KNOWLEDGE DOCUMENT: IDENTIFICATION, MONITORING AND EVALUATION OF ADDITIONALITY IN HABITAT BANKS

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ENVIRONMENTAL POLICY INNOVATION CENTER

A. Executive Summary

Additionality is a fundamental integrity principle of habitat banking and other biodiversity credit issuing projects and ensures that " [...] *credits can only be assigned to biodiversity outcomes that are attributable to the project intervention, and would not have otherwise happened*" (Biodiversity Credit Alliance). This means that the interventions and ecological uplift that result from the habitat bank would not have happened in the absence of the bank's creation and management and helps ensure that the investments in the project fulfill their objectives. Additionality has been a long-standing principle in other habitat banking programs in England and the U.S., and also in carbon mitigation markets.

Biodiversity markets supplied by habitat banks in Colombia include both a compensatory offset market and voluntary biodiversity credit developers. All habitat banks in Colombia must initially be approved for operation and credit sale through a two stage process; first the Ministry of Environment and Sustainable Development (MADS) approves banks creation and operation, and then the National Authority of Environmental Licences (Autoridad Nacional de Licencias Ambientales "ANLA") approves the use of bank credits for use in Compensation Plans for third parties' (credit buyers) environmental impact. These agencies have different priorities given their distinct regulatory competencies, and their interpretations of additionality vary accordingly, with MADS stressing holistic and effective preservation and restoration-oriented management, while ANLA stresses restoration activities such as tree planting on degraded lands in order to compensate impacts elsewhere. The duplicative approval process, along with the lack of specificity and transparency in each agency's understanding of additionality poses significant challenges to habitat bank operators.

This analysis seeks to clarify two contexts for the evaluation of additionality for habitat banks: First, the regulatory process of approval of the habitat bank itself. This context considers baseline conditions, bank creation outputs like management plans, and other evidence of good management and integrity principles that indicate the likelihood of the project being additional over time. This we will call *Approval Additionality* which is a task carried out by MADS in its application of Resolution 1051 of 2017. And secondly the process to evaluate the degree of uplift over time, i.e. performance relative to a baseline and counterfactual, carried out through measurement of the actual observed change in the site and fulfillment of management milestones, called *Outcome Additionality*. This latter stage is essential for verifying the integrity of compensation provided by habitat banks, and may be best suited for ANLA, through Resolution 256 of 2018. These two stages of evaluation may consider additionality differently for projects more focused on restoration vs. preservation, but the habitat banking market can benefit from regulatory certainty on how criteria are applied in both contexts.

Regulatory agencies must evaluate habitat banks quite early in their operation, but because biotic additionality is achieved over time, *credit release schedules* (concept to be detailed further in this document) can be a useful tool to link Approval and Outcome additionality to monitor performance over the long term. This is not current policy in Colombia but could be a useful recommendation to refine the existing policy where the 10-30% of credits may be withheld pending confirmation of performance thresholds or management milestones, drawing a clear connection between the outputs of habitat bank design and management with the outcomes of biotic additionality.

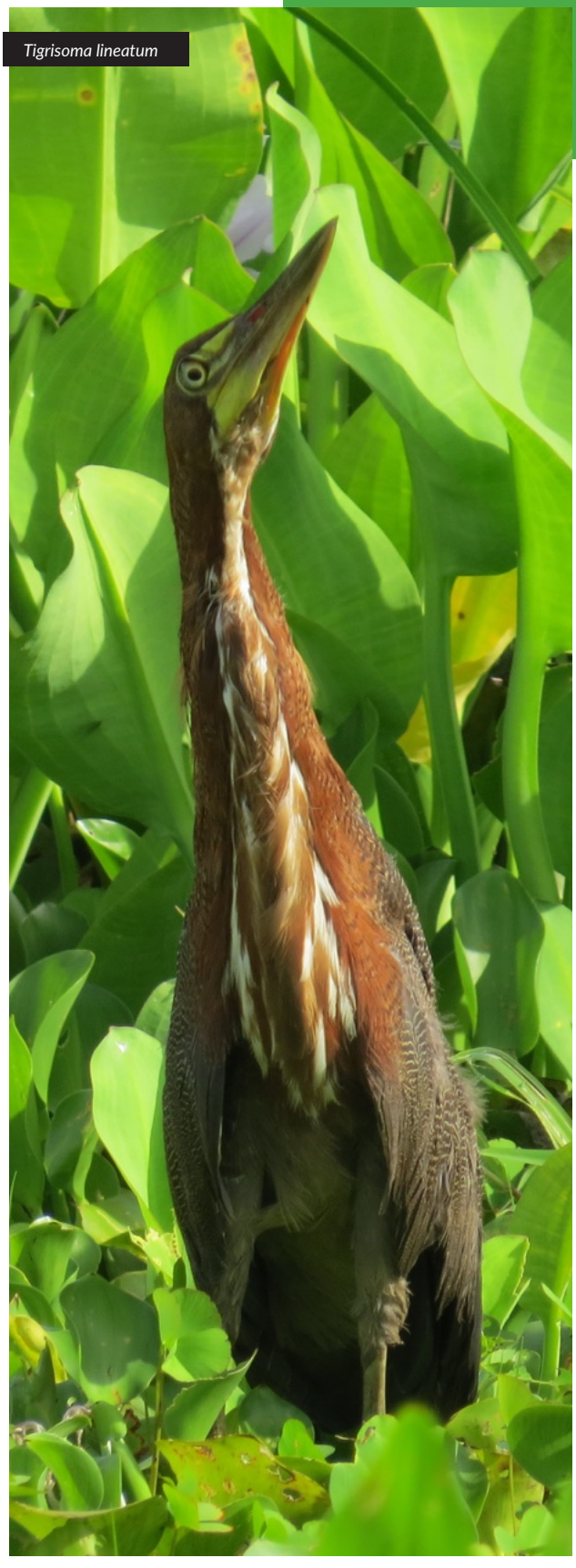
Colombia's habitat banking policy framework is a sophisticated approach to driving investment in ecological restoration and preservation, and further policy refinement holds great potential to improve market function and regulatory efficiency, and may be applicable, with adaptations, to broader contexts including privately managed natural reserves.

Included below is a proposed Methodology for the Evaluation of Additionality in Colombia'sHabitat Banks prepared by EPIC.

as well as a mandated 1% financial investment in environmental compensation in the same watershed where water is taken from natural sources under Decreto 2099 de 2016[4].

Terrasos also sells biodiversity credits within a voluntary biodiversity credit market where buyers in Colombia and abroad seeking to invest in biodiversity outcomes can purchase Terrasos's voluntary credits called *Tebus*, i.e. "Terrasos Biodiversity Units". These credits are created through Terrasos's own proprietary protocol[5] and like compliance credits, Tebus represents the uplift in biodiversity created by Terrasos's investment and management activities in the habitat bank. Despite the distinctions between the credit protocols and the use of these two kinds of credits (offsets called *cupos*, and voluntary credits called *Tebus*), both are generated from the same habitat banks with a largely unified management regime. However, the areas designated for Tebu and the regulated offset market do not overlap, ensuring that there is no double counting of biodiversity outcomes for either market within the habitat bank.

Habitat banking and other kinds of biodiversity-focused projects in both regulatory and voluntary markets should meet a minimum standard of practice to achieve high integrity and well-functioning markets[6]. These include integrity principles to ensure equivalent standards across projects in a market, measures to create project permanence, monitoring and enforcement mechanisms, and principles to ensure that projects are additional. Additionality is of prime importance to habitat banks' success in Colombia, and a core criterion for project approval by Colombian government agencies.



Tigrisoma lineatum

4. https://www.minambiente.gov.co/wp-content/uploads/2021/08/decreto-2099-de-2016.pdf

5. Protocolo para la Emisión de Créditos Voluntarios de Biodiversidad, 2022, Terrasos https://www.terrasos.co/wp-content/uploads/20-protocolo-para-la-emision-de-creditos-de-biodiversidad-voluntarios-beta-espanol.pdf

6. Principles for Better Biodiversity Credits, Nature Credit Working Group, 2024. https://www.policyinnovation.org/publications/biodiversity-credit-principles

C. The importance of additionality in habitat banking

According to the Biodiversity Credit Alliance:

> ***Additionality means a requirement that credits can only be assigned to biodiversity outcomes that are attributable to the project intervention and would not have otherwise happened.***[7]

For habitat banks, this means that the interventions and ecological uplift that result from habitat bank creation would not have happened in the absence of the bank's creation and management. While there are a number of interpretations and applications of additionality, the fundamental goal is to ensure the efficacy of the wide array of investments (financial, material, and labor) in the project towards fulfillment of their conservation objectives. Were these investments worthwhile, and did they achieve anything? Additionality requires that the conditions at the outset of a project and the efforts made to create a habitat bank are likely to result in positive changes that wouldn't otherwise have happened if the bank hadn't been created and managed. For biodiversity specifically, it requires that biodiversity improvements that have been recorded through monitoring over time are above and beyond what would have happened in the absence of the project, in dynamic ecosystems subject to the local climate, economy, government, and other factors.

Additionality in habitat banks is a specific application of the principle of *conservation effectiveness*, where the success of preservation and restoration projects carried out by governments and non-profit organizations have not been measured through profit and loss, but instead through the degree to which the conservation strategies achieved their intended outcomes. Analysts and academics have made great strides in evaluating the value of conservation interventions,[8] and have revealed an overall story of success despite the variability in outcomes. Building upon this legacy of innovation and evaluation of effectiveness, market-based efforts have become major centers of conservation and restoration investment, where success may be measured in similar terms, but is linked to for-profit entities. Here, similar goals of effectiveness come into play, but within a market context. When regulated well, market-based mechanisms can encourage the development of skilled communities of practice that create high quality outcomes for biodiversity and attract large scale investment beyond philanthropic and taxpayer funded work. In addition, allowing the private sector to provide conservation enables government to be in a more neutral evaluation, monitoring and enforcement role.

