

TA 6746 Nature Credits Background Study

Final Report

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List of Acronyms

ADB	Asian Development Bank	ISSB	International Sustainability Standards Board
AWC	Asian Waterbird Census	ITMOS	Internationally Transferred Mitigation Outcomes
BCA	Biodiversity Credit Alliance	IUCN	International Union for Conservation of Nature
CDM	Clean Development Mechanism	KMGBF	Kunming Montreal Global Biodiversity Framework
CER	Clean Energy Regulator	MDB	Multilateral Development Bank
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation	MRV	Monitoring, Reporting, and Verification
CSR	Corporate Social Responsibility	NARIA	Natural Asset Recovery Investment Analytics
CSRD	Corporate Sustainability Reporting Directive	PES	Payment for Ecosystem Services
EAAF	East Asian-Australasian Flyway	RFI	Regional Flyway Initiative
EAAFP	East Asian-Australasian Flyway Partnership	SBTN	Science Based Targets Network
ECD	Ecological Character Description	SDG	Sustainable Development Goals
ESG	Environmental, Social, and Governance	SEC	Securities and Exchange Commission
EU	European Union	SFDR	Sustainable Finance Disclosure Regulation
FPIC	Free, Prior, and Informed Consent	TEK	Traditional Ecological Knowledge
GBF	Global Biodiversity Framework	TNFD	Taskforce on Nature-related Financial Disclosures
GEF	Global Environment Facility	UN	United Nations
GHG	Greenhouse Gas	UNDP	United Nations Development Programme
IAPB	International Advisory Panel on Biodiversity Credits	UNFCCC	United Nations Framework Convention on Climate Change
ICVCM	Integrity Council for the Voluntary Carbon Market	VCS	Verified Carbon Standard
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services	WEF	World Economic Forum

I. Executive Summary

This Report constitutes the final output for Phase 1 of the Asian Development Bank's **Nature Credits Study**¹ which explores the potential of nature credits as a scalable, high-integrity mechanism to channel private capital towards conservation of sites in the Regional Flyway Initiative (RFI). The RFI, led by ADB, is advancing innovative financing solutions to support the long-term conservation of critical wetlands along the East Asian-Australasian Flyway (EAAF)—one of the world's most important yet threatened migratory routes for waterbirds. These wetlands sustain biodiversity, provide vital ecosystem services, and underpin millions of livelihoods in the region. Despite their ecological and socioeconomic value, EAAF wetlands face alarming rates of degradation driven by unsustainable development and the impacts of climate change. Globally, public financing for wetland protection remains insufficient, contributing to the global biodiversity funding gap, which is projected to exceed US\$1.15 trillion annually by 2030. **Mobilizing private sector investment is essential to close this gap and secure lasting conservation outcomes.**

Nature credits are seen as among the innovative nature finance solutions that could contribute to closing such gap. As a market-based mechanism, this finance instrument can channel financial flows from private sector actors with dependencies – direct and indirect – to natural ecosystem areas. This Study examines such potential in the context of RFI sites, taking off on prior studies conducted by ADB on ecosystem services and carbon sequestration potential while drawing from practitioner insights of existing nature credit mechanisms, as well as the global literature on the topic. It likewise pulls in expert insights from carbon market practitioners, drawing parallels and contrasts to pick up lessons from the relatively more mature governance of carbon credits.

In examining existing programs, the Study helps to enrich understanding of the 'state-of-play' of these programs, highlight gaps, and emphasize opportunities (Chapter 6). It further interrogates existing concepts (Chapter 4), and – perhaps boldly – forwards an expansive conceptual foundation and definition of 'nature credits', one that quantifies positive ecological outcomes across biodiversity, climate, and ecosystem services: **Nature credits are evidence-based units of ecological improvement designed to drive and finance the halt and reversal of nature.** By capturing a fuller range of ecosystem values, this *expansive definition* allows alignment with RFI's goals to enhance biodiversity, build climate resilience, and support local communities. Anchoring on this definition, the Study proceeds to examine potential Demand and Supply for these credits, framed through the context of RFI sites and the activities, motivations, and intended outcomes relevant to these areas (Chapter 7). Finally, the paper attempts to conceptualize the 'nuts and bolts' that would be key in developing RFI-based nature credits (Chapter 8). Salient insights from these chapters are summarized below.

- **The global market for nature credits is gaining momentum, driven by increasing private sector demand for nature-positive investments, regulatory disclosure requirements, and growing philanthropic interest.** However, challenges such as the lack of standardized measurement frameworks, the complexity of monitoring and verification, and the emerging state of enabling policies persist.
- **Understanding demand-side motivations are critical to establishing viability and sustainability of nature credit mechanisms.** Unlike the carbon markets where buyer claims, as well as fungibility principles, are widely accepted and established, nature credit mechanisms are still navigating the evolving landscape of buyer motivations coupled with varying levels of awareness on dependency or 'debt' to nature. This Study helps to enrich this understanding by introducing its **Tiered Nature Dependency Framework**, which classifies potential buyers based on their ecological dependency, material risk exposure, and strategic motivations. This structure distinguishes between site-dependent engagements – where buyers have a direct reliance on ecosystem services provided by wetlands – and broader, non-site-dependent participation driven by reputational, ethical, or ESG commitments. This buyer-aligned approach ensures that credit claims remain credible, appropriately safeguarded, and aligned with both ecological integrity and market expectations.

¹ TA 6746- Nature Credits Study with Country Case Studies in Southeast Asian Countries

- **At the supply side, RFI nature credits may be designed through two primary credit archetypes: *restoration credits* and *loss avoidance credits*, with a proposed multi-metric approach that rewards ecological uplift as a project successfully delivers positive change from one state to another or sustains protected state against a baseline.** Restoration Credits are generated through demonstrable improvements in wetland ecosystem health, assessed using robust multi-metric indicators across *hydrology*, *vegetation*, and *biodiversity (biological)*. The volume of credits may correspond to both the area restored and the degree of ecological uplift achieved. Loss Avoidance Credits recognize the value of safeguarding intact wetlands by rewarding sustained protection and stewardship, with credits quantified based on the area under conservation and the duration of maintained ecosystem function.
- **To uphold market integrity, the proposed RFI nature credit framework adopts the Biodiversity Credit Alliance (BCA)'s 21 High-Integrity Principles as a foundational guide.** These principles—spanning ecological outcomes, social equity, and governance safeguards—are critical to ensuring credibility, transparency, and fairness in nature credit programs. At the same time, the framework recognizes that implementing these principles will vary in complexity across different RFI sites, particularly given the ecological diversity and socio-economic realities of the region. Their application will be progressively tested and validated through engagement with potential buyers, project proponents, and stakeholders during Phase 2. This process will ensure the framework remains both scientifically robust and practically achievable, while maintaining alignment with ADB's Environmental and Social Safeguards.

The conclusions and recommendations from this background study will be the lift-off point for the project's Phase 2, which shall dive into country contexts for the Philippines, Thailand, and Bangladesh. It will look at the identified gaps and further confirm their form and extent at these countries and their RFI sites, while also examining the in-country applicability of the proposed demand and supply concepts. Local policy conditions - their enabling and inhibiting potential - will also be examined with multi-stakeholder consultations helping to unpack local insights. **It is expected that the challenges - and opportunities - that could arise from the application of Phase 1 concepts, metrics, and measures will be fleshed out in these country deep-dives, thus finally elevating much-needed perspectives on nature credits from the Global South.**

II. Definition of Terms

Additionality

The principle that the environmental benefits attributed to a project would not have occurred in the absence of the intervention or the financial incentive provided by the credit mechanism (Gillenwater, 2012).

Biodiversity Credit

A biodiversity credit is a certificate that represents a measured and evidence-based unit of positive biodiversity outcome that is durable and additional to what would have otherwise occurred (BCA, 2024)

Carbon Credit

As defined by World Bank (2023), is tradable, intangible instrument representing a unit of carbon dioxide (CO₂) equivalent, (typically one tonne that is reduced, avoided, or sequestered by a project), and is certified/verified to an internationally recognized carbon accounting standard.

Carbon Market

A trading system where governments and non-state actors buy and sell greenhouse gas (GHG) emission credits to achieve climate targets and implement climate actions cost-effectively. Carbon markets can be broadly categorized into compliance markets (mandated by regulation) and voluntary markets (participants act voluntarily to offset emissions or support climate action) (UNEP, n.d.).

Commodification of Nature

Putting a price on nature and making it tradable (Namati et al., 2023)

Double Counting

A phenomenon whereby a single benefit is claimed by two separate income streams (rePLANET, 2023)

East Asian-Australasian Flyway

One of nine global migratory bird routes, spanning 22 countries from the Russian Far East to Australia and New Zealand. It is a critical habitat for over 50 million migratory waterbirds from more than 250 populations, including 36 globally threatened species (EAAFP, n.d.).

East Asian-Australasian Flyway Partnership

A network of partners (governments, NGOs, and international organizations) which aims to

protect migratory waterbirds, their habitat and the livelihoods of people along the EAAF (EAAFP, n.d.).

Environmental Claim (or Claim)

Are any claims about the environmental attributes or impact of a product or business, including claims that a product or business has no negative impact, a positive impact, or a comparatively better impact on the environment (EACA. 2022).

Free, Prior, and Informed Consent

Is a specific right granted to Indigenous Peoples. FPIC allows Indigenous Peoples to provide or withhold/withdraw consent at any point in projects that impact them and/or their territories, and to engage in negotiations to shape the design, implementation, monitoring, and evaluation of projects (FAO, n.d.).

Kunming Montreal Global Biodiversity Framework

A landmark agreement adopted at COP 15 following four years of intense consultation, provides an ambitious roadmap for humanity to live in harmony with nature by 2050. This historic framework sets forth four long-term goals for 2050 and 23 actionable targets to be met by 2030 (Convention on Biological Diversity, n.d.).

Leakage

Leakage is the unintended displacement of environmental harm (often manifesting as land-use spillover) caused by an environmental policy or intervention (conservation or restoration activities). This displacement reduces the overall benefits and effectiveness of the original policy (Meyfroidt, et al., 2020).

Loss Avoidance Credit

Is one of the two RFI Credit Archetype in this study which are generated from interventions that protect, maintain and steward ecosystem health (halting nature loss).

Mitigation Hierarchy

A widely used good practice framework that guides users towards limiting as far as possible the negative impacts on biodiversity from development projects. It can be applied to projects in any sector and is based on a sequence of four iterative actions: avoiding and minimizing any negative impacts (prevention), before restoring and finally

offsetting residual impacts (remediation) (The Biodiversity Consultancy, n.d.).

Monitoring, Reporting, and Verification

Provides a foundational framework for tracking progress against environmental goals, particularly concerning greenhouse gas emissions (mostly used in carbon markets) (Sustainability Directory, 2025).

Nature

Refers to the natural world with an emphasis on the diversity of living organisms (including people) and their interactions among themselves and with their environment (Diaz, et al., 2015).

Nature Credits

As defined in the context of this study, are evidence-based units of ecological improvement designed to drive and finance the halt and reversal of nature.

Permanence

The permanence of a unit of carbon removal or biodiversity gain refers to the likelihood of the CO₂ sequestered, or biodiversity gained being maintained into the future. Long-lasting project permanence goes hand in hand with the quality of the credits that it produces and is critical to ensuring long term impacts that either reduce green-house gas (GHG) emissions or increase biodiversity (rePLANET, 2023).

Restoration Credit

Is one of the two RFI Credit Archetype in this study which are generated from activities that restore degraded wetlands ecosystems (reversing nature loss) to its fully functioning state.

Regional Flyway Initiative

A large-scale transboundary program that seeks to mobilize \$3 billion in investments over ten years to protect, restore, and sustainably manage a comprehensive network of threatened natural wetlands— including mangrove forests, peatlands, marshes, tidal mudflats, and coral atolls—along the East

Asian-Australasian (EAA) Flyway (Asian Development Bank, 2021).

Science-based Target Network

A global collaboration that enables companies and cities to set and achieve science-based targets for nature, ensuring their actions are aligned with global sustainability goals and contribute to a nature-positive future. It provides guidance and frameworks for assessing impacts and dependencies on nature and setting ambitious, measurable targets (SBTN, n.d.).

Task Force on Nature-related Financial Disclosures

A global initiative that provides a framework for organizations to report and act on nature-related risks and opportunities. Its recommendations aim to help financial institutions and companies integrate nature into their decision-making, leading to more sustainable financial flows and positive outcomes for nature (TNFD, n.d.).

Tiered Nature Dependency Framework

Is a framework under this study which classifies potential buyers based on their ecological dependency, material risk exposure, and strategic motivations. This structure distinguishes between site-dependent engagements—where buyers have a direct reliance on ecosystem services provided by wetlands—and broader, non-site-dependent participation driven by reputational, ethical, or ESG commitments.

III. Introduction and Background

A. Objective of the Study

The Regional Flyway Initiative (RFI) is a long-term sustainable development program led by the Asian Development Bank to scale up conservation initiatives in a number of critical wetlands across the East Asian-Australasian Flyway (EAAF)– recognized as one of the most vulnerable of the eight major migratory flyways globally. The EAAF covers 22 countries stretching from far east Russia and Alaska in the north, traversing East and Southeast Asia, all the way to New Zealand and Australia in the south.

Through the RFI program, 147 wetlands (also known as the RFI sites) have been identified for prioritized intervention and sustained funding to support biodiversity conservation, climate resilience, and community empowerment.

As a part of the RFI, a Nature Credits Study has been initiated to explore sustainable market-based opportunities that may uplift the conservation and protection of RFI sites and identify secure and sustainable ongoing finance. The project aims to explore the evolving field of nature credits, to determine if this finance mechanism is appropriate for RFI, and to help build a structured understanding of how these mechanisms can work in practice, especially in the context of wetlands in the global south.

This RFI Nature Credits Study covers two (2) phases: Phase 1 focuses on the development of a background study on nature credits, exploring conceptual foundations and frameworks, and realizing gaps and opportunities from the current state of play; and Phase 2 which takes the results of the background study to further test and explore their application in the country-specific context of the Philippines, Thailand, and Bangladesh. The development of country case studies will utilize site-specific data generated by experts from the BirdLife, East Asian-Australasian Flyway Partnership (EAAFP), and consultants from University of Southampton, during the Site Identification Phase of the RFI Program, to test the viability of these wetlands to generate and support nature credit programs.

B. Scope of the Study and Regional Flyway Initiative Background

The East Asian-Australasian Flyway (EAAF) supports 50 million migratory waterbirds, containing populations of more than 210 species, 20% of which are considered globally threatened.² Wetlands across the EAAF face an alarming rate of decline due to uncontrolled anthropogenic activities (including land conversion and drainage, reclamation, and pollution) and exacerbated impacts of climate change. Many different and ecologically significant species and local human communities depend on wetlands and their ecosystem services for survival. The EAAFP was established to amplify activities for the protection of migratory waterbirds, their habitats, and the local livelihoods that depend on them. Currently, the partnership is composed of 41 partners from various national governments, intergovernmental agencies, international non-government organizations, international organizations, and private enterprises.³

Wetlands in Southeast Asia provide a wide range of ecosystem services. They serve as vital roosting and breeding grounds for migratory waterbirds and sea turtles and support diverse species, including those that are dependent on mangrove and seagrass habitats and ecosystems.⁴ Beyond sustaining biodiversity, these wetlands also support millions of people across the region through fisheries, coastal protection, carbon storage, and tourism—making them critical for local livelihoods and food security. This dynamic is mirrored in South Asia, particularly in Bangladesh, where wetlands are

² East Asian-Australasian Flyway Partnership (EAAFP). (2023). EAAFP 2023 Brochure. Retrieved from https://www.eaaflyway.net/wp-content/uploads/2023/12/EAAFP-2023-Brochure-10th_linked_font-linked_final_WEB-ver..pdf

³ East Asian-Australasian Flyway Partnership. (n.d.). Partners. Retrieved on 15 May 2025 from <https://www.eaaflyway.net/partners/>

⁴ Yong, D. L., Kee, J. Y., Aung, P. P., Jain, A., Yeap, C. A., Au, N. J., Jearwattananok, A., Lim, K. K., Yu, Y. T., Fu, V. W. K., Insua-Cao, P., Sawa, Y., Crosby, M., Chan, S., & Crockford, N. J. (2022). Conserving migratory waterbirds and the coastal zone: The future of South-east Asia's intertidal wetlands. *Oryx*, 56(2), 176-183. <https://doi.org/10.1017/S0030605320001374>

central to both ecosystem health and socioeconomic resilience.⁵ They play a significant role in supporting the nation's inland and marine fisheries, while also providing raw materials that sustain traditional livelihoods. Despite their ecological importance, these ecosystems are often undervalued and poorly prioritized, making them vulnerable to unsustainable economic developments.

From a flyway context, conservation operates on the principle of irreplaceability—protecting one site contributes to the broader conservation of the entire network. Hence, if a particular site is lost, the integrity of the whole network is compromised.⁶ The conservation and protection of most RFI sites are primarily supported by national governments. Of the 147 priority sites, 108 are protected or partially protected, while 39 remain unprotected.⁷ In nearly all cases, site management and land tenure fall under government jurisdiction. However, public funding for these areas is often unsustainable and insufficient, particularly for ensuring long-term conservation. The RFI aims to address these funding challenges by promoting nature-based financing mechanisms tailored to the needs of these critical wetlands and the local communities that depend on them. The rise of nature markets is seen as a catalytic financing tool that will mobilize investments and enhance private sector participation in global biodiversity conservation.

The ADB Nature Credits Study seeks to explore the potential for the establishment of nature markets in South and Southeast Asia, more specifically by building a case for nature credit mechanisms for funding ongoing wetland conservation, protection, and restoration. The study will examine the potential 32 RFI sites (12 sites for the Philippines, 12 sites for Thailand, and 8 sites for Bangladesh) for nature credits. This also reviews existing nature credit mechanisms and methodology (including carbon credits) borrowing relevant concepts and setting out best practices to develop a high integrity framework for nature credits as relates to wetland ecosystems.

IV. Conceptual Foundations

Environmental markets have traditionally evolved around single service instruments—most commonly carbon credits and biodiversity credits—that monetize specific ecosystem services. While these instruments have been effective mechanisms in mobilizing finance for targeted goals like emissions reduction or species/habitat conservation, their narrow focus can overlook the broader contribution of nature to people, economies, and planet. For this reason, this study adopts a more holistic lens, examining 'nature credit' as a scalable, market-based mechanism that reflects and rewards the full range of services and values that nature sustains.

As touched upon in the above discussion, RFI sites are not only critical wetland ecosystems but also indispensable lifelines that sustain migratory waterbirds and the diverse communities. Migratory waterbirds serve as key indicators of wetland health due to their sensitivity to environmental changes.⁸ Ecologically, these species support ecosystem functionality through nutrient cycling, seed

⁵ Lamsal, P., Atreya, K. P., Pant, K. P., & Kumar, L. (2017). People's dependency on wetlands: South Asia perspective with emphasis on Nepal. In *Wetland Science* (pp. 407-419). Springer

⁶ Pressey, R. L., Humphries, C. J., Margules, C. R., Vane-Wright, R. I., & Williams, P. H. (1993). Beyond opportunism: Key principles for systematic reserve selection. *Trends in Ecology & Evolution*, 8(4), 124-128. , as cited in Crosby, M., Wee, S. Q. W., Yong, D. L., Allport, G., Chowdhury, S., Gan, X., Hagemeijer, W., Jensen, A. E., Lang, D., Layusa, C., & Yoon, S. (2025). An innovative approach in identifying a network of priority wetland sites in the East Asian-Australasian Flyway for a new sustainable management investment programme. bioRxiv. <https://doi.org/10.1101/2025.03.05.641701> [https://doi.org/10.1016/0169-5347\(93\)90023-I](https://doi.org/10.1016/0169-5347(93)90023-I), as cited in Crosby, M., Wee, S. Q. W., Yong, D. L., Allport, G., Chowdhury, S., Gan, X., Hagemeijer, W., Jensen, A. E., Lang, D., Layusa, C., & Yoon, S. (2025). An innovative approach in identifying a network of priority wetland sites in the East Asian-Australasian Flyway for a new sustainable management investment programme. bioRxiv. <https://doi.org/10.1101/2025.03.05.641701>

⁷ Crosby, M., Wee, S. Q. W., Yong, D. L., Allport, G., Chowdhury, S., Gan, X., Hagemeijer, W., Jensen, A. E., Lang, D., Layusa, C., & Yoon, S. (2025). An innovative approach in identifying a network of priority wetland sites in the East Asian-Australasian Flyway for a new sustainable management investment programme. bioRxiv. <https://doi.org/10.1101/2025.03.05.641701>

⁸ Ramsar Convention Secretariat (2010). Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance. Ramsar handbooks for the wise use of wetlands, 4th edition, vol. 14. Ramsar Convention Secretariat, Gland, Switzerland.

dispersal (pollination), and maintenance of aquatic food webs among others.⁹ While it may be argued that these sites may not necessarily have the highest carbon or biodiversity potential, the RFI program leverages the full potential of nature credits to generate greater returns for conservation and sustainable management of these sites—piloting a blueprint that can be replicated across countries and contexts to drive meaningful, long-term change.

This section lays the theoretical and definitional groundwork of the study and introduces a clear and progressive definition of nature credits. It considers the current gap in conservation financing and the evolving options for different nature financing mechanisms that has led to the emergence of market-based 'nature credits.' This is followed by an elaboration of the foundational differences between carbon and nature systems, particularly in terms of fungibility and ecosystem complexity, which is a crucial reference in conceptualizing nature credits. With these distinctions made, the study report then presents a conceptual framework for how nature credits could be applied to RFI.

A. Definition and Scope of Nature Credits

1. Nature Defined

The holistic characteristic of nature—embracing both living and life supporting **non-living components**—presents it not as a single asset, but as an **integrated functioning system**. As articulated by Diaz, et.al. (2015) in the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) Conceptual Framework:

“Nature refers to the natural world with an emphasis on the diversity of living organisms (including people) and their interactions among themselves and with their environment”¹⁰.

This framing expands nature’s definition beyond biodiversity to include climate systems and other abiotic elements—such as carbon, water, energy, minerals, etc.—that underpin stability and planetary health. The definition also holds intrinsic value in the sustained provision of ecosystem services that benefit human and non-human communities over long periods of time. In the dynamic landscape of environmental markets, nature is recognized as fundamental ‘natural capital’ that supports economic dependency to human society and economies, making it a critical asset for long term-value creation and risk management.

