Ecosystem Marketplace
A FOREST TRENDS INITIATIVE

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NATURE'S INVESTMENT FRONTIER

Practical paths forward for biodiversity markets and finance

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About Ecosystem Marketplace

Ecosystem Marketplace (EM), a non-profit initiative of Forest Trends, is a leading global source of credible information on environmental finance, markets, and payments for ecosystem services. For nearly two decades, EM has run the world's first and only globally recognized and standardized reporting and transparency platform for voluntary carbon market (VCM) credit pricing data, news, and insights, alongside flagship reports including State of Biodiversity Mitigation, State of Private Investment in Conservation, and the State of Watershed Investments, and a range of white papers, special reports, and analyses. EM data on prices, regulation, science, and other relevant issues on environmental service markets and climate finance have been used extensively by a range of market actors, from companies, journalists, and investors, to practitioners, natural resource agencies, academics, and local and indigenous communities.

About Forest Trends

Forest Trends Association is a 501(c)(3) organization founded in 1999. Forest Trends works to conserve forests and other ecosystems through the creation and wide adoption of a broad range of environmental finance, markets, and other payment and incentive mechanisms. Forest Trends does so by 1) providing transparent information on ecosystem values, finance, and markets through knowledge acquisition, analysis, and dissemination; 2) convening diverse coalitions, partners, and communities of practice to promote environmental values and advance development of new markets and payment mechanisms; and 3) demonstrating successful tools, standards, and models of innovative finance for conservation.

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Foreword

RICARDO BAYON, KATHERINE HAMILTON, YUEJIA PENG, DAVID TEPPER, MICHAEL JENKINS, and GENEVIEVE BENNETT

Look at the news: fires, floods, drought, climate change, species loss. All it takes is a quick glance at the news to see that our natural world is in crisis. But what if these are symptoms of a deeper problem? What if our economic system itself has a fundamental glitch pushing us toward bad environmental decisions?

We live in a world where most of our everyday decisions, from the mundane to grandiose (whether we buy a cup of coffee or not, or whether we build a dam or not) are shaped by our economic operating system. This system—call it finance, call it capitalism, call it the market—has been organically built over the past centuries. It is one of the most powerful human achievements. Without it, our modern world wouldn't exist.

But it has one potentially fatal flaw: it's blind to the older operating system that runs life on Earth—the interconnected web of living systems in forests, coral reefs, wetlands, and all ecosystems. This "NatureOS" turns solar energy into food and fiber, cycles nutrients, and provides clean air and water. It makes life possible. Yet, unless nature's products become "natural resources" (wood, food, minerals), our “EconomyOS” doesn't consider them valuable. They're literally priceless, in the sense that they don't have a market price. As a result, their value is implicitly zero as an input into economic decision-making, leading to decisions that destroy nature. This isn't a new problem. If you’ve studied economics even in passing, you’ve heard nature's services referred to as "externalities" to our economic system.

We know there's a bug in EconomyOS; we just don't know how to debug it. For decades, we've experimented with solutions: government regulations and subsidies, ecosystem service markets (carbon markets, biodiversity offsets), and incorporating nature's value into investment decisions (Socially Responsible Investing, ESG factors, disclosure requirements). Some experiments work, some don't, and for others it's too soon to tell. But we know we need to do more to drive investment in nature commensurate with its true value.

The Ecosystem Marketplace (EM) was created twenty years ago to track and make sense of such solutions. It's compiled information on voluntary carbon markets, biodiversity markets, and water-related ecosystem services. Through meetings, webinars, and books, it's helped various initiatives learn from each other.

Things have changed since EM's creation. Carbon markets have grown into a nearly $100 billion industry. Biodiversity and water markets have progressed, too. Yet, it sometimes feels like we're no closer to bringing NatureOS and EconomyOS together than we were in 2005. The experiments seem to operate in silos, with little time spent looking across markets or considering the broader view—seeing the forest for the trees, if you will.

This report, in the best tradition of EM, offers that broader view. It provides a diverse and deeply informed set of perspectives on what we've learned about markets and finance for biodiversity over the course of decades of experimentation. It offers no "silver bullet" solutions. Nor is it a prescription or roadmap setting out the exact road to scale—because the truth is, no one knows what that is. What this report does is offer travelers on the road some hard-earned knowledge and advice for what they're likely to encounter along the way. We hope it spurs reflection, conversation, and new thinking.

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Nature’s rulebook: Biodiversity's unique position in environmental finance

GENEVIEVE BENNETT

> “You don’t understand anything unless you understand there are at least three ways.”
>
> — M. Minsky

Biodiversity-based investment themes are suddenly in the spotlight, after years of feeling like a bit of an understudy to the carbon market. Given a ballooning finance gap for nature, and the obvious materiality of nature risk to business, there is renewed interest in economic instruments that can drive private investment toward interventions to avert biodiversity loss or restore degraded ecosystems, and in doing so generate attractive cash flows.

These economic instruments have been around for decades. The first habitat banks[1] appeared in the United States in the early 1980s as a way for public works agencies and state departments of transportation to comply with US Clean Water Act rules on mitigating impacts to wetlands . But recent growth in the market for voluntary carbon credits has clearly been a catalyst for renewed interest in whether a similar instrument might be applied to the problem of global nature loss. It’s been buoyed by a surge in venture capital funding for NatureTech startups, a sizeable number of whom are focused on measurement, reporting, and verification (MRV) and biodiversity credits.

The voluntary carbon market (VCM) offers useful lessons for biodiversity. Sophisticated market infrastructure borrowed from the VCM (consolidated registries, spot trading, futures contracts, Blockchain, to rattle off a few), financial innovations (specialized carbon banks, forward purchase agreements, Advanced Market Commitments) would avoid a lot of reinventing of the wheel. So would learning from the VCM’s methodological improvements and quality assurance mechanisms (dynamic baselines, integrity councils, independent ratings agencies, jurisdictional approaches, nested accounting systems). That’s critical, because we are literally in the midst of a mass extinction event.

But there are important differences between carbon and biodiversity as conservation asset class categories. To explain those differences, it’s helpful to ask a basic question: What are

Misiones, Argentina. Credit: Lucia Carolina Larrea.

[1] See page 20 for an explanation of habitat banking.

environmental markets for? It turns out there are actually two different blueprints when you look at the history of market-based mechanisms driving value to nature: compensation and capital preservation.

We follow the logic of compensation when there is a need to carefully control the overall amount of some negative impact on nature. The classic example is the total sum of a pollutant entering a system. This could be greenhouse gas emissions entering the atmosphere; it could be nitrogen entering a river system from a wastewater treatment plant; it could be groundwater withdrawals from the wells that share an aquifer. A maximum allowable amount of impact is determined (presumably in line with what science says this amount should be), either in the form of a regulatory cap or standard or self-imposed voluntarily by actors in the system.

An environmental market allows everyone participating in the system to either simply stay under the limit, or, if they go over it, compensate by buying tradable credits or permits. These represent either a quantified amount of positive uplift or pollution allowed. On the other side of that purchase is someone who has either come in substantially under their allocated pollution target, or who has found some way to actually remove impact/pollution from the system. Either way, they can sell those units they don't need to a polluter who needs them. The idea is that so long as the system as a whole stays under the limit, it doesn't matter exactly how that happened. This kind of flexibility is useful for identifying efficiencies. It also creates positive incentives to innovate or minimize impact, since any marginal improvements now have economic value.

This is a good solution when there are many different roads to achieving a desired outcome, and lots of room for improvement in terms of technology or management.

The second logic is that of capital preservation. This comes into play when you're using a market-based mechanism to send a price signal to protect an ecosystem asset or service that's extremely hard to replace. Destruction of nature becomes very expensive when you actually have to pay for repairs or carry nature risk on your books. Here, the market's purpose is not to encourage seeking out more efficient ways of doing something, although it can certainly match buyers to sellers of conservation assets. Markets built on this logic are set up to encourage buyers to do everything possible to avoid participating in the market in the first place.

This makes sense because ecologically, it's better to protect nature in the first place than to try to restore it after it's destroyed. Ecological restoration as an art and science has made great leaps and bounds, but restored ecosystems typically don't fully match the ecological function of undisturbed natural systems. The house always wins. Still, some degree of damage to nature is inevitable: humans grow food, build roads, construct cities, and produce energy. A market accepts that reality and puts a meaningful price on the impact. This both disincentivizes destruction and generates cash for cleanup. Frameworks like the mitigation hierarchy (see page 8) limit the potential for abuse or greenwashing and position the market option as the last resort. There's a fundamental conservatism baked into this model, compared to markets based on the logic of compensation.

The carbon markets follow the logic of compensation. Biodiversity historically has straddled the fence. Biodiversity markets exist to explicitly compensate for damage. They also exist to drive finance into nature-as-irreplaceable asset (e.g., infrastructure). This makes prototyping a biodiversity credit market solely on the voluntary carbon market a bit of an uneasy fit.