A notable example of the principle of additionality in action is in the United States, which maintains two large-scale biodiversity offset markets[9] to compensate for impacts to wetlands and streams, and to endangered

7. Biodiversity Credit Alliance (2024). Definition of a Biodiversity Credit. Issue paper. https://www.biodiversitycreditalliance.org/wp-content/uploads/2024/05/Definition-of-a-Biodiversity-Credit-Rev-220524.pdf

8. Penny F. Langhammer et al.,The positive impact of conservation action. Science 384, 453-458(2024). DOI:10.1126/science.adj6598

9. Wetland Mitigation and Endangered Species Habitat Banking, United States, Revenues for Nature Guidebook Series, 2024, Green Finance Institute https://hive.greenfinanceinstitute.com/wp-content/uploads/2024/10/R4N-GUIDEBOOKS-US-WETLANDS.pdf

Buteogallus meridionalis

are in principle fungible, biodiversity is inherently tied to a restricted geography and must be ecologically equivalent. Carbon can be commodified and bought and sold as such, while biodiversity markets must remain locally oriented and only used as offsets within that limited geography. This ecological and geographic link affects additionality as well, as biodiversity bank design and management must be integrated into that same landscape and its conservation strategies, rather than as with carbon projects which can in principle exist in isolation. The process of evaluating additionality in biodiversity projects like habitat banking is operating amidst this background and must take these market-oriented challenges into account both in its evaluation criteria, and its accommodation of risk and the perception of integrity that the process creates, while ensuring that the site's integrity is maintained for the long term. Preservation and restoration both have a role to play in habitat banks (and can be effectively integrated), and in many cases the scarcity or rarity of an ecosystem justifies its preservation. That said, the potential for excessive scrutiny of projects that are primarily preservation given their apparent similarity to "avoided deforestation" carbon projects suggests that projects that prioritize restoration may face more market acceptance at this current phase of market development.

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D. Defining additionality: Context and application of additionality in practice

a. Variability across formal standards of additionality in Colombia

Within the set of texts that make up the Colombian policy framework that regulate habitat banking and the use of bank credits (*cupos*) for compensatory offsets, there are multiple definitions of additionality. Among them:

- Resolution 1051 of 5 June 2017, which regulates Habitat Banking, offers the following:

  "Adicionalidad: Demostrar que los resultados de la implementación del Banco de Hábitat proporciona una nueva contribución a la preservación, recuperación, rehabilitación, y/o restauración, de la biodiversidad producto de su gestión."

  "Additonality: Demonstrate that the results of the implementation of the Habitat Bank provide a new contribution to the preservation, recovery, rehabilitation, and/or restoration of the biodiversity resulting from its management."

  which does not conflict with the BCA definition above.

- Resolution 0256 of 22 February 2018, which adopts the updated *Manual de Compensaciones Ambientales del Componente Biótico*, we find the following definition:

  "Adicionalidad: esta se da cuando los resultados de la compensación son adicionales a los que hubieran ocurrido en ausencia de la medida de compensación del proyecto, obra o actividad. Una compensación de biodiversidad debe proporcionar una nueva contribución a la conservación que es adicional a la que se habría producido sin la que tiene lugar en la compensación."

  "Additionality: This occurs when the results of the offset are additional to those that would have occurred in the absence of the offset measure of the project, work or activity. A biodiversity offset must provide a new contribution to conservation that is additional to what would have occurred without the offset taking place."

  which likewise largely aligns with BCA definition above and includes the element of the counterfactual more explicitly than Resolution 1051 of 2017.

In current practice, however, habitat banks must be approved through a two-stage process in order to transact credits for compensatory offsets. First MADS approves the habitat bank insofar as it has fulfilled the current criteria for habitat banks, including additionality (as MADS defines it) and other factors. And then the bank must seek approval from ANLA to use credits for a specified environmental impact that requires compensation on a hectare-for-hectare basis, again including a variety of criteria. Additionality is defined differently between the two somewhat duplicative stages of the approval process, however, reflecting the variability in the priorities of the two agencies. Despite the formal definition and prioritization of additionality in both agencies' policies, neither one has published or makes use of a standardized methodology to evaluate and/or measure additionality in habitat banks; this document and the proposed Methodology below (H. Additionality Evaluation) are in part an effort to suggest an approach that may provide a more practical approach to this task. Explicitly defined and published criteria would make compliance and evaluation

more straightforward, and shifting the currently duplicative approval process at bank inception to a more efficient alignment with agency priorities through a single approval phase via MADS, and an outcome-oriented performance stage later on via ANLA would greatly enhance the supply and implementation of compensatory habitat credits. This process could even be applied to other compensation mechanisms associated with private nature reserves.

Outside of the regulatory processes above, Terrasos currently uses a series of binary conditions to evaluate additionality for the issuance of voluntary biodiversity credits, outlined in its Protocol for the Issuance of Voluntary Biodiversity Units[14] that include gains in areas preserved and/or restored, avoiding losses in biodiversity, and barrier analyses:

Table 1. Additional conditions: Analysis of barriers affecting biodiversity gains.

Criterion of additionality	Applies (Yes/No; justification)*
1. It generates additional profits in terms of preserved and/or restored areas.	
2. It helps to prevent biodiversity losses.	
3. It reduces investment barriers (e.g. lack of financial resources) to maintain interest in ecosystems with a high degree of conservation.	
4. It reduces institutional barriers (e.g. restriction by policies and laws, institutional risks, lack of law enforcement).	
5. It reduces technological barriers (e.g. access to information, lack of training and knowledge in information technologies, lack of technological infrastructure).	
6. It reduces barriers related to local traditions (as opposed to local knowledge or cultural traditions).	
7. It reduces barriers related to prevailing practices ("the project is the first of its kind in the region").	
8. It reduces environmental barriers (e.g. degraded soils, extreme events, limitations due to adverse climatic events).	
9. It reduces social barriers (demographic pressure, social conflicts, lack of organization at the local level).	
10. It reduces barriers to tenure and property rights.	
11. It improves functional connectivity for key species within the ecosystem.	

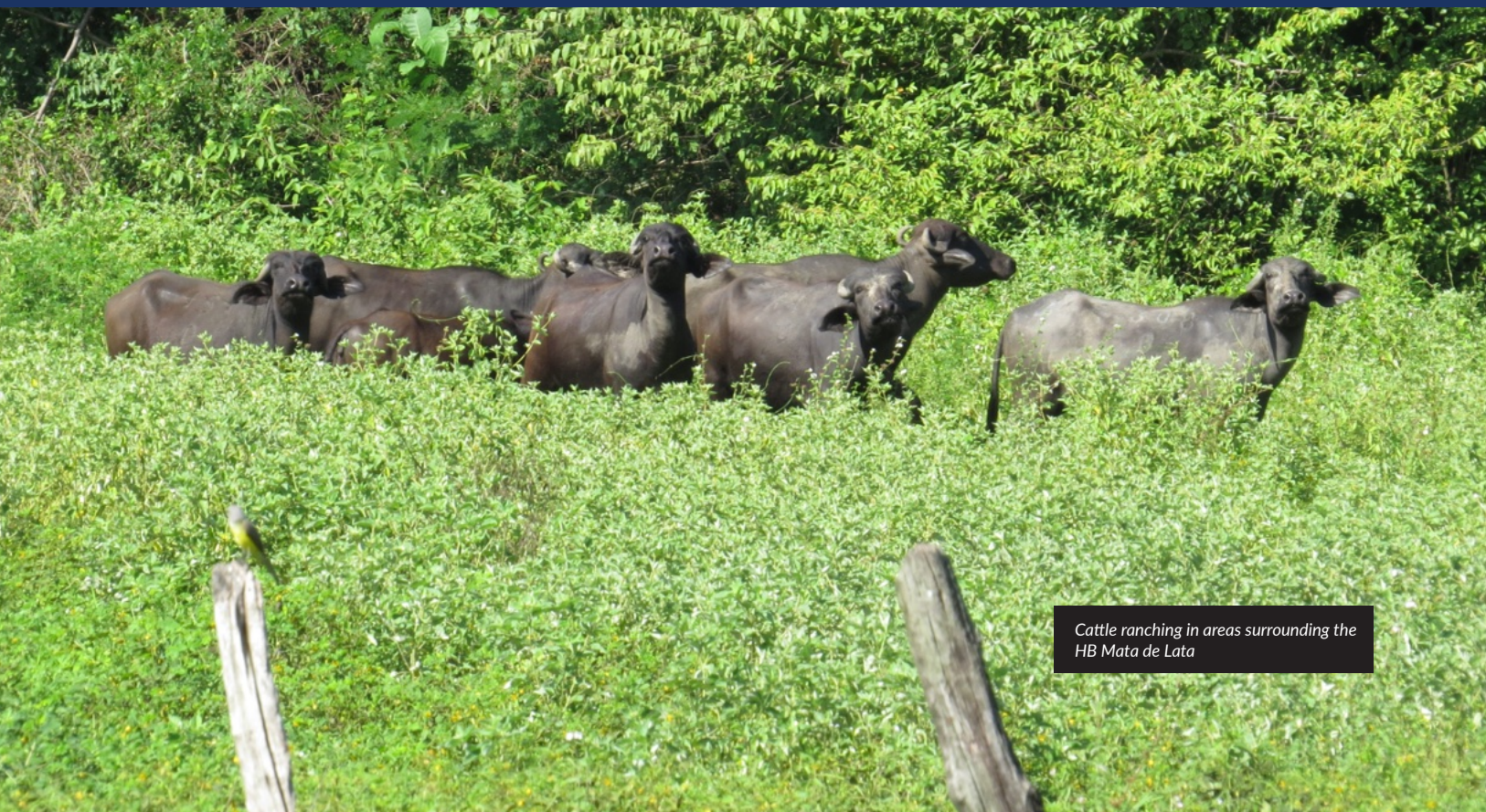
Note: * For each project, it is necessary to analyze which additionality criteria apply to its specific context and justify the mechanisms or actions that will allow each barrier to be overcome. the table should serve as an example; projects can add or remove criteria depending on the context and particularities of the ecosystem being targeted for preservation and/or restoration. **Projects using thos Protocol must justify at least seven (7) additionality and three (3) complementary criteria.**