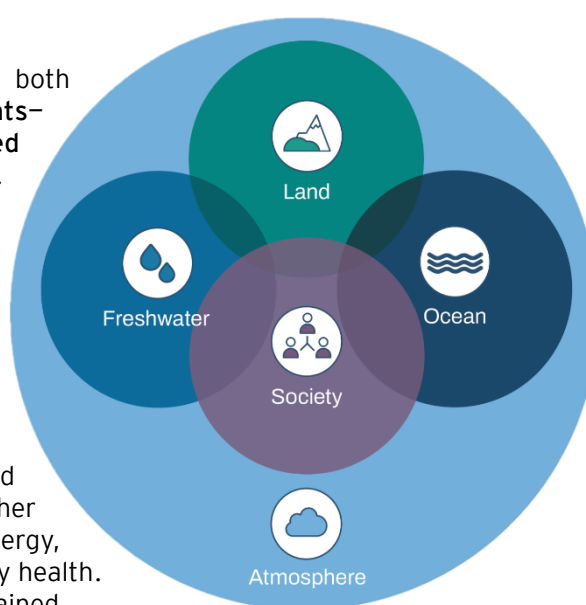


Figure 1. Nature's Four Realms
(source: TNFD, 2023)

This foundational definition of nature is critical to framing ‘nature credits’—it allows us to adopt an **inclusive** scope of what the mechanism covers—carbon, biodiversity, ecosystem services—and why it is insufficient to *interchangeably* use it with what is a relatively narrower scope, such as biodiversity credits, as has often been the case in most market applications and understandings to date. This broader and inclusive definition of nature credits also allow us to refrain from further reinforcing the dichotomization of carbon and nature as it recognizes carbon as inextricably part of nature (see more on this discussion at Special Focus - Carbon Credits). This all-encompassing definition of nature credits is equally critical for RFI (and wetland ecosystems in general) where the sites are inherently multi-functional, delivering overlapping ecosystem services such as carbon storage, migratory bird

⁹ Green, A. J., & Elmberg, J. (2014). Ecosystem services provided by waterbirds. *Biological Reviews*, 89(1), 105-122. <https://doi.org/10.1111/brv.12045>

¹⁰ Díaz, S., Demissew, S., Carabias, J., Joly, C., Lonsdale, M., Ash, N., Larigauderie, A., Adhikari, J. R., Arico, S., Báldi, A., Bartuska, A., Baste, I. A., Bilgin, A., Brondizio, E. S., Chan, K. M. A., Figueroa, V. E., Duraipappah, A., Fischer, M., Hill, R., ... Zlatanova, D. (2015). The IPBES Conceptual Framework—connecting nature and people. *Current Opinion in Environmental Sustainability*, 14, 1-16. <https://doi.org/10.1016/j.cosust.2014.11.002>

habitat, flood regulation, and nutrient cycling. This integrated definition allows for any crediting mechanism applied to RFI sites to capture the wide range of potential values, e.g., ecological, cultural, hydrological, socioeconomic, embodied in these ecosystems.

With this definition, we are now able to slot nature credits in a clearer context within the gamut of financial mechanisms for nature, as further discussed in the following section.

2. Nature Credits and the Many Facets of Global Nature Financing

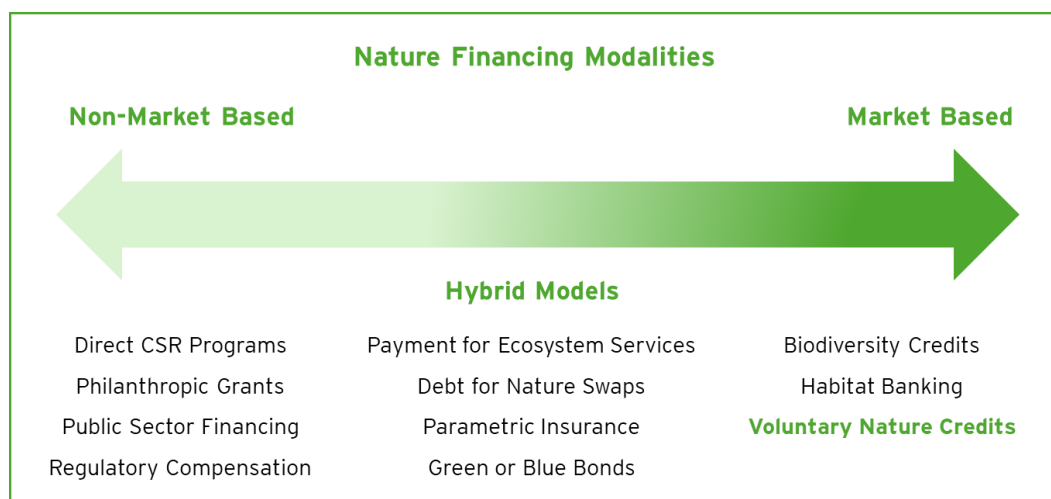


Figure 2. Spectrum of Nature Financing Modalities

Figure 2 above illustrates the nature finance landscape along a continuum of mechanisms, from non-market to market-based models, each differing in scale, replicability, and dependence on private capital. Traditional approaches like direct CSR programs and debt-for-nature swaps are largely non-market and rely on public or philanthropic funding, with limited permanence or scalability. Hybrid models, such as payment for ecosystem services (PES) and parametric insurance, offer performance-based incentives but often face implementation barriers tied to land tenure, ecological complexity, or cost efficiency. Even biodiversity offsets and habitat banking, while grounded in regulation, face skepticism over ecological equivalence and their use as a license to degrade.

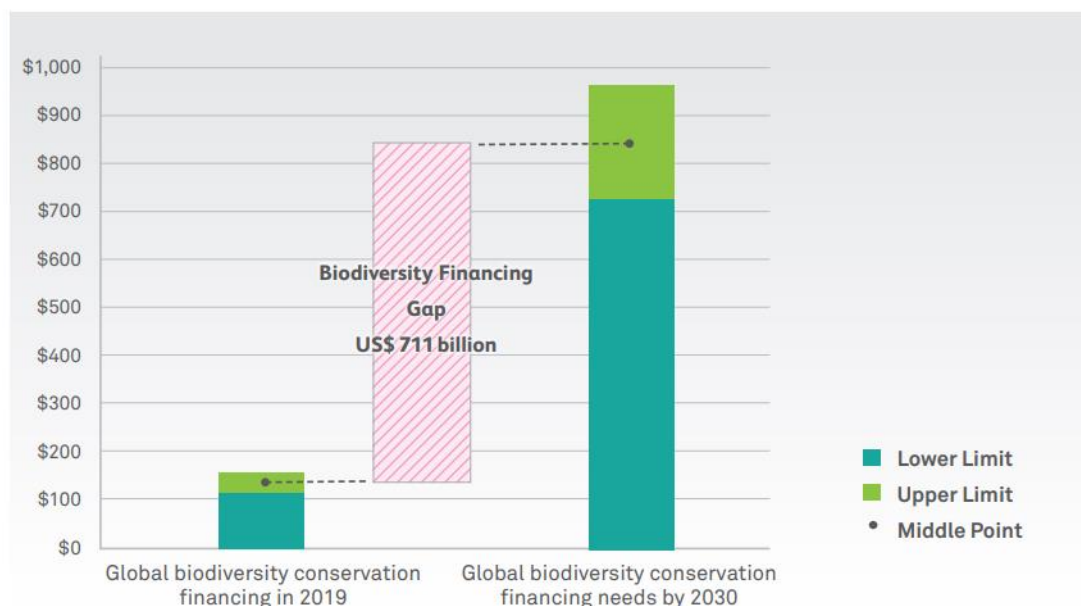
While public and philanthropic sources have long underpinned global conservation efforts, persistent financing gaps, especially in the Global South, have prompted growing interest in market-based solutions. Historically, nature conservation has relied heavily on government budgets, donor aid, and multilateral grants. More recent studies have emphasized a significant funding gap: it is estimated that financing only covers approximately 16-19% of the overall need to reverse the trend of decline in ecosystems. The Biodiversity Funding Gap, as presented in Figure 3 estimates that around US\$ 598-824 billion (an average of US\$ 711 billion) annually¹¹, but more recent studies from BloombergNEF now project that nearly US \$1 trillion (or even up to US \$1.15 trillion) per year will be needed by 2030 to reverse ecosystem decline and sustain biodiversity, highlighting the urgent need to scale up sustainable financing for nature by 2030.¹²

A core ambition of the Kunming-Montreal Global Biodiversity Framework (KMGBF) is to halt and reverse biodiversity loss by 2030, marking a global shift from minimizing damage to actively restoring and sustaining nature. This global goal for nature underpins all targets of the framework and sets the context for how financial mechanisms must evolve. In particular, Target 19 calls on governments to mobilize at least US\$200 billion per year in biodiversity-related public and private investments,

¹¹ Paulson Institute, The Nature Conservancy, & Cornell Atkinson Center for Sustainability. (2020). Financing nature: Closing the Global Biodiversity Financing Gap. Retrieved <https://www.paulsoninstitute.org/conservation/financing-nature-report/>

¹² BloombergNEF, & Natural History Museum. (2024, October 22). Biodiversity Finance Factbook: COP16 Edition. https://assets.bbhub.io/professional/sites/24/Biodiversity-Finance-Factbook_COP16.pdf

reflecting the scale of resources to achieve this reversal.¹³ This is reinforced by the Sustainable Development Goals Nos. 14 (Life Below Water) and 15 (Life on Land) which emphasized the importance of integrating ecosystem values in the national and corporate accounting systems.¹⁴



Note: Using midpoints of the current estimates and future needs, current global biodiversity conservation financing (left graph) may need to increase by a factor of 5–7X to meet the estimated global need for biodiversity conservation (right graph).

Figure 3. Global Biodiversity Financing versus Global Biodiversity Conservation Needs

Multilateral sources of conservation finance (such as ADB) have increasingly recognized the need to mobilize new forms of capital for nature, particularly through innovative instruments like payments for ecosystem services, blended finance, and environmental markets. In a 2021 report, ADB emphasized the importance of linking nature protection to sustainable economic models, particularly in biodiversity-rich regions like Southeast Asia.¹⁵ This focus is reinforced by the 2021 MDB Joint Nature Statement, which commits multilateral development banks to scaling up finance for nature and water priorities, providing a clear mandate for advancing conservation finance. At UNFCCC COP28 in 2023, MDBs reaffirmed this commitment, pledging to accelerate climate and development finance through enhanced private sector engagement and blended finance solutions.¹⁶ These efforts are echoed by the GEF and UNDP, which highlight that without structural shifts in finance, conservation goals under the Global Biodiversity Framework will remain unmet.

At the same time, voluntary initiatives have emerged to align private sector activity with global biodiversity goals. The Taskforce on Nature-related Financial Disclosures (TNFD), launched in response to growing recognition that nature loss poses material financial risks, and aims to help businesses and investors assess, manage, and disclose their nature-related dependencies and impacts.¹⁷ Complementing this, Science Based Targets Network (SBTN) enables companies in setting

¹³ Convention on Biological Diversity. (2022). Kunming-Montreal Global Biodiversity Framework 2030 Targets (with Guidance Notes). <https://www.cbd.int/gbf/targets>

¹⁴ United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. <https://sdgs.un.org/2030agenda>

¹⁵ Asian Development Bank. (2021). Asian Development Outlook (ADO) 2021: Financing a green and inclusive recovery. Mandaluyong, Philippines: Asian Development Bank. <https://www.adb.org/publications/asian-development-outlook-2021>

¹⁶ Asian Development Bank. (2023). COP28 Multilateral Development Banks (MDB) Joint Statement. <https://www.adb.org/news/cop28-multilateral-development-banks-mdb-joint-statement>

¹⁷ TNFD. (2023). Recommendations of the Taskforce on Nature-related Financial Disclosures. https://tnfd.global/wp-content/uploads/2023/08/Recommendations_of_the_Taskforce_on_Nature-related_Financial_Disclosures_September_2023.pdf

measurable, science-based targets for nature- translating global biodiversity goals into actionable corporate strategies.¹⁸

The modalities summarized in Table 1 provide a clear view of the diverse portfolio of nature financing mechanisms currently in use, reinforcing the spectrum of nature financing mechanisms shown in Figure 2. From regulatory-driven biodiversity offsets to voluntary CSR programs, each modality presents unique advantages and constraints that reflect the complexity of funding conservation outcomes.

Table 1. Modalities of Nature Financing Mechanisms

Modality	Description	Limitations
Biodiversity Offsets/ Habitat Banking	• Compensation for biodiversity loss or impacts brought by developments • Conservation or restoration of similar habitats to what was initially damaged or impacted (regulatory in nature)	• Incentivized ecosystem destruction- offsets are used as immediate remedy instead of last resort • More controversial- challenges in ensuring ecological equivalence
Payment for Ecosystem Services	Incentive-based mechanism that pays local communities or land managers to sustain or enhance ecosystems for continued or improved delivery of services	• Requires stronger land tenure systems and institutional capacity • Supply and demand for ecosystem services are locality-specific and non-tradeable
Nature-based Carbon Markets	Carbon credit generation via nature-based and climate mitigation projects (i.e. reforestation, restoration, etc.)	• Carbon-centered approach- undermining other inherent ecosystem values and co-benefits • Greenwashing claims by buyers
Parametric Insurance	Pre-determined payouts for ecosystem/nature repair and restoration based on established parameters	• Disproportionate costs of payout versus actual ecological damage / loss incurred • Lacks capacity to account for the full and complex ecological disturbances
Debt for Nature Swaps	Debt-relief in exchange for the government's commitment to protect and conserve its natural resources (support to conservation and restoration projects)	• Lengthy and complex negotiation process • Dependent on political and multilateral coordination and funding
Green and Blue Bonds	Debt instruments where proceeds finance climate/nature-positive projects (e.g., Seychelles Blue Bond, World Bank Wildlife Conservation Bond)	• Limited by national debt capacity, issuer credit rating, and investor interest • Usually time constrained (5-10 years) and tied to bond terms
Direct Corporate Social Responsibility	Voluntary corporate initiatives that support social and environmental based programs	Lack of permanence - activities are typically short-lived and not strategically aligned with the long-term conservation needs

¹⁸ Science Based Targets Network. (2023). SBTN guidance for setting science-based targets for nature. <https://sciencebasedtargetsnetwork.org/how-it-works/the-first-science-based-targets-for-nature/>

Modality	Description	Limitations
Nature Credits	Quantified, independently verified, and transactable positive outcomes for nature , resulting from protection, restoration and stewardship activities, and delivering measurable biodiversity and other ecosystem benefits ¹⁹	• Measurement and verification remain complex and context-specific • Risk of commodifying unique ecological features • Governance and integrity frameworks are still evolving

Even with an expanding portfolio of nature financing mechanisms, the global biodiversity funding gap remains substantial. This disparity highlights both the magnitude of ecological challenges and critical structural and market limitations, especially in unlocking the full potential of private sector capital for nature.

Emergence of Nature Credits in Conservation Finance

There is an increasing understanding that conservation financing needs to expand beyond traditional public-subsidy models. This calls for further work to explore the potential of beyond-subsidy or beyond-philanthropy forms of financing that could mobilize private sector capital, the form of finance recognized as the largest available source of financing for resource-intensive conservation and restoration programs.²⁰ Specifically, in the past two decades or more, ‘market-based mechanisms’—either purely or hybrid—are increasingly recognized as “bridges” that can close the funding gaps, mainly by compelling businesses to tie nature conservation financing to their value chains and corporate commitments.

The rise of carbon markets and growth in uptake of carbon credits, combined with the surge in corporate ESG, nature positive commitments, and nature-related reporting frameworks, have served as blueprints for the development of nature credits. In this evolving landscape, nature credits are emerging as a promising mechanism within the broader family of market-based conservation instruments. This represents a next-generation approach that aims to internalize the value of ecosystem services—biodiversity, water regulation, flood control, soil health—into financial decision-making.

It is within the above-discussed context of persistent underfunding, growing urgency, and evolving instruments that nature credits are being explored. They represent a potential shift from reactive project funding toward proactive, demand-driven investment in ecosystem services. Unlike carbon credits, which are largely climate mitigation-focused, nature credits offer the opportunity to link investments not only to impact avoidance but also to positive ecological outcomes and systemic resilience. They are increasingly being explored as a flexible instrument capable of meeting diverse objectives: from compliance with biodiversity regulations, to achieving sustainability-linked financing targets, to enabling companies to credibly report on nature-positive strategies.

3. Nature Credits: Unifying Concept for Market-Based Financing Mechanisms

There has been a notable rise in interest in nature credits as a finance mechanism in the past decade, buoyed by their inclusion in global efforts such as the KMGBF, which cited biodiversity offsets and credits as key options to drive funding for biodiversity-related public and private investments by 2030.²¹

¹⁹ Biodiversity Credit Alliance. (2024). What is a biodiversity credit? Retrieved from <https://www.biodiversitycreditalliance.org/faq/what-is-a-biodiversity-credit>

²⁰ Paulson Institute, The Nature Conservancy, & Cornell Atkinson Center for Sustainability. (2020). Financing nature: Closing the Global Biodiversity Financing Gap. Retrieved <https://www.paulsoninstitute.org/conservation/financing-nature-report/>

²¹ Convention on Biological Diversity. (2022). Kunming-Montreal Global Biodiversity Framework. Decision 15/4, Annex I. Retrieved from <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>

In practice, the scope and profile of market-based nature finance mechanisms continue to evolve, anchored not only by what is considered 'nature' (as discussed previously) but on what activities and outcomes are considered 'creditable' and credible or high integrity. Predominant conceptual tensions include the distinction between carbon credits, biodiversity offsets, and other valuations of ecosystem services (e.g., provisioning watershed services). Biodiversity credits continue to develop traction in emerging voluntary markets from Commonwealth and European Union countries, primarily focusing on measurable biodiversity outcomes. Many actors involved in the shaping, influencing, and trading of market-based nature financing still (incorrectly and) interchangeably use the terms biodiversity credits and nature credits, and there remain overlaps and confusion in what the credits are essentially accounting for. In Table 2 below, we summarized into themes the most commonly recognized taxonomies that define the concept and scope of 'nature credits': primarily *positive impact credits* (non-offset), *conservation finance-oriented credits*, and *offset-based mechanisms* (mostly as compliance pieces to compensate for ecological equivalence).

Consequently, these distinctions have important implications for the design, governance, and marketization of these credit mechanisms, often leading to related yet pluralistic market-based 'nature finance via credits' programs. These distinctions also risk conceptual tensions that may affect how nature credits are defined, used, and applied in the current RFI Nature Credits Study—a challenge that we will seek to address in the remainder of this Section.

Table 2. Modalities of Nature Financing Mechanisms

Theme	Defining Agency or Framework	Term Defined	Harmonized Definition	Key Features
Positive Impact Credits (Non-Offset)	Biodiversity Credit Alliance (BCA), World Economic Forum (WEF), Pollination, Conservation International	Biodiversity Credit	Credits that represent verified, additional gains/ positive outcomes in biodiversity or ecosystem health, beyond compensatory mitigation.	• Outcome-based • Focused on nature-positive gains • Intended to finance restoration or conservation rather than compensate for harm.
Conservation Finance Oriented Credits	Conservation Finance Alliance	Nature Credit	Performance-based credits rewarding conservation outcomes, often linked to local community benefits.	• Emphasizes financial sustainability and community benefit • Aligned with long-term conservation outcomes and blended capital models.
Offset-Based Mechanisms	UK Biodiversity Net Gain (BNG), Australian Biodiversity Offset Schemes, US Wetland & Species Mitigation Banking, EU No Net Loss Policy	Biodiversity Offset/ Credit	Credits defined by ecological equivalence and like-for-like compensation to offset residual biodiversity loss from development.	• Compliance-driven • Ecological equivalence and permanence are legally mandated (but subject to contentions due to fungibility issues) • Usually tied to development mitigation.

A Framework to Define Nature Credits

The persisting challenges to define and scope nature credits can be grouped into three key themes:

- i. **Enduring anchor to offsetting logic.** Many existing frameworks continue to anchor nature credits primarily within the logic of offsetting—tracing its references to the carbon markets—often without a robust articulation of how or when nature can be equivalently substituted. This approach tends to compress all forms of nature-based interventions into a narrow compensation for impact or loss paradigm, limiting the scope for recognizing proactive, strategic, or stewardship-driven investments.
- ii. **Lack of differentiation between buyer-level motivations and project-level objectives.** The lack of differentiation between project-level objectives and buyer-level motivations has created confusion in credit classification and claim legitimacy. In many instances, nature credit systems pre-label interventions—such as biodiversity or ecosystem restoration projects—without adequately accounting for the varied contexts in which these credits are ultimately used. This misalignment may undermine both credibility and market utility.
- iii. **Struggle to accommodate non-fungibility and complexity of ecological assets.** Unlike carbon, nature assets are place-based, multidimensional, and often embedded in social, cultural, or indigenous values that resist commodification. Treating these assets as interchangeable can lead to both ecological risk and reputational liability.

These challenges underscore the need for an ‘expansive’ framing that moves beyond a supply-driven, category-led approach, and one that can ‘unify’ the pluralistic existence of market-based nature finance mechanisms. Such an approach also recognizes and supports a unifying theme emerging across the surveyed literature in this study, mainly that: **nature credits are evidence-based units of ecological improvement designed to drive and finance the halt and reversal of nature loss**. This ability to inclusively capture positive ecological outcomes across different buyer motivations may well be what sets up nature credits—as defined in this Study—as a potentially innovative and unifying concept for market-based nature financing.

In Figure 4 below, we introduce a ‘Tiered Dependency Framework’ to expand how nature credits are scoped, categorized, and ultimately aligned with buyer dependency to nature, while recognizing the risks and challenges to project developers. This framework emerges from a synthesis of practical constraints observed in the field and across current market application, ecological governance principles, and a recognition of the expanding roles that public, private, and philanthropic actors play in financing nature.