There is another way in which biodiversity is not like carbon: there's a clear investment opportunity when it comes to climate change . Financing EV charging infrastructure or emerging carbon capture and storage technologies are new kinds of investment, but ultimately ones that can return profits to


Puerto Casado, Paraguay. Credit: Claudia Merlos for Quadriz.

the firm making the investment.

It's harder to see how the benefits of financing activities that result in, say, greater species richness, or more reliable floodwater absorption, will flow back directly to the investor in the form of short-term financial return. Some might, but most of that value will be diffused: good for all of us on Earth writ large, less so for our financier. This is why a banker told a reporter at Bloomberg during the biodiversity negotiations in Cali last year that “Nature feels more like a philanthropic topic than a profit center."

In other words, biodiversity investments often look like public goods—like infrastructure. And infrastructure is something that the public sector pays for, although of course there are all sorts of interesting opportunities for companies to come in as partners on finance, design, risk management, delivery, and so on. But the public sector is ultimately the most logical buyer when you’re operating on the logic of infrastructure.

Biodiversity also lacks the fungibility of carbon. A ton of greenhouse gas emissions is essentially the same as any other ton in the world in terms of pollution impact, regardless of where or how it was emitted. This creates the possibility for a global market. One “unit” of biodiversity is unlike any other, although two units might be comparable in terms of functional uplift to an ecosystem, or mean species abundance. This difficulty ensuring “like-for-like” replacement makes it difficult to imagine a global market for biodiversity compensation with any kind of credibility (although it is theoretically possible for credits). This is widely recognized by most working in the space today and is a key reason for the recent push to clarify that voluntary biodiversity credits should only be used to achieve purely positive increases in the sum total of biodiversity, rather than being claimed as offsets.

But there’s another implication which is less well recognized. Fungibility opens space for innovation. We can count on greater efficiencies and technological innovations for managing greenhouse gas pollution in the future. In the next decade, we’ll probably see tremendous strides made in approaches to carbon removal from the atmosphere, for example. On the other hand, we are not going to see the invention of some technological widget for churning out highly functional ecosystems or improved species richness in whatever direction you point it.

For this reason, there’s no “green transition” play in biodiversity finance like there is in carbon. Remember that the VCM as originally designed was not solely about creating an offset mechanism so companies could claim to be “net zero.” The VCM is a mechanism for driving finance toward sectoral shifts in low-to-zero-carbon energy, agriculture, waste management, and so on that would otherwise not get finance. This is a principle known as “financial additionality.” As industries mature and no longer meet the financial additionality criterion, those project types exit the carbon market. This is happening to carbon credits from renewable energy, for example, as renewables have become cost-competitive with fossil fuels generation. In theory, when the global economy has decarbonized, there will be no offset need nor opportunities. The carbon market is, if it works as intended, moving inexorably toward its own expiration date.

Here again, biodiversity and nature are a bit different. We can transition to an economy that doesn't rely on fossil fuels. On the other hand, it's hard to imagine an economy that functions with no impact on nature at all. But what we can do is link ongoing economic activity to continual repair of the damage and assist nature in regenerating itself. At the same time, we can harness public and philanthropic resources to preserve existing natural assets, based on the logic of capital preservation.

In doing so, we'd see new business models emerge based on restoration and regeneration—a whole "restoration economy," with jobs that would be difficult to outsource, roboticize, or replace with AI (although new technology can certainly drive better results at scale). This is already happening in the United States, where ecological restoration now employs more people than coal mining.
It's a future worth pursuing. This report offers some perspectives from experts in biodiversity and nature finance on what the forward path looks like to drive more private investment into nature and biodiversity. It begins with a look back on what we've learned about delinking development from nature loss from three decades of experience and experimentation with biodiversity markets, with an essay contributed by Adam Davis, Co-founder and Managing Partner at Ecosystem Investment Partners ("Offsets and investments: Thoughts on de-linking economic development and biodiversity loss," (page 12).

There are sizeable opportunities, connected to a wave of new infrastructure investment on the horizon globally to expand that model to new geographies, as Mariana Sarmiento, Charles Bedford, and Dr Timothy Male argue ("How we harness an infrastructure boom to close the biodiversity finance gap," page 18). Doing so would chart a different course for economic development in Global South countries where nature is substantially still intact. Nature-based asset classes are a promising field for entrepreneurs and land managers.

But a reality check is due on what is likely to really attract demand, Ben Guillon and I argue ("Design for demand: What actually drives private finance for nature?", page 22). A "Field of Dreams" mentality ("If you build it, they will come") is likely to get entrepreneurs in trouble.

On the demand side, biodiversity credits and other conservation assets offer a path to not simply fix the damage, but go "nature positive" by creating more nature than there was before. These ambitions need to be grounded in the mitigation hierarchy, or credits could be used for greenwashing, warn Martine Maron, Fabien Quétier, and Amrei von Hase ("No shortcuts to nature positive," page 30).

Biodiversity might lend itself well to being "stacked" with or "stapled on" to other investments in carbon and value chains. Julia McCarthy and Ryan Sarsfield ("Beetles in a pay stack," page 33) offer a useful framework for thinking about how to do this effectively.

This report is ultimately a collection of perspectives from people with a collective century's worth of experience in biodiversity markets, drawing from commentary and thought leadership published by Ecosystem Marketplace news. You may not agree with all of it; I doubt all of the authors agree with one another on some of the issues raised. We hope you'll find it thought-provoking, and more importantly, useful in doing good work.

GENEVIEVE BENNETT is the Director of Communications and Strategic Outreach at Forest Trends.

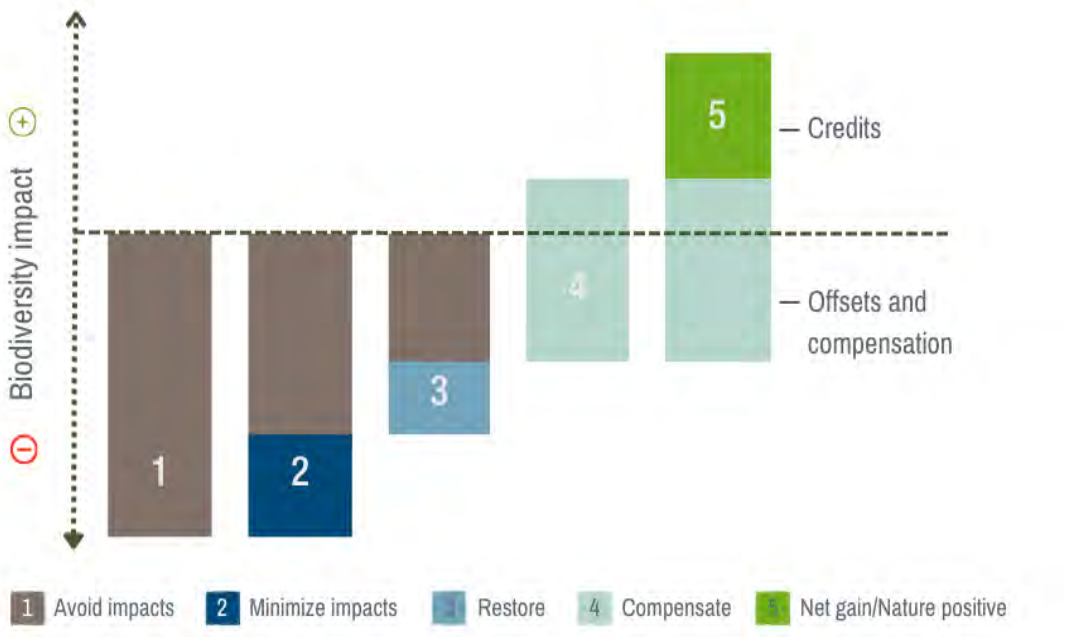
Biodiversity markets: A few foundational concepts

As nations around the world struggle to reverse the trend of biodiversity loss and ecosystem services degradation, attention has turned to the major drivers: agricultural expansion, infrastructure development, and urbanization. Many new development projects and investment strategies now adhere to the concepts of "no net loss," net gain, or nature-positive impact on biodiversity. "No net loss" means that negative impacts on species, habitat quality, ecological function, and/or ecosystem services caused by the project are outweighed by measures taken to mitigate for those impacts. Net gain takes the concept a step further, where restoration and conservation (e.g., gain) exceeds the original damage the project caused (e.g., loss). Meanwhile, "nature positive" implies a purely positive result, not linked to compensation for damages at all.

The mitigation hierarchy

The mitigation hierarchy (Figure 1) is a set of steps for achieving these outcomes. When a development project, like construction of a new highway, is likely to have negative impacts on biodiversity, project designers and regulators can follow these steps to avoid, minimize, and rehabilitate negative impacts, and then offset or compensate for any remaining damage. Obviously, this is a complicated process that requires a lot of work—and that is precisely the point. Although development projects with net-negative impacts to biodiversity might still be approved if there is overriding public interest, the idea is to divert development from places that are more biologically valuable and encourage development in places where impacts are relatively low.

Figure 1. The mitigation hierarchy



Source: Forest Trends 2025.