14. Protocol for the Issuance of Voluntary Biodiversity Units, Version 3.0, 2022. Terrasos https://www.terrasos.co/wp-content/uploads/20-protocolo-para-la-emision-de-creditos-de-biodiversidad-voluntarios-beta-espanol.pdf

Establishment of methodologies for collecting information on fauna

Despite the general consensus on the concept of additionality and its importance, specific indicators must be applied with the social, economic, political, and ecological context of the project in question, and these cannot be considered in isolation from the policy and practice of a given governance framework or market protocol. What might be considered additional in one country or market might not be elsewhere, but all contexts require specificity and transparency that reflects that context. And because the regulatory or verification entity (a government agency or third-party auditor in a voluntary market) is fulfilling a distinct function based in law or formalized protocol, additionality must be understood in the context of the *purpose of that function*. While a generic, broadly applicable definition (like BCA's above) makes note of "biodiversity outcomes," little or no actual biodiversity gains are evident in real terms when a bank is early in its development; these outcomes will only come about and be feasible to evaluate over the longer term, typically years. But the task at hand for many evaluations of additionality in Colombia's markets and similar examples elsewhere is during this initial phase of development when banks must be approved or rejected. This process evaluates banks for quality, integrity, and compliance with the rules, whether formal government-designed regulations or voluntary market methodological and verification protocols. Once approved, it is common to refer to a project as being "additional", but a strict, outcomes-oriented definition would consider an approved bank that is compliant with additionality criteria to be deemed only *likely to be additional over time* as its management and development progress and generate biotic outcomes.

With that distinction in mind, this document considers two primary goals of evaluation, which are often confused and conflated in practice, and the variables and indicators we recommend below are categorized accordingly. The additionality evaluation method below is intended to analyze habitat banks in Colombia as as a two-step process: (1) whether the *establishment* of the habitat bank is additional to the status quo of the landscape in which it is located and the bank merits approval by regulatory authorities; this will be referred to as "*Approval Additionality*". This step is mostly aligned with the regulatory role of MADS in executing Resolution 1051. And step (2) whether the habitat bank's performance over time does indeed provide ecological uplift that is greater than what would have occurred on the site in the absence of preservation and/or restoration interventions; this is referred to as "*Outcome Additionality*". Because this analysis is so relevant to the use of credits for compensatory offsets, ANLA's regulatory role in carrying out Resolution 256 accords well with this step in the process.



Cattle ranching in areas surrounding the HB Mata de Lata

1.

Approval Additionality: To approve or validate a newly created project site as compliant with standards and regulations in order to allow the site to generate and sell credits and operate in the market. Additionality in this context is a series of indicator-based criteria that contribute to a higher likelihood of biotic additionality over time. Under current practice, Colombia's regulatory agencies (the Ministry of Environment and Sustainable Development, *MADS*, and the National Authority of Environmental Licences *ANLA*) must consider a proposed project site and whether or not it meets the regulatory standards as required by Colombian law and formal guidance, and this results in *two approval processes*, one for each agency. MADS considers habitat banks based on conservation management areas. ANLA considers banks from the more specific perspective of compensation and evaluates additionality regarding a proposed *Compensation Plan* that considers the validity of using habitat bank credits to offset a specific case of environmental impact (see below). The consequence of this is that ANLAs criteria differs from MADS as it is focussing on the no net loss requirement of the entity that has to compensate. Consequently, ANLA could ask for additional informational requirements or deny the use of the bank for compensation purposes claiming that, contrary to what MADS has already approved, thus creating uncertainty for landowners, potential investors, and other interested parties and ultimately disincentivising the creation of habitat banks for compensatory purposes, or worse, creating perverse incentives to degrade land for the sake of ANLAs aproval.

These requirements must anticipate risks and barriers to effective performance and long-term execution of the site's management plan, but by definition this process of approval of the bank for use in compensation must occur at the beginning of a decades-long stewardship and management process. While the long-term viability and effectiveness of the bank in fulfilling its intended compensatory purpose is critical to an effective system, neither ANLA nor bank developers can delay approval for 10 or 20 years while the bank's management in practice is verified. The approval process may consider the land use history and the current condition of the site to guard against perverse incentives e.g. potentially lucrative credit sales without investing in long term management of the site. But because a bank cannot operate without formal regulatory approval, neither the implementation and measurement of the site relative to a baseline or counterfactual *over time*, nor the ecological response of the site's biodiversity can be carried out (yet). And while safeguards, insurance, buffer pools, and other mechanisms can guard against project failure going forward, and additionality in practice and outcome (see below) cannot yet be definitively determined, governments should nonetheless facilitate through their approval process a fixed point in time after which a project is considered additional and can operate in the market.

While current practice involves a two stage *approval* process through both MADS and ANLA (to be clear, distinct from the two stages proposed here), MADS may be most effective in fully evaluating the bank site and project management at the baseline level in a single step, which aligns with their current role in analysis and oversight of banks, private reserves, and protected areas as part of a holistic national biodiversity strategy.

2.

Outcome Additionality: To evaluate the degree of uplift over time, i.e. performance relative to a baseline and counterfactual. This is carried out through periodic monitoring and ensures a long-term standard of quality over the life of the project and measures the actual observed change in the site. This change can then be compared to the baseline measurements of the project site, and where appropriate also compared to the surrounding landscape and neighboring properties to consider the effectiveness of the project's stewardship compared to non-project areas in the same ecosystem[15]. Unlike the integrity principles, management criteria, and other aspects of a crediting protocol that indicate the *likelihood* of a project being additional relative to a proposed counterfactual (as in (1) above), this aspect of additionality involves actual measurement over time as basis for evaluation, even if the counterfactual scenario for the site itself is by definition unobservable. Depending on the crediting protocol used (outside of the narrow application in Colombia's regulatory framework where this is not incorporated into current law), this can also be a means to incentivize and confirm the release of more credits from the same hectares previously approved, or through additional credit releases from other areas of the same project when credits are tied to specific hectares, as they are in Colombia's voluntary credits market.

See Section F below for more discussion on how incentives and credit release schedules may be effectively designed to balance project viability (especially in financing) with market integrity.

One aspect of this measured-over-time additionality is that even well executed projects may not be able to provide evidence of uplift over some moderate time scales given the variability of ecological time and response[16]. Deserts, boreal forests, or other slow-changing habitats may take decades to respond ecologically to management interventions, and in these cases it may be appropriate to base credit issuance on management outcomes - at least in part - rather than measured ex-post biodiversity uplift. In this context, as with (1) above, the biotic additionality is assessed based on defined and verifiable activities that correlate with, and are likely to lead to biotic uplift, even if those activities are not direct evidence of biotic uplift having already occurred. While many tropical ecosystems are assumed to be faster to respond ecologically, developers and regulators should approach bank design and management with this potential variability of action-response time in mind.

Current practice in this area of additionality analysis has not been approached in this systematic evaluation context of performance over time, but ANLA is particularly well suited to this task given its mandate to ensure the full implementation of ecological compensation for environmental permittees through Resolution 256 and aligns with the definition of additionality posed by the *Manual de Compensaciones del Componente Biótico*[17] (see below).

15. Comparisons with the surrounding landscape are not current practice in the U.S. habitat banking system but are used in some carbon projects - especially avoided deforestation - as a kind of experimental control, though in practice this is technically difficult, and especially so with biodiversity credit projects that must use a wider set of analytical techniques beyond remote sensing analyses.

16. See page 17, Biodiversity Credit Alliance (2024). Definition of a Biodiversity Credit. Issue paper. https://www.biodiversitycreditalliance.org/wp-content/uploads/2024/05/Definition-of-a-Biodiversity-Credit-Rev-220524.pdf

17. Manual de Compensaciones del Componente Biótico, https://archivo.minambiente.gov.co/index.php/bosques-biodiversidad-y-servicios-ecosistematicos/estrategia-nacional-de-compensaciones-ambientales/manual-de-compensaciones-del-componente-biotico.

A third context to consider when evaluating additionality is with respect to another site requiring compensation due to anticipated or already incurred impacts. In this context, credits issued from the project site are directly compared to impacted sites as offsets, and this scenario is important in Colombia where ANLA considers formal *compensation plans* on a hectare-for-hectare basis between impacts and uplift. However, this document is oriented towards the additionality of habitat banks and their own qualities, where comparative elements are oriented relative to a bank's own baseline and counterfactual scenarios, and this may be applicable to regulatory processes for private reserves registered as protected areas. Evaluation based on comparisons to sites requiring compensation may entail a *no net loss* analysis whereby if a bank is considered insufficient to meet this goal, then the agency can ask for additional compensation measures, rather than withdrawing the prior approval of the habitat bank by MADS. It is worth noting that in peer countries' markets (US and UK), both impacts and offsets are evaluated and measured against neutral standards - accounting for ecological equivalency - rather than against each other in a direct comparison of the habitat bank with the impacted site (I.e. the site generating compensatory credits compared to the site requiring compensation). This standardization is one of many factors that make for a more effective and dynamic market. This aspect of comparative additionality between the impacted site and the habitat bank used as an offset is, however, beyond the scope of this analysis.

