both the data requirements (Section 7.5.4) and the proxy requirements (Section 7.5.3).
3) set a reference value for the proxy Condition indicator (Step 3 in Section 7.3).

The chosen ecoregional Condition indicator and its data source must not be changed within the monitoring period.

Step E3. Obtain historical values for Condition indicators

Obtain the historical value of the Condition indicator for each available time-step for a maximum of 10 years prior to the project start date.

Step E4. Standardize historical ecoregional Condition indicator

Standardize the ecoregional Condition indicator for each available time-step in the historical data by dividing it by the indicator's reference value (Step 3 in Section 7.3), per the following formula.

$$SI_{k,-t} = \frac{I_{k,-t}}{Rv}$$

Where:

$SI_{k,-t}$ Standardized Condition indicator *k* at time-step $-t$

$I_{k,-t}$ Absolute Condition indicator *k* at time-step $-t$

t Time-step within the available historical period ($-t$ years before project start)

Rv Reference value for Condition indicator

Where multiple Condition indicators are used to calculate the ecoregional rate of change, create a composite Condition indicator using the standardized indicators at each available time-step, using the following formula:

$$C_{-t} = \frac{1}{n}\left(SI_{1,-t} + SI_{2,-t} + \cdots + SI_{k,-t}\right)$$

Where:

C_{-t} Composite standardized Condition indicator at time-step $-t$ in the historical period

$SI_{k,-t}$ Standardized Condition indicator *k* at time $-t$

t Total number of time-steps within the available historical period ($-t$ years before project start)

n Total number of Condition indicators

Step E5. Calculate linear rate of change of Condition indicator over time

Use ordinary least squares linear regression to calculate a linear rate of change over time using the available historical time-steps for the ecoregional Condition indicator (or the composite Condition indicator at time $-t$, where multiple Condition indicators are used) using the following formula:

$$C_{-t} = \widehat{\Delta C} \times t + \epsilon_{-t}$$

Where:

C_{-t} Composite standardized Condition indicator at time-step $-t$ in the historical period (Step E4)

t Total number of time-steps within the available historical period ($-t$ years before project start)

ϵ_{-t} Random error term at time-step $-t$ minimized in the linear regression

$\widehat{\Delta C}$ Estimated historical annual rate of change in the Condition indicator

Step E6. Set estimated crediting baseline

Set the estimated historical annual rate of change ($\widehat{\Delta C}$) as the estimated crediting baseline parameter ($\hat{B}_{pre}$) (i.e., $\hat{B}_{pre} = \widehat{\Delta C}$).

Step E7. Calculate dynamic crediting baseline at verification

Calculate the dynamic crediting baseline at each verification as follows:

1) At the end of the monitoring period, obtain the updated data for the ecoregional Condition indicator(s) for all available time-steps in the monitoring period, then repeat Step E4 and Step E5 using the updated data to produce the observed annual rate of change in the Condition indicator during the monitoring period ($\overline{\Delta C}$).

2) Set the observed annual rate of change ($\overline{\Delta C}$) as the dynamic crediting baseline ($\hat{B}_{post}$) (i.e., $\hat{B}_{post} = \overline{\Delta C}$) and adopt the dynamic crediting baseline $\hat{B}_{post}$ value as the crediting baseline parameter *B* for quantification of net biodiversity outcomes.

Box 15. Best Practice Guidance for Ecoregional Method

Project proponents should increase data collection efforts over the monitoring period and regularly check for new data availability as per the Nature Framework's adaptive management requirements (Section 5.11) to enable the use of the matched control or habitat conversion risk methods to calculate the crediting baseline in a future monitoring period.