Figure 2. Biodiversity credits versus biodiversity offsets and compensation

	CREDITS	OFFSETS & COMPENSATION
ASSET	A measurable unit of biodiversity outcome that is durable and additional to what would have otherwise occurred	
INTENT	Positive impact	Full compensation for negative impact
USAGE	"Nature positive" action	Regulatory compliance or Voluntary "no net loss" action
SPECULATIVE TRADING?	Potentially	Generally not
FORMAT	Credit; Claim	Turnkey mitigation; Compensation fund contribution; Habitat bank credit

Source: Forest Trends 2025.

Offsets and compensation

Offsets should be used only as a last resort. We use the term "offsets" in this report to refer to actions taken to compensate for quantified residual adverse impacts to species, habitat quality, ecological function, and/or ecosystem services that cannot be avoided, minimized, and/or rehabilitated (Figure 2). Offsets might take the form of restoration of degraded ecosystems, creation of new ecosystems or habitats, or protecting existing high-quality ecosystems at risk of degradation or loss (also known as an "averted risk" approach).

Since offsets can only work if they're implemented correctly and guided by well-designed frameworks, professionals working in the policy and practice of biodiversity offsetting came together beginning in 2004 to develop a framework for best practice. They formed The Business and Biodiversity Offsets Programme (BBOP), which is a collaborative network of over 80 organizations and individuals involved in offsetting including companies, financial institutions, government agencies, and civil society organizations. BBOP has developed a set of principles for international best practice in biodiversity offsets (Box 1), informed by the on-the-ground experiences of its business partners.[2]

Credits

Like offsets, credits are a measurable unit of biodiversity outcome which is both durable and additional. However, "credits" in this report refer to purely positive outcomes: there is no explicit connection to a negative impact somewhere in the world requiring compensation (Figure 2). As a result, the equivalence ("like for like") requirement we find in biodiversity offsetting best practice doesn't apply. In turn, this means there is, in theory, a potential market for trading biodiversity credits globally—which has never been true for offset units.

[2] See: https://www.forest-trends.org/bbop/.

Nevertheless, credits should enter the picture only in the context of the process the mitigation hierarchy sets out: to skip straight to "nature positive" without any attention to the prior steps is essentially greenwashing, as Martine Maron, Fabien Quétier, and Amrei von Hase explain later in this report (page 30). Certainly it could be possible to avoid offsetting, if that is desired, by fully avoiding, minimizing, and restoring impacts. But credit buyers cannot claim to be "nature positive" only by buying biodiversity credits; they must go through the full process.

The biodiversity credit market is rapidly evolving. It is beyond the scope of this report to lay out best practice or describe leading market frameworks. We recommend referring to the work being done by Biodiversity Credit Alliance, a multi-stakeholder group convened to steer development of principles underpinning a very high-integrity biodiversity credit market, and guide market participants in implementing those principles.[3]

Box 1. The BBOP principles

Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development* after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function, and people's use and cultural values associated with biodiversity.

These principles establish a framework for designing and implementing biodiversity offsets and verifying their success. Biodiversity offsets should be designed to comply with all relevant national and international laws, and they should be planned and implemented in accordance with the Convention on Biological Diversity and its ecosystem approach, as articulated in National Biodiversity Strategies and Action Plans.

1. Adherence to the mitigation hierarchy: A biodiversity offset is a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimization, and on-site rehabilitation measures have been taken according to the mitigation hierarchy.

2. Limits to what can be offset: There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.

3. Landscape context: A biodiversity offset should be designed and implemented in a landscape context to achieve the expected measurable conservation outcomes, taking into account available information on the full range of biological, social, and cultural values of biodiversity and supporting an ecosystem approach.

4. No net loss: A biodiversity offset should be designed and implemented to achieve in situ (e.g., onsite or locally), measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity.

[3] See: https://www.biodiversitycreditalliance.org/.

Box 1. The BBOP principles *(continued)*

5. Additional conservation outcomes: A biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity to other locations.

6. Stakeholder participation: In areas affected by the project and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, and implementation and monitoring.

7. Equity: A biodiversity offset should be designed and implemented in an equitable manner, which means sharing the rights and responsibilities, risks, and rewards associated with a project and offset among stakeholders in a fair and balanced way and respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognized rights of indigenous peoples and local communities.

8. Long-term outcomes: The design and implementation of a biodiversity offset should be based on an adaptive management approach that incorporates monitoring and evaluation, with the objective of securing outcomes that last at least as long as the project's impacts and preferably in perpetuity.

9. Transparency: The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner.

10. Science and traditional knowledge: The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge.

*While biodiversity offsets are defined here in terms of specific development projects (such as a road or a mine), they could also be used to compensate for the broader effects of programs and plans.

Offsets and investments: Thoughts on de-linking economic development and biodiversity loss

ADAM DAVIS

Last year marked the 25th anniversary of the first Katoomba Group meeting—a community that first came together in 1999 with a shared quest to convert the theoretical value that comes from restoring nature into a practical way for people to make a living. It's hardly been a simple or straightforward path, but we've made a lot of progress together.


A caterpillar in the the Paraná rainforest. Credit: Lucia Larrea.

I'd like to share some of what I've learned on that path since 1999, when I became a dedicated student of "applied ecosystem service theory," and eventually started a firm—with much leadership and help from my stalwart partners—that is now a significant investor in ecological restoration.

Since we founded the firm, called Ecosystem Investment Partners, in 2007, we have raised over $1 billion in investment capital, and invested in over 100 restoration projects across 15 states. These projects have restored over 43,000 acres of wetlands and 230 miles of streams. They eliminate some 7,900 tons of nutrient and sediment pollution each year. And they provide livelihoods for people who are protecting and restoring nature where they live.

This feels like success, for sure, but it's a very humbling kind of success, too. One of the things that sticks with me as I've grappled with the challenges of building a business and making investments is the "Big Problem" of how inadequate the available financial resources for nature are, compared to the resources for destructive and damaging human activity.

I won't repeat the depressing statistics here; you likely know them well enough already. But suffice to say the pace of progress is not sufficient. What follows then are some thoughts on at least one aspect of the Big Problem, which has to do with the concept of mitigating harm from economic activity. These are informed by my experience working in the United States—I don't want to pretend to have deep understanding of, much less answers for, the myriad variations on government structures and laws and customs that are found around the world. My hope is to provoke curiosity and more dialog, in the spirit that has characterized the Katoomba Group for these past 25 years.

The mitigation hierarchy: A brief history

The principle of mitigation, or making up for harm, is a fundamental part of environmental permitting systems in the United States. But it's seen as a last resort, after harm has been avoided and minimized. A hierarchy of "avoid, minimize, then mitigate" is the structure for law and regulation

for limiting the damage of the great human systems for mining, harvesting, drilling, manufacturing, transportation, building, consumption, and throwing the leftovers away.

The Clean Water Act, first signed into law in October of 1972, established the basic structure for protecting the "physical, chemical, and biological integrity" of "Waters of the United States", and it was certainly a great step forward. One part of that law aimed at stopping the further destruction or filling of wetlands, which had been at that point reduced from some 220 million acres down to under 110 million acres in the lower 48 states.

But just five years later, the National Wetlands Policy Forum recognized that it was simply not possible to stop all further impacts to wetlands as the population continued to grow. If the country was going to grow at the contemporaneous rate of 15 million people every five years, then roads and houses and schools and all manners of infrastructure to support the growth would be needed. The Forum recommended that some type of structure for "no net loss" be put into place, whereby some impacts could be allowed, but only if they were offset by an equivalent amount of restoration in the same watershed.

It was the administration of President H.W. Bush that ultimately put the new No Net Loss policy into place, and from the beginning, the mitigation hierarchy of "avoid, minimize, mitigate" was emphasized. Good planning had to precede a permit to damage Waters of the United States, and a permit applicant had to demonstrate that they had done as much as they could practically do to reduce harm before they would be given permission to proceed.

The fundamental problem with this policy formula, however, is that there is no bright line or absolute standard that allows us to know how much avoidance and minimization is enough. Theoretically, it's possible to avoid and minimize all the way to zero by simply not doing the development project at all or moving it to a location that has no wetlands. But certain types of development, like roads, pipelines, and transmission lines that cross entire landscapes, are very hard to route around all wet ground, and there are parts of the country that exist on low elevation land that goes on for tens or hundreds of miles in all directions.

So, the mitigation hierarchy makes sense as an approach and a principle, but in practice, the permitting decision is necessarily a compromise. Some damage is ultimately going to happen on the land even in the presence of good policy that is well enforced. And this is where a well-designed mitigation program should enter the picture.

Good mitigation and bad mitigation

In the United States, the response was to develop a compensatory mitigation program that allowed some damage, but only if it was tied to scientifically verifiable restoration in the same watershed. Permitted entities who impacted Waters of the United States could mitigate for unavoidable residual damages themselves, or they could contract with a third-party provider, like a "mitigation bank" that creates and sells wetland, stream, and other ecological credits by restoring and protecting degraded ecosystems.