Finally, the importance of incentive structures in policy frameworks must be taken into account in defining additionality evaluation methods. This is especially true with (1) Approval Additionality above where a determination must be made regarding additionality as part of project approval such that the project can proceed with its operations and ultimately, transactions to generate revenue. While strict adherence to a policy framework and approval criteria is essential for the proper operation of the market, maturing compensatory frameworks (as in Colombia) must not be regulated so onerously such as to inhibit market entrants, or create regulatory criteria so narrow that even advanced developers struggle to fulfill them. Governments should recognize and facilitate efforts to develop high integrity projects without undue restrictions in order to build up a stock of credits. This is even more true in the early years of market development where supply can be limited due to limited capacity and financing, as is the case with Colombia where only a handful of companies have created habitat banks[18], and where the balance of unfulfilled environmental obligations - the potential demand - totals more than 500 M USD[19]. However, the main idea behind the creation of Habitat Banks was to solve a policy and implementation problem, not just generate business. Therefore, if it is too complex, the problem of non-compensation policy will persist.

18. Habitat Banks, Colombia, Revenues for Nature Guidebook Series, 2024, Green Finance Institute https://hive.greenfinanceinstitute.com/wp-content/uploads/2024/10/R4N-GUIDEBOOKS-COLOMBIA-HABITAT-1.pdf

19. PNUD-BIOFIN.(2024). Bancos de Hábitat en Colombia: su evolución y su manejo contable y tributario.

Panoramic view of HB Mata de Lata

E. Policy Context and Opportunities in Colombia

a. Ministry of Environment and Sustainable Development

Colombia's Ministry of Environment and Sustainable Development (MADS) is tasked with managing the recovery, conservation, protection, territorial zoning, management, utilization of renewable natural resources (including biodiversity), and protected areas, and plays a key role in the approval of habitat banks. MADS's policy focus is based on Resolution 1051, Article 3, which regulates conditions for the creation of habitat banks. The priorities under Article 3 are *additionality* (as above), *complementarity* (with other environmental planning and management efforts at the regional and national level), *sustainability and permanence* to ensure long term maintenance of preservation, restoration, and sustainable use, *payment for performance*, and *knowledge management*. MADS sees habitat banks as useful additions to the existing range of conservation efforts in Colombia, and complementary to the country's National Protected Areas System (SINAP).

Approved banks are entered into the Registry of Ecosystems and Environmental Areas (REAA), part of SINAP, which designates them formally for conservation oriented land use, if not necessarily through formal gazetting like a national park. As such, the protection of the site is of high priority, along with the suite of management activities typically required, i.e. evaluation of environmental stressors ("), addressing local economic activity that impacts biodiversity and developing alternatives, environmental awareness and economic well being of the local community, and so on. Among MADS's goals are to achieve " loss through the use of the bank for compensation[20], and to align the means to do that with existing regional and national efforts in order to create complementarity between different conservation strategies. Additionality by MADS is viewed in the sense that the bank's establishment and management must represent a *new contribution* to previous efforts which include restoration and preservation strategies to ensure landscape connectivity and functionality in the long-term.

20. Manual de Compensaciones de Compensaciones del Componente Biótico, https://archivo.minambiente.gov.co/index.php/bosques-biodiversidad-y-servicios-ecosistematicos/estrategia-nacional-de-compensaciones-ambientales/manual-de-compensaciones-del-componente-biotico

Livestock Production

b. National Environmental Licensing Authority

In contrast to MADS, the National Environmental Licensing Authority (ANLA) is oriented by its role in assessing environmental impact and ensuring that environmental management plans that avoid, minimize, restore and compensate impact are duly implemented, ANLA operates this regulation forms including compensation. In this regard, we identified a certain predisposition to accept conservation actions over those aimed at restoration, reflected in a request for more detailed information to justify the importance of conservation in certain areas.

Given the country's immense biodiversity, detailed compensation factors[21] are used to account for a habitat's representativeness, rarity, remaining habitat, and rate of loss. When impacts are assessed and a license is issued, ANLA seeks to offset that impact with an appropriate degree of ecological equivalence. This includes specific requirements for habitat type, credit amount, activities that will offset the impact (e.g., preservation or restoration), and location, typically within the same watershed. Habitat banks are one option for meeting this obligation (along with support for private reserves, conservation agreements, contributions to environmental funds, etc.) and must meet requirements to qualify as offsets, as assessed by ANLA. While ANLA takes into consideration the overall management of the bank and the balance between restoration and preservation, we found that there is a noted preference for restoration over preservation actions, with greater emphasis placed on management actions such as restoration-oriented tree planting, which is seen more favorably as a proactive and clearly demonstrated investment in the site.

Habitat Bank delimitation

This is reflected in the creation of a greater number of specific requirements for preservation actions, in terms of demonstrating their additionality. However, these are based on satellite-based analyses, which may overlook the on-the-ground reality of the proposed offset site which is more evident at smaller scales.

21. https://www.minambiente.gov.co/documento-entidad/anexo-2-listado-factores-de-compensacion/

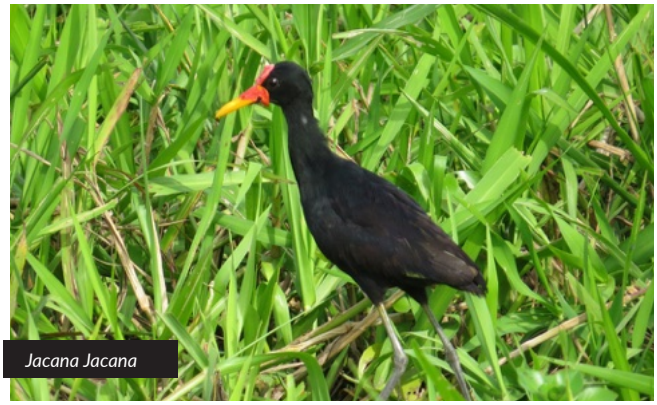
c. Dynamics of preservation vs restoration and implications for additionality

Given the differences in definition and approval criteria for additionality between MADS and ANLA (which can sometimes be reflected in a greater preference for restoration versus preservation by ANLA), we find that habitat banks and their management strategies successfully generate positive impacts on biodiversity in an integrated and holistic manner without limiting those improvements exclusively to a specific number of hectares that are designated as preservation or restoration. A typical bank is likely to be a mosaic of areas with different degrees of ecological intactness or degradation; such mosaics are quite commonly the dominant land use pattern in Latin America where extensive cattle production is carried out in forested regions. The determination of which areas in a given bank are designated as "preservation" or "restoration" is the product of a site-specific evaluation of the socioeconomic, physical, and biological components of the site that are assessed in the management plan, but do make use of some consistent criteria including remote sensing based land cover classification techniques.[22] This tendency to create banks out of mosaics, and integrate restoration and preservation in the same management plan is somewhat similar to habitat banking in the U.S. (though more formally "zoned" hectare-by-hectare in Colombia), and to some voluntary biodiversity credits, but quite different from carbon credit projects which may be wholly considered restoration or preservation.

While this mosaic approach is generally acceptable to MADS and ANLA, challenges have arisen over the relative proportion of each in a given project, especially when compensation plans may only include a portion of the available credits and require hectare-scale specificity for which credits are to be used for a given compensation plan. And because there is no single objective threshold to designate a hectare as suitable for restoration or preservation, the degree of ecological intactness - e.g. forest regrowth - may be considered too advanced in some areas to be acceptable as restoration. Where this creates challenging dynamics for bank operators or overall market operation, it may be useful to consider alternative policies more similar to England or the U.S., where credits in approved banks are largely fungible and not specified on a hectare basis for compensation. This avoids scrutiny related to the degree of degradation or intactness (and the implied additionality) on any one hectare, provided that the bank as a whole meets approval criteria for ecological equivalency (the same habitat type and geography - such as a watershed - and other measures of ecosystem structure, function, and resource provision).[23]

22. CORINE Land Cover Analysis, IDEAM http://www.ideam.gov.co/web/ecosistemas/metodologia-corine-land-cover

23. Wetland Mitigation and Endangered Species Habitat Banking, United States, Revenues for Nature Guidebook Series, 2024, Green Finance Institute https://hive.



Jacana Jacana

Nyctidromus albicollis

d. Lessons Learned from policy refinement in other markets

While there are relatively few examples of analogous biodiversity offset systems in other countries, the history of their development is instructive. England has not yet reached a full year since the launch of its Biodiversity Net Gain Policy (BNG) in early 2024 but has been piloting it for a decade[25]. Perhaps the most ambitious biodiversity offset and habitat banking policy in the world, BNG requires the full offsetting of significant biodiversity with a 10% net gain[26]. The policy has its origins in UK and EU legislation going back decades[27], with its current framework built upon Schedule 7A of the Town and Country Planning Act 1990 (inserted by the Environment Act 2021)[28], and the current metric began testing over a decade ago. Additionality policy in practice continues to be refined and has focused on whether efforts towards compliance with existing regulation[29] (nutrient reductions, species protection, among others) should be eligible to count towards BNG.