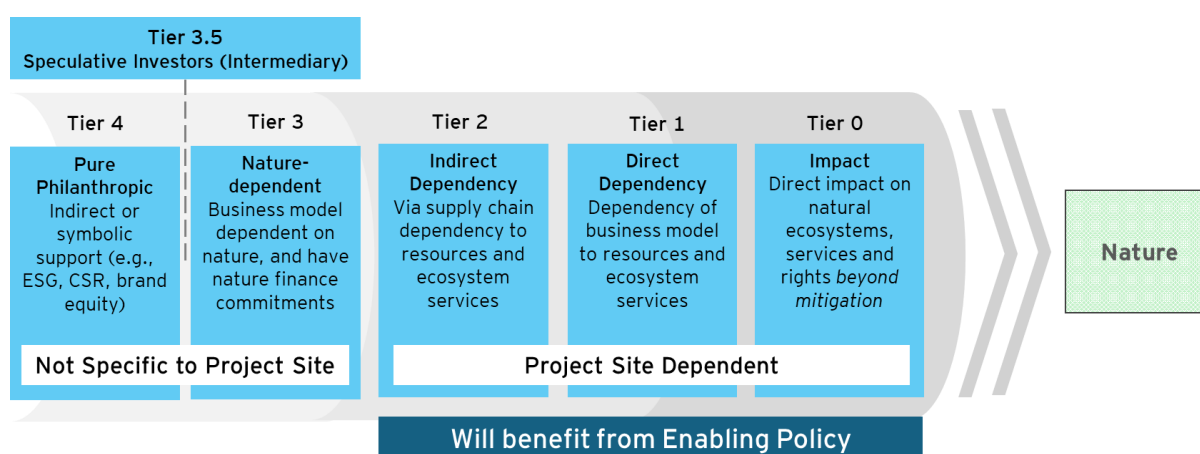


Figure 4. Tiered Nature Dependency Framework

At its core, this model shifts the organizing principle of nature credit definition from supply-side categorization to demand-side relevance. Rather than asking projects to conform to rigid labels at the point of origination, the framework classifies credits according to the degree of ecological dependency, material risk, and strategic value they represent to buyers and how sellers can align at

these conceptual levels. In this definition, nature credits can encompass the many ‘values’ presented in ecological systems—from biodiversity to provisioning to regulating—while allowing a functioning linkage to buyer motivation: for non-offset (e.g. direct economic dependency or indirect value chain risks), offset (compensatory compliance to nature loss), or conservation finance (including philanthropic commitments), among others. This approach not only accommodates a broader range of conservation, repair, and restoration activities but also enables more transparent and responsible credit use across voluntary, compliance, and hybrid financial applications. Ultimately, this framework seeks to bring clarity to three core dimensions:

- i. **Claim legitimacy** - by linking the nature of the credit use to the level of buyer dependency;
- ii. **Safeguard prioritization** - by differentiating when and how protections should scale with potential harm or misuse; and
- iii. **Market development pathways** - by creating structured tiers that facilitate innovation without undermining ecological rigor.

This framing allows us to look at nature credit typologies by tiers defined by their dependency on a natural site's services. This also allows potential groupings of how credit uses can be profiled, and what safeguards should be adhered to. While neither exhaustive nor rigidly prescriptive, this tiered approach to defining nature credits presents an expansive view that can accommodate the multifaceted nature of ecosystems and their services. This becomes especially relevant to highly diverse ecosystems like those found across the RFI sites.

Additionally, the framework distinguishes between site-dependent and non-site-dependent buyer engagements. Tiers 0 to 2 are site-dependent, with buyers' nature-related risks or dependencies directly linked to specific ecosystems. Credit purchases at these tiers are tied to the ecological performance or protection of project sites and benefit significantly from enabling policies that ensure legal recognition, credibility, and long-term impact—while also reducing risks and supporting the resilience of ecosystems critical to business operations. It is important to note that *only Tier 0 buyers are expected to make fungible offset claims*, typically to address residual impacts after applying the mitigation hierarchy. *Buyers in Tiers 1 and 2, despite being site-dependent, are expected to make contribution claims rather than use credits for offsetting purposes.* Their engagement reflects a proactive investment in ecosystem health linked to their operations, without equating credits to compensatory offsets.

In contrast, Tiers 3, 3.5, and 4 are generally non-site dependent. Buyers at these levels are driven by broader strategic, ethical, or reputational objectives—such as meeting ESG goals, speculating on nature credits as appreciating financial instruments, or supporting global biodiversity—rather than relying on services from a particular location. Similarly, credit purchases at Tiers 3 and 4 are contribution-based and do not serve as fungible offsets. Tier 3.5 is unique in that its buyer archetype seeks neither to offset residual ecosystem impacts nor make contribution claims for nature-positive outcomes. Rather, these actors are predicted to purchase and hold nature credits for the purposes of speculative investment, potentially liquidating the assets for a profit at a later point in time.

It is worth mentioning that companies are not strictly siloed into a single tier. Depending on their operations, supply chains, and strategic priorities, they may straddle multiple tiers simultaneously such as engaging site-based interventions for critical dependencies (e.g. Tier 1 and 2) while also supporting broader ESG or reputational initiatives through contributions aligned with Tiers 3 and 4.

Credit Typology by Tier

Table 3. Typology of Buyer Dependency

Tier	Buyer Dependency	Credit Demand Driver	Safeguards, Quality, & Claims
Tier 0	Direct impact on natural ecosystems, services and rights <i>beyond mitigation</i>	Offsetting residual impact , but only after satisfying all conditions of the mitigation hierarchy and equivalence	Highest safeguard enforcement; Regulatory oversight; Exclusion zones based on ecological or cultural thresholds Possible use as offset
Tier 1	Direct dependency of business model to resources and ecosystem services	Sustaining the business model by securing critical ecosystem services	High-integrity MRV; Stakeholder consent and benefit-sharing; Site-specific baselines; Leakage ²² and permanence controls;
Tier 2	Via supply chain dependency on resources and ecosystem services	Supply chain resilience	Contribution claims
Tier 3	Business model dependent on nature, and have nature finance commitments	Contributing to global ecosystem health	
Tier 3.5	No associated direct or indirect dependency on nature as a motive	Speculative investment purposes	As nature credits will not be tailored to such use cases, safeguards and quality characteristics will depend on the specific credits purchased
Tier 4	Indirect or symbolic support (e.g., ESG, CSR, brand equity)	Meeting reputational objectives	Transparency in disclosures; Not used for offsetting nor contribution claims
i. Tier 0 (residual impacts) applies when all steps in the mitigation hierarchy have been exhausted and residual impacts on nature remain, which must then be offset through nature credits. Credit purchases at this tier must be used strictly as a last resort, with strong safeguards and regulatory oversight to avoid greenwashing and ensure high-integrity offsetting claims. ii. Tiers 1 to 2 are particularly important for integrating nature into core business functions. These tiers represent buyers whose business models or supply chains depend on ecosystem services but who may not necessarily owe a direct ecological debt. Here, nature credits are used as tools to enhance resilience, adaptive capacity, and environmental performance, enabling buyers to make sound contribution claims based upon the nature-positive outcomes associated with their purchased credits. This integration supports forward-looking strategies that embed nature in operations and investment planning, without relying on the traditional offset logic of equivalence or compensation. iii. Tiers 3 to 4, meanwhile, are foundational to nature credits as an inclusive and voluntary market mechanism. These buyers are driven less by direct dependency and more by ethical leadership, long-			

²² **Leakage**, the unintended displacement of environmental harm, is a critical concern in carbon and biodiversity credit systems, where project success in one area might shift negative impacts elsewhere. To counter this, strategies include adopting broad jurisdictional or landscape-scale approaches (Schwartzman et al., 2021), conducting ex-ante risk assessments with corresponding credit discounting (Meyfroidt et al., 2020), and implementing adaptive management based on continuous monitoring (Keith et al., 2011). These measures collectively aim to ensure the genuine, net environmental integrity and benefits of credited actions by accounting for and mitigating potential displacement.

term value creation, or stakeholder and reputational goals. Their participation broadens the credit market, enabling support for high-integrity restoration or protection efforts even when not linked to a specific ecological liability. Nature credits at these tiers are often aligned with ESG, CSR, and philanthropy commitments.

- iv. **Tier 3.5** represents speculative investors and their use cases for nature credits. Such buyers will source credits classified into Tiers 0 through 4, and for their purposes when considered as a group, do not warrant specific ecosystem protection or restoration objectives, safeguard mechanisms, quality indicators, or claims-making processes that are distinct from those of the other tiers. Thus, credits purchased by Tier 3.5 buyers may be categorized by their direct origin from Tier 0, 1, 2, 3, or 4, without any changes to credit characteristics following purchase. These market actors do not have a direct or indirect nature dependency associated with their nature credit acquisitions, and procure credits with the goal of speculating on their value for future financial gain.
- v. While **Tier 4** buyers may be less concerned with site specificity, their investments are crucial in scaling up nature-positive outcomes and mainstreaming biodiversity into financial and reputational strategies. In contrast to the stringent safeguards and potentially more complex MRV processes deployed for nature credits intended for buyers categorized into Tiers 0 through 3 (notably for the offsetting use case of Tier 0), an opportunity exists for Tier 4-bound credits to integrate more efficient safeguard and MRV standards to expedite their delivery to market. Utilizing a modified set of principles would not undermine market trust so long as satisfactory measures are taken to retain a high level of integrity. Such measures may have the benefit of being less involved and less time-consuming than those used to ensure compliance-grade qualities. Adding such a nuance to nature credit certifications and issuances would grant Tier 4 buyers additional flexibility and optionality, possibly easing the verification, transaction, and claim-making/credit retirement processes by reducing potential barriers otherwise posed by conceptual, organizational, or regulatory complexities.

In capturing these tiers, the framework reflects the evolving role of nature in economic thinking, not only as a place of impacts to be offset or compensated, but as a foundation of value that must be sustained.²³ Additionally, treating nature credits as a unifying framework that incorporates non-offset, offset, and conservation finance-oriented credits provides both a conceptual and practical advantage for the RFI sites. While taxonomies often silo these credit types based on thematic or market logic, such separation can inadvertently constrain the opportunities for ecosystems like wetlands to access diversified and sustainable financing streams. This integrated framing expands the space for wetlands to be recognized not only as compensatory instruments but also as proactive contributors to climate resilience and socio-ecological stewardship.

Lastly, in proposing this expansive definition of nature credits, this Study thus acknowledges the inextricable 'carbon value' present in nature. While it is premature to subsume carbon credits (as an established and maturely governed market) under the emerging market of nature credits, it acknowledges the value of drawing on the experience of carbon markets. Carbon markets, as one of the more mature and structured forms of nature financing, offer important lessons in standardization, verification, and scalability that can guide the development of a credible and effective nature credit framework for RFI. This important comparison and contrast of carbon markets vis-à-vis nature credits is presented in a dedicated section.

²³ Similar thinking on this theme may be found in "The Economics of Biodiversity: The Dasgupta Review" (Final Report - The Economics of Biodiversity: The Dasgupta Review - GOV.UK)

V. Special Focus: Fundamental Difference of Carbon Credits and Nature Credits

This comparative brief offers a deeper look at the evolving landscape of carbon and nature credits—two related but fundamentally distinct approaches to nature finance. Understanding this distinction is crucial, as nature credits must explore mechanisms to integrate with and leverage off carbon credits whilst seeking to go beyond carbon metrics to reflect the full range of ecosystem services and values.

While carbon markets offer a mature reference point, the development of nature credits calls for a more integrated approach. This analysis aims to **learn** from existing carbon frameworks, **lift** relevant best practices, and **leverage** these insights to shape a high-integrity environmental market within the RFI context.

The table below compares carbon and nature credits, highlighting key linkages and critical differences.

Table 4. Comparative Landscape of Carbon and Nature Credits

Aspect	Carbon Credit	Nature Credit
Conceptual Framing	Carbon as an Impact - Emissions need to be reduced or removed	Nature as an Asset - Delivers wide array of ecosystem services- treated as natural capitals
Risk Framing	Climate Risk (often in terms of Physical and Transition Risk from carbon-intensive activities)	Nature Risk (Water Scarcity, Species Extinction, Supply Chain Disruptions, etc.)
Environmental Concerns	Carbon Emissions - One of the drivers of climate change	Nature Loss - Often entails ecosystem degradation, biodiversity decline, loss of natural capital
Core Objective	Climate Change Mitigation through Emission Removal, Reduction, and Avoidance	Protection, Restoration and Stewardship of Natural Ecosystems and Biodiversity
Unit of Trade	1 metric ton of CO₂ equivalent avoided or removed	Usually outcome or area-based (e.g. hectares conserved or protected, species preserved); No consistent unit that could be used in registries, pricing, or comparisons.
Metrics	Established Carbon Accounting Methodologies	Typically valued through ecosystem services, biodiversity metrics, or ecological outcomes/health
Existing International Treaties and Agreements	Paris Agreement Task Force on Climate-Related Financial Disclosures	Convention of Biological Diversity, Ramsar Convention, Convention on Migratory Species, Convention on International Trade in Endangered Species of Wild Fauna and Flora, etc.
Market Maturity and Governance	Mature markets with established standards (Compliance and Voluntary Markets)	Emerging market with evolving methodologies and standards (Largely voluntary but is currently being integrated into emerging frameworks (e.g. Task Force on Nature Financial Disclosures)
Demand Drivers	Compliance with regulations, voluntary offsetting, ESG Goals, Net Zero Commitments, Climate Strategies, and Energy Transition	Tied to Nature-positive and ESF Goals, Value Chain Resilience, Sustainable Land and Water Use

Aspect	Carbon Credit	Nature Credit
Buyers	Corporates, Financial Institutions, Governments	Corporates (ecosystem-dependent supply chains), ESG and Governments, and some NGOs
Supply Sources	REDD+, Renewable Energy, Methane and Carbon Capture, etc.	Ecosystem restoration and protection, and species conservation
Permanence	Long-term Carbon Storage	Long-term Ecosystem Health and Protection
Co-benefits	Nature and Social benefits including biodiversity	Carbon and Social benefits
Fungibility	Accepted as Fungible	Limited Fungibility
MRV Complexity	Developed MRV system; Highly standardized, technology-enabled monitoring	Multi-metric and Complex MRV systems (basket of metrics); Complex, multispectral ecological assessments, site-specific
Registries	Well-established registries (e.g., Verra's VCS, Gold Standard) that enable credit issuance, tracking, and transfer with standardized protocols	Emerging registries under development or pilot phases (e.g., New South Wales (NSW) Biodiversity Stewardship Credit Registers, ICVCM Nature Credits, Plan Vivo Registry, Accounting for Nature's pilot Nxt.Nature registry and other regional biodiversity registries); Lack of standardized units and protocols complicate integration and market transparency
Risk and Reversal Management	Buffer pools, insurance mechanisms standard	Buffer pools / reversal protocols to be introduced
Temporal Credit Window	Annual issuance with vintage year	Crediting tied to health improvements and protection duration; guidance on intervals needed
Challenges	Additionality, Permanence, Double Counting, Greenwashing Claims	Fungibility, Lack of Valuation Standards, Limited Market Scope (often locality-specific)

At the core, carbon and nature represent fundamentally different environmental assets. Carbon is a measurable externality, emitted and removed in standardized units, allowing it to be treated as a tradable commodity. In contrast, nature is a complex asset made up of diverse, location-specific ecosystems with ecological, social, and cultural significance. These differences directly shape how each asset is approached in environmental markets.

One of the key consequences of this distinction is **fungibility**. Although facing criticism and contention, carbon credits are broadly accepted as fungible because it represents a single quantifiable outcome, reduction or removal of greenhouse gas (GHG), irrespective of where or how they are generated. This makes carbon well-suited for market-trading, aggregation, and pricing. Nature credits, however, face inherent limits to fungibility. Because nature encompasses biodiversity, its outcomes cannot be easily substituted across geographies—ecosystem functions, species composition, and local values vary significantly across landscapes. The [Boston Consulting Group](#) offers useful insights on challenges of using credits for like-for-like compensation, and provides recommendations in scaling demand for credits.

These differences have shaped the structure and maturity of each market as outlined in Table 4. Carbon markets have developed around clear methodologies, regulatory alignment, and standardized Monitoring, Reporting, and Verification (MRV) systems, which together enable scalability and liquidity. Despite its limitations, this system provides valuable lessons for emerging nature credit markets—particularly in areas such as standard-setting, verification infrastructure, and investor confidence.

For the Regional Flyway Initiative, recognizing these distinctions is critical. Carbon markets offer a foundational model, but the development of nature credits requires a more flexible and site-sensitive approach—one that reflects the ecological uniqueness of RFI wetland sites while drawing from carbon's institutional and operational strengths. In doing so, nature credits can support high-integrity conservation finance, without replicating the pitfalls of offset-based carbon trading.

Stacking and Stapling Nature Credits with Carbon Credits

As established earlier in this study, carbon is one of many ecosystem services provided by nature, placing it within the broader ecological value of natural systems and hence a possible inclusion within the broader bucket of nature credit options. However, carbon credits—while rooted in nature—are treated as distinct market instruments. This separation in market design possibly allows carbon credits to be stacked (from the same parcel of land) or stapled (from related sites or activities) with nature credits, since each represents a different verified outcome and revenue stream.

Stacking Credits: Multiple Benefits from a Single Location

Stacking refers to generating and selling different types of environmental credits from the same parcel of land or specific project activity. Stacking occurs *"when various overlapping ecosystem services produced on a given piece of land are measured and separately 'packaged' into a range of different credit types or units of trade that together form a stack."*²⁴ This is permissible when each credit type represents a distinct and separately verifiable environmental outcome. To prevent double-counting, rigorous methodologies and independent verification are crucial for each credit type, ensuring the same environmental benefit is not claimed under different labels.

For example, Australia's Cassowary Credits Scheme, led by Terrain NRM, enables landholders to earn biodiversity credits for improving rainforest condition, which can be stacked with Australian Carbon Credit Units (ACCUs) to generate multiple revenue streams from the same parcel of land.^{25,26} The Clean Energy Regulator (CER) endorses this, ensuring distinct biodiversity and carbon outcomes through separate MRV. Similarly, Nxt.Nature's CarbonPlus combines carbon credits with co-benefits like biodiversity and water quality, each quantified and verified independently.

Stapling Credits: Linking Related Environmental Efforts

While "stapling" is often used to describe the linking of different credit types, it is a concept that aligns closely with **bundling** in formal environmental market discussions. Bundling generally *"refers to when more than one ecosystem service produced on a piece of land is sold as a single trade or credit to a single buyer."*²⁷ In the context of "stapling," it extends this concept to involve connecting or "bundling" credits from related sites or activities, often across a broader landscape or supply chain, to provide a more holistic environmental claim. While not necessarily from the exact same land, the activities are interconnected or mutually reinforcing. Credit inflation or double counting in stapling is mitigated by

²⁴ Business and Biodiversity Offsets Program (BBOP). (2018). As cited in Environmental Policy Innovation Center. (n.d.). Beetles in a Pay Stack: Stacking and Bundling in Biodiversity Credit Markets. Retrieved from <https://www.policyinnovation.org/insights/beetles-in-a-pay-stack>

²⁵ Eco-Markets Australia. (2025, May 22). Credit stacking - An Australian first. Retrieved from <https://eco-markets.org.au/2025/05/22/credit-stacking-an-australian-first>

²⁶ Terrain NRM. (2025). Cassowary Credit Scheme. Retrieved from <https://terrain.org.au/what-we-do/biodiversity/cassowary-credit-scheme>

²⁷ Institute of Environmental Management and Assessment (IEMA). (2023). As cited in Environmental Policy Innovation Center. (n.d.). Beetles in a Pay Stack: Stacking and Bundling in Biodiversity Credit Markets. Retrieved from <https://www.policyinnovation.org/insights/beetles-in-a-pay-stack>

transparently linking combined claims to verifiable actions and distinct outcomes across different, but related, project sites.

International actors such as CreditNature are testing integrated natural capital credit frameworks that allow for bundling ecosystem integrity and carbon outcomes, appealing to investors seeking holistic environmental value.²⁸ This "stapling" allows buyers to claim both carbon reduction and broader biodiversity protection, even if projects are separate but strategically linked. Examples include Tasman Environmental Markets (TEM) and Wilderlands combining carbon reduction with biodiversity protection, and South Pole's EcoAustralia program, which staples ACCUs with Australian Biodiversity Units (ABUs) from complementary project sites, offering a combined environmental claim without double-counting.

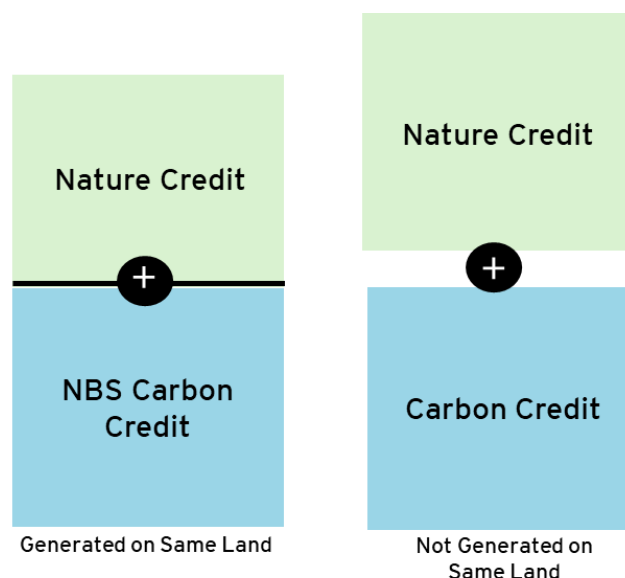


Figure 5. Stacked and Stapled Nature and Carbon Credits

Figure 5 above illustrates how nature credits can be stacked or stapled with carbon credits. Notably, each variation carries distinct use cases and implications on buyer's claims. This approach enables wetland sites within the RFI network to leverage multi-benefit crediting strategies, aligning better with both compliance and voluntary market preferences. However, stacking, bundling/stapling biodiversity credits with other ecosystem services requires robust transparency safeguards, bringing careful attention to additionality, double-counting, and consistent monitoring standards.²⁹

Carbon Credit Potential in RFI Sites

Note: This section is preliminary and will be refined based on both previous and further required work to assess carbon stock and sequestration potential of RFI sites. Additional discussion will be provided in Phase 2 as more country data become available.

It is understood that many of the RFI sites exhibit high potential for carbon project development due to their size and carbon-rich ecosystem types. A further project-level carbon feasibility study may clarify this point better, however, in the interest of contextualizing carbon credit and nature credit potential of RFI sites, this section examined preliminary possibilities for the RFI sites. Table 5 below offers a preliminary framing of carbon market feasibility, structured into key themes.