Wetland mitigation in the United States has laid the groundwork for all of the environmental compensation markets that have followed. A chief lesson has been that good mitigation requires that certain core criteria be met: credits need to represent real, meaningful, additional, and durable benefits.

"Real" and "meaningful" matter, because otherwise when damage on the land is allowed, how would we know if the impacts of that damage have been made up for? To do that, we have to be able to measure how much damage there was, not just in terms of the number of acres, but in terms of the ecological function provided on those acres. The metrics for the system that relate to biodiversity,

Alviso Marsh, Don Edwards wildlife refuge, south San Francisco bay, CA.

clean water, and the full set of functions and values provided by nature need to be tracked before the damage and afterwards. Then those metrics need to be similarly applied to a restoration site to understand the amount of uplift created there. This emphasis on functional equivalence helps to ensure that wetland mitigation is truly compensating for the ecological loss resulting from development.

High standards for durable land protection and for measurable improvement from a baseline ensure that wetland mitigation bank results are clearly "additional" to what would have happened otherwise, and their restoration or enhancement activities are directly related to the investment made in them. As for the standards for durability, while "permanence" is beyond the scope of human control, and therefore should be beyond the scope of human laws, mitigation banks are very durable indeed. They are required to have long-term management plans and financial assurances in place to ensure that the restored wetlands can be monitored and maintained well into the foreseeable future.

Ultimately, the effectiveness of any environmental offset program depends on the integrity of the credits being traded. By ensuring that credits represent real, additional, durable, and ecologically meaningful benefits, programs like wetland mitigation banking provide a model for how market-based approaches can be used to balance economic development with environmental conservation. And it's working. This market-based approach has been remarkably effective: as of 2021, there were 1,642 approved mitigation banks in the United States, including 1,692,748 acres of wetland mitigation banks and 406,351 acres of stream mitigation banks that make permitting economic activity both possible and more responsible than it would be otherwise.

Mitigation banking is not a perfect solution. But it's still the right idea, and ethically superior to giving up on at least trying to offset damage or just suggesting that all development should come to a halt.

Of course it would be better if no one ever impacted wetlands again, and it would also be better if we could just stop burning all fossil fuels today. But high-quality offsets help. As a model for recognizing the value of nature and ensuring that the costs of environmental damage are internalized by those who cause it, mitigation banking represents a significant step forward.

The critics of biodiversity and carbon offsets should take note: it is not the existence of good offsets that allows damage to occur, but rather the absence of them. By placing a value on natural resources and requiring those who harm them to bear the cost of restoration, mitigation banking (and good carbon offsets, too) create a powerful incentive to minimize impacts from the start. The less damage they cause, the less they will have to pay in mitigation costs. This encourages both more thoughtful planning and more investment in environmental protection.

So: good mitigation is different than bad mitigation. Good mitigation uses scientifically verifiable methods and metrics to ensure that the amount of offset is equivalent to the amount of impact. And it has legal and financial assurances in place to make sure that the offset—the restored area—is durable over time. Mitigation credits come from work that is truly "additional" because restoration simply doesn't occur without land control, a design that receives permits, and activity on the ground. Finally, mitigation credits have to be in place before they may be sold as offsets so there's no temporal loss between the time of impact and the benefit of restoration.

Many criticisms of carbon and biodiversity credits and offset programs are really criticisms of bad mitigation program design. If a credit does not really make up for the damage it is being sold to make up for, then the program is flawed and the whole notion of offsetting is in jeopardy.

What is the alternative to mitigation?

In June of 2023, the European Union (EU) Commission recently stripped biodiversity offsets from its taxonomy of "sustainable activities" that contribute to the protection and improvement of the natural environment. It's a terrible decision at the very moment when our natural world is most in need of innovative ways to pay for the enormous restoration and conservation challenges in front of us, to eliminate one of the most established, readily investable, and impactful mechanisms for financing environmental improvement. And because income from credit sales provides the only incentive for private investment in restoration, this decision goes directly against the ethical investment and business practices that the EU Commission is trying to encourage.

What could be the rationale for such a move? As the Senior Economist at WWF, a member of Platform on Sustainable Finance, put it: "Offsetting is intrinsically tied to biodiversity harm elsewhere, the result is a zero-sum game for biodiversity and on that basis, it cannot represent a substantial contribution to biodiversity."

I'd argue that this position entirely misses the essential point: requiring offsets that allow a project to prevent healthy natural systems from dropping below baseline conditions is the very definition of what it means to be sustainable—i.e., taking away no more than can be replaced. And of course, "zero sum" is vastly preferable to continuing to lose biodiversity. In fact, offsets qualified by scientifically verifiable restoration of land along with permanent protection through endowments for long-term monitoring and maintenance are in fact the very definition of what sustainability requires. This is also what a high-quality offset requires.

In a world where impacts to biodiversity will continue to occur, the only alternative to offsetting impacts is not offsetting impacts. Restoration projects are needed, and the wildlife and natural

systems that benefit from those projects do not know or care how the restoration work is ultimately funded.

While the EU Commission now opposes offsets, it still supports biodiversity credits. These credits, however, appear to be mainly a repackaging of existing conservation and restoration activities (already being funded by government and philanthropy) into credit form. While crediting that improves measurement is laudable, it does not represent a significant source of new revenue to pay for restoration and conservation efforts.

As David Sternlicht (2023) of the investment firm, Ethic, recently wrote, "We can't solve the ecological crisis without considering the role of money and markets. Per Bloomberg, current annual funding for biodiversity and nature protection is $166 billion, with the lion's share (76 percent) coming from government spending and the remainder from the philanthropic and private sectors (Cuming and Bromley 2023). The same report estimates that "$830 billion in annual additional capital flows must be redirected this decade to begin to bend the curve on nature loss." There is simply no compelling evidence for the notion that measuring traditional conservation action using biodiversity "credits" will provide additional funding.

Offsets that come from good mitigation projects requiring the actual accomplishment of restoration goals under rigorous scientific standards represent new and additional funding that is now critical. Offsetting will continue to provide the best available mechanism to replace what we take now for the benefit of future generations because the alternative to "no net loss" is simply "net loss."

Parting thoughts

I hope what I've written here is helpful as a discussion of the elements of good mitigation or biodiversity credit program design. But there's one more item that needs to be addressed, which is the question of whether or not people should be able to make money from nature at all. The controversy around this question has been around for decades, but it still swirls around the debates about program design and credit integrity.

While some of the criticism against private capital investment in restoration is simply anti-capitalist rhetoric in a more subtle form, there's also the notion that restoration projects paid for by government or philanthropy are inherently more ethical than those that make up for the impacts of current economic activity. But the government and philanthropic funds that are available originate from past economic activity; activity that was not required to provide offsets. If offsets had been required in the past, the damage these funds are seeking to correct might never have occurred in the first place.

In the end, the question of who pays for environmental restoration involves issues of fairness and responsibility, but also of effectiveness.

By shifting the burden of making it right onto those who cause the damage, rather than those who inherit it, we can create a system that incentivizes both ecological conservation and emissions reductions. Mitigation banking offers a promising model for how this can be achieved, not by allowing damage to occur, but by ensuring that it comes with a price tag. Only by recognizing the value of nature in the way that people commonly value things—by paying for it—can we hope to protect it for generations to come.

But there's an even more fundamental point about the ethics of making money through the

protection and restoration of nature. And it's simply this: the choice before us is not whether to place a financial value on the ecosystem services related to carbon, water, and biodiversity. That choice was made long ago when real estate and natural resource extraction placed a financial value—a number—on the land. As soon as land was recognized as being valuable to build things on or take things from, there was a price for each and every acre. The price, however, was for development and production, for roads and buildings, and for mining, oil and gas, agriculture, and timber.

So, it's not that biodiversity, carbon, or wetland credits "put a value on nature." That was done long ago. These new credits put a value on the protection and stewardship of nature. Credits are a countervailing force that represents not what we can take from nature, but what nature does when it is sufficiently protected and left alone.

And only by tying credits to offsets will we send the right price signal that makes it more expensive to damage the natural world and more valuable to protect it. The old ways of government and philanthropic protection that tried to take nature out of the economy by turning it into parks and protected areas have made a huge difference for the good, and they need to continue. But they are simply not sufficient to the scale and the urgency of the task at hand today.

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How we harness an infrastructure boom to close the biodiversity finance gap

MARIANA SARMIENTO, CHARLES BEDFORD, and DR. TIMOTHY MALE

Global-record levels of investment in infrastructure are, ironically, posing a massive threat to our planet's infrastructure.

By that we mean natural infrastructure: the natural areas and processes that filter our water, minimize flooding, absorb air pollution, prevent erosion and landslides, and so forth. Living ecosystems like forests, wetlands, or coastal mangroves make our planet livable. And when built infrastructure is planned in harmony with nature, it often works better. Drinking water reservoirs don't quickly fill in with sediment. Living shorelines complement seawalls. Rain gardens reduce urban flooding.