25. https://www.gov.uk/government/collections/biodiversity-net-gain

26. Biodiversity Net Gain, England, Revenues for Nature Guidebook Series, 2024, Green Finance Institute https://hive.greenfinanceinstitute.com/wp-content/uploads/2024/10/R4N-GUIDEBOOK-BNG-ENGLAND.pdf

27. Patel, M. Biodiversity Net Gain: Understanding the Most Ambitious Biodiversity Policy in the World, 2023. Environmental Policy Innovation Center https://www.policyinnovation.org/publications/biodiversity-net-gainnbspunderstanding-the-most-ambitiousbiodiversity-policy-in-the-worldnbsp

28. https://www.legislation.gov.uk/ukpga/2021/30/schedule/14/enacted

29. What you can count towards a development's biodiversity net gain - GOV.UK https://www.gov.uk/guidance/what-you-can-count-towards-a-developments-biodiversity-net-gain-bng

The United States Wetland Mitigation and Endangered Species Habitat Banking markets are the largest and most well established in the world and likewise are built upon legislative and policy frameworks over decades[30]. The Clean Water Act (CWA) of 1972 (Section 404) and the Endangered Species Act (ESA) of 1973 (Sections 7 and 10) set the stage for the protection of water and biodiversity, and only later did the full structures of compensatory offsets and habitat banks take form, with "no net loss" rules coming into effect only in 1990 and 2023, respectively. Additionality as a technical term had not previously been formally defined in these markets, though there have long been strong parallel policy structures to ensure that habitat banks are indeed created and managed to create additional outcomes, including legal instruments for site protection, financial assurance, measurement of a baseline and the determination of units of measurement, adherence to performance standards and monitoring requirements, and explicit plans for the compensatory work to be carried out through long-term, and adaptive management of the site. In 2023, the U.S. Fish & Wildlife Service defined[31] additionality as "*...when the benefits of the measure improve on the baseline conditions of the site that is compensating for the impacted resources and their values, services, and functions in a manner that is demonstrably new and would not have occurred at the compensatory mitigation site without the measure.*" (Definition similar to that of MADS in the Colombian case) The CWA's 2008 Rule[32] doesn't explicitly define additionality but does so "in spirit[33]", stressing the "'*no net loss' of wetland acreage and function.*"

By comparison, Colombia's policy frameworks have developed at a rapid and ambitious pace and are likely to mirror these England and U.S. examples of legislative evolution, policy harmonization, and refinement of frameworks over time. While Colombia's environmental compensation framework preceded the formal guidance for habitat banking and had not initially included habitat banking as a recognized means to compensate impacts, there is an excellent opportunity for learning and improvement of critical integrity principles like additionality. The experience of other markets shows that an iterative process of implementation, analysis, and refinement through legislation and policy adjustments can create meaningful improvement, despite the many challenges in early market development.

31. U.S. Fish & Wildlife Service Mitigation Policy (Appendix 1, 501 FW 2) https://www.fws.gov/policy-library/A1501fw2

32. Compensatory Mitigation for Losses of Aquatic Resources under CWA Section 404 (Final Rule) https://www.epa.gov/cwa-404/compensatory-mitigation-losses-aquatic-resources-under-cwa-section-404-final-rule

33. Madsen, Becca. 2024 https://www.policyinnovation.org/blog/why-offsets-on-public-lands-is-a-bad-idea Environmental Policy Innovation Center.

F. Linking Outputs and Outcomes with Incentive Structures

a. The right balance of regulation and market function

In Colombia and other countries' habitat banking policies, it is essential to develop regulatory requirements and incentives that facilitate the functioning of the market, and this is no less true when evaluating additionality. Bank operators and their investors benefit from clear criteria and streamlined regulatory processes. This is true in Colombia as in the rest of the world where the private sector tends to advocate for a lower regulatory burden, but participants in habitat banking, private nature reserves, and other environmental investments also tend to recognize the necessity of maintaining rigor and integrity standards, in order to prevent good projects being undercut in the market by low quality alternatives that have not fulfilled integrity principles or standards of good management, with additionality being a central principle.

The question then is how to balance the prerogatives of bank creation and operation - a capital intensive and long-term investment - with the need to uphold these high standards, evaluate the likelihood of additionality at bank creation and throughout the long term management of the bank. Financing is a perennial challenge, as a great deal of the cost of a bank is front loaded, but demonstrating that additionality has materialized (when understood as the outcomes of biotic additionality compared to baseline or counterfactual) takes decades. The earlier that credits are released, the more likely it is that bank operators can generate revenue through credit sales and can recoup their investment, and the *timing* of revenue[34] is quite important in its own right. A credit sold now is fundamentally worth more than a credit sold 25 years from now to a bank operator. Habitat banking and similar markets like carbon credits have approached this dilemma from different perspectives, seeking to balance regulatory rigor and market viability, where a compromise is sought between ideal policies that support fully ex-post crediting (with credits released after outcomes are fully evidenced) and those that are financially preferable to operators (credits released fully at project approval).

34. Edinger, Grace. 2024 A Balancing Act: Optimizing Payment Schedules in Environmental Pay for Success Contracts Environmental Policy Innovation Center.

Current policy implementation in Colombia might pose difficulties for this approach, given that hectares are not fungible within a bank when used for compensation, so the release of some credits poses the question of *which* hectares. This would require clarification on behalf of MADS to allow for this fungibility, but it could be a highly effective policy refinement.

Nonetheless, the following are some examples of how this balance is addressed:

- Colombia's offset system provides for rigorous approval of bank criteria - including additionality - at bank creation, but once a bank is approved, the total number of *cupos* that the bank is able to produce are 100% available for use in compensation of environmental obligations. Long term performance and its measurement is not directly tied to credit release or sale. Interestingly, Resolution 1051, Article 3, through which MADS defines the enabling conditions for habitat banking, includes "*Payment for Performance*" among the top line criteria, which includes "*measurable and demonstrable conservation gains in terms of fulfilment of management and impact milestones, oriented towards improvement in the conditions of the ecosystems, biodiversity, and ecosystem services contrasted with the reference baseline, whose performance results determine the conditions for an agreement between the habitat bank and a third party and/or holder of environmental obligations*." However, as previously mentioned, due to the Colombian context this could be a complex process, as the approval of each credit release would imply an additional level of review by the environmental authority, which may also be complex given the two stages of banking review through MADS and ANLA.

- In the U.S., Wetland Mitigation and Endangered Species Markets, "credit release schedules" are formally used to balance the need for earlier credit sales with performance milestones, i.e. the demonstration of additionality. These milestones are not wholly tied to ecological measurements, e.g. an easement that ensures long term site protection (essential for additionality) may merit a certain percentage of credits being released. Typically a US bank allows 80-90 percent of credits to be sold within 5 years, but the remaining credits can only be sold if there is evidence that the bank is working as intended and the bank operator is carrying out the anticipated management and complying with other regulations and milestones. Recently released guidance[37] from the U.S. Army Corps of Engineers (the designated regulatory agency) explicitly addresses the degree of importance that project design should matter for bank approval, noting "*Because ecosystem development processes are often highly variable and unpredictable, a mitigation work plan with a 60% level of design detail should be sufficient to cover the basic tasks for constructing the mitigation bank project, and for the Corps' decision on whether to approve or disapprove the mitigation plan for the mitigation banking instrument." In no uncertain terms "credit release review and approval process for mitigation banks is the primary risk management tool."*

- Carbon markets - both regulatory and voluntary - have been plagued by the perception (often well founded) of a lack of additionality in some projects, due to selection of project sites where far less change would have occurred to the forest carbon on the site regardless of the bank's creation, as well as faulty project approval mechanisms, and faulty performance. Risk can be partly mitigated by ex-post crediting, but losses of carbon stocks may occur and retroactively negate additional outcomes (due to forest fires, e.g.). Buffer pools[38] may be used, where a certain percentage of credits may be held back for sale by the carbon registry as an insurance mechanism. In some cases, the balance between more secure pay-for-performance, evidence-based ex-post crediting and financial viability is worked out with long term forward contracts or offtake agreements that allow a project to release credits at defined intervals tied to monitoring (perhaps every 5 years) over the life of the project, but be paid up front, or operate with a secure long term contract.

- Terrasos also sells credits (called "tebus") through its own voluntary protocol, and here there is a defined link between outcomes and credit release in tranches of 20%. They use a defined set of milestones that include both management actions and also ecological performance, but this "credit release scheme" does not require defined time intervals and so may be achieved earlier provided that milestones are reached.

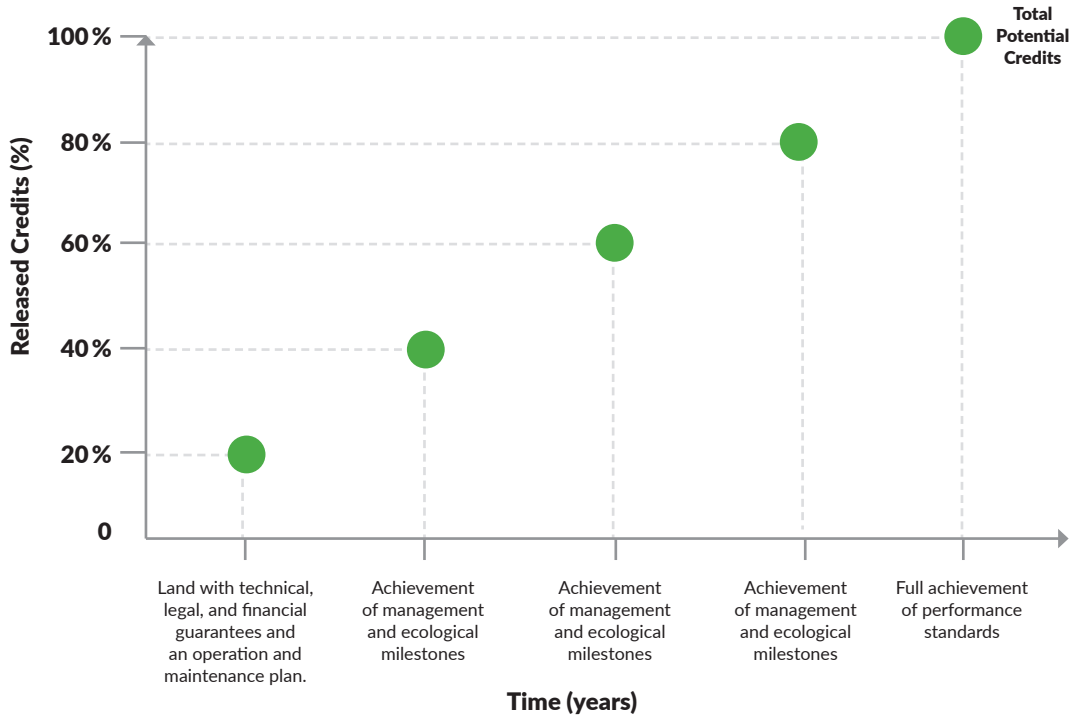
37. Madsen, B. New Corps Memos on Timelines for Reviewing Mitigation Banks are a Game-Changer, 2024, Environmental Policy Innovation Center, https://www.policyinnovation.org/blog/new-corps-memos-on-timelines-for-reviewing-mitigation-banks-are-a-game-changer

38. Guide to Carbon Credit Buffer Pools, Sylvera. https://www.sylvera.com/blog/carbon-credit-buffer-pools

This system is similar to U.S. regulatory markets by withholding the release of *some* credits in order to verify performance - and likewise additionality is confirmed over time rather than simply confirmed at the bank's creation before biological outcomes have been achieved. See the figure below ("Figure 9" in the original) from the Protocol below[39]:

39. Protocol for the Issuance of Voluntary Biodiversity Units, Version 3.0, 2022. Terrasos https://www.terrasos.co/wp-content/uploads/20-protocolo-para-la-emision-de-creditos-de-biodiversidad-voluntarios-beta-espanol.pdf

Figure 1. Voluntary Biodiversity Units Release Scheme.