²⁸ CreditNature. (2023, June 1). Stacking and bundling natural capital credits with confidence. Retrieved from <https://creditnature.com/2023/06/01/ecosystem-integrity-stacking-and-bundling-natural-capital-credits-with-confidence>

²⁹ World Economic Forum, Biodiversity Credit Alliance, & International Advisory Panel on Biodiversity Credits. (2025). High-level principles to guide the biodiversity credit market. World Economic Forum. https://www.biodiversitycreditalliance.org/wp-content/uploads/2025/05/377455_High_Level_Principles_to_Guide_the_Biodiversity_Credit_Market_En_v7_May-2025.pdf

Table 5. Key Considerations for Carbon Credit Feasibility in RFI Wetland Sites

Theme	Preliminary Considerations
Eligibility and Additionality	- Projects must demonstrate that their activities go beyond business-as-usual and are not already funded or mandated. - The presence of RFI support and existing protected area designations could challenge this, requiring strong justification of carbon finance as essential for project scale or enhanced outcomes.
Applicable Methodologies and Standards	Potential Verra (VCS) methodologies: - VM0007 (REDD+ with Wetland Restoration and Conservation) - VM0033 (Tidal Wetland and Seagrass Restoration) - VM0047 (Afforestation, Reforestation, and Revegetation) Potential Gold Standard methodologies: - Activity Requirements for Blue Carbon and Freshwater Wetlands - Methodology for Sustainable Management of Mangroves Potential Offset Schemes - Voluntary Carbon Market (VCM) - Internationally Transferred Mitigation Outcomes (ITMOS), including bilateral arrangements (subject to site applicability) - Quasi-compliance schemes such as CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) <i>Suitability depends on ecosystem type (e.g., mangroves, peatlands, seagrass) and activity (e.g., restoration, avoided degradation, rewetting).</i>
Land Tenure, Permanence, and Leakage Considerations	- Projects must secure clear land and carbon rights, which can be complex in multi-jurisdictional wetlands. - Long-term permanence must be demonstrated with risk assessments and buffer reserves - Leakage (emissions displaced to areas outside the project boundary) must be evaluated and mitigated.
Opportunities for Integrated Benefits	- Wetland carbon projects can generate co-benefits aligned with RFI goals: biodiversity conservation, climate resilience (e.g., flood protection), and community livelihoods. - Standards like Verra's CCB and Gold Standard's SDG alignment frameworks support certification of these co-benefits.
Key Challenges	Data Availability: Limited baseline carbon stock and ecological data for most RFI sites, especially for soil carbon. Technical Capacity: Requires specialized knowledge for MRV, methodology application, and project validation. Financial Viability: Upfront costs and market price volatility may affect project sustainability. Governance and Tenure: Fragmented or unclear governance may hinder secure implementation and benefit-sharing.

VI. Nature Credits and the State of Practice

Growing interest in nature credits has catalyzed a diverse and rapidly evolving landscape of schemes and pilot programs across the globe. This chapter provides a situational overview of the current state of practice, where we examine how nature credits are being conceptualized, implemented, and transacted across key contexts. It reviews key use cases to assess what has worked and where critical challenges persist. By analyzing these emerging practices, the chapter aims to extract lessons that can inform a context-responsive and ecologically grounded framework for RFI sites.

A. Existing Use Cases

Early-stage examples of nature credit projects and transactions offer useful insights into the development and implementation of nature credits. In Table 6, we collate various initiatives that can fall under our umbrella definition of nature credits, outlining their characteristics according to location, program and credit type, quantification method, buyer profile, and claims use. Breakout Box 1, meanwhile, highlights the GreenCollar NaturePlus™ Credit Scheme that presents relevant features to potential nature credit projects in RFI sites. Key themes emerging from a review of these existing cases highlight an emergence of voluntary or hybrid markets—citing a potentially flexible blending of compliance and market-based models—accommodation of different ecosystems and activities, and variation in approach to qualification. A high-level summary of some of these characteristics and nature credit examples is presented below:

- **Geographic and Structural Diversity:** The various nature credit initiatives span geographies from the Amazon (Savimbo), Southeast Asia (Wallacea Trust) to New Zealand (Ekos) and across Australia (where most initiatives originate including Government-led Nature Repair Market, Nature Plus, Cassowary Credits and Wilderlands). Structurally, programs vary: publicly-led (e.g., Australia's Nature Repair Market), private sector-led (Wilderlands, Green Collar), and non-profit-led (Plan Vivo, Wallacea Trust), highlighting the multifaceted governance arrangements possible in nature credit markets.

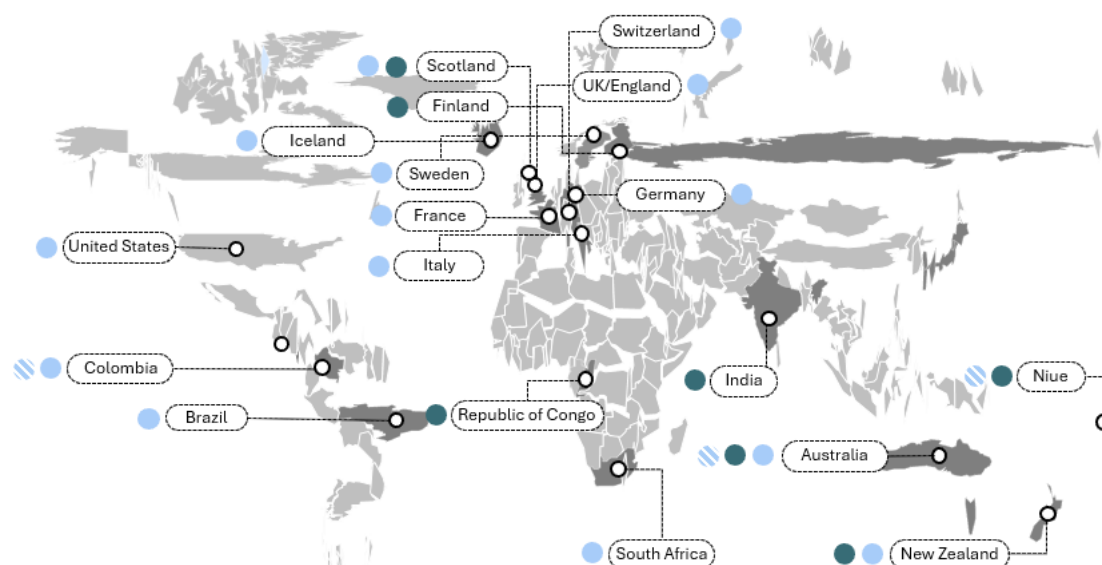


Figure 6. Global Existing Use Cases of Nature/Biodiversity Credits

- **Nature-Based Solutions and Ecosystem Targets:** Most initiatives focus on terrestrial conservation, reforestation, or threat mitigation. Wetland-specific initiatives are notably sparse. However, frameworks such as Plan Vivo PV Nature, SD Vista, and Terrasos offer transferable methodologies applicable to wetland ecosystems through their emphasis on habitat conservation, community involvement, and measurable biodiversity outcomes.
- **Credit Types and Implementers:** Some programs issue standardized biodiversity credits (Savimbo, Wilderlands), while others like Nature Plus or CreditNature introduce bespoke credit units based on “uplift” or ecological improvements. Programs often rely on community-based conservationists, NGOs, or regional agencies (e.g., Terrain NRM, Ekos), underscoring the critical role of local actors in sustaining projects.

- **Qualification & Quantification:** Measurement methods range from area-based assessments (e.g., hectares conserved) to outcome-based metrics (e.g., species recovery). CreditNature and Value Nature emphasize science-based metrics and remote sensing technologies. CreditNature, for example, has a proprietary metric known as the Ecosystem Integrity Index, developed under their Natural Asset Recovery Investment Analytics (NARIA) framework, which considers ecological processes such as ecosystem structure, function, biodiversity and resilience.
- **Buyer Profiles and Demand Signals:** Buyers of nature credits typically include ESG-conscious corporations, philanthropic foundations, and in some cases, government entities with regulatory or policy-driven requirements (e.g., UK's Biodiversity Net Gain). In the context of Southeast Asia, particularly the Philippines, Bangladesh, and Thailand, demand for nature credits is expected to emerge from private sector actors with supply chain dependencies on ecosystem services, such as agribusiness, fisheries, tourism, and real estate sectors. For example, coastal developers and infrastructure projects may require nature-based solutions to manage flood risks and safeguard assets, while corporations with sustainability commitments may seek credits that deliver measurable biodiversity and community co-benefits. EcoAustralia provides a model for regulated offset buyers, while platforms like Savimbo and Wilderlands appeal to voluntary buyers seeking co-benefits. Across these countries, philanthropic and development partners also play a catalytic role in seeding demand, especially where regulatory frameworks for biodiversity markets are still emerging.
- **Claims** span nature-positive outcomes, community upliftment, and biodiversity enhancement. Some initiatives, like Plan Vivo and Open Earth Foundation, emphasize contribution overcompensation, distancing from offset narratives.

Table 6. Existing Use Cases of Nature-based Credit Program

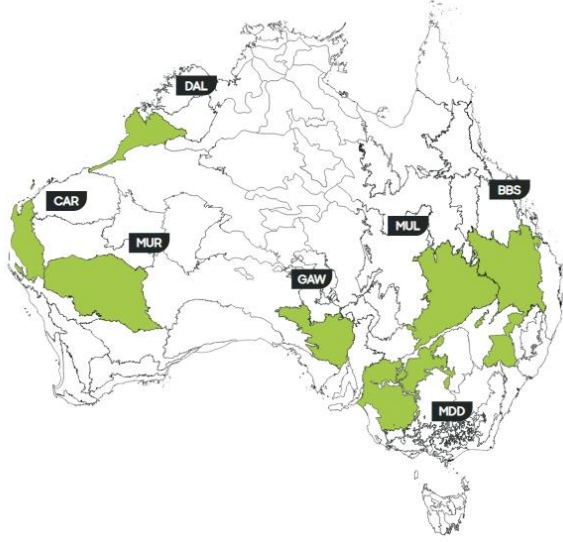
Market Function	Program Type	Initiative	Location	NbS Focus	Credit Type	Implementers	Qualification Basis	Quantification Method	Buyer Profile	Dollar Value per Credit Unit	Claims Type
Blended/Hybrid Mechanism	NGO/ Public	Terrain NRM	North Queensland	Land regeneration, Threat mitigation	Habitat Credits	Regional body	Ecosystem improvement	Field-based ecological assessment	Local government, CSR	Not specified	Ecosystem resilience
Blended/Hybrid Mechanism	Private	Terrasos	Latin America	Habitat Banking, Offsets	Habitat Credit	Environmental firms	Legal mitigation requirements	GIS + baseline + ecological scoring	Infrastructure, real estate firms	~\$30-\$35 per unit (USD 24.95- avg. price on Regen Marketplace as of Jan 2025)	Offset with high co-benefits
Compliance Offset Market	Private	South Pole's EcoAustralia	Australia	Habitat Banking, Offsets	Biodiv. Unit stapled with Verified International Carbon Credit	Private firm	Impact offsetting	Compliance-based metrics	Offset buyers (developers)	Specific unit pricing depends on bundled product market rates	Regulatory compliance
Compliance Offset Market	Public	Nature Repair Market	Australia	Restoration, Conservation	Biodiversity Credit	Government-led	Legislative baseline	Standardized biodiversity metrics	Regulated developers	Not specified	Legal offset
Compliance Offset Market	Public	Biodiversity Net Gain	United Kingdom	Development-linked restoration	BNG Units	Govt + developers	Planning policy requirement	Statutory biodiversity metric	Developers, regulatory	~£22,000 (~\$27,800 USD) per unit (2021 estimate). Forecasts: £8,000 - £30,000 (~\$10,100 - \$37,900 USD) per unit	No net loss + measurable net gain
Voluntary Contribution Market	NGO/Framework	SD Vista	Global (Emerging)	Any nature-positive outcome	SD Vista Biodiv. Credit	Verified projects	SDG-linked ecological targets	Multi-metric biodiversity assessment	ESG, voluntary market	Not specified	Nature-positive, SDG aligned
Voluntary Contribution Market	Non-Profit	Savimbo Biodiversity Credit	Colombian Amazon	Protection, Threat Mitigation	Biodiversity Credit	Local communities	Threat reduction activities	Community-verified biodiversity gains	Voluntary market	Current unit price (June 2025): \$6.50 to \$10 per ha.	Conservation contribution
Voluntary Contribution Market	Non-Profit	Plan Vivo PV Nature	Global	Reforestation, Restoration, Protection	PV Nature Credit	NGOs, communities	Community-led restoration	Plan Vivo standard and tools	CSR buyers, philanthropy	Not specified	Biodiversity uplift, co-benefits
Voluntary Contribution Market	Non-Profit	Ekos Biocredita Programme	New Zealand	Forest conservation, Community NbS	Biocredita Credit	NGOs, Landowners	Custom ecological criteria	Local biodiversity indicators	Small businesses, philanthropies	Price per Credit: US\$ 6.72	Local sustainability, co-benefits
Voluntary Contribution Market	Non-Profit	The Wallacea Trust	Wallacea Ecoregion	Protection, Restoration	Biodiversity Credit	Scientists, NGOs	Species and habitat metrics	Species-based biodiversity index	Academic, philanthropic buyers	Not specified	Biodiversity resilience

Table 6. Existing Use Cases of Nature-based Credit Program (continued)

Market Function	Program Type	Initiative	Location	NbS Focus	Credit Type	Implementers	Qualification Basis	Quantification Method	Buyer Profile	Dollar Value per Credit Unit	Claims Type
Voluntary Contribution Market	Private	Nature Plus Credit	Australia	Vegetation, Land Restoration	Nature Plus Credit	Private sector	Site-specific ecological plans	Verified conservation outcomes	ESG corporates	Not specified	Nature-positive
Voluntary Contribution Market	Private	Wilderlands	Australia	Protection, Threat mitigation	Hectare Credit	Private organization	Long-term area protection	Digital mapping + ecological tracking	Individual, corporate donors	Current price (Jan 2025): AUD 5-10 per BDU (equivalent to roughly US \$3.30-6.60)	Personal conservation contribution
Voluntary Contribution Market	Private	Credit Nature	Scotland (UK)	Uplift of degraded lands	Nature Uplift Unit	Environmental start-up	Nature uplift interventions	Measured habitat condition change	ESG corporates	Price per Credit: £100.00 (US \$137.11)	Uplift claim, habitat enhancement
Voluntary Contribution Market	Private	Value Nature	Global (EU-led)	Restoration, Landscape NbS	Custom Nature Credit	Tech-enabled firms	Restoration protocols	Tech-driven biodiversity data	ESG investors	Fixed base: ~\$10/hectare for 10-year conservation. Floating component (additional reward) based on Ecosystem Integrity Score.	Ecosystem service delivery
Voluntary Contribution Market	Non-Profit	Open Earth Foundation	Global	Tech-MRV, Restoration	Tokenized Biodiv. Credit	Research orgs	Remote-sensing verification	Blockchain + remote sensing	Innovation/im pact funders	Not specified	Digital verification of outcomes
Voluntary Contribution Market	Private	Org. for Biodiversity Certificates	France	Protection, Restoration	Biodiversity Certificate	Ecologists, nonprofits	On-ground verification	Localized habitat condition scoring	CSR, conservation sponsors	Not specified	Verified biodiversity contributions
Voluntary Contribution Market	Private	Nature Plus Credit	Australia	Vegetation, Land Restoration	Nature Plus Credit	Private sector	Site-specific ecological plans	Verified conservation outcomes	ESG corporates	Not specified	Nature-positive

Note: Information on pricing and transactions are not immediately discoverable.

Breakout Box 1: GreenCollar NaturePlus™ Credit Scheme

 Current Status: 20 Registered Projects undergoing feasibility scoping 2 Projects issuing credits 60,435 Credits issued for restoration and conservation of environmental conditions	GreenCollar NaturePlus™ Credit Scheme The NaturePlus™ credit scheme applies an environmental accounting framework to generate credits from projects that actively restore or conserve the environmental condition of native species and ecosystems. The scheme is designed to enable scalable voluntary investment to be targeted at projects that continually demonstrate real, measurable and independently verified biodiversity outcomes. NaturePlus™ projects must demonstrate progressive measured improvement to be awarded credits (i.e. restoration). Once condition has reached a sustainable level, projects switch to maintenance and must remain above that level to continue crediting (i.e. conservation).	NaturePlus® Australian Pilot Projects   =  1 NaturePlus™ Credit 1 hectare of active restoration or conservation of habitat or species.
Generation of the Credit Unit • Restoration (1%) uplift of the condition of an environmental asset over 1ha over monitoring period • Conservation (maintenance) of an environmental asset over 1ha over monitoring period		

B. Actors and Relationships in the Market

Activating a nature credits market requires it to function like any established market, with defined actors, platforms, and a clear supply and demand dynamic. Key components such as market accessibility and infrastructure are essential for facilitating efficient transactions. The current nature credit landscape shows structural parallels from carbon markets but also presents unique dynamics and governance mechanisms. Below presents a broad map of these actors and their relationships. Understanding these dynamics will inform this study's subsequent application to the context of RFI.

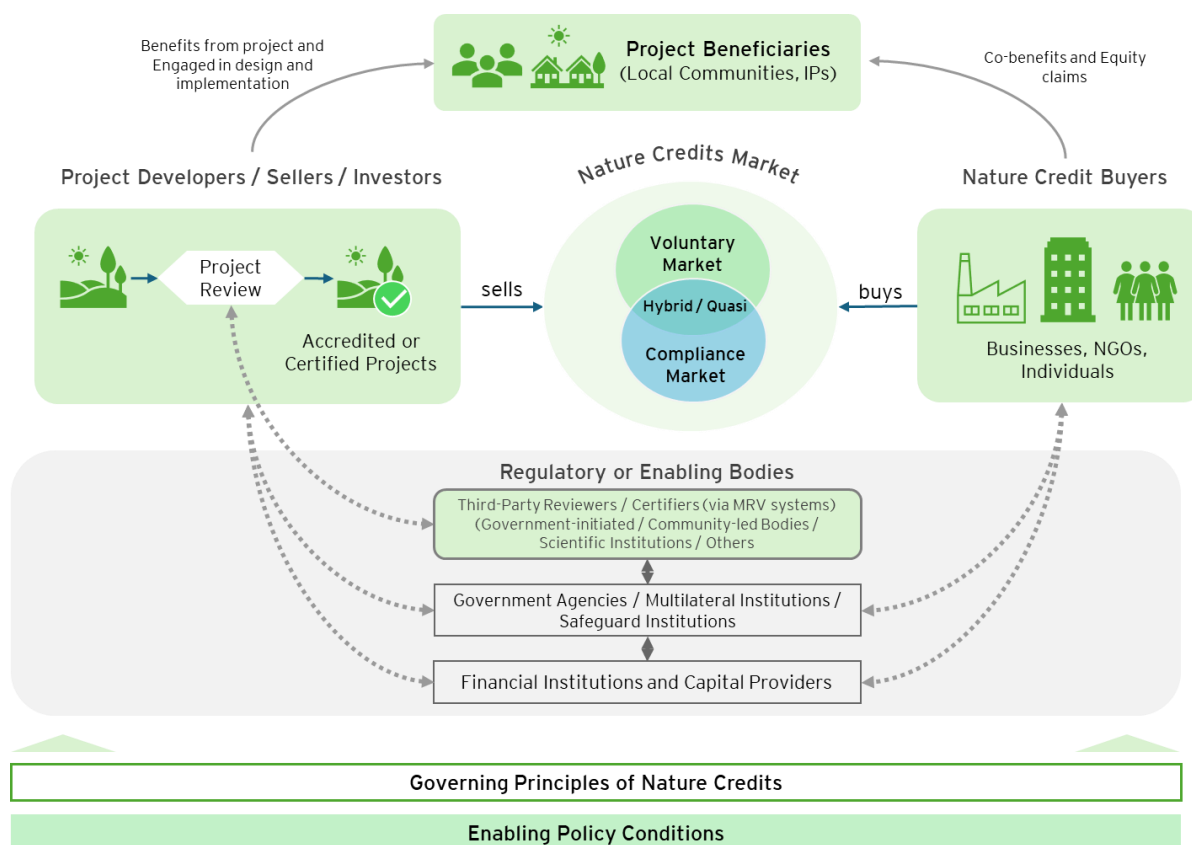


Figure 7. High-Level Map of Actors and Relationships in Nature Credits Market

- **Credit Developers and Stewards:** NGOs, indigenous groups, and project developers are critical in creating, managing, and project verifiers.
- **Buyers:** Corporates, especially in high-nature-risk sectors, and ESG investors form the core of the demand base.³⁰
- **Project Beneficiaries:** The nature credits market is designed to generate benefits for local communities and Indigenous Peoples. Their meaningful participation is embedded throughout project implementation, including roles in MRV. They also share in the co-benefits generated from the project, ensuring that nature-positive outcomes also support community well-being and livelihoods.
- **Standard Setters and Registries:** Emerging entities like Verra and the Biodiversity Credit Alliance are developing methodologies, standards, and registry platforms.
- **Governments and Multilaterals:** Provide policy and regulatory environments, and often initial funding or guarantees.

³⁰ NatureFinance. The Future of Biodiversity Credit Markets Governing High-Performance Biodiversity Credit Markets. Mar. 2023.

- **Financial Institutions and Capital Providers:** Catalyze financing for both buyer and seller sides. They could also enable resources for government institutions.

The interplay of relationships among actors are emerging given the dynamic developments of this market, with no universally adopted market architecture to date, relative to carbon markets.