And yet, while spending on infrastructure globally is approaching $9 trillion per year, investment in natural infrastructure lags as a rounding error in comparison. Biodiversity spending garners between $165 and $208 billion a year at most (Bloomberg NEF 2023).

In Latin America, deforestation and land-use rates are at unprecedented levels, with the region losing around 2.6 million hectares of forest annually between 2010 and 2020 (FAO 2020). That's driven by economic development: the International Development Bank (IDB) Invest and International Finance Corporation (IFC) portfolios in Latin America for infrastructure, energy, agribusiness, water, and sanitation will exceed $9 billion in the coming years. This trend is unlikely to change, particularly considering recent political developments and peace agreements in countries like Colombia, which have led to expanding agricultural frontiers in areas previously inaccessible during the conflict. These changes represent immediate economic benefits to communities, but at the same time they also threaten critical biodiversity hotspots and have driven up land prices by as much as 30 percent in key regions (Grupo Banco Mondial n.d.).

Compensation requirements mean biodiversity finance is poised to increase significantly.

In order to delink new development projects from biodiversity loss, infrastructure lenders, both public and private, are considering new mechanisms for compensating for the impacts of financed projects.

Many are guided by the (IFC Performance Standard 6 (PS6), which requires measures to minimize habitat fragmentation such as biological corridors, restoring habitats during operations and/or after operations, and implementing biodiversity offsets.

Due to PS6 and the IDB Natural Capital and Biodiversity Mainstreaming Action Plan (Watson et al. 2024), it's likely that many IDB, IFC, and other development bank projects will need to offset their environmental impacts or invest in nature-positive strategies.

If these tools can deliver direct finance by compensating for the impact on nature of infrastructure development in the amount of just 5 percent of annual global spending on infrastructure, it could yield $150-500 billion annually, assuming a $9B portfolio. That would go a long way toward closing the biodiversity finance gap, currently estimated at $942 billion per year.

Habitat banking can be a part of the infrastructure finance landscape—delivering faster, more cost-effective, and more durable ecological restoration.

With the uptick of infrastructure investment, especially those investments aligned with the Sustainable Development Goals (SDGs), the timing is opportune to work on a country-by-country and project basis to develop these habitat banking systems into robust parts of the infrastructure finance landscape.

Habitat banks offer a "positively disruptive" alternative to traditional low-quality, dispersed, short-term compensation interventions done directly by project developers. Also known as conservation banking, nature compensation systems, or biodiversity offsetting, habitat banking has emerged as a market-based approach to conserve biodiversity by compensating for, or offsetting, the environmental impacts from development, primarily large infrastructure such as roads, pipelines and powerlines, ports and airports, and large agricultural and urban development.

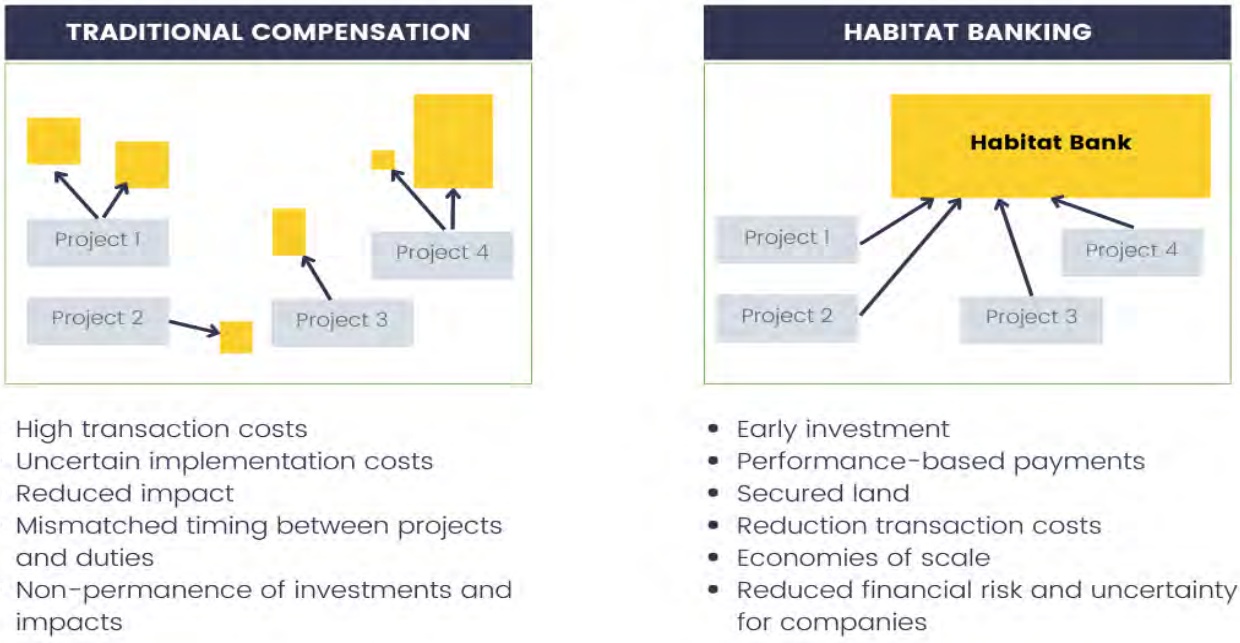
The habitat banking model stands apart from traditional government-run compensation schemes due to its performance-based payments, where funds are either disbursed from an independent trust upon the habitat bank operator achieving statutory milestones or where natural assets cannot be sold until milestones are achieved.

In Colombia, habitat banks that issue compliance biodiversity units offer compelling advantages (Figure 3):

- Cost is lower ($10,000/hectare vs $18,000 /hectare under traditional schemes). Environmental licensing can cause major delays in infrastructure project implementation, leading to cost overruns. Habitat banks help mitigate these risks.
- Approval times are faster at 12 months versus 26 months, saving costs for project developers.
- Projects boast longer permanence—registered for 30 years versus 12 years by traditional compensation projects (Figure 4).

Note: These numbers are for Terrasos-developed projects only, which comprise 10 of the 18 existing habitat banks. Other bank figures are not publicly available.

Figure 3. Traditional compensation versus habitat banks



Source: Terrasos

Here's a quick primer on how habitat banks work.

There are many design features that are critical to make private habitat banks effective. Figure 3 summarizes how they operate in Colombia.[4] The simplest way to describe habitat banks in Colombia is that private companies with biodiversity management experts on staff identify strategic locations to invest in large-scale conservation and restoration projects. The bank generates compensation credits from that work that can be sold to development projects. This model operates on a pay-for-results basis over a 30+ year period, utilizing a sinking fund that is vested over 15 years to ensure long-term ecological stability. All costs including obtaining land use permission, payments for landholders, labor, and supplies are bundled into the cost of credits.

Habitat banks provide a pathway for voluntary private investments in biodiversity.

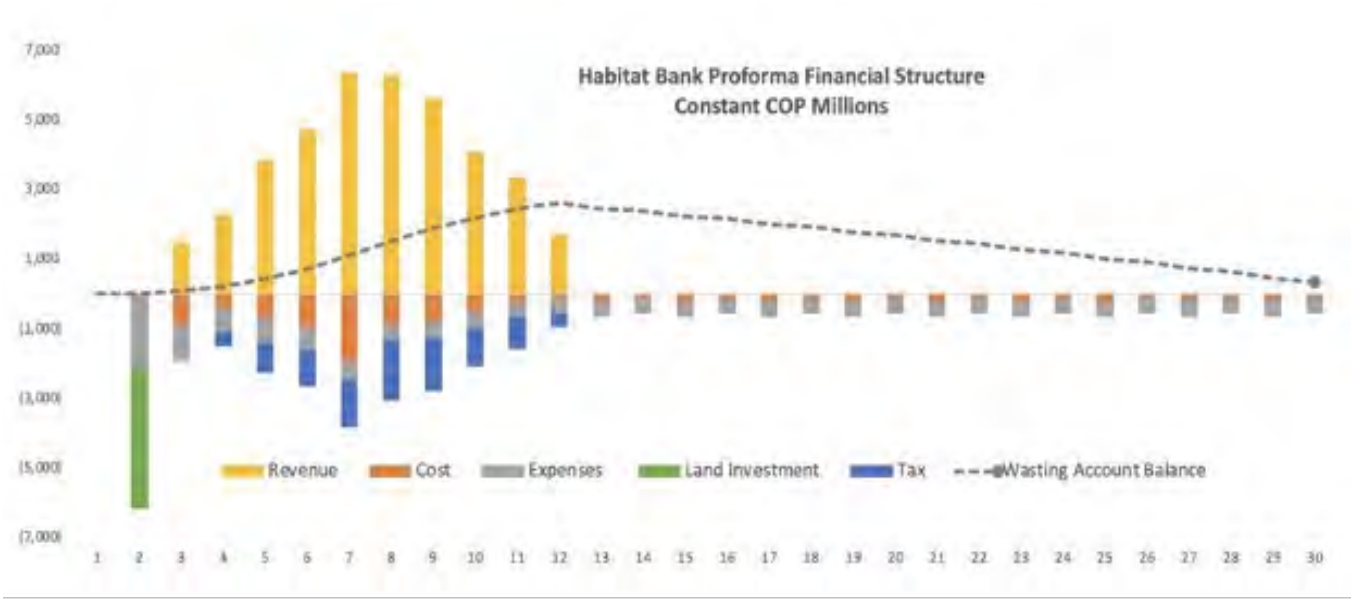
While mandatory biodiversity compensation driven through infrastructure lending or public policy is one use case, habitat banks could also support greater private investment motivated by financial disclosures on nature and/or demand for nature-positive biodiversity credits.