Terrasos personnel at the Mata de Lata HB at the Cesar, Colombia.

G. Notes on Evaluation Methodology

a. Relevant source material

In preparation for this document and the Evaluation Methodology (H. Additionality Evaluation) developed by the Environmental Policy Innovation Center (EPIC), a number of resources were consulted to consolidate best practice and policy approaches towards additionality as applied to habitat banking, and by extension, to biodiversity-focused crediting projects. Beyond the current regulatory frameworks in use by MADS and ANLA as detailed above, the principal bodies of work include:

- **U.S. Wetland Mitigation and Habitat Banking:** As detailed in Section E(d) above, policy guidance and practice has evolved over time, and only recently explicitly incorporated additionality into policy in endangered species banks. Nonetheless both markets in the U.S. have developed a standard of practice over the last three decades that support restoration and preservation outcomes that would not otherwise have occurred. In particular, these markets were in part the model for Colombia's habitat banking policy framework and are the closest direct analogue to Colombian policy.
- **Voluntary biodiversity credit methodologies:** A number of methodologies have been drafted over the last few years and are all in the early stages of use, with Terrasos's Protocol (detailed above) prominent among them. Others consulted included the Plan Vivo Biodiversity Standard (PV Nature)[40], which includes a Baseline Scenario and Additionality Assessment Tool, as well as the Verra SD Vista Nature Framework[41].
- **Principles for Better Biodiversity Credits**[42], a recent publication by EPIC developed by a working group of likeminded restoration businesses, NGOs, investors, and other thoughtful advocates to define a set of core principles and practices to improve the effectiveness of biodiversity investment, help credit-supplying businesses grow to meet demand, and to inform participation in global discussions and policy development around regulatory, disclosure-related, and purely voluntary biodiversity credits. These principles promote clarity in additionality and related integrity criteria that were relevant to the Evaluation.
- **The Biodiversity Credit Alliance's Definition of a Biodiversity Credit**[43]: This work, which was edited in part by EPIC and Terrasos, defines and explains additionality, but declines to provide more definitive guidance. The set of issues outlined in the "Issues for further discussion" reveal some of the ongoing debates among biodiversity credit market participants and stakeholders around how additionality is defined.

40. Plan Vivo Biodiversity Standard, Version 1.0, 2024 https://www.planvivo.org/pv-nature-documentation

41. Verra SD Vista Nature Framework, Version 1.0, 2024. https://verra.org/wp-content/uploads/2024/10/SD-VISta-Nature-Framework-v1.0.pdf

42. Principles for Better Biodiversity Credits, Nature Credit Working Group, 2024. https://www.policyinnovation.org/publications/biodiversity-credit-principles

43. Definition of a Biodiversity Credit, Issue Paper No. 3, 2024, https://www.biodiversitycreditalliance.org/wp-content/uploads/2024/05/Definition-of-a-Biodiversity-Credit-Rev-220524.pdf

- Finally, **current policy and practice in carbon credit markets** was considered given the generally acknowledged importance of additionality to credit market integrity, but also the recognized difficulty these markets have encountered in establishing definitive methods for evaluation.

b. The role of social factors in additionality and other elements related to biotic outcomes

Biological conservation has a long history of success in maintaining species, intact ecological systems, and the services they provide, but scrutiny has grown in recent decades of the history of exclusionary land acquisition and other failures to recognize the land and resource rights of local communities, particularly those of indigenous peoples[44]. The Biodiversity Credit Alliance includes among its working groups the Communities Advisory Panel[45] in order to ensure adequate representation of Indigenous Peoples and local communities in its operations, standards, and agenda setting.

In this context, and with the growing body of practice of conservation and carbon markets, more expansive concepts of additionality have been promoted, including "social additionality" to encompass the participation, inclusion, economic well being, and consent of communities, among other principles, in project design and management. These rest on both core ethical standards and good conservation practice. Applied to habitat banking, there is some ambiguity between upholding these standards and practices, and how social outcomes are understood to be core elements of project "additionality". While good project design and management does indeed overlap with criteria for additionality given that additional outcomes are contingent on the overall success of the project, the Evaluation Methodology detailed below does not explicitly include social additionality or other concepts of additionality in its indicators, beyond where the barrier analyses involve social and cultural elements, or where distinctions in policy and law (like land tenure) may pose distinct challenges for operating on Indigenous, Afro-Colombian, or other communities' lands.

44. Colchester, Marcus. "Conservation policy and indigenous peoples." Environmental science & policy 7.3 (2004): 145-153..

45. Communities Advisory Panel, Biodiversity Credit Alliance https://www.biodiversitycreditalliance.org/cap/

The core purpose of habitat banking, like biodiversity credits, is to create *biological outcomes*, rather than attempting to ameliorate a larger list of societal problems.

These social and legal dynamics are a determining and contributing factor in generating positive impacts on biodiversity and, therefore, on additionality. It is therefore suggested that additionality analyses consider aspects such as environmental awareness, the conversion of some economic activities to conservation-related aspects and technical capacity building for conservation, among others, without which projects may be unable to generate gains in biodiversity.

The core purpose of habitat banking, like biodiversity credits, is to create *biological outcomes*, rather than attempting to ameliorate a larger list of societal problems. That said, there need not be any inherent conflict between ecological integrity and social well being, and well managed projects must engage thoughtfully with local communities to maintain the social license to operate and achieve durable biotic additionality. Just as communities rely on the resources and services provided by nature, so too do successful projects rely on the knowledge and participation of communities.

H. Additionality Evaluation

a. Methodology for the Evaluation of Additionality in Colombia's Habitat Banks

Defining additionality

According to the Biodiversity Credit Alliance, "*Additionality means a requirement that credits can only be assigned to biodiversity outcomes that are attributable to the project intervention and would not have otherwise happened*."[46] For habitat banks, this means that the interventions and ecological uplift that results from habitat bank creation would not have happened in the absence of the bank's creation. We use this definition of additionality to develop proposed indicators and an evaluation method for additionality in the context of habitat banks in Colombia.

Context and application of additionality in Colombia

Additionality in the case of habitat banks is evaluated at two points in the bank's project cycle by two regulatory agencies in Colombia: the Ministry of Environment and Sustainable Development, *MADS*, and the National Authority of Environmental Licences *ANLA*). This takes place through the two stage habitat bank approval process in order to transact credits for compensatory offsets. First MADS approves the habitat bank insofar as it has fulfilled the current criteria for habitat banks, including additionality (as MADS defines it) and other factors. And then the bank must seek approval from ANLA to use credits for a specified environmental impact that requires compensation on a hectare-for-hectare basis, again including a variety of criteria. Additionality is defined differently between the two agencies, however, reflecting the variability in the priorities of the two agencies. This document proposes a process and indicators

46 . Biodiversity Credit Alliance (2024). Definition of a Biodiversity Credit. Issue paper. https://www.biodiversitycreditalliance.org/wp-content/uploads/2024/05/Definition-of-a-Biodiversity-Credit-Rev-220524.pdf

for evaluating additionality in Colombia's habitat banks in the Additionality Assessment tool below. The proposal takes into account the varying concepts of additionality that bank developers face in the regulatory process, best practice in other markets, and the indicators it currently uses, and proposes a holistic set of evaluation criteria for additionality that provides robust evidence and can meet the requirements of both regulatory agencies as well as voluntary credit market efforts.

The purposes of this tool are to:

- Provide guidance on baseline scenario development from which additionality can be measured, including identification of existing barriers to preservation and restoration at existing and future habitat bank sites
- Integrate current best practice on additionality and criteria for application within habitat banks in Colombia
- Harmonize divergent additionality criteria developers face through the regulatory process
- Allow developers to evaluate the strength of additionality in individual habitat banks
- Allow developers to design future habitat banks with robust additionality criteria in mind

Assessing additionality depends on the establishment of a baseline at the outset of project development. The baseline and additionality analyses should be captured in a management plan for the site, which details the interventions that will be made to provide ecological uplift, avoid loss, or for other outcomes that would not materialize in the baseline scenario. A management plan is a critical piece of information for a bank's approval as it details the actions that will be taken - and provides assurances of those actions and their permanence - to achieve additionality.