C. Gaps and Challenges of Existing Nature Credit Framework

As any emerging market mechanism, nature credit, while promising, faces several critical challenges that need to be addressed to ensure their effectiveness and integrity. These challenges warrant consideration when being applied to initiatives like the RFI, which hopes to implement nature credit mechanisms across diverse ecological and socio-economic contexts:

1. **Defining and Standardizing 'Units of Nature':** Unlike carbon credits, which are standardized by measuring CO₂ equivalents, biodiversity credits lack a universally accepted unit of measurement. This absence of standardization complicates the valuation and trading of biodiversity credits, considering the complex and context-specific nature of biodiversity.³¹
2. **Limited Fungibility and Market Liquidity:** The unique and location-specific nature of biodiversity assets limits the fungibility of biodiversity credits. This limitation hinders the development of liquid markets, as credits are not easily interchangeable. The complexity of biodiversity makes it challenging to create standardized products that appeal to a broad market.
3. **MRV Complexities:** MRV systems are essential for the credibility of nature credit markets. To date, the absence of a robust, transparent, and cost-effective MRV frameworks poses a significant barrier. Challenges include the need for dynamic baselines, comprehensive monitoring of species populations, and independent validation processes. While sophisticated MRV solutions often involve third party input and application of novel technology that adds additional financial costs to the development and delivery of a nature credit project, these challenges can be effectively addressed by strategically integrating technological advancement and invaluable local expertise. Consideration of local stewardship inputs to MRV including recognition and use of traditional ecological knowledge should not be underplayed as an important development priority for nature credit projects.

Cost-effective MRV tools for RFI wetland sites include leveraging readily available remote sensing data from satellites (like Sentinel or Landsat) which offer frequent, broad-scale monitoring of wetland area changes, vegetation health, and hydrological patterns. This reduces the need for extensive, costly ground surveys. Furthermore, the deployment of low-cost sensors can provide continuous, real-time data on critical wetland health indicators like water quality, offering consistent monitoring without high labor costs.

Integrating local stewardship and traditional ecological knowledge (TEK) into MRV strengthens both ecosystem understanding and project cost-effectiveness. Local communities, with their deep familiarity of wetlands and generations of site-specific knowledge, are well-positioned as co-monitors. For instance, the Asian Waterbird Census (AWC) provides a successful blueprint for how volunteerism and citizen science can reliably track and monitor waterbird populations in vast wetland sites across Asia, demonstrating the power of collective local observations for long-term ecological monitoring. Combining TEK with scientific tools such as remote sensing enables more comprehensive, culturally relevant monitoring—capturing ecological baselines, site conditions, and ecosystem changes often overlooked by conventional approaches.

4. **Insufficient Policy and Regulatory Frameworks:** given the relative nascence of these financing mechanisms, comprehensive policy and regulatory support have yet to be realized, thereby presenting challenges on the scalability and integration of biodiversity credit markets. Clear legal frameworks are necessary to define property rights, ensure compliance, and

³² Biodiversity Credit Alliance. (2023). Demand-side sources and motivation for biodiversity credits: Issue paper. Biodiversity Credit Alliance. https://www.biodiversitycreditalliance.org/wpcontent/uploads/2024/05/BCAIssuePaper_DemandOverview06122023-final.pdf

provide incentives for participation. (See section VII below for a summary of suitable enabling policy).

D. Comparative Insights and Relevance to RFI

Lastly, our review of the existing landscape for nature credits allows us to draw comparable insights and relevance to their potential adoption in RFI sites. This section synthesizes the key drivers and challenges identified earlier, as well as assessing their relevance in the context of RFI ecosystems. The goal is to draw actionable insights that will inform the design of potential nature financing structures and will be of potential testing in the second phase of this study.

1. Common Drivers to Nature Credit Programs

- a. Private sector appetite for ESG-aligned investments is growing. This increases pressure on businesses to demonstrate their commitment to sustainability, including to nature-based initiatives such as nature credit programs
- b. Regulatory frameworks demanding nature-related disclosures are becoming more stringent, with an emphasis on accountability and transparency - thus incentivizing companies to mitigate, compensate, or offset their environmental impacts.
- c. Philanthropic interest in scalable conservation solutions is rising, particularly as stakeholders look to fund impactful projects that offer measurable and long-term environmental benefits.

2. Common Challenges

- a. Lack of standardization in credit quantification remains a significant hurdle, hindering market efficiency and trust in nature-based solutions.
- b. High transaction and verification costs continue to limit the scalability of projects, particularly for smaller initiatives.
- c. Limited transparency in claims and buyer intentions complicates market development and undermines confidence among stakeholders.

3. Relevance to Wetlands

- a. While many initiatives are not wetland-specific, the methodologies used by Plan Vivo, Terrasos, SD Vista, and CreditNature are adaptable to the RFI context. These approaches offer flexibility in applying proven models to wetlands.
- b. Key insights emphasize localized MRV frameworks, community co-benefits, and modular crediting systems that align with ecosystem complexity, all of which are crucial for the unique dynamics of wetland ecosystems.
- c. The inclusion of Indigenous Peoples and Local Communities (IPLCs) in benefit sharing, MRV and governance is critical. Pilot cases in Australia highlight the value of their participation. This is especially relevant for RFI sites, where IPLCs depend on wetlands for their livelihoods. One of the RFI's primary goals is to empower these communities through sustainable livelihoods, ensuring that they benefit directly from conservation efforts.

Applying the Nature Credit Framework to the Regional Flyway Initiative

After establishing the “*what*” and the “*so what*,” the next sections address the question: “*What now?*”. This Part 2 of the report builds on the foundational insights discussed in the preceding chapters and applies them through the RFI lens. This section distills key findings into actionable directions using data derived from site selection phase of the RFI.

VII. Nature and its 'Value': Valuation of Dependencies of Business and Economy on Natural Ecosystems

A. Significant to whom? Examining Multiple Lenses of 'Valuing' Nature

A critical insight from existing nature credit initiatives, as well as from the mature carbon markets, is that for nature credit markets to achieve sustainability, support and scale, they must be propelled by buyer motivations that extend beyond altruism. These motivations are increasingly unpacked as rooted on multiple factors stemming from the perceived '**significance**' of a natural ecosystem, its *valuation*, and the *dependencies* and *impacts* that can be anchored on it and its components. Significance, however, is often not singularly determined and is fundamentally based on who is defining it. There is plurality in the ways that a wetland, for example, is deemed significant – perhaps socio-economically for some, culturally for others, scientifically or ecologically for others.

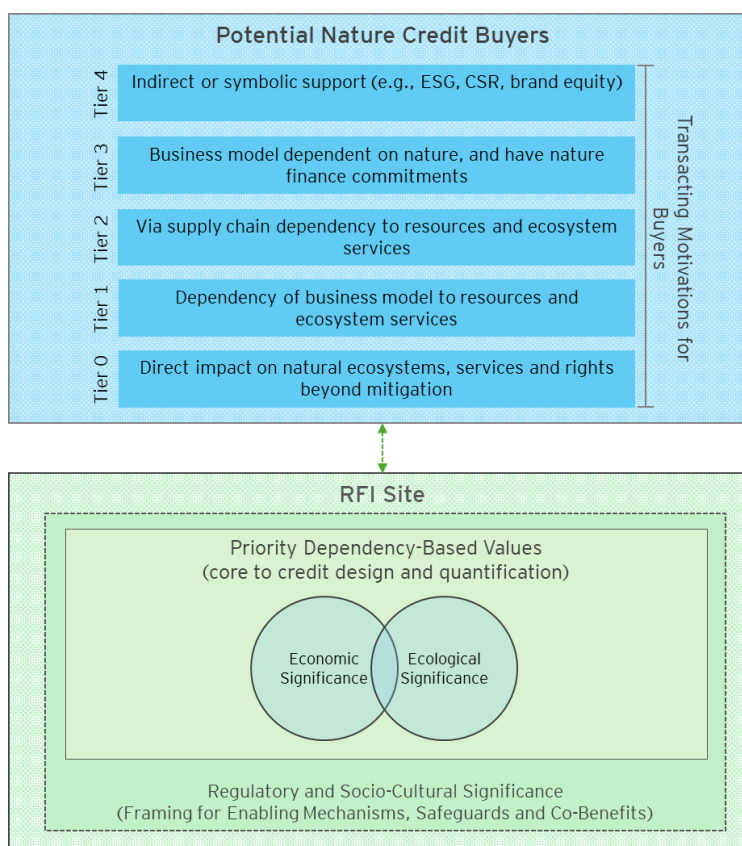


Figure 8. Significant and Relationship to Buyer Motivations

In the context of RFI, unpacking which lens of significance is elevated vis-à-vis nature credits will be crucially anchored on understanding buyers' motivations and their perceived link to the natural ecosystems in RFI sites. These lenses fundamentally shape what could be counted, credited, and claimed in an RFI nature credit design. These motivations are shaped not only by how buyers value nature, but also by how they see their relationship to it—whether as beneficiaries of ecosystem services, risk-exposed actors in fragile supply chains, or stewards with a sense of restitution or “debt” to nature. This does not, however, presuppose an inherent subsuming or hierarchy of ‘value’ (i.e. economic significance over ecological value) but rather a ‘scoping’ of which valuations become the stronger anchors for a sustainable and scalable nature credit product. Figure 8 illustrates (as also previewed in Chapter 4), how elevating buyer motivations—whether in the form of dependency, debt, impact/compliance, or altruism—are the strongest dials for which the market can best comprehend nature credit products.

B. Understanding Demand: Framing the Market for RFI Nature Credits

1. Mapping Potential Buyer Archetypes of RFI-based Nature Credits

With an understanding of significance as discussed in the previous section, the next critical factor in establishing the ‘formula’ for a sustainable nature credit market is demand, anchored on the *buyers* of the product. This subsection dives into currently apprised profiles of buyers, their drivers and motivations to purchase nature credits, and their concerns and priorities. This section is based on the authors’ extensive previous engagement with both public and private sector actors already participating in environmental markets and those with potential new commitments to invest into nature credit projects. However, further discussions with specific potential RFI nature credit buyers would further support and validate this section.

In analyzing potential buyer archetypes relevant to nature credit markets, particularly those applicable to the RFI context—we drew insights from our previously described scanning of current initiatives across different geographies and market functions (see Table 6 from Chapter VI) and overlaid these with the above-discussed considerations on significance and perceived dependency to nature. From this matrix, buyer profiles were identified based on stated motivations (e.g., ESG alignment, regulatory compliance, conservation impact, philanthropic pledges), transaction characteristics, and the nature of claims associated with each initiative. Table 7 below presents a list typifying potential nature credit buyers with their expected dependency to nature.

Table 7. Typology of Nature Credit Buyers based on their Dependencies to Nature

Credit Typology Tier/s and Buyer Archetype	Primary Motivation	Characteristics	Examples in Buyers
Tier 0 (Impact), Tier 1 (Direct Dependency), and Tier 2 (Indirect Dependency) Operational Risk-Exposed Buyers	Risk mitigation due to ecosystem dependency	Depend on ecosystem services or supply chains vulnerable to ecosystem degradation	Agri-businesses (e.g., palm oil producers), water utilities, fisheries, tourism operators in coastal areas
Tier 0 (Impact), Tier 1 (Direct Dependency), Tier 2 (Indirect Dependency), and Tier 3 (Nature-Dependent) Compliance-Oriented Buyers	Regulatory or voluntary scheme requirements	Participate in emerging frameworks (e.g., TNFD, CSRD, EU Green Claims Directive)	Financial institutions, real estate developers, companies adhering to ASEAN sustainability reporting standards
Tier 1 (Direct Dependency), Tier 2 (Indirect Dependency), and Tier 3 (Nature-Dependent) Strategic Buyers	Long-term value creation and competitive edge	Align nature credits with core sustainability strategy, often linked to biodiversity or climate goals	Renewable energy firms, asset managers with ESG mandates, regional development banks (e.g., ADB)
Tier 3 (Nature-Dependent) and Tier 4 (Pure Philanthropic) Reputationally-Driven Buyers	License to operate and brand value	Invest in nature credits to meet stakeholder, consumer, or regulatory expectations	Consumer brands, retail companies, mining companies under scrutiny
Tier 3 (Nature-Dependent) and Tier 4 (Pure Philanthropic) Impact Investors	Measurable environmental and social returns	Seek quantifiable biodiversity, climate, and community co-benefits alongside Return of Investment	Green funds, blended finance platforms, social impact investors interested in Southeast Asian conservation projects
Tier 4 (Pure Philanthropic) Philanthropic/Altruistic Buyers	Conservation impact and legacy building	Motivated by ethical, cultural, or ecological concerns rather than financial returns	Foundations, high-net-worth individuals, faith-based organizations, international NGOs (e.g., BirdLife International)

Businesses are facing growing expectations to understand and manage their dependencies and impacts on biodiversity and nature—driven by tightening global regulations, evolving corporate sustainability commitments, and rising investor scrutiny. Nature-related risks, from supply chain disruptions to ecosystem service loss, are becoming material business concerns, while opportunities to invest in nature-positive solutions are expanding. EY has been supporting companies across sectors to prepare for this evolving landscape offering advisory services for transitioning to nature positive. For example, EY has helped an agrifood company develop its biodiversity strategy in anticipation of CSRD requirements—assessing its dependencies, impacts, risks, and opportunities across 24 priority commodities. Similarly, EY has advised a global food and beverage company in designing a methodology to quantify the ecosystem services benefits of its water replenishment program, building a stronger case for transitioning to nature-based solutions. EY has assessed the benefits of nature-based solutions (NbS) investments across projects spanning Europe, Asia Pacific (including sites in the Philippines, Thailand, Vietnam, Indonesia, Japan and Australia), Latin America, US, and Europe, the Middle East, India, and Africa (EMEIA)

2. Potential Drivers of Demand: Motives of Buyer Appetite for Nature Credits

The emergence of frameworks such as the TNFD and Science-based Targets for Nature from the SBTN are creating momentum for businesses across industries to assess their ecosystem impacts and dependencies, plan actions and interventions, mitigate material risks, and proactively implement regenerative measures.³² The disclosures required by these frameworks have enabled stakeholders and executive boards of companies to increasingly demand accountability and transparency with respect to both nature-related risk abatement and nature-positive contributions, urging businesses towards allocating a greater volume of resources to these goals.

The BCA, for example, argues that biodiversity credits can leverage a non-offset based opportunity to support favorable biodiversity outcomes (especially in scenarios where a direct link between firm operations and impacts in the value chain may be challenging to identify), reflecting Tier 4 nature credit characteristics discussed in the Credit Typology table above. Nature credits possess the potential to finance projects beyond the boundaries of traditional carbon markets, such as coral reef regeneration or improvements in biodiversity markers in threatened ecosystems.³³ Compensating for ecosystem damage related to the impact and dependencies of a company, as well as proactively contributing to ecological health and resilience, are of interest to shareholders and stakeholders. The former is an established driver of demand for offset instruments like carbon credits. The latter, according to a 2024 study conducted by the Pollination Group, are key claims that purchasers of adjacent biodiversity credits seek to make.³⁴ This demand is bolstered by existing regulatory compliance and voluntary schemes, among other potential sources of market engagement. Below summarizes anticipated demand drivers for nature credits.

1. **Policy and Financial Disclosure Drivers** - Regional and national financial policy on biodiversity and nature-related disclosures are expected to be an influential force in generating both initial and long-term demand for nature credits. In the European Union (EU), the Sustainable Finance Disclosure Regulation (SFDR) and Corporate Sustainability Reporting Directive (CSRD) will spur companies and financial institutions to evaluate, disclose, and create commitments to address their impacts on biodiversity and nature. Although originating in the EU, these regulations will apply equally to multinationals operating in the EU, or “transiting products or services in the EU, and their global value chain footprint, including impacts outside the EU.”³⁵ As the first global market to implement such policies, the EU regulations may serve as a template that other national

³² Biodiversity Credit Alliance. (2023). Demand-side sources and motivation for biodiversity credits: Issue paper. Biodiversity Credit Alliance. https://www.biodiversitycreditalliance.org/wpcontent/uploads/2024/05/BCAIssuePaper_DemandOverview_06122023-final.pdf

³³ International Advisory Panel on Biodiversity Credits (2024). Recommendations for high integrity demand for biodiversity credits. Demand Working Group report. Available at: www.iapbiocredits.org/resources

³⁴ Waterford, L., FitzSimons, V., Back, O., Gorring, A., Hutchinson, J., Martin, M., Ingram, C., Philip, T., Cheesman, J., & Swann, E. (2024). State of voluntary biodiversity credit markets. Pollination Group. <https://pollinationgroup.com/global-perspectives/state-of-voluntary-biodiversity-credit-markets/>

³⁵ Biodiversity Credit Alliance. (2023). Demand-side sources and motivation for biodiversity credits: Issue paper. Biodiversity Credit Alliance. https://www.biodiversitycreditalliance.org/wpcontent/uploads/2024/05/BCAIssuePaper_DemandOverview_06122023-final.pdf

and supra-national entities can pattern similar disclosure requirements after. The UK Financial Conduct Authority, United States Securities and Exchange Commission (SEC), and various financial regulators throughout the globe may develop similar legislative measures in the future, representing a movement towards collectively adopting conservation and restoration-focused financial disclosures. Additionally, policies of EU financial institutions may impact businesses seeking investment from EU-based entities, even if those companies have no EU-based operations. Compliance with EU regulations may present the only pathway to access financing from the region, which will force the alignment of non-EU firms with European disclosure standards as a prerequisite to attracting EU capital. Nature credits, whether intended for fungible offsetting or non-fungible contribution claims, may function as key strategic tools for businesses aiming to comply with regulations, incorporate nature into business considerations, address ecological risks, and deliver positive outcomes for stakeholders.³⁶

2. **Voluntary Nature Commitments** - Many companies are expected to pursue nature-oriented objectives in alignment with leading standard-setting organizations, such as the Taskforce on Nature-related Financial Disclosures (TNFD) & Science Based Targets Network (SBTN). It is also anticipated that Corporates will seek to support and align with the goals and targets of the KMGBF. Alignment with these frameworks by a company, whether on a voluntary basis or to satisfy mandated financial disclosure requirements, entails evaluating impacts and dependencies on biodiversity and nature throughout the value chain and demonstrating actions to address associated risks. These assessments will enable firms to design strategies focused on nature protection and restoration, which may incorporate the use of nature credits as levers for delivering those strategies.
3. **Risk Mitigation for Nature-Dependent Businesses** - Ecosystem degradation and biodiversity loss present urgent material risks to firms with value chains reliant on ecosystem services. The degeneration of certain natural elements, such as processes that facilitate the growth of specific crops, can be devastating for individual companies and entire industries alike. Though businesses acting alone may have limited influence in increasing supply chain resilience, consortiums of firms have greater incentive to collaboratively contribute to nature conservation. Nature credits can offer an attractive inroad for the private sector to directly finance the preservation of key ecosystems.
4. **Business-to-Consumer Companies seeking Differentiated Value** - Retail companies that sell directly to consumers can capitalize on nature credits by linking the acquisition and claims of credits to customer purchases. This would serve as a means of signaling the nature-oriented values of a business and differentiating their offerings by associating transactions with positive ecological outcomes, thereby broadening the base of voluntary retail demand for nature credits. The benefit of enhanced brand reputation for companies may be significant, especially for companies with more material nature dependencies or impacts. In the biodiversity credit space, enhancing marketing and brand value is the strongest perceived driver of demand (followed by risk mitigation potential).³⁷
5. **Jurisdictional Environmental Compliance Requirements** - Regional and national environmental policy on biodiversity and nature impact compensation already exists in several jurisdictions and may become more widespread as the global regulatory emphasis on nature strengthens. Countries such as the US, Colombia, South Africa, Canada, and Australia enforce strict limits on domestic biodiversity impacts, and operate (or are in the process of establishing) mitigation banks to offset unavoidable effects. These jurisdictional programs, developed in collaboration with local stakeholders (including Indigenous Peoples and local communities) both shape demand for regulated credit schemes (which aim to facilitate offsetting and/or positive contributions to nature) and set a baseline that voluntary initiatives should not undermine. Voluntary credits can

³⁶ International Advisory Panel on Biodiversity Credits (2024). Recommendations for high integrity demand for biodiversity credits. Demand Working Group report. Available at: www.iapbiocredits.org/resources

³⁷ Waterford, L., FitzSimons, V., Back, O., Gorrington, A., Hutchinson, J., Martin, M., Ingram, C., Philip, T., Cheesman, J., & Swann, E. (2024). State of voluntary biodiversity credit markets. Pollination Group. <https://pollinationgroup.com/global-perspectives/state-of-voluntary-biodiversity-credit-markets/>

complement or expand these efforts by financing conservation over larger areas beyond the scope of government interventions.

Most national no-net-loss or net-gain rules apply only domestically. However, evolving EU requirements on limiting biodiversity and nature impact for projects seeking access to EU financial institution funding can drive credit demand abroad, even where local regulations may still be developing.

6. **Philanthropy** – Altruistic and philanthropic contributions to ecosystem protection, conservation, and restoration are significant and should not be overlooked as an impetus for nature credit demand. These purchases are entirely voluntary, typically seeking to contribute to positive action rather than compensating or offsetting for residual ecosystem impacts. The sector strongly values clear demonstrations or proof of claimed outcomes, underscoring the importance of transparency and integrity in any planned nature crediting mechanism.

Nature credit claims will underpin market growth, and various actors involved in the market are seeking to define how these claims can be made. As nature is better and more broadly valued by the public and private sectors, it is anticipated that the value of nature credits will rise significantly, making them an attractive commodity class in their own right. Credit purchasers will want to leverage credits for offsetting, abatement, beyond-the-value-chain contributions, or to align with GBF targets, all under programs harmonized with frameworks such as TNFD, SBTN, ISSB, ICVCM, and the EU Green Claims Directive. Although precise buyer priorities, such as whether they require cross-border fungibility or simply contextual comparability, remain unclear, understanding these preferences is essential for project and credit design. This topic, in the context for RFI, will be further explored in Chapter 8 of this paper.

3. Nature Credit Attributes that May Impact Demand

Businesses and organizations influenced by the demand drivers outlined above are likely to exhibit diverse responses, each guided by specific incentives, pressures, or strategic priorities most relevant to them. Table 8 below summarizes the key nature credit characteristics that buyers might consider in their decision-making.

Table 8. Common Considerations of Buyers in Nature Credit Programs (with reference to³⁸)

Attribute	Description
Speed and simplicity	Preference for products that are easy to comprehend and transact, without needing expert knowledge.
Seller reputation	Desire for products backed by a reputable seller, reducing the buyer's due diligence and risk.
Transparency on Free, Prior, and Informed Consent (FPIC)	Need for clarity regarding the existence of FPIC, effective rights-holder involvement, and equitable benefit-sharing.
Liability	Expectation that the seller, not the buyer, is responsible for addressing any project shortcomings or failures.
Reliability Risks	Aversion to credits with inconsistent supply, which could lead to unmet stakeholder expectations.
Evidence	Demand for credits with clearly quantified biodiversity and social outcomes, based on transparent metrics and a defined duration.
Clear rights	Requirement for transparent and credible information concerning land and resource tenure rights.
Geographic location	Buyers may prefer credits from specific regions, particularly those within their value chain or aligned with SBTN land targets.