The Taskforce on Nature-related Financial Disclosures (TNFD) encourages and enables businesses and financial institutions to assess, report, and act on their nature-related dependencies, impacts, risks, and opportunities. This disclosure protocol, though not yet mandatory, is widely in use and increasingly elevates biodiversity as a primary consideration in investment decisions.

Meanwhile, a nascent voluntary market for biodiversity credits or units whereby biodiversity ecological outcomes can be purchased for compensation or contribution purposes has sprung up in numerous jurisdictions. Habitat bank credits may be used to meet this demand, too.

[4] See: https://www.ecosystemmarketplace.com/wp-content/uploads/2024/11/Habitat-Banking-Explained-1.pdf.

Figure 4. Sample cash flows of a 30-year habitat bank



Source: Terrasos.

We can realize massive benefits from scaling this tool to more countries.

An investment coalition of philanthropic funders, development banks, private enterprises, and NGOs could accelerate the adoption of habitat banking across the developing world. Doing so creates a path for rapidly scaling the funding going to nature conservation, leveraging limited dollars to create permanent funding where before there was none.

That requires an understanding of the countries, industries, or financing structures that already have the best enabling conditions for habitat banking across the biodiversity-rich Global South. Dissemination of the lessons from Colombia's habitat banking program to more countries is critical, as is replication of its strongest features alongside those learned in other countries' experiences. It means engaging with both demand drivers and policy-setters like national governments, multilateral finance institutions, and key commercial banks financing infrastructure development. It also requires building the supply pipeline of high-quality habitat bank projects.

The outcomes could be transformative: massive resource mobilization, restoration happening at landscape scale, more efficient regulation that's enforced more effectively, and sustained biodiversity gains and climate resilience.

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Design for demand: What actually drives private finance for nature?

What if the problem with conservation finance isn't a lack of capital—but a lack of real demand?

BEN GUILLON and GENEVIEVE BENNETT

Introduction: The conservation finance challenge

Interest in innovative financial instruments and market-based mechanisms like environmental credits is growing, driven by a glaring need to increase private finance for nature. The inadequacy of current action on the biodiversity crisis is increasingly obvious to decision-makers. Despite recent progress on a global resource mobilization strategy to deliver the target of $200 billion a year by 2030 set by Parties to the Convention on Biological Diversity, the real challenge lies in execution of that strategy. Meanwhile, meaningful progress has yet to be made on eliminating subsidies harmful to biodiversity, which vastly exceed nature-positive finance flows.

Any significant biodiversity funding agreement will likely include private finance as an important component. Public funding for biodiversity, while growing steadily, remains far below commitments and needs. Meanwhile, private finance for nature has stalled in recent years, despite growing interest from investors and increasing corporate commitments to nature-positive outcomes.
This stagnation has led to a surge of interest in innovative financial instruments and market-based mechanisms—from biodiversity credits to blockchain-enabled environmental markets—that might mobilize private finance for nature. However, many of these innovations struggle to generate meaningful financial flows to on-the-ground conservation projects.

The core challenge is that conservation finance often follows a flawed development path. Projects typically start with worthy ecological goals, then attempt to retrofit market demand, rather than starting with understanding who might pay and why. To overcome this challenge, we need to reframe our thinking. Instead of asking, "How can we fund this important conservation project?" we should ask, "How might we create environmental solutions that deliver enough value for specific customers that they would pay for them?" This shift in mindset requires approaching conservation finance like a startup venture, not a traditional conservation project.

Evidence: Uneven growth in nature-positive markets

Over the last decade, the "nature positive" portion of the economy—business models, financial instruments, and sectors that actively restore and generate nature—has increased its value fivefold, reaching approximately $1.5 trillion in estimated annual economic output. However, this growth has been remarkably uneven across different models and sectors.

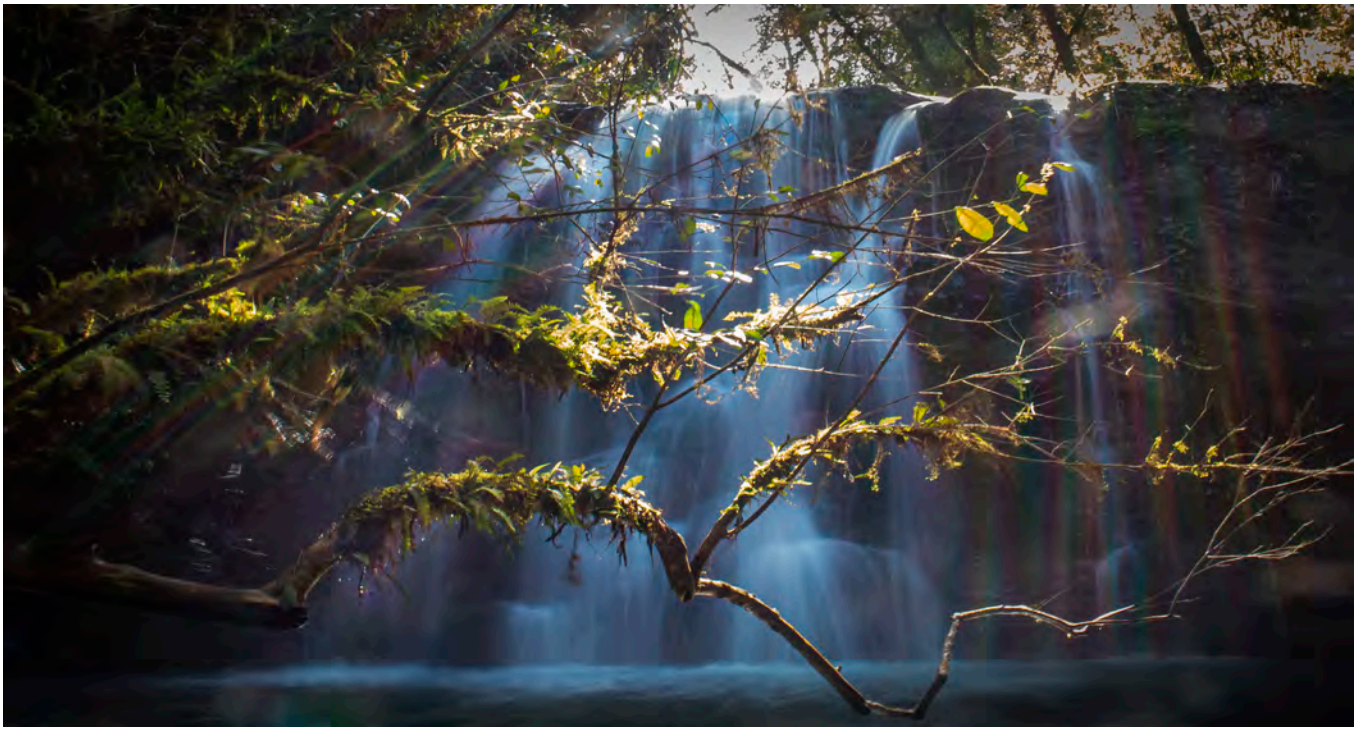
Some markets and business models have flourished. The wetland mitigation banking sector in the United States has developed into a robust $3 billion annual industry, supporting businesses ranging from small entrepreneurs to major asset managers. The "restoration economy" in the United States now employs more people than the coal mining industry. The voluntary carbon market, despite recent challenges, remains a significant channel moving private finance to climate mitigation projects in the Global South. In key agricultural industries with historical connections to deforestation,

demand for certified sustainable products is now growing faster than demand for conventional commodities.

Other promising approaches have underperformed expectations. Payments and benefits-sharing for access to genetic resources received considerable attention when introduced but have generated minimal financial flows at scale. The recently established Cali Fund for the Fair and Equitable Sharing of Benefits from the Use of Digital Sequence Information on Genetic Resources represents the latest iteration of this approach. While its objectives align with the Convention on Biological Diversity's three pillars (conservation, sustainable use, and equitable sharing), it follows the pattern of creating mechanisms without first confirming market demand. After three decades of similar approaches since 1992, benefits-sharing mechanisms have so far consistently failed to generate significant funding.

In the middle ground are models like water funds, which pool contributions from public, private, and philanthropic actors to invest in watershed restoration and conservation. While these funds have proliferated since 2010, when it comes to engaging private finance beyond situations with clear operational or reputational benefits for contributing companies, private capital interest has been very limited.

This uneven pattern reflects one core truth: private finance follows demand, not ecological need.