Notably, the management plan submitted as part of the application for bank approval contains the plans for interventions that developers will undertake to generate additionality. This is not the additional uplift itself, but rather the *plan for how that uplift will be achieved*, with assurances provided. As such, additionality in the case of habitat banks is evaluated as a two-step process. The first stage is carried out during the habitat bank registration stage, which is carried out by the MADS, and the second stage is carried out once a habitat bank is proposed for compensation, which is carried out by the ANLA. Based on this conceptual understanding, we proceed to propose the following:

(1) whether the establishment of the habitat bank is additional to the status quo of the landscape in which it is located, whether the bank merits approval by regulatory authorities, and its likelihood of generating additional biotic outcomes; this will be referred to as "***Approval Additionality***" and is best suited to be carried out in a singular process through MADS (Res. 1051), and

(2) whether the habitat bank's performance has indeed provided ecological uplift that is greater than what would have occurred on the site in the absence of preservation and/or restoration interventions; this is referred to as "***Outcome Additionality***" and is best aligned to ANLA's role (Res. 256) in assuring ecological compensation for permittees. See Section D above for more detail.

It is worth mentioning that the additionality analysis is not intended to assess the achievement of no net loss of a particular project where another site requires compensation due to anticipated or already incurred impacts. In this context, credits issued from the project site are directly compared to impacted sites as offsets, and this scenario is important in Colombia where ANLA considers formal *compensation plans* on a hectare-for-hectare basis between impacts and uplift. Under these scenarios, analysis should be done on an individual basis and by taking into account the full suite of compensatory

actions and sites that are being proposed. Though this aspect of comparative additionality between the impacted site and the habitat bank used as an offset is beyond the scope of the analysis below, it is worth noting that in peer countries' markets (US and UK), both impacts and offsets are evaluated and measured against neutral standards - accounting for ecological equivalency - rather than against each other, and this standardization is one of many factors that make for a more effective and dynamic market.

With this in mind, the methodology below is oriented towards analysis of habitat banks and their own qualities, with the comparative elements oriented relative to a bank's own baseline and counterfactual scenarios. This would also be applicable to regulatory processes for private reserves registered as protected areas.

Portidium sp.

Baseline

Additionality can only be measured from a robust and defensible baseline. The baseline includes both the initial state of the project site *and* the probable future trajectory of that site. For example, a robust baseline for a 10,000 hectare parcel of forest would include the initial condition of the forest (e.g., tree cover, forest health) as well as the likely condition of the forest into a future period. Establishing the baseline is inclusive of social, economic, environmental, and regulatory influences at the site. If the forest, for example, is permanently protected in the baseline scenario due to existing regulations, then a biodiversity credit project that only intervenes to protect the land cannot be additional. The quantitative and qualitative information contained in the baseline should be used to consider the bank site, its landscape context, its biotic and other characteristics during the *Approval Additionality* process at bank inception through MADS, while the same baseline measurements should be subsequently used by ANLA during the *Outcome Additionality* process later on to evaluate the change in the bank site through the same indicators and data collection processes.

The elements of a robust baseline are captured in the table below, which include data collection on the initial baseline condition and assessment of existing barriers to the proposed preservation and/or restoration work happening in the baseline scenario.

The methodology below is oriented towards analysis of habitat banks and their own qualities, with the comparative elements oriented relative to a bank's own baseline and counterfactual scenarios.

Module 1: Baseline Development - Required Elements

The following are a series of core elements of baseline and their respective indicators that must be characterized by a project to measure additionality. It is important to mention that biological indicators must be defined according to the ecological conditions of each site (e.g. grasslands vs. forests) and management plans defined for each area. What is important for additionality is that they are included in the formulation of the baseline and in the additionality criteria, but the choice at that level of detail of the biological and ecological criteria of each area and also that they are subject to the theoretical approval of the environmental authorities that regulate the market in Colombia.

Baseline Element	Indicators	Data Collection
Initial baseline condition Data collection and documentation of existing land cover/ land use and laws and regulations governing land use.	Landscape conditions assessment	Context specific as per the site's conditions and ecology, should include ecological and structural metrics that are adequate to characterize the site and its surroundings, and may include metrics such as those below: ○ -Forest cover ○ -Canopy height ○ -Biodiversity indices (e.g. Shannon, Simpson) ○ -Landscape Context ○ -Above ground biomass
	Biodiversity assessment	Context specific as per the site's biological communities, should include species-focused metrics that are adequate to characterize the site, and may include metrics such as: ○ Plant and animal species occurrence and abundance
	Existing protections assessment	Level of protection (relative permanence), including physical (site accessibility), legal, environmental, or other factors. These should be characterized qualitatively, noting the formal legal status of the site at the baseline.
	Biodiversity impact assessed prior to bank creation [1]	Evidence of significant (> 15%) biodiversity impact not otherwise attributable to climate or other force majeure causes over look-back period of 5 years, e.g. deforestation. This should be measured through remote sensing analysis to account for changes in land cover, land use.
	Existing regulations, economic incentives and social norms for land use	Inventory of existing factors influencing decision-making and conditions at the project site, e.g. influential legal or policy measures and their enforcement (or lack thereof), prevailing farming or resource extraction practices, cultural practices towards land use and biodiversity resources, local economic or employment trends,

Baseline Element	Indicators	Data Collection
Barrier Analyses Barrier analyses are context-specific and cover the range of potential barriers to preservation and/or restoration at a specific site.	*All barriers below are context-dependent, and may all apply to any one habitat bank. Identification and analyses of all applicable barriers is required.*	
	Political and Institutional barriers	Aspects of legislation or political economy, or regulatory practice that prevent restoration or preservation projects from taking place, which may include risk aversion, institutional inertia, or the failure to enforce current law or policy.
	Ecological / environmental barriers	Aspects of the site's ecology or conditions that pose barriers to preservation or restoration, for example soil or water conditions or degradation, extreme weather events, invasive species or disease presence, etc.
	Technical / capacity barriers	Information, resource, or other operational barriers that prevent preservation or restoration from taking place, which can include access to information, a lack of training and familiarity with information technologies or other areas of expertise, lack of technological or material infrastructure.
	Economic / financial barriers	A lack of investment resources or markets. In some circumstances, market norms may pose barriers, such as certification practices that limit innovation.
	Social / cultural barriers	Aspects of the local communities and cultural practice that pose barriers to preservation or restoration, e.g. demographic change or pressure, social organization or cultural conflict, cultural resistance to proposed activities.
	Land tenure barriers	A lack of clear land tenure, or ongoing risks or rights conflicts can derail a project, and contributions to better clarity and reinforcement of rights can allow a project to succeed.
Development of Future Baseline Scenarios Future baseline scenarios are developed using data on the initial baseline conditions and probable future land uses and conditions at the site (e.g., threat of future development), using initial baseline and barriers analyses. Future baseline scenarios can consider regional trends to determine potential land uses and ecological conditions at the project site.		
Notes: [1] To prevent the unintended consequence of a land owner altering the initial site condition (e.g., by cutting the forest) in order to artificially lower a baseline before restoration activities, land cover and existing protections should also be evaluated for a period of time before project development.		

Mata de Lata Habitat Bank, Cesar, Colombia.

Module 2: Project Approval Criteria for Additionality

The indicators below are intended to provide a comprehensive set of criteria which can be used to evaluate the likelihood of additionality for Colombian habitat banks. These indicators are oriented towards those additionality considerations that are central to habitat bank approval carried out by MADS, but where possible should consider and be harmonized with the needs of the subsequent evaluation of *Outcome Additionality* (Module 3) carried out by ANLA to regulate effective ecological compensation. Despite the division of regulatory oversight proposed here, constructive engagement between the two agencies will be essential to the efficient execution of both of their respective mandates.

Project Approval Criteria	Indicators	Metric	Compliance Criteria
Ecological Uplift	Current degree of ecological intactness of the site. *Where applicable to restoration oriented projects (i.e. where preservation-only projects are not viable or compliant).*	% of site classified as intact, according to IFL analysis[47] or IDEAM's preferred analytical approach.	Quantitative - threshold as %. *A reasonable threshold might be 30/40/50% or less of a site being ecologically intact to be considered additional subject to the specific ecological context and regulator policy preferences. For more intact sites with a higher % forest cover, additionality is still achievable but the number of credits should be discounted by some proportion or amount, i.e. 1 ha of high % forest cover might qualify as 0.75 ha of transactable credit value.*
	Biodiversity impact prior to bank creation - Project operator must demonstrate that site was not impacted with intent to lower the baseline or to extract resources (e.g. timber) prior to bank creation	Level of biodiversity impact not otherwise attributable to climate or other force majeure causes over look-back period of 5 years, e.g. deforestation. This should be measured through remote sensing analysis to account for changes in land cover, land use.	Evidence of significant (> 15%) impact not otherwise attributable is disqualifying. Qualitative - narrative and Quantitative/ evidence based (documents, remote sensing or GIS data, etc.) Bank operator must demonstrate compliance

47. Potapov, Peter, et al. "The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013." Science advances 3.1 (2017): e1600821.