³⁸ Biodiversity Credit Alliance. (2023). Demand-side sources and motivation for biodiversity credits: Issue paper. Biodiversity Credit Alliance. https://www.biodiversitycreditalliance.org/wpcontent/uploads/2024/05/BCAIssuePaper_DemandOverview_06122023-final.pdf

Attribute	Description
	A 2024 study conducted by the Pollination Group found that biodiversity credit buyers have been observed to be interested in whether biodiversity credits are generated by projects proximate to their operations, investments, and/or sourcing regions. ³⁹
Relevance	Buyers, especially governments and conservation-focused entities, will seek credits that offer significant biodiversity conservation impact in priority ecosystems.
Claims	Buyer interest will heavily depend on the scope and integrity of claims they can make regarding the credit, including integration with other environmental outcomes like climate.
Tradability / transferability	Buyers will likely favor credits that can be easily traded or transferred, indicating a preference for more liquid markets.
Auditability	Credit design must allow for independent third-party verification of the credit's existence and claimed quantity.
Comparability	To enable comparison, credits should ideally use standardized metrics across various ecosystems, species, and locations.

For all buyer archetypes, the presence of trustworthy indicators of quality and third-party validation certifications of credit integrity will influence market appetite for nature credits, similar to how these attributes continue to be critical to carbon credit purchasers from both impact and reputational perspectives.

4. Buyer Concerns and Potential Barriers to Demand

Understanding buyer concerns is critical to designing nature credit mechanisms that align with real-world motivations and unlock demand. As discussed above, buyers are not a monolith—they approach credit purchases with varying expectations tied to risk management, brand positioning, regulatory outlook, and internal values. The table below outlines common concerns that influence buyer behavior in emerging nature credit markets, along with potential action steps they can take in response.

Table 9. Key Buyer Concerns when Making Nature Credit Purchases (with reference to⁴⁰)

Key Buyer Concern	Potential Action Steps
Enhancing ESG credentials	Choose credits recognized in ESG ratings frameworks; include these purchases in sustainability disclosures; highlight improved credentials to investors.
Narrative-building	Select projects with clear narratives, such as Indigenous or local community involvement; feature these stories in marketing and stakeholder communications.
Value promotion	Engage employees and leadership to identify priority causes; prioritize credits that align with organizational values; involve teams in credit selection.
Generating Real Ecological Impact	Research project outcomes to ensure meaningful biodiversity benefits; favor credits with measurable ecological results; seek third-party validation.

³⁹ Waterford, L., FitzSimons, V., Back, O., Gorring, A., Hutchinson, J., Martin, M., Ingram, C., Philip, T., Cheesman, J., & Swann, E. (2024). State of voluntary biodiversity credit markets. Pollination Group. <https://pollinationgroup.com/global-perspectives/state-of-voluntary-biodiversity-credit-markets/>

⁴⁰ Biodiversity Credit Alliance. (2023). Demand-side sources and motivation for biodiversity credits: Issue paper. Biodiversity Credit Alliance. https://www.biodiversitycreditalliance.org/wpcontent/uploads/2024/05/BCAIssuePaper_DemandOverview_06122023-final.pdf

Key Buyer Concern	Potential Action Steps
Affordability	Compare pricing across providers; prioritize lower-cost options while ensuring they meet necessary business or regulatory requirements; allocate budget accordingly.
Forestalling Regulation	Invest in voluntary credits and publicize these actions as proactive conservation work; document outcomes to demonstrate to regulators that new mandates are unnecessary.
Avoiding Public relations Crises	Identify operations with high reputational risk; purchase credible credits to mitigate those impacts; transparently communicate efforts to stakeholders.

Though pre-implementation prospects for nature credit demand appear to be favorable overall, several barriers exist to the broader adoption of nature credits by market participants. It is crucial for future nature credit programs to concretely respond to and address these challenges, as failure to do so may compromise the ecological objectives that crediting schemes set out to achieve. The barriers may be segmented into two categories, namely: (1) barriers to awareness and trust, and (2) barriers to demonstrating the benefits of supporting nature credits.⁴¹

1. Barriers to Awareness and Trust

- a. **A lack of understanding of the underlying principle of nature credits** - It may remain difficult for market participants to comprehend the value of nature credits if consistency is not achieved with respect to overarching governance standards, comparable ecosystem metrics, and quantification methods for the ecosystem metrics. Nature credits must also align with widely accepted indicators utilized by the global scientific community and international nature monitoring systems, or risk decreased credibility and narrower market appeal.
- b. **A lack of defined use cases and high-integrity claims scenarios** - Unlike carbon offsets traded in voluntary and compliance carbon markets, nature credits (especially those intended to fulfill contribution purposes rather than compensation purposes) represent inherently non-fungible outcomes. Clear, standardized guidance on permitted claims will be essential to the adoption of nature credit programs at the inception stage. As the market evolves to accommodate more or revised use cases for credits, standards and guidance should develop in parallel to meet shifting market demands.
- c. **A lack of market infrastructure and oversight** - Learning from the carbon market, nature credits will need a host of supporting infrastructure and governance mechanisms to achieve long-term viability. This includes the presence of reputable programs, third-party assurance entities, organized and transparent registries, safeguard and ethics frameworks, standardized procedures for outcome measurement and MRV, and a trusted set of transaction modalities.

2. Barriers to Demonstrating the Benefits of Supporting Nature Credits

- a. **Strategic disconnect between business incentives and investment in nature** - In some jurisdictions, certain incentives (such as government subsidies) create more advantageous conditions for highly-polluting, emissions-intensive corporate operations to persist. The financial attractiveness of capitalizing on these opportunities presents a hindrance to investment in nature-positive action and resilience, which may therefore dampen the growth prospects of nature credits.
- b. **A lack of understanding of nature credit functions in risk abatement and long-term strategic planning** - Without defining their dependencies and impacts on nature, businesses may fail to recognize the value of nature credit investment in meeting their needs and supporting both non-nature and nature-related targets. If the spectrum of

⁴¹ International Advisory Panel on Biodiversity Credits (2024). Recommendations for high integrity demand for biodiversity credits. Demand Working Group report. Available at: www.iapbiocredits.org/resources

nature-related risks remains underappreciated, potential buyers will not consider the use of nature credits as a tool to ease exposure to operational risk (due to direct or indirect ecosystem dependency) and financial risk (e.g., compliance-mandated penalties for residual ecological impacts, decreased consumer support due to unsustainable practices, etc.). For companies that directly rely on ecosystem services for operational continuity, and even companies with less immediate environmental dependencies, nature credits are a pathway to contribute to ecological health by financing specific, measurable outcomes.

C. Understanding Supply: Developing Nature Credit Projects in RFI Sites

This section presents how the supply of nature credit projects under the RFI can be designed—building on concepts from carbon markets while tailoring the approach to the ecological, institutional, and socio-cultural realities of wetland ecosystems critical to migratory birds. These proposed key areas reflect the project team's current understanding, which will be further built out, validated, and refined in Phase 2 through detailed assessments and stakeholder engagement with ADB, the RFI team, and relevant country partners.

The intention is to provide a practical foundation for conceptualizing credible, measurable, and context-appropriate nature credit projects within RFI sites. While the specifics will be tested and enhanced during Phase 2, this section outlines the core building blocks for how supply can be generated, verified, and aligned with market expectations, recognizing the complexities and opportunities of wetland ecosystems across the Flyway.

The following key areas are critical to structuring nature credit supply:

1. Archetyping Ecosystems in RFI Sites

- Characterize wetland ecosystem types by ecological function, degradation level, and restoration potential, building on existing RFI datasets and classifications
- Assess how different wetland archetypes align with various tiers or types of nature credits, including restoration, protection, maintenance, and stewardship interventions.

2. Mapping Profiles of Potential Project Developers

- Identify key categories of potential project developers, such as protected area managers, Indigenous custodians, community groups, NGOs, and research institutions.
- Assess the institutional conditions, technical capacity, and enabling factors necessary to develop high-integrity nature credit projects across RFI sites.

VIII. Nuts and Bolts to Establishing Nature Credits: Qualifying and Quantifying

A. Principles in Designing Nature Credit Mechanisms

Effective nature credit mechanisms must channel private finance toward measurable protection and restoration outcomes by aligning with ecosystem improvement goals, meeting buyer priorities, and ensuring credits represent actual ecological gains. Effective nature credit mechanisms must effectively channel private finance toward measurable protection and restoration outcomes by aligning with ecosystem improvement goals, meeting buyer priorities, and ensuring credits represent actual ecological gains. These must scale with impact, balance scientific rigor with cost-efficiency, incorporate safeguards for local communities, and align with global standards to ensure credibility, comparability, and interoperability across nature markets. Below are the core principles that guide the design of such mechanisms:

Table 10. Principles in Designing Nature Credits

Design Principle	Core Description	Key Considerations
Purpose-Driven Finance	The mechanism must be structured to explicitly mobilize private-sector capital	Align every design feature with the goal of funding ecosystem health

Design Principle	Core Description	Key Considerations
	toward verifiable conservation, restoration, or enhancement outcomes.	improvements; avoiding features that dilute the conservation impact.
Buyer-Centric Design	Credits should align with buyers' business incentives, not just philanthropic interest.	Tailor credit packaging (e.g., formats, disclosures) to meet buyers' risk, regulatory, and ESG reporting needs; emphasize value-chain relevance.
Outcome-Based Recognition	Credits must represent measurable ecosystem gains beyond a baseline, not just effort or investment.	Require robust monitoring, reporting, and verification protocols; emphasize ecological outcomes (e.g., species return, vegetation growth).
Recognition of Scale and Impact	Credit valuation should account for the size, type, and ecological significance of the protected or restored area.	Factor in habitat type, endemic biodiversity, and carbon potential to ensure high-impact projects are appropriately valued.
Optimized Rigor and Cost Efficiency	Balance scientific accuracy with the cost-efficiency of the crediting process.	Use proportionate verification tools; avoid over-complexity; ensure most funds go toward conservation actions rather than overheads.
Socio-Economic Safeguards	Credits must respect community rights and livelihoods, integrating social safeguards into design.	Apply FPIC protocols, design benefit-sharing models, and ensure local participation and socioeconomic resilience are not compromised.
Alignment with Broader Frameworks	Ensure interoperability with global standards (e.g., BCA), while avoiding excessive complexity.	Use accepted guidelines for baselines and MRV to enhance credibility and comparability; simplify wherever possible to reduce barriers to entry.

B. Qualifying Nature Credits

1. Archetypes of Eligible Activities

Any approach to qualify and quantify suitable projects as part of an effective nature credit framework needs to consider the full range of eligible activities. The Restorative Continuum Framework (Figure 9), UN Decade on Ecosystem Restoration, could prove to be useful for this purpose. The Framework provides a structured approach for guiding ecosystem restoration through a spectrum of actions—from protecting intact ecosystems, to sustainably managing modified areas, to actively restoring degraded sites.⁴² This continuum reflects the interconnected and overlapping nature of restoration activities rather than a strict hierarchy. For example, clean-up efforts may be classified as rehabilitation when aimed at recovering ecological functions, or as remediation when focused on removing pollutants. This fluid approach acknowledges the complex, dynamic conditions of ecosystems and supports adaptive interventions tailored to site-specific needs. The framework effectively outlines restoration and conservation activities relevant to wetlands, the primary ecosystems targeted by the Regional Flyway Initiative (RFI).

⁴² FAO, SCBD & SER. 2024. Delivering restoration outcomes for biodiversity and human well-being - Resource guide to Target 2 of the Kunming-Montreal Global Biodiversity Framework. Rome, Montreal, Canada and Washington, DC

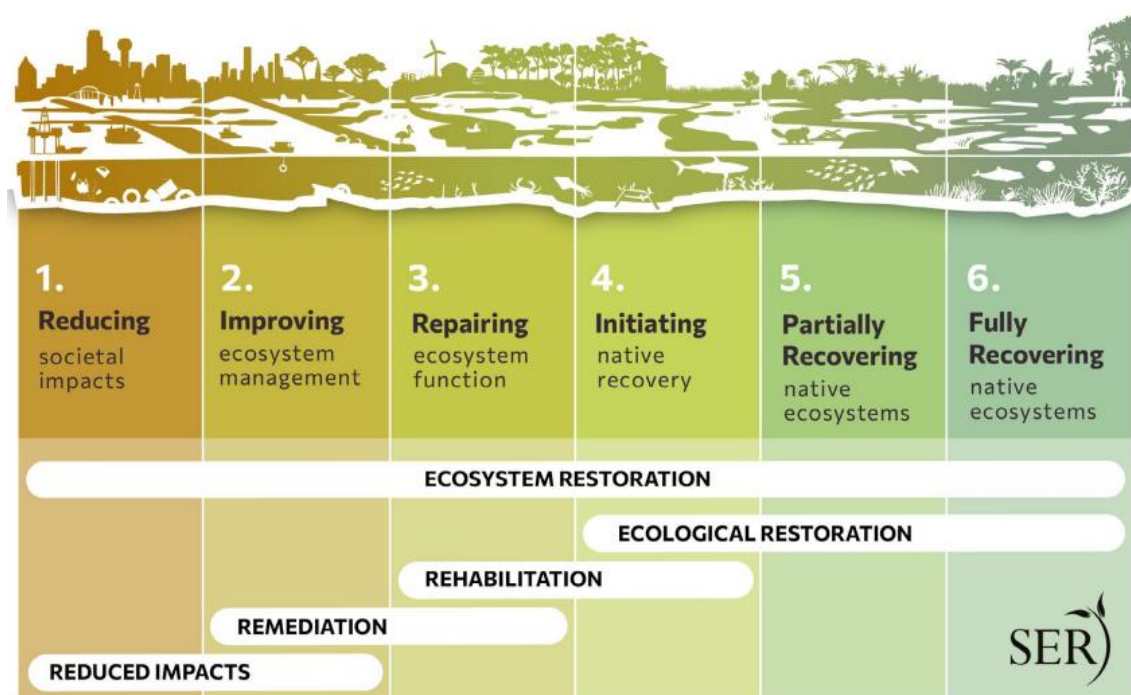


Figure 9. The Restorative Continuum Framework (Source: FAO, SCBD, and SER. 2024)

For the purpose of this study, the restorative continuum has been distilled into two simplified archetypes: **Restoration** and **Loss Avoidance**. These archetypes are defined based on the primary conservation objective or targeted ecological outcome. It is important to emphasize that, in practice, these actions should not be treated as mutually exclusive. Rather, they are often most effective when applied in a complementary manner across landscapes, reinforcing one another to achieve multiple nature-positive outcomes.

Table 11. Archetype of Eligible Activities for Nature Credits

Activity Archetype	Expansive Framework of Nature Credits Alignment	Primary Objective
Restoration (Restorative Actions)	Activities that contribute to <i>reversing nature loss</i>	Restore degraded wetlands to enhance delivery of ecosystem services and improve ecosystem health
Loss Avoidance (Maintenance, Protection and Stewardship Action)	Activities that contribute to <i>halting nature loss</i>	Prevent further degradation, maintain ecosystem function, and protect ecosystems from threats to biodiversity, carbon stocks, and hydrological services

In Table 11, ecosystem rehabilitation and restoration are combined due to their overlapping goals and methods. Restoration aims to recover original ecosystem conditions, while rehabilitation focuses on restoring ecological functions; both ultimately aims to enhance ecosystem integrity and the delivery of services. In practice, these approaches frequently converge. Similarly, remediation and threat reduction are clustered under the archetype of loss avoidance, as they are often jointly implemented to reduce or halt further degradation. This classification is especially relevant in the context of RFI wetlands, which regardless of their protected status, remain vulnerable to pollution, habitat loss, and uncontrolled land and water development pressures.

2. Nature Credit Archetypes

Archotyping nature credits can enhance marketability and strengthen conservation impact. Aligning these wetland-specific credits with buyer motivations, value chain dependencies, and/or altruistic interests enables businesses to match their purchases with their nature-positive goals and objectives.

Building on earlier discussion, the proposed wetland-specific nature credit archetypes mirror the structure of eligible conservation activities and reflect existing use cases such as Plan Vivo's Restoration and Conservation Certificates and Verra's Nature Framework guidance. These archetypes provide a standardized way to translate ecological interventions into verifiable and investable credit units.

This study focuses on two nature credit archetypes applicable to RFI sites:

1. **Restoration Credit** - generated from activities that restore degraded wetlands ecosystems (reversing nature loss) to its fully functioning state
2. **Loss Avoidance Credit** - generated from interventions that protect, maintain and steward ecosystem health (halting nature loss)

In practice, restoration efforts cannot succeed without corresponding measures that protect ecosystems from ongoing and future threats. For this reason, a Loss Avoidance Credit is an essential complement to a Restoration Credit. While both activities are often implemented together, this study delineates them to highlight their distinct ecological roles and crediting functions. Specifically, Loss Avoidance Credits are designed to ensure the sustained safeguarding of wetlands—either those already in good ecological condition or those that have been successfully restored.

In degraded sites that require active recovery, Restoration Credits must be generated first, as these activities inherently include protective measures that support restoration outcomes. Once restoration reaches a measurable threshold of improved ecosystem health (as outlined in Section VII.c. Quantifying Nature Credits) credits can then transition to maintenance, protection, and stewardship. However, this sequencing is not always required in sites that do not need restoration; such sites may generate Loss Avoidance Credits from the outset.

This flexibility is especially critical for RFI sites, where wetland ecosystems face persistent and compounding threats—from land-use pressures to climate-driven impacts such as drought, peat fires, sea-level rise, ocean acidification, coastal erosion, and the increasing intensity of tropical cyclones. These stressors can undermine restoration gains if not actively managed. Recognizing this reality, the RFI nature credit framework integrates both restoration and long-term protection to deliver durable, high-integrity outcomes for wetland conservation along the flyway.

3. Baseline and Project Scenario

Establishing a clear baseline and project scenario is essential to proving additionality in nature credit projects. These scenarios provide the foundation for demonstrating that ecological improvements are a direct result of project interventions and would not have occurred under business-as-usual conditions. The concept of additionality is foundational in environmental markets particularly in carbon offsetting where credited benefits must exceed what would have occurred without the project.⁴³ Typically this is assessed by comparing a defined baseline scenario that assumes no external influence or incentive from the crediting mechanism, with a project scenario that reflects the ecological outcomes resulting from an intervention.⁴⁴

Proving Additionality for RFI Sites: Baseline vs. Project Scenario

Unlike carbon, nature's complexity creates challenges in defining credible baselines and proving additionality. The IUCN emphasized that establishing a credible counterfactual scenario, a projection of what would happen in the absence of a nature credit intervention, is essential but more methodologically demanding. The absence of universally standard (and accepted) metrics for

⁴³ Gillenwater, M. (2012). What is Additionality? Part 1: A long-standing problem. Greenhouse Gas Management Institute.

⁴⁴ Hamrick, K., & Gallant, M. (2017). Unlocking Potential: State of the Voluntary Carbon Markets 2017. Forest Trends' Ecosystem Marketplace.

biodiversity, ecosystem function, or resilience compounds the difficulty in ensuring robust additionality assessments.⁴⁵

Establishing credible baselines for nature credit projects in wetlands must account for potential ecosystem services tradeoffs, such as the displacement of cultural benefits for local communities due to site protection. Identifying these tradeoffs is crucial for developing safeguards that ensure projects not only achieve ecological improvements but also maintain or enhance social equity and holistic benefits.

The table below illustrates how additionality can be demonstrated across ecological, climate, biodiversity, and hydrological dimensions in RFI wetland sites. It also identifies potential data sources and outlines how project outcomes exceed the business-as-usual baseline:

Table 12. Demonstrating Additionality using Baseline and Project Scenario

Component	Baseline Scenario	Project Scenario	Possible Data Sources	How Additionality Is Demonstrated
Ecological Condition	Continuing wetland degradation (e.g., mangrove deforestation, peatland drainage/conversion, pollution)	Ecological restoration or protection improves ecosystem structure and function	Remote sensing (e.g., Landsat, Sentinel), historical aerial imagery, field surveys	Ecological improvements are clearly above documented degradation trends
GHG Emissions/ Carbon Stock	Emissions from peat oxidation, mangrove biomass loss, and wetland degradation	Measurable carbon gains via sequestration and avoided emissions	IPCC Wetlands Supplement, Verra VM0033, Remote sensing, Soil and biomass carbon sampling	Carbon benefits exceed business-as-usual; validated using accepted models
Biodiversity Indicators	Declining populations of migratory birds, invasive species expansion, habitat fragmentation	Restoration of species habitats and stabilization of populations	BirdLife datasets, eBird, site-based Avian monitoring, IUCN Red List, National List of Threatened Species	Species return or stabilization not expected under baseline trends
Hydrological Regime	Ongoing disruption from drainage, tidal restriction, water diversion	Reestablishment of natural flow regimes, wetting of peat, tidal connectivity	Hydrological models, in situ water level data, drone-based DEMs	Measurable improvements in wetland water balance not required by regulation

Establishing baseline and project scenarios is a critical first step; however, proving additionality requires more than showing improvements over business-as-usual. Environmental credit standards like the CDM and Verra's VCS/SD VSta highlight four primary forms of additionality that guide project eligibility: **regulatory, financial, technological/common practice, and outcome-based additionality**. These are adapted for nature credit projects to ensure they deliver real, measurable, and genuinely additional benefits.

These demonstrations of additionality may be assessed using the standard forms in Table 12. However, regulatory additionality may be particularly challenging to establish for RFI sites, as many are already under some form of legal protection or under national government jurisdictions. In such

⁴⁵ IUCN. (2023). Options paper: High-integrity nature crediting framework - Version 1.0. International Union for Conservation of Nature. <https://www.iucn.org/sites/default/files/2023-12/iucn-nature-credit-options-paper-v1.0.pdf>

cases, it must be clearly demonstrated that existing laws or policies are not ‘enough’, or that the protection frameworks are insufficiently resourced to deliver the intended ecological outcomes. This gap between formal protection and actual ecological situations also help support the case for financial additionality; it highlights that without credit revenue, governments and site managers may lack the sustained funding required to maintain or enhance the integrity of the sites or the whole flyway over time. Table 13 presents how these forms of additionality are applied to RFI sites.