A waterfall that feeds into the watershed of the Paranaense forest in Misiones, Argentina. Credit: Lucia Carolina Larrea.

Diagnosis: Why conservation finance often falls short

The "Field of Dreams" trap

Over the last decade, the "nature positive" portion of the economy—business models, financial instruments, and sectors that actively restore and generate nature—has increased its value fivefold, reaching approximately $1.5 trillion in estimated annual economic output. However, this growth has been remarkably uneven across different models and sectors.

Many conservation finance initiatives fail because they start with worthy ecological goals and then

attempt to retrofit market demand—a "build it and they will come" approach that rarely succeeds in business or conservation.

This trap is particularly seductive in conservation because the ecological need often seems so obvious. When practitioners see degraded watersheds or fragmented habitats, the imperative to act feels clear. They develop sophisticated intervention plans based on ecological science and only afterward try to convince potential beneficiaries to pay. When interest is limited, the project either stalls or requires ongoing subsidies, never achieving financial sustainability.

The practitioners become so focused on the importance of ecological restoration that they fail to understand how other stakeholders perceive the problem—or whether they perceive a problem at all. A water utility may view watershed degradation as a minor operational concern rather than an urgent priority deserving significant investment. A corporation may see biodiversity loss as a distant issue that is disconnected from their core business.

The "Tool in Search of Application" trap

Conservation practitioners can become enamored with particular market mechanisms or tools, trying to force them into situations where they may not be appropriate. This is analogous to a software developer creating an elegant application without first confirming anyone wants to use it.

The current enthusiasm for biodiversity credits exemplifies this risk. Rather than starting with clearly identified willing payors, many initiatives begin with the crediting mechanism itself, assuming demand will materialize as the market develops. The core innovation—standardization of conservation outcomes—assumes that standardization itself solves a problem for potential buyers, a presumption rarely tested through customer discovery.

Similarly, the application of blockchain technology to environmental markets often proceeds without clearly identifying what specific customer problem it solves. Is decentralization addressing a real pain point for market participants? Does the current market truly suffer from transparency or trust issues that blockchain uniquely resolves? These fundamental questions often remain unasked.
This tool-first approach leads to sophisticated mechanisms that struggle to find sufficient demand because they weren't designed around actual customer needs in the first place.

Misreading market signals

A third critical problem in conservation finance is misinterpreting market signals—particularly confusing investor interest with actual customer demand. Investors may express enthusiasm and even make verbal commitments, but many don't write checks until they see evidence of market traction. When they do invest, it's typically because they perceive potential for future cash flow—a good proxy for market demand, but only a proxy with inherent limitations.

Proving early traction with customers is far more valuable than investor interest. Actual commitments from payors—those who will purchase the environmental service or benefit—provide stronger validation of market demand than even the most enthusiastic investor feedback. This distinction is crucial because investors are ultimately betting on future customer payments, not providing those payments themselves.

This confusion sometimes leads to unnecessarily complex financial structures that don't actually increase the funding available for conservation. Innovative structures like environmental bonds or blended finance vehicles only add value when they accomplish at least one of three outcomes: bringing new resources to conservation, increasing efficiency or speed of implementation, or effectively shifting risks to parties better positioned to bear them (such as investors or insurers). Without achieving at least one of these goals, such mechanisms merely repackage existing funding flows

rather than expanding them—creating financial smoke and mirrors without real impact.

In some cases, financial engineering is used to disguise the absence of a real payor altogether. This creates the illusion of market-based financing when the mechanism actually depends on philanthropic or public funding to function.

In short, the market doesn't reward intent. It rewards relevance.

Treatment approach: Thinking like a startup

First principles and problem definition

Instead of starting with ecological needs, successful conservation finance projects begin by understanding how environmental interventions create value that specific stakeholders will pay for. This requires going back to first principles and asking fundamental questions: What problem are we solving? Who experiences this problem? How might we create solutions that align with their priorities and needs?

This approach recognizes that organizations engage with environmental initiatives based on their identity, narrative, and material interests—not out of a sense of ethical obligation. A corporation might invest in watershed protection not because they "should," but because it reduces operational costs, mitigates regulatory risks, strengthens community relationships, or aligns with their brand positioning.

Systems thinking is essential to this process. By mapping the entire ecosystem of stakeholders, regulatory incentives, operational dependencies, and competitive dynamics, practitioners can identify leverage points where environmental interventions align with organizational priorities. This holistic view reveals opportunities that a narrower focus on ecological restoration alone might miss.

Prototyping, testing, and learning

Conservation finance projects typically involve substantial upfront costs and long timelines before generating returns. This creates significant risk if key assumptions about buyer demand prove incorrect. The startup approach mitigates this risk through rapid prototyping, testing, and iteration. Just as tech entrepreneurs launch early-stage products to test adoption, conservation ventures must test willingness to pay before scaling restoration.

Instead of developing comprehensive projects before confirming demand, practitioners should create low-cost prototypes to test critical assumptions. For example, before investing in a full-scale wetland restoration project, a developer might:

- Create visual simulations of the proposed project and measure potential buyers' responses.
- Develop sample credit documentation to get feedback on measurement approaches.
- Propose simplified pilot transactions that validate willingness to pay.

Each prototype should be designed to answer specific questions about market demand: Are buyers more interested in biodiversity metrics or water quality outcomes? What verification standards create sufficient comfort for transaction approval? What pricing thresholds trigger heightened scrutiny in procurement processes?

The minimum viable product (MVP) concept can transform how conservation finance projects are developed. Rather than waiting until all ecological elements are perfectly designed, practitioners should identify the simplest version of their offering that delivers sufficient value to attract initial buyers. An MVP approach might involve starting with a smaller geographic area, focusing on fewer ecological metrics, or simplifying verification processes while maintaining scientific integrity.

Human-centered design interviews with potential buyers are critical to this process. These conversations should explore not just whether a buyer might be interested, but their specific decision-making processes, internal approval requirements, budget constraints, and competing priorities. Often these interviews reveal unexpected insights: a corporate sustainability officer might care more about the storytelling potential of a project than its precise ecological metrics, while a compliance manager might prioritize regulatory certainty above all else.

Crucially, conservation finance practitioners must be willing to pivot when early testing reveals that initial assumptions don't hold. If the original concept doesn't resonate with potential customers, it's better to adapt the approach based on feedback than to persist with a flawed model. Funders should build flexibility into their grants to allow for prototyping and pivoting rather than forcing practitioners to pursue dead-end approaches simply because they were included in the original proposal. This flexibility helps avoid the traps discussed earlier, preventing practitioners from becoming stuck on a problem or tool that won't work in the market.

This cycle of building, measuring, learning, and pivoting allows conservation finance practitioners to develop solutions that genuinely meet market needs, rather than hoping demand will materialize for solutions designed in isolation.

A systematic framework for designing conservation finance

While human-centered design and lean startup methodologies provide the overall approach, a systematic framework can help practitioners avoid the "Field of Dreams" trap by focusing attention on the key elements of successful conservation finance projects. This framework examines three fundamental elements: value creation and demand, value capture mechanisms, and market size and scaling potential.

Value creation and demand

Understanding the different types of markets for environmental benefits is essential for identifying potential sources of demand. Each market type is driven by distinct factors that influence willingness to pay.

Natural markets emerge when environmental projects deliver measurable benefits to specific beneficiaries. The value creation is straightforward: it maps directly to operational or financial outcomes. Consider watershed protection that reduces water treatment costs. The value creation is clear (reduced operating expenses), the beneficiary is identifiable (the water utility), and the benefit is quantifiable.

What makes these markets powerful is that they align environmental outcomes with existing business imperatives. When an agricultural company invests in soil health, they capture immediate value through increased productivity and reduced input costs. The environmental benefit becomes a means to achieve an operational goal, not an end in itself.

Compliance markets create value by helping organizations meet regulatory obligations. While the immediate value is avoiding penalties, successful projects recognize that compliance markets also offer opportunities for competitive advantage. Organizations can position themselves as industry leaders who shape, rather than simply follow, environmental standards.

The wetland mitigation banking industry exemplifies this dynamic. The most successful banks don't just sell credits—they build business reputations as trusted partners who help clients navigate complex regulatory requirements while delivering superior environmental outcomes.

Voluntary markets generate value through connections to organizational identity and narrative. Companies participate not because they must, but because environmental stewardship aligns with who they are—or who they want to be. This might mean being seen as an ethical leader, building employee engagement, demonstrating innovation in addressing global challenges, strengthening stakeholder relationships, or managing reputational risks.

Understanding this identity dimension is crucial because it affects willingness to pay and demand stability. Organizations that embed environmental action into their core identity tend to be more reliable partners than those pursuing one-off "green" initiatives.

Public procurement often serves as a mechanism to capture various forms of value creation. Government agencies might act as direct beneficiaries seeking natural value (e.g., flood protection), compliance purchasers meeting regulatory obligations, aggregators of public demand for environmental benefits, or long-term stewards of natural assets.