Project Approval Criteria	Indicators	Metric	Compliance Criteria
Durability Any positive effect on biodiversity achieved must be durable. This requires assurance provisions to back the project's execution, the financial resources and structures for long term management, and site protections tied to the land itself.	Strong and multi-decadal or permanent land use restrictions either through covenants or easements that run with the ownership of the land.	Long-term protection of site areas from which credits are released	Scoring: Protection (years) ○ 30 or longer = compliant ○ Between 15 and 30 = compliant, but could use improvement ○ < 15 = non-compliant
	Long-term endowments or analogous financial arrangements to pay for predictable multi-year ecological management needs and maintenance of the habitat banks.	% of projected long-term habitat bank management costs covered by established funding/financing mechanisms, i.e. (funding accounting for/total costs)*100	Quantitative Scoring: % of long term costs accounted for ○ > 80% = Compliant ○ 60 - 80% = compliant, but could use improvement ○ < 60% = noncompliant
	Significant insurance and bonding requirements on credit providers similar to those for gray infrastructure and construction projects that last until all the biodiversity outcomes on the sites that contribute to the transacted value of credits have been achieved. Note: Environmental compensation is not currently insurable in Colombia, and is rarely available elsewhere - this indicator is offered for consideration for future policy development	% of anticipated credits backed by insurance or bonding mechanisms	Quantitative (not required, but should be considered for future inclusion in policy): Higher insurance and bonding requirements will yield greater additionality benefits.
Financial For a project to be additional from a financial perspective, the project must depend on credit revenue.	The primary financial motivator for the project is through the sale of credits.	% of total revenue from sale of biodiversity credits.	Quantitative: based on % of revenue from credit sales: ○ > 80% = Compliant ○ 60 - 80% = compliant, but could use improvement ○ < 60% = noncompliant
	Project costs covered by biodiversity credit sales (rather than external grants, philanthropic or government subsidies that do not require repayment, or through stacking or bundling with carbon or other credits etc.)	% of restoration, management, monitoring, insurance and protection costs paid for by sale of biodiversity credits i.e. (projected credit revenue/total costs)*100	Quantitative: based on % of total cost offset by credit sales: ○ > 80% = Compliant ○ 60 - 80% = compliant, but could use improvement ○ < 60% = noncompliant

Project Approval Criteria	Indicators	Metric	Compliance Criteria
Regulatory The project and/ or its listed interventions and/or intended outcomes should not be already required by law or regulation in the initial baseline condition or future baseline scenarios.	The core project objectives and/ or interventions as defined in the management plan (for example, ecological restoration of a degraded area) are not required by law or regulation	Interventions/project objectives exceed those required by law or regulation in the baseline	Qualitative (yes/no) Project activities and objectives must exceed regulatory requirements
Barrier Removal/ Reduction	Proposed activities and interventions will remove or reduce one or more barriers to preservation / restoration identified in the baseline scenario	Project management plan clearly articulates how Barriers (as identified in baseline analyses) are addressed by project	Qualitative - narrative and/ or evidence based (documents, remote sensing or GIS data, etc.) Bank operator must demonstrate compliance
	Proposed activities and interventions will provide additional ecological uplift over the baseline condition, appropriate to project design (i.e. restoration, preservation, avoided loss, threat removal, etc.)	Project management plan clearly articulates how ecological uplift will be achieved over the baseline condition, appropriate to project design.	Qualitative - narrative and/ or evidence based (documents, remote sensing or GIS data, etc.) Bank operator must demonstrate compliance

Module 3: Outcome Additionality: Measurement of performance over time

The following criteria are included to represent a comprehensive view of additionality - including both the criteria for bank approval (as above) and the results generated over the life of the bank's operation (below) that may be used by ANLA in conjunction with its role to ensure high integrity ecological compensation via the apply of the mitigation hierarchy towards the goal of *no net biodiversity* loss. Long term monitoring and assessment of impact is standard practice in Colombia'shabitat banks, and monitoring is a regulatory requirement throughout a bank's operation, and these assessments should play a central role in the evaluation of a bank's additionality over time . That said, these criteria are not currently used to directly inform the quality, quantity, or credit release schedule of compensation credits in Colombia, unlike other crediting systems where credit release schedules are in use. Given this circumstance, and the variability of the indicators and metrics which must be adapted to the ecological and regional context of each bank, these are offered as general guidance rather than direct application.

Outcome Criteria	Indicators	Metric	Measurement
Management Milestones Milestones and indicators an ongoing logging and monitoring of the site's management, including reporting, administration, and completion of activity.	As per activities defined in project management plan. The indicators must be defined according to the ecological conditions of each site and management plans defined for each area. What is important for additionality is that they are included in the formulation of the baseline and in the additionality criteria.	The completion and submission of reports, construction and maintenance activities, site patrols, community engagement, monitoring activities, and others.	Qualitative and quantitative: As appropriate given frequency and nature of management activities. Bank operators, regulators, and credit buyers may interpret this degree of milestone achievement as relevant for regulatory compliance or market-oriented rationales.
Uplift relative to baseline (restoration) Can the positive change (uplift) in the bank site be attributed to the bank creation, development, and management, or would it have occurred anyway? Specific criteria will vary by site, but may include: changes in forest cover or other ecological intactness measure, wildlife habitat, species richness, soil quality.	The degree of change relative to the baseline ecological state and conditions of the site: ○ Landscape conditions and biodiversity indicators	The measured change relative to (a) the starting condition of the site, and (b) relative to the (counterfactual) anticipated ecological trajectory of the site without intervention (e.g. anticipated natural forest regrowth in the baseline scenario). Neighboring sites and local/regional context may be relevant controls for confirming this divergence. Context specific as per the site's conditions and ecology, should include ecological, structural, and species-focused metrics that are adequate to characterize the site and its surroundings, and may include metrics such as: ○ Remote sensing analyses of forest cover, structure, canopy height, patch analyses ○ Species turnover rates, recruitment and mortality, guild analyses, biodiversity indices (Shannon, Simpson) ○ Measures of organic matter in soil, above ground biomass, etc.	Quantitative: Performance is based on the *increase* from the baseline measurements in percentage terms. Bank operators, regulators, and credit buyers may interpret this degree of improvement as relevant for regulatory compliance or market-oriented rationales.

Outcome Criteria	Indicators	Metric	Measurement
Uplift relative to baseline (preservation or avoided loss) Can the maintenance or avoidance of loss in the bank site be attributed to the bank creation, development, and management, or would it have occurred anyway? Specific criteria will vary by site, but may include: changes in forest cover or other ecological intactness measure, wildlife habitat, species richness, soil quality. .	The degree of change relative to the baseline ecological state and conditions of the site: ○ Landscape conditions and biodiversity indicators	The measured change relative to (a) the starting condition of the site, and (b) relative to the (counterfactual) anticipated ecological trajectory of the site without intervention (e.g. where threat mitigation or a reduction in impact may have occurred more broadly beyond the project site). Neighboring sites and local/regional context may be relevant controls for confirming this divergence. Context specific as per the site's conditions and ecology, should include ecological, structural, and species-focused metrics that are adequate to characterize the site and its surroundings, and may include metrics such as: ○ Remote sensing analyses of forest cover, structure, canopy height, patch analyses ○ Species turnover rates, recruitment and mortality, guild analyses, biodiversity indices (Shannon, Simpson) ○ Measures of organic matter in soil, above ground biomass, etc.	Quantitative. Performance is based on the maintenance of the baseline measurements, i.e. a 0% change represents no net loss[48]. Bank operators, regulators, and credit buyers may interpret this degree of maintenance as relevant for regulatory compliance or market-oriented rationales.
Payment for Performance and Outcome-based Indicators: The interpretation of the degree of performance for the above indicators may be used as a compliance and performance assurance mechanism in the form of "credit release schedules," which are not currently provided for in Colombian regulation. These mechanisms may withhold 10-30% of credits pending confirmation of milestones or quantitative degrees of uplift as measured above. See Section F(b) above for further information.			

48. Note: In some cases, a bank that achieves no net loss in biodiversity may be considered additional compared to the overall context, provided that the no loss is demonstrable relative to the loss measured in regionally neighboring areas, suggesting a divergence attributed to bank management.

I. Conclusion

Additionality is a core integrity principle of habitat banking. Forgoing additionality – or failing to demonstrate it, can create skepticism of the integrity of ecological compensation and hamper demand in the market. Most importantly, a lack of additionality undermines the core rationale for investments in biodiversity. After all, what is the justification for such a vast investment of expertise, effort, and financial resources if not to achieve real and measurable outcomes that would not have happened otherwise?

Additionality in habitat banks must adapt to the legal and regulatory context of the geography where the project is sited. Because it addresses policy processes, human decision-making, and planning amidst counterfactual hypotheses, it does not lend itself to a universally objective and quantitative approach. That does not imply, however, that it is beyond the realm of analysis nor that its evaluation involving some degree of subjectivity renders any attempt to do so ineffective or prone to bad faith actors. **To operate effectively in a regulated market, there must be a functional compromise between what might be an idealized version of additionality and its evaluation with the necessities of real-world operation of habitat banks, including the imperfect predictability and variability of natural systems.**

What is the justification for such a vast investment of expertise, effort, and financial resources if not to achieve real and measurable outcomes that would not have happened otherwise?

And despite this inherent complexity and **the need for compromise, explicitly defined and published processes, criteria, and methodologies within each regulatory body is essential to support a dynamic and functional process of ecological compensation.**

Colombia's regulatory processes carried out by the Ministry of Environment and Sustainable Development (MADS) and the National Authority of Environmental Licenses (ANLA) reflect the distinct mandates of its agencies and have evolved over time as the policy framework has developed. The additionality evaluation methodology proposed here was created with the status quo in mind but is a departure from – and an imperfect fit for – the current practice of these agencies. **We offer here what we hope is a useful distinction between "approval additionality" and "outcome additionality" to clarify that a habitat**

The additionality evaluation methodology proposed here was created with the status quo in mind but is a departure from – and an imperfect fit for – the current practice of these agencies.

bank must be reviewed by the competent authorities in a regulatory system at the very beginning of a bank's operations, i.e. through a single review by MADS (Res. 1051), but also as a long term performance measure reflecting the core importance of ecological outcomes for compensation, i.e. by ANLA (Res. 256).

This dynamic of bank approval early in operation coupled with performance measured over time poses a potential conflict between the needs of credit developers and investors to obtain a timely "green light" for bank operation and (some) credit sales, with the assurances for regulators and buyers of high-integrity projects backed by regulatory rigor. Credit release schedules, linking the verification of management outputs with ecological outcomes to verify additionality, are a tool to balance these prerogatives for long-term projects.

Finally, a notable theme in the development of Colombia's market and elsewhere (England, US) is the wisdom that comes from policy refinement over time. As with other aspects of Colombia's environmental compensation and habitat banking frameworks, the evaluation of additionality will be improved over time as the market matures. Ensuring additionality - as with other core integrity principles - strengthens confidence in compensation processes and nature markets, and will help grow Colombia's investment in habitat banks, and ultimately produce better outcomes for nature.