Table 13. Applying Forms of Additionality for RFI Sites

Forms of Additionality	How Additionality is Demonstrated	Evidence/Data Supporting Additionality
Regulatory Additionality	Activities go beyond what existing laws require or what is enforced on the ground	• Site legal reviews • Management effectiveness assessments (despite existing conservation measures, wetland health continues to decline or remains degraded due to ongoing pressures.)
Financial Additionality	Wetland restoration cannot be sustained without credit funding due to insufficient public financing	• Financial gap analysis (showing allotted budget covers only a portion of restoration/maintenance and protection cost) • Budget reports vs. project cost
Technological Additionality/ Common Practice	Restoration methods or scales adopted are not widely practiced regionally	• Regional practice reviews • Expert consultations • local baseline data
Outcome-based Additionality	Improved wetland health metrics directly linked to project actions not seen in baseline	Field surveys, time-series data on species, water quality, vegetation cover, etc.

C. Quantifying RFI Nature Credits

1. State of Ecosystem Health: Recognizing Outcomes from a Buyer’s Viewpoint

In this framework, credits are issued based on measurable improvements in ecosystem health or condition. Wetland ecosystem health is defined along a five-level scale, from Level 0 (fully degraded or modified) to Level 1 (reference or fully restored or natural state). This scale, *as discussed further below*, is based on key indicators of wetland health: hydrological function, vegetation, and biological integrity, providing a quantifiable structure for evaluating and tracking improvement interventions.

Driving Ecosystem Recovery: Restoration Interventions in RFI

Figure 10 illustrates the temporal progression of ecosystem health in relation to the issuance of *restoration credits*. The x-axis represents time, while the y-axis represents levels of ecosystem health (0 to 1). Notably, time is not a fixed determinant for all restoration projects since this varies depending on the scale of intervention, ecosystem type, and site-specific conditions. The curve shown in the graph reflects how restoration efforts result in observable and results-based improvements in ecosystem health.

A key principle in this crediting model is that credit issuance begins from the actual starting condition of the wetland (baseline reference point), not necessarily from the lowest level of degradation. Therefore, the curve does not start at point (0,0). Many RFI project sites begin from intermediate ecological states—often between Levels 0.4, 0.6 or sometimes even 0.8 (this could possibly be true for sites with protected status). Recognizing this starting point prevents undervaluing

existing ecosystem function and ensures credits reflect only the net improvement achieved through active restoration.

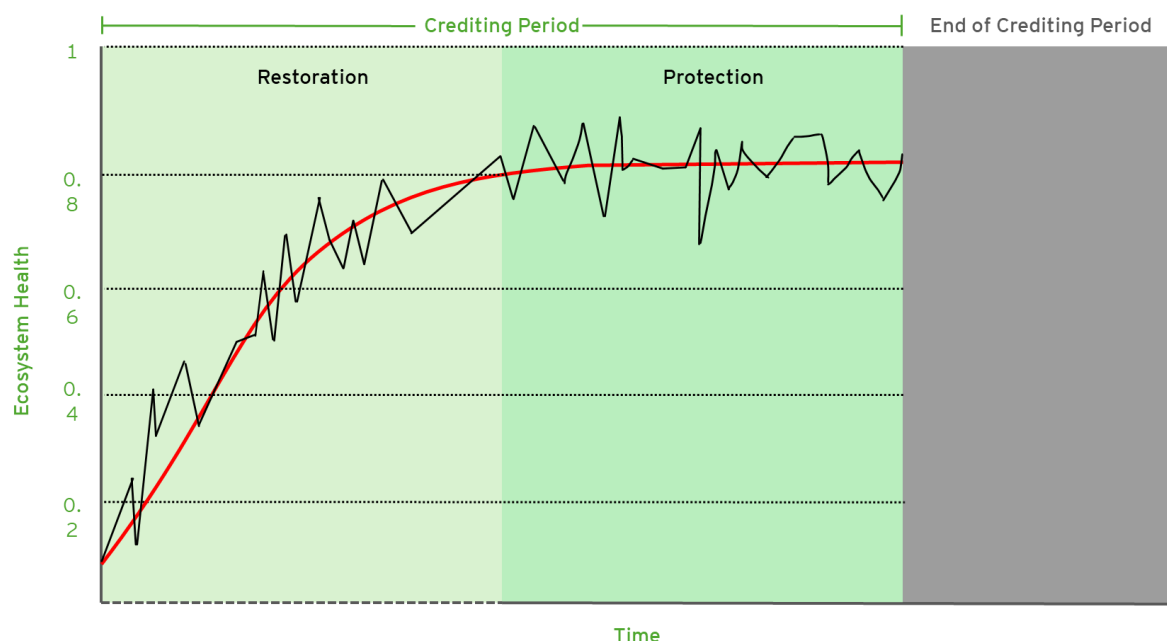


Figure 10. Scale of Ecosystem Health Improvement and Restoration Credit Issuance. Red Line: Modelled Change in Wetland Health; Black Line: Actual Stochastic Change in Wetland Health

As restoration progresses and the ecosystem meets the thresholds for higher levels, credits are issued incrementally with each documented “jump” on the scale. This stepwise issuance reinforces the results-based nature of the crediting framework, ensuring that credits correspond directly to verifiable ecological gains.

Core Indicators of Wetland Health in Restoration Efforts

Table 14. Wetland Ecosystem Health Scale and Associated Metrics

Level	Restoration Stage	Hydrological Metrics	Vegetation Metrics	Biological Metrics
0	Fully Degraded	Inland: Severely altered or absent hydrological regime (e.g., drained, blocked channels); <10% of the wetland area is inundated or saturated according to its natural seasonal or year-round pattern; flooding or water presence highly disrupted or absent Coastal: Tidal amplitude is essentially restricted or equal to 0	Native vegetation absent or <10%; dominance of invasive species (marshes, riparian forests, seagrasses, mangroves, swamp forests)	Key species absent; HSI < 0.3; minimal faunal activity; absence of migratory birds, aquatic fauna (e.g., fish, amphibians), or benthic organisms; no evidence of habitat use by dependent species
0.2	Hydrological Function Reintroduced	Inland: Partial recovery of inundation (e.g., seasonal rewetting); 10-30% of wetland area inundated or saturated during expected seasonal periods or tidal cycles; water distribution irregular or spatially fragmented	Early signs of native vegetation; ≤30% native cover (marshes, riparian forests, presence of pioneer or opportunistic species; initial establishment of habitat-forming plants	HSI 0.3-0.5 for select target species; isolated sightings of waterbirds, amphibians, fish, or benthic indicator fauna; very limited use of habitat by wildlife or aquatic species

Level	Restoration Stage	Hydrological Metrics	Vegetation Metrics	Biological Metrics
		Coastal: Tidal amplitude is introduced but likely significant reduced compared to natural conditions; 30% of the natural amplitude	(e.g., seedlings, shoots, grasses)	
0.4	Hydrological Stability + Vegetative Recovery	Inland: Stable inundation or saturation restored across ≥50% of wetland area in line with its natural seasonal or year-round hydrological regime; hydrological connectivity partially restored Coastal: Tidal amplitude is present but reduced in amplitude compared to natural conditions; 50% of the natural conditions	≥50% native vegetation cover; reduced invasives, developing structural complexity (e.g., expanding seagrass patches, young mangroves, marsh grasses, riparian saplings)	HSI 0.5-0.7; breeding individuals of key species observed; moderate species richness; increasing presence of birds, fish, amphibians, or benthic organisms; partial re-establishment of habitat uses
0.6	Functional Vegetation + Improving Faunal Use	Inland: Inundation or saturation extent reaches ≥70% of wetland area, consistently aligned with natural seasonal or continuous wetland dynamics; hydrology supports expected ecosystem functions Coastal: tidal amplitude is substantially improved but may still vary slightly from natural patterns; ≥70% of natural amplitude	≥70% native vegetation cover; increasing habitat complexity across vertical and horizontal structure (e.g., multi-layered canopies, dense herbaceous cover, zonation of species)	HSI ≥0.7; increasing populations of migratory birds, fish, vulnerable species, or other wetland-dependent fauna; functional habitat use confirmed (e.g., nurseries, breeding sites, feeding areas)
0.8	Fully Functioning Ecosystem	Inland: ≥90% of wetland area inundated or saturated in accordance with its natural seasonal cycles or permanent water presence; predictable, stable water distribution across the landscape Coastal: Tidal amplitude nearly matching natural cycles; 90% of the reference or natural tidal amplitude	≥90% native vegetation cover; well-developed, multi-layered and diverse plant communities; clear natural zonation (e.g., mangrove bands, marsh zones, seagrass meadows, riparian forests)	HSI ≥0.9; stable or increasing populations of key species; high species richness and functional diversity; restored ecosystem processes supporting species recruitment, breeding, and faunal resilience
1	Reference Ecosystem State (<i>Theoretical Benchmark</i>)	Full extent of natural inundation or saturation restored across 100% of wetland area; inundation patterns or tidal amplitude mimic pristine or undisturbed hydrological conditions, including expected seasonal variability where relevant	Pristine or near-pristine native vegetation structure and composition; full ecological succession present; intact species diversity and natural zonation patterns characteristic of the ecosystem type	Ecological reference condition with intact species assemblages, trophic networks, and full habitat use across taxa (e.g., birds, fish, amphibians, benthic communities); high ecological resilience

The ecosystem health scale outlined in the Table 14 provides a structured framework to quantify wetland condition and restoration progress. This scale spans from Level 0 through incremental stages of recovery up to Level 1. Each level is defined by key measurable criteria in hydrology, vegetation, and biodiversity (biological), which collectively reflect the health of wetland ecosystem.

The design of this scale draws inspiration from the Ramsar Convention's Ecological Character Description (ECD), which identifies critical components and indicators necessary to describe wetland ecological character. However, to ensure practicality and accessibility for local monitoring and crediting processes, these indicators have been simplified and adapted. The focus is on observable, repeatable metrics that capture meaningful ecosystem changes without requiring complex or resource-intensive assessments.

The integrated Wetland Health Metrics table is designed to apply across both coastal/marine and inland wetlands, providing a consistent yet flexible framework for RFI Nature Credit projects.

For the **Hydrological Metrics**, the specific indicators should be selected based on the ecosystem type and restoration context. For example, tidal amplitude—refers to vertical difference between high tide and low tide—is critical in coastal wetlands such as mangroves, salt marshes, and seagrass beds, while inundation patterns, connectivity, or rewetting may be more relevant for freshwater wetlands like floodplains, marshes, or peatlands.

Similarly, **Vegetation Metrics** should reflect ecosystem-specific targets. In some cases, such as mudflat restoration, the desired outcome may be the removal or prevention of vegetation to maintain open habitat for shorebirds. In freshwater lakes or wetlands, vegetation recovery may include removal of invasive species to allow native plant communities to reestablish.

For the **Biological Metrics**, indicators should focus on the site's identified key species or priority species, which may include migratory waterbirds (this is particularly consistent in all RFI sites), fisheries species, amphibians, or other taxa relevant to the wetland's ecological and conservation value. Species selection should align with Ramsar criteria, biodiversity priorities, or project-specific conservation goals.

Independent Metric Approach

It is recognized that while the three core metrics—hydrology, vegetation, and biodiversity—are assessed independently for measurement and credit calculation, they are inherently interconnected in defining overall wetland health. Improvements in one area often influence progress in others; however, these components do not always advance at the same rate across different wetlands. Wetlands vary significantly in their natural condition, ecological responses, and restoration trajectories. For example, some wetlands may demonstrate substantial improvement in hydrological function, such as restored tidal flow or water table stabilization, while vegetation recovery may lag, or biodiversity use may remain low due to ecological time lags or site-specific factors. In other instances, biodiversity indicators such as waterbird use or fish nurseries may return before substantial vegetation recovery occurs, particularly in sediment-poor or newly reconnected wetlands. Given this natural variability, the assessment framework treats each metric independently, recognizing that different components of wetland health improve at different rates. This approach allows measurable ecological progress to be acknowledged across hydrology, vegetation, and biodiversity, while maintaining scientific credibility and flexibility in credit issuance.

The specific computation of level improvements—or “level jumps”—for each metric, along with the detailed formula for calculating RFI Restoration Credits, is discussed in *Section 7.c.ii. Defining RFI Nature Credit Unit*, which provides technical guidance for consistent and transparent credit quantification.

This flexible, ecosystem-responsive approach ensures that RFI Nature Credits are based on measurable, ecologically meaningful improvements, while maintaining relevance to diverse wetland types and site-specific conditions. Importantly this approach allows the health scale to be applied across various wetland types and restoration contexts, facilitating transparent credit issuance and

progress tracking. Notably, Level 1 is retained as an ecological benchmark representing near-natural reference conditions, serving primarily as a conceptual target rather than a realistic restoration endpoint given ongoing human impacts and environmental variability.

It is important to note that the proposed metrics and thresholds within the Wetland Health Scale are considered preliminary and intended as an initial framework. These indicators require further field testing, validation, and refinement to ensure scientific robustness and practical applicability across different wetland types and restoration scenarios. This process will be partially covered under Phase 2.

Recognizing Stochastic Ecosystem Behavior in Credit Design

Ecosystems rarely follow a predictable or linear restoration path. Instead, they are subject to stochastic behavior—natural variations influenced by climatic fluctuations, biological responses, and external pressures that affect ecosystems⁴⁶. This means that ecological uplift may occur in non-uniform, irregular intervals, and ecosystem health can experience sudden jumps, lags, or even temporary reversals despite ongoing interventions.

This study emphasizes the importance of recognizing stochasticity into crediting models—particularly through MRV systems—to effectively capture these non-linear dynamics. Doing so allows restoration frameworks to capture and reward actual points of uplift as they occur, rather than relying solely on fixed timelines or assumptions of gradual improvement. This approach strengthens the credibility of credit issuance and ensures that interventions are responsive to the real-time ecological trajectory of the site, not just its projected one.

The Need for Sustained Protection: Justifying Maintenance and Protection Credits

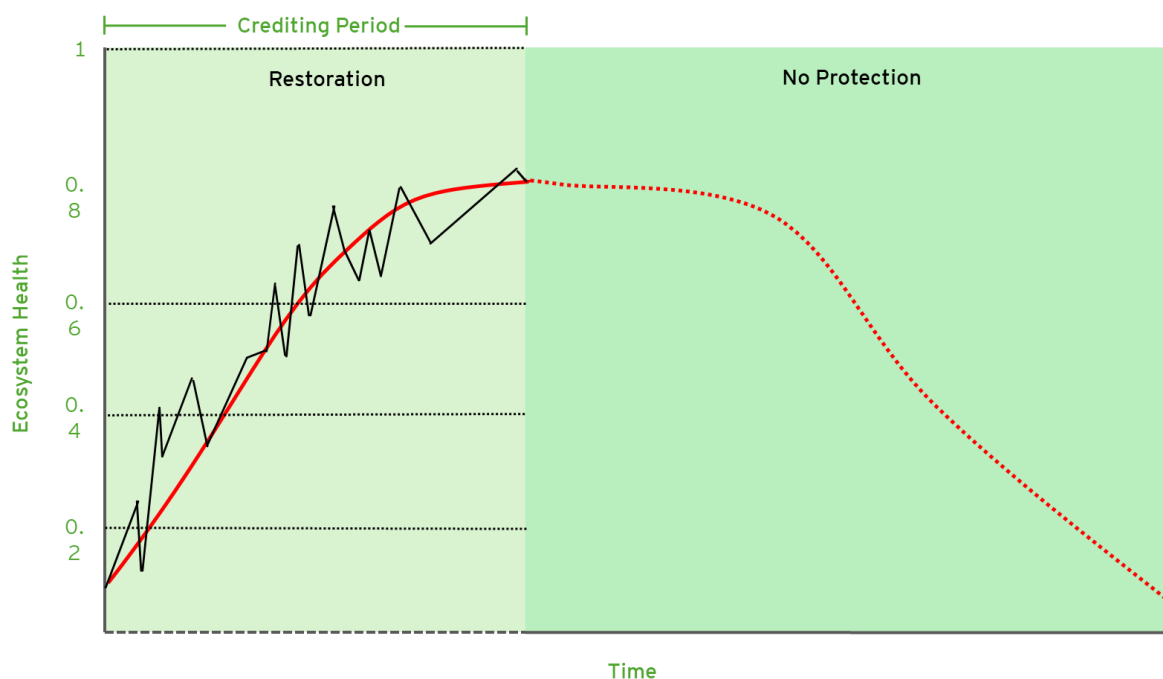


Figure 11. Decline of Ecosystem Health Without Sustained Protection. Red Line: Modelled Change in Wetland Health; Black Line: Actual Stochastic Change in Wetland Health; Red Dotted Line: Predicted Decline in Wetland Health

Without a sustainable nature financing mechanism, ecosystems, once restored to an ideal state, are vulnerable to decline (Figure 11). This potential reversion reflects the inherent vulnerability of natural systems to external threats—such as climate change, land-use change, and invasive species—

⁴⁶ Chesson, P. (2000). *Mechanisms of maintenance of species diversity*. Annual Review of Ecology and Systematics, 31, 343-366. <https://doi.org/10.1146/annurev.ecolsys.31.1.343>

particularly when protection efforts are underfunded or absent. To prevent this backsliding, protection or maintenance credits become essential. These credits recognize the ecological and financial value of sustained stewardship, covering both the cost of protection and any further ecological uplift.

Unlike restoration credits, which are based on measurable improvements in ecosystem condition, maintenance and protection credits are explicitly time-based—quantified by the duration over which a restored ecosystem is maintained at a functioning state. In this context, time becomes the key unit of measurement, directly reflecting the ongoing effort and investment required to safeguard ecological gains.

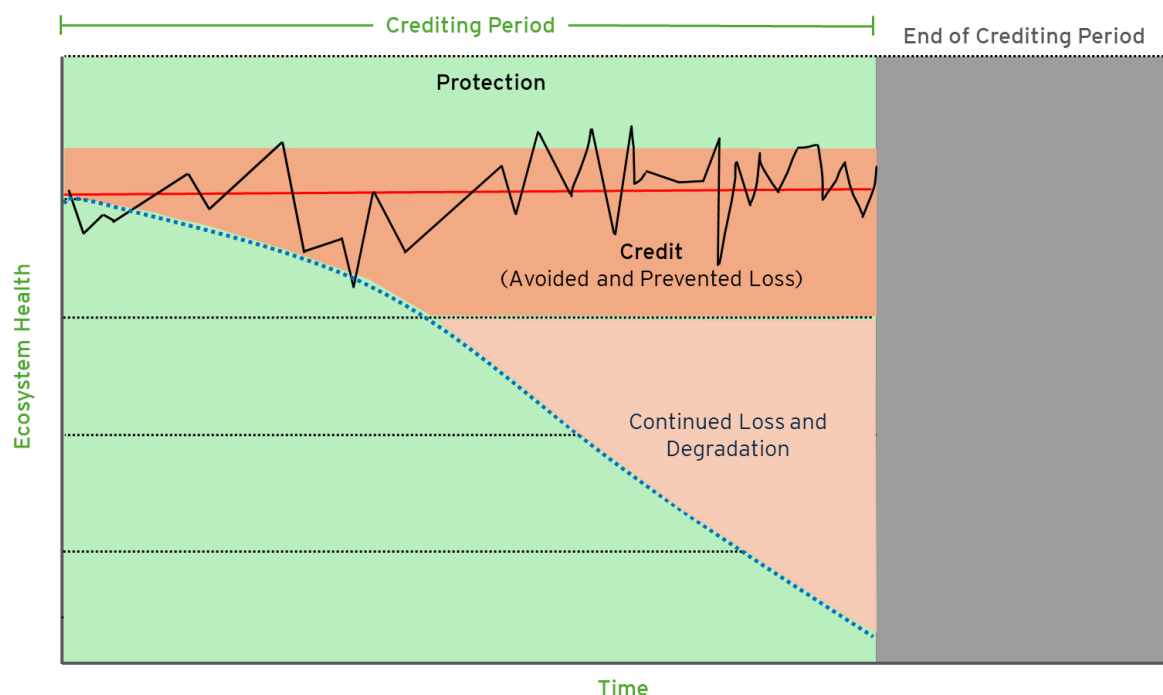


Figure 12. Maintenance and Protection Credits Issuance for a Fully Functional Baseline. Red Line: Modelled Project Scenario; Blue Dotted Line: Predicted Degradation Scenario; Black Line: Actual Stochastic Change in Wetland Health

In some cases, RFI sites may already be in a fully functioning state at the outset (e.g., Level 0.8 on the health scale). In such cases, maintenance and protection credits are calculated based on the projected difference (darker orange shaded region) between two trajectories shown in Figure 12: the alternative scenario (blue dotted line), which depicts ecological decline in the absence of protection, and the project scenario (red line), which illustrates how proactive interventions sustain ecosystem health over time. The creditable activities are designed to deliver benefits above the projected scenario (red line), accounting for continuing degradation pressures beyond the project's direct control and embedded within the counterfactual. In this context, the credit reflects the avoided degradation attributable to the project, acknowledging that—even with legal protections—broader external pressures often drive gradual ecological decline without targeted financed interventions.

Unexpected Ecological Reversal and Its Implication on Credit Structuring

In this scenario (Figure 13), a site has reached a high-functioning state (Level 4) and is actively generating protection and maintenance credits under the assumption of maintaining ecosystem health in a stable manner. However, a sudden disruptive event—such as a peat fire, severe drought, or tropical cyclone—abruptly degrades ecosystem health, pushing it back down the scale (e.g., from Level 0.8 to Level 0.4 or 0.6). This implies that the site can potentially requalify for restoration credits, as renewed intervention becomes necessary.

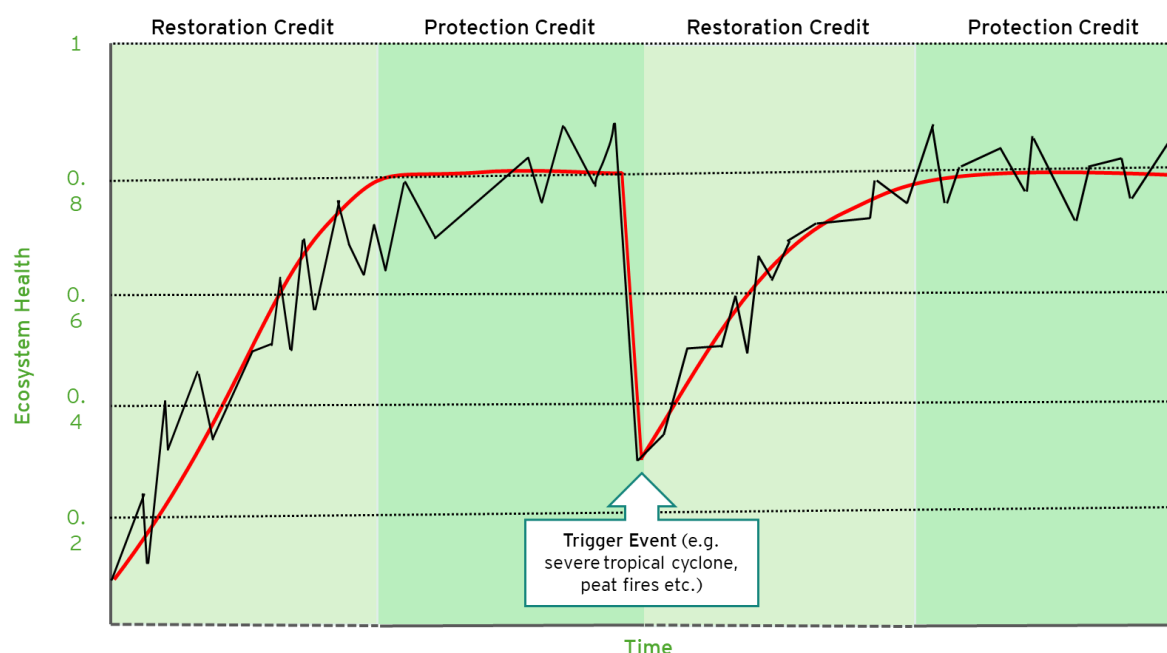


Figure 13. Transition from Protection to Restoration Credit Due to Trigger Events. Red Line: Modelled Change in Wetland Health; Black Line: Actual Stochastic Change in Wetland Health.

2. Defining the RFI Nature Credit Unit

It is proposed that each RFI Nature Credit Unit represents a **results-based quantifiable improvement or maintenance of wetland ecosystem health**. As presented in the preceding section, quantification method varies by credit archetype:

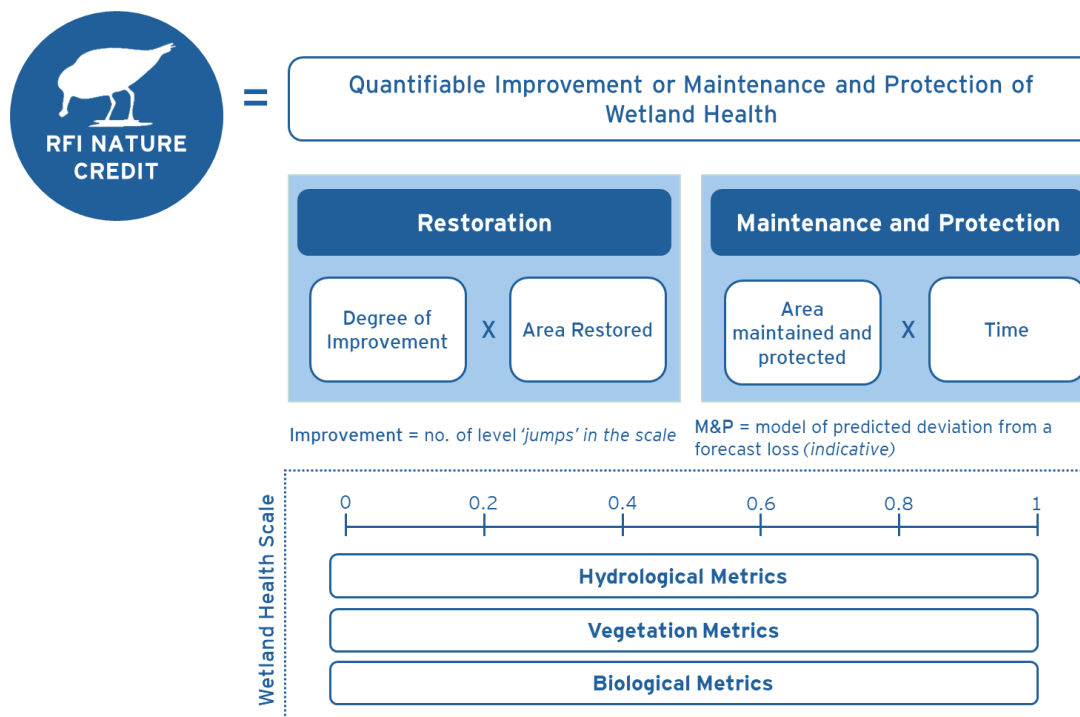


Figure 14. Quantification of RFI Nature Credit and Its Archetype

- **RFI Restoration Credit** is calculated by multiplying the degree of ecosystem health improvement—measured as the number of level jump/s on the defined scale—by the area

restored. The temporal aspect is implicit, since restoration outcomes progress over variable timelines depending on the ecosystem type and nature of intervention.

As discussed in the preceding subsection on the **Independent Metrics Approach**, each of the three core metrics is assessed separately based on its respective level jump, which represents the numerical improvement in condition along the defined Wetland Health Scale. A partial credit is calculated for each metric using the following formula:

$$\text{Partial Credit} = \text{Level of Jump} \times \text{Area Restored (ha)}$$

The final RFI Restoration Credit is then determined by averaging the partial credits across all three metrics:

$$C = (c_h + c_v + c_b) / 3$$

Where **C** is Total RFI Restoration Credit; **c_h** is Partial Credit (Hydrology); **c_v** is Partial Credit (Vegetation); and **c_b** is Partial Credit (Biological)

This methodology, *though needs further testing and verification*, ensures that measurable ecological gains across all dimensions of wetland health are recognized independently, while encouraging a comprehensive, ecosystem-wide approach to restoration over time. It allows projects to generate credits based on legitimate, verifiable improvements even when certain ecological components may temporarily lag due to natural variability or site-specific challenges.

- **RFI Loss Avoidance Credit** is quantified by multiplying the area under protection by the duration of sustained protection, recognizing the value of avoiding degradation over time. Time is definitive unit in this context as the measure of sustained maintenance and protection is highly dependent on time. Consistent with the independent metrics approach applied to restoration credits, the eligibility for Loss Avoidance Credits also considers the three core indicators—hydrology, vegetation, and biodiversity—separately. To ensure ecological credibility, it is proposed that a minimum threshold level of at least Level 0.4 or higher be met across all three metrics before protection credits can be generated. This threshold reflects a baseline of partial ecological function necessary to justify the issuance of credits for avoiding degradation.

Under the RFI nature credit mechanism, project periods should span at least **20 to 30 years** to ensure permanence. To support this, there must be both an incentive (e.g., community fund) and an instrument (e.g., a land covenant to restrict harmful activities) in place in perpetuity—even if the credit issuance cycle itself only runs for 20 or 30 years.

D. Nature Credit Principles

The UNDP BCA, in partnership with the World Economic Forum (WEF) and the International Advisory Panel on Biodiversity Credits (IAPB), have developed High-Integrity Principles (HIPs) to guide the biodiversity credit market. These 21 principles, which emphasize measurable outcomes for nature, equity for people, and strong governance, are highly relevant for informing nature credit frameworks in ecologically and socially complex contexts such as the RFI sites

The 21 HIPs in the BCA document draw from over twenty existing standards across carbon and biodiversity markets, reflecting broad consensus on high integrity in biodiversity credits.⁴⁷ The RFI nature credit framework adopts the full suite of High-Integrity Principles (HIPs) developed by the Biodiversity Credit Alliance (BCA), recognizing them as the foundation for credible, inclusive, and scientifically sound nature credit mechanisms. However, their practical implementation will

⁴⁷ Biodiversity Credit Alliance. (2025, May). High-level principles to guide the biodiversity credit market [White paper]. World Economic Forum. Retrieved May 30, 2025, from https://www.biodiversitycreditalliance.org/wp-content/uploads/2025/05/377455_High_Level_Principles_to_Guide_the_Biodiversity_Credit_Market_En_v7.pdf

understandably vary based on the ecological conditions, governance structures, and capacity across different pilot countries.

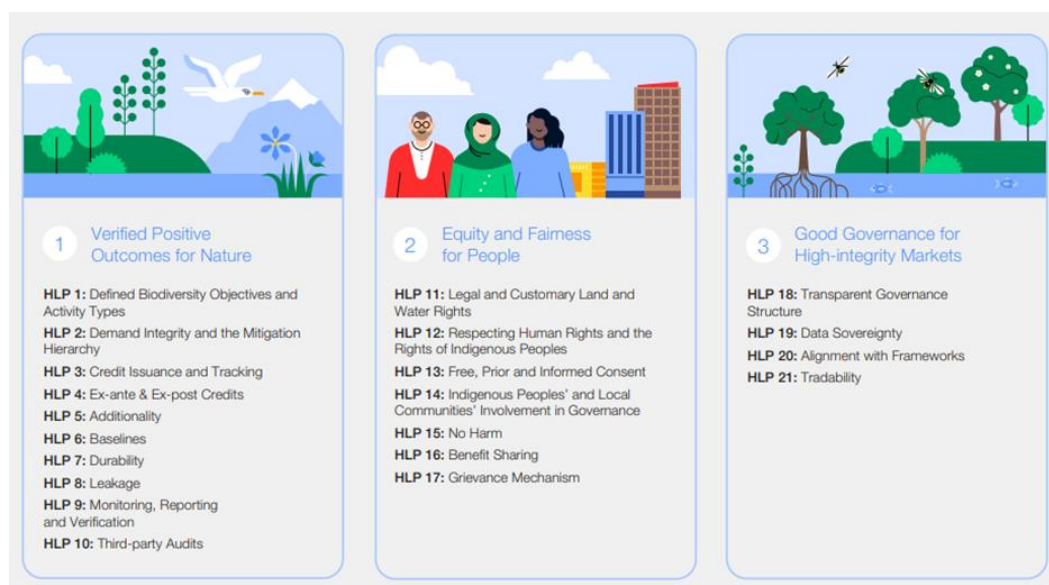


Figure 15. High Level Principles from UNDP Biodiversity Credit Alliance

However, translating these principles into practice across diverse RFI sites will inevitably present varying levels of complexity. Some principles may be relatively straightforward to meet, while others—particularly those requiring institutional reform, advanced technical capacity, or enabling policies—may prove more challenging and require additional support.

Phase 2 of this Study will provide a critical space to test how these principles can be operationalized across diverse RFI sites. Specifically, the next phase will work with stakeholders to:

- Identifying which principles are achievable under current conditions;
- Highlighting principles that, while essential, require further technical, institutional, or financial support; and
- Exploring targeted capacity building, policy alignment, and resource mobilization to help stakeholders progressively meet all integrity requirements.

This approach maintains alignment with the HIPs while embedding flexibility to account for site-specific contexts, especially in regions with limited resources or complex socio-ecological conditions. To maintain credibility and stakeholder buy-in, it will be essential to communicate transparently about where additional support is needed and why—without undermining the framework's overall integrity.

E. Validation, Verification, and Issuance

The process of validating, verifying, and issuing nature credits is central to ensuring that the environmental benefits are real, measurable, and credible. Drawing from Plan Vivo's implementation experience, the following five sequence provide a useful reference for guiding the governance architecture of nature credit for RFI.

1. Project Registration and Validation

At the outset, projects are registered with a recognized certification body—in Plan Vivo's case, this is the Foundation itself. Registration requires submitting a detailed project design that outlines objectives, methodologies, and expected outcomes. Validation is a critical early step where an independent party reviews this design to ensure it meets the required standards. This process safeguards the integrity of the credit system by confirming that projects are well-planned, feasible, and aligned with the intended conservation outcomes and community goals.

2. Periodic Monitoring

To maintain confidence in the credits issued, projects must undergo periodic verification—Plan Vivo requires this every five years. Verification involves a thorough, third-party assessment of monitoring data and project activities, ensuring that the claimed benefits (such as biodiversity improvements or habitat protection) are being delivered. This step addresses potential risks of over-crediting or misreporting, thereby maintaining market and stakeholder trust.

3. Transparency and Communication

Plan Vivo mandates clear and regular reporting on project progress and impact, allowing stakeholders—including communities, investors, and regulators—to track outcomes. Transparent communication also supports adaptive management, enabling projects to respond to challenges or changing conditions.

4. Retroactive Crediting

Plan Vivo permits credits for up to five years before validation, provided there is evidence that projects were additional and intended for certification. This flexibility encourages early action and supports projects that may face delays in formal validation.

5. Risk Management and Long-Term Monitoring

Environmental projects carry inherent risks, such as natural disasters or land-use changes that could reverse conservation gains. To address this, Plan Vivo requires projects to implement risk mitigation strategies designed to preserve benefits over a long horizon (at least 50 years). Periodic reassessment of risks and the creation of a risk buffer (where a portion of credits is reserved) help safeguard the system's integrity against unforeseen reversals.

F. Identifying Enabling Policy and Role of Government

Enabling policies for nature credits are policies that support the creation and use of these credits to finance conservation and restoration projects. These policies aim to incentivize private investment in nature-positive outcomes and provide a framework for credible and transparent nature credit markets.

Some of the key aspects of the necessary enabling policy include:

1. Setting the Stage:

- **Legislation:** Enabling policies often involve enacting legislation that establishes a framework for nature credit markets, including rules for project eligibility, verification, and trading.
- **Policy Frameworks:** These frameworks define the types of projects eligible for nature credits, the metrics used to measure their impact, and the governance structures needed to ensure transparency and integrity.
- **International Recognition:** Enabling policies may also aim to ensure that nature credits are recognized and accepted internationally, facilitating their use in both domestic and international finance mechanisms.

2. Key Components of Enabling Policies:

- **Project Eligibility and Standards:** Policies define the types of projects that can generate nature credits, such as conservation, restoration, and sustainable land management practices.
- **Verification and Monitoring:** Mechanisms are established to ensure that projects meet the standards set by the policy and that the outcomes they generate are accurately measured and verified.

- **Market Infrastructure:** Enabling policies often involve creating or supporting marketplaces where nature credits can be bought and sold, facilitating the flow of finance to conservation and restoration projects.
- **Incentives and Demand:** Policies may include incentives, such as tax breaks or other financial support, to encourage businesses and individuals to invest in nature credits.
- **Integrity and Transparency:** Robust governance frameworks are needed to ensure the integrity and transparency of nature credit markets, building trust among investors and other stakeholders.
- **Collaboration and Capacity Building:** Enabling policies may involve fostering collaboration among governments, businesses, and civil society organizations to develop and implement nature credit programs.

3. Examples of Enabling Policies:

- **The Nature Repair Act 2023 in Australia:** This Act establishes a world-first legislated, national, voluntary biodiversity market, providing a framework for nature credits.
- **NARIA (National Biodiversity Policy, Reporting and Finance) in Australia:** This framework aims to catalyze scalable, high-integrity nature markets.
- **EU Framework for Nature Markets:** Emergence of a common framework to enable the development of credible, effective, and regulated nature markets across member states.

4. Benefits of Enabling Policies:

- **Mobilizing Finance for Nature:** Enabling policies provide a mechanism for businesses and individuals to invest in nature-positive outcomes, channeling funds towards conservation and restoration projects that are supported by Government program.
- **Supporting Ecosystem Integrity:** By financing projects that improve or maintain ecosystem integrity, nature credits can help protect and restore biodiversity and meet both national and international commitments including the GBF.
- **Creating Economic Opportunities:** Nature credit markets can create economic opportunities for landowners, local communities, and businesses involved in conservation and restoration, and stimulate markets and broader economic growth.
- **Aligning Business Practices with Sustainability:** Enabling government policies encourage businesses to integrate sustainability into their operations, promoting a more environmentally responsible approach and drive the demand for nature credits in a transparent and consistent way.

5. Enabling Policies Challenges and Considerations:

- **Ensuring Integrity and Transparency:** Robust governance frameworks are needed to prevent fraud and ensure that nature credits deliver positive environmental outcomes.
- **Defining Clear Metrics and Standards:** It is crucial to develop standardized metrics and standards for measuring the impact of nature credits to ensure that they are comparable and credible and the role of Government in this cannot be underplayed.
- **Addressing Potential Trade-offs:** Enabling policies need to consider the potential trade-offs between different land uses and ensure that nature credits do not lead to unintended negative consequences that misalign with other growth agendas.
- **Engaging and Empowering Indigenous Peoples and Local Communities:** It is important to ensure that Indigenous Peoples and local communities are involved in the design and implementation of nature credit programs, recognizing their rights and traditional knowledge.

The presence and maturity of each of these various enabling policies and government functions in supporting a nature credit scheme for the RFI in the specific context of the three focus countries will be assessed in the following phase.

IX. Recommendations and Next Steps

Building on the conceptual framing, global state of practice, and identified gaps in market infrastructure for nature credits, this study presents the following recommendations for operationalizing high-integrity, scalable nature credit mechanisms tailored to the RFI wetlands—and beyond.

1. Development of Detailed Method and Standard Relevant for RFI

For RFI, there is a need to develop a detailed, context-appropriate method and standard. This involves adapting to global best practices and frameworks to reflect the integrated ecological, climate, and socio-economic values of wetlands, while ensuring robust safeguards and equitable benefit-sharing. Such tailored standards are foundational for market credibility, environmental integrity, stakeholder acceptance, and future scalability across the region.

2. Pilot Registration, Issuance, and Transactions for Nature Credits in RFI

To operationalize nature credit mechanisms and build market confidence, it is recommended to implement pilot projects within selected RFI wetlands to:

- Test the full lifecycle of nature credits, including project registration, issuance, MRV, and real-world transactions;
- Take the method and approach to a third-party testing (possibly Accounting for Nature) and refinement vis-à-vis the existing approaches—this will form part of the roadmap in Phase 2;
- Demonstrate the additionality, permanence, and integrity of wetland restoration and protection activities under diverse ecological conditions;
- Engage a representative set of buyers across dependency tiers to validate both offset-driven and contribution-based market demand;
- Explore stacking or bundling of nature credits with carbon credits where appropriate, ensuring transparency, integrity, and prevention of double counting.

Such pilots will provide critical lessons for refining methodologies, addressing implementation challenges, and scaling nature credit markets effectively.

3. Program-Level Assessment of Feasibility, Market Appetite, and Operationalization Principles

A program-wide assessment is recommended to evaluate the broader feasibility and operational potential of nature credit mechanisms across the RFI and other ADB-supported initiatives. This assessment should:

- Gauge market appetite from public, private, and blended finance actors, including buyers beyond those with direct ecological dependencies;
- Identify key operational challenges, institutional requirements, and enabling factors necessary for successful implementation at scale;
- Refine operational principles, including integrity thresholds, safeguards, and differentiated approaches based on buyer profiles and ecosystem contexts.

This assessment will provide strategic guidance to ensure nature credit design is scalable, context-appropriate, and aligned with both ecological and market realities.

4. Further Development of Enabling Policy Mechanisms for Nature Credits

Supportive policy and governance frameworks are essential to ensure the credibility, legitimacy, and long-term sustainability of nature credit markets. It is recommended to:

- Collaborate with national and subnational governments in RFI countries to establish enabling legal, regulatory, and institutional frameworks for nature credits;
- Ensure policy mechanisms address key integrity components, including additionality, permanence, leakage prevention, and transparent benefit-sharing with IPLCs;
- Integrate nature credit mechanisms within broader biodiversity, climate, and sustainable development policies to create synergies and leverage public-private finance opportunities.

Strong policy foundations will enhance market acceptance, environmental integrity, and alignment with national and global commitments.

5. Establishment of a "Buyers Club" to Secure Early-Phase Demand

To catalyze early market development and reduce risk for project developers, it is recommended to convene a coalition of committed public and private sector buyers—a “buyers club”—to:

- Support offtake agreements for high-integrity nature credits generated through initial pilots and demonstration projects;
- Engage a diverse set of buyers, including those motivated by compliance, ESG objectives, or nature-positive investment strategies;
- Facilitate knowledge exchange, buyer alignment, and early transaction data collection to inform market design and scaling.

Such early buyer engagement is critical to demonstrating demand, building market confidence, and enabling a functional nature credit marketplace.

6. Explore Extension of Nature Credit Mechanisms Beyond RFI to Other ADB Program Locations

- Assess other suitable ADB-supported landscapes, such as forests and possibly other marine ecosystems, for the application of nature credit mechanisms;
- Adopt methodologies, safeguards, and market structures to diverse ecological and governance contexts while maintaining alignment with global integrity principles;
- Scale high-integrity nature credit markets to contribute meaningfully to biodiversity conservation, climate mitigation, resilience building, and sustainable development targets across the Asia-Pacific region.

Expanding the nature credit framework beyond wetlands will increase its relevance, impact, and contribution to ADB’s broader nature-positive financing objectives.

Next Steps: [Phase 2] Advancing Nature Credit Readiness in Pilot Countries

Phase 2 aims to operationalize the RFI Nature Credit Framework by focusing on the supply side potential of nature credits within these pilot countries. This involves a deeper evaluation of site-level viability, enabling conditions, and readiness for developing high-integrity nature credit mechanisms, specifically for RFI sites. Key focus areas for Phase 2 include:

- **Country-Specific Application of Phase 1 Findings:** Ensuring the RFI Nature Credit Framework reflects country-level realities, including wetland typologies, socio-economic conditions, and conservation priorities.
- **Viability Assessment of RFI Sites:** Conducting high level assessment of RFI sites in each country to determine their viability for nature credit generation.
- **Analysis of Enabling Policies, Programs, and Market Readiness:** Reviewing country-specific policies, regulatory frameworks, and programs relevant to nature credit implementation—including those related to biodiversity conservation, wetlands management, and climate finance—and identifying gaps, barriers, and opportunities to strengthen the enabling environment for credible and scalable nature credit mechanisms.
- **Site Prioritization Based on Nature Credit Potential:** Applying structured criteria to prioritize RFI sites within the three countries based on their nature credit potential, ecological significance, socio-economic co-benefits, and market viability.

Through this targeted country-level work, Phase 2 will provide the evidence base, practical insights, and refined frameworks necessary to advance the design, testing, and early implementation of high-integrity nature credit mechanisms, aligned with both global best practices and country-specific needs.

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