Value capture mechanisms

Converting the value created by environmental interventions into reliable revenue streams represents one of the most challenging aspects of conservation finance. This challenge requires understanding both the nature of the benefits and the practical mechanisms for monetizing them.

Forest floor biodiversity in Barker Pass, Tahoe City, CA. Credit: Tica Lubin.

The first step is to diagnose where your environmental benefits fall on the spectrum from private to public goods. Are the benefits excludable (can you prevent non-payers from receiving them)? Are they rivalrous (does one person's use diminish another's ability to benefit)? These characteristics fundamentally shape which value-capture mechanisms are most appropriate.

For benefits with private good characteristics, like sustainable timber or agricultural products, direct market transactions often work well. The challenge shifts to production, certification, and market access rather than the fundamental value capture mechanism itself.

For benefits with club good characteristics—like exclusive access to restored natural areas—membership models, permits, or access fees can effectively capture value. The New York City watershed agreement exemplifies this approach, where the city secured improved water quality through upstream conservation rather than building costly filtration infrastructure.

The greatest challenge comes with public good benefits like biodiversity protection or carbon sequestration, where traditional market mechanisms break down. Here, practitioners must create artificial excludability (through regulation or voluntary commitments) or find ways to bundle these benefits with more easily monetized values.

In practice, effective conservation finance projects often layer multiple value capture mechanisms to create a sustainable financial model. A nature reserve might combine ecotourism revenue (private good) with carbon credits (public good made excludable), payments from downstream water users (club good), and philanthropic support for pure public good elements that can't be easily monetized.

The key to success lies in matching the value capture mechanism to both the nature of the benefit and the market context. A practitioner designing a watershed conservation program should ask:

Which aspects of watershed function can be linked directly to operational benefits for specific users? Which require regulatory frameworks to create demand? Which align with corporate identity or narrative needs? By tailoring value capture mechanisms to these different dimensions of value, conservation finance projects can build more resilient revenue models.

Market size and scaling potential

Understanding market size and scaling potential is essential for conservation finance success, yet theoretical market estimates often lead to disappointing reality. The journey from theoretical ecosystem service values to actual market transactions involves several critical steps of thinking.

The first dimension to consider is the nature of your potential payor base. Beyond simple numbers, consider which segments have the strongest motivation to pay based on regulatory exposure, operational risks, or identity alignment. A watershed conservation project might identify municipal water utilities as the theoretical market, but closer examination might reveal that only utilities in certain regulatory environments or facing specific water quality issues represent realistic prospects.

Equally important is developing a nuanced understanding of willingness to pay. Price points established in related markets create powerful anchoring effects. Many biodiversity initiatives struggle because potential buyers mentally compare their pricing to carbon credits at $7/ton, regardless of the differing costs of implementation. The key question becomes: What reference points shape your potential buyers' perception of value, and how might you reframe the conversation to establish more appropriate price expectations?

Market accessibility represents another critical dimension often overlooked in theoretical market calculations. What portion of potential payors can you reasonably reach through your channels, and what fraction will actually convert to paying customers? A watershed project might identify 50 potential corporate contributors, but reaching decision-makers and navigating procurement processes might limit actual access to just 10-15 companies.

The competitive landscape shapes market potential in ways conservation practitioners often underestimate. For biodiversity impact, a company faces multiple options: they could purchase biodiversity credits, fund a non-profit conservation organization, make payments to government agencies, implement their own offset projects, or simply do nothing. Each alternative solves the same fundamental problem for the company but with different cost structures, co-benefits, and implementation challenges. Understanding your solution's positioning amid these alternatives is essential for realistic market assessment.

By working through these dimensions of thinking, conservation finance practitioners can develop a more accurate picture of market potential. A watershed restoration project that initially estimates market size at $20 million (based on 20 percent potential savings on $100 million in water treatment costs) might, after careful analysis, recognize a realistic addressable market closer to $1.4 million. This profound difference has implications for everything from project scale to financial structure.

Beyond current market size, scaling potential depends on replication possibilities, economies of scale, and potential network effects. Can your approach be replicated across multiple watersheds or ecosystems? Do fixed costs (like measurement systems or market infrastructure) create economies of scale as transaction volume grows? Could your project create network effects where each new

participant increases value for existing participants? These questions help distinguish between one-off successes and approaches with true scaling potential.

Conclusion: Beyond conservation finance

This framework offers a starting point for designing conservation finance mechanisms that align with market demand rather than hoping demand will materialize for worthy ecological projects. By thinking like startup founders rather than traditional conservationists, practitioners can significantly increase their chances of developing financially sustainable approaches to nature protection and restoration.

However, it's important to recognize the limitations of conservation finance. Private finance works best when there is already money in the system—when there are stakeholders who can benefit financially, operationally, or reputationally from environmental outcomes. In contexts where potential payors lack resources or don't perceive clear benefits, conservation finance may not be appropriate. Therefore, conservation finance should not be seen as a replacement for public funding of nature. We cannot expect private dollars to fill in gaps in what the public sector is best suited to pay for, particularly for environmental values with public good characteristics.

The most promising path forward lies in a fundamentally different approach to conservation finance design. Rather than treating financial mechanisms as an afterthought to ecological planning, we need integrated teams that bring together ecological expertise, business acumen, design thinking, and systems analysis from the earliest stages of project development. This approach requires a different set of capabilities than those found in traditional conservation organizations or financial institutions alone.

By intentionally designing conservation finance solutions from first principles—combining rigorous customer discovery, iterative testing, and systematic market analysis—we can unlock new waves of private finance for biodiversity. The future of conservation finance belongs not to those with the most elegant ecological plans or the most sophisticated financial structures, but to those who most deeply understand the intersection of environmental value and market demand.

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No shortcuts to nature positive

MARTINE MARON, FABIEN QUÉTIER, and AMREI VON HASE

There's high energy out there these days around biodiversity crediting as a tool to achieve "nature positive" goals. The World Economic Forum (n.d.) has identified biodiversity credits as a key strategy to unlock finance for nature and created a dedicated initiative around them. Some carbon market actors tell Ecosystem Marketplace they're moving into biodiversity as the next big thing. There's considerable excitement around the prospect of nature-related financial disclosures driving a surge in demand.

McKinsey analysts recently projected a $69 billion market by 2050 under a middle-of-the-road scenario, and $2 billion in demand by 2030. For reference, Ecosystem Marketplace's (2017) last biodiversity market update found that voluntary biodiversity credits transacted perhaps $10 million per annum as of 2017, and that was probably an unusually big year, attributable to the Business and Biodiversity Offsets Programme's efforts at the time —so these are bullish numbers.

The excitement calls to mind the voluntary carbon market (VCM) in 2019. And proponents of biodiversity crediting are looking at the VCM for useful lessons. They're mindful of how integrity concerns triggered a massive contraction in the carbon market in 2023 (Ecosystem Marketplace 2024). The World Economic Forum's biodiversity credits initiative, along with expert groups like the Biodiversity Credit Alliance, are working to stand up governance and integrity mechanisms to avoid similar stumbles in the nascent biodiversity credit market.

For "nature positive" to succeed, it must build on lessons learned.

In a recent commentary published in Nature (2024), experts in the field, all members of the IUCN's Thematic Group on Impact Mitigation and Ecological Compensation, offers some key principles for achieving nature positive that draw on lessons learned from past experiments in biodiversity crediting, as well as from other nature markets. The authors set out three recommendations to avoid biodiversity markets "amounting to mere greenwash" (Maron et al.).

First, don't abandon the mitigation hierarchy.

Biodiversity offset markets have been around for decades, most notably in the United States, Australia, and the United Kingdom. Compliance markets for biodiversity mitigation are in fact ten times the size of the global VCM, though they receive far less attention (UNEP 2023). The United Kingdom recently launched its own national "Net Gain" policy, while the head of the European Commission has called to establish a market for biodiversity credits in the European Union.

However, proponents of new biodiversity markets are careful to emphasize that they're talking about biodiversity credits, rather than biodiversity offsets. Whereas an offset is meant to compensate directly for a negative impact on biodiversity, a credit is presented as a purely positive addition to the sum total of biodiversity, used by its buyer to do good, rather than make up for bad. Given the blowback that carbon markets are facing related to suspicions that buyers are using offsets as a kind of get-out-of-jail-free card, and given the inherent difficulties in ensuring that an offset project will truly compensate for the specific biodiversity values that were lost, this stance makes sense.

And yet, distancing biodiversity credit markets from their predecessors also means not learning from that experience.

"Sometimes you hear decision-makers or market actors speak as if 'nature positive' is a new solution that will finally fix the challenges of conserving biodiversity," says Martine Maron, lead author of the Nature (2024) paper and a professor at the University of Queensland. "But those challenges have been around for a very long time, and the conservation field has learned a lot about how to grapple with them."

Ensuring that companies and other actors that damage nature can't simply reach for an offset instead of limiting their damage is a problem that biodiversity markets wrestled with decades ago. Their solution: the mitigation hierarchy (Figure 1 on page 8). It's a process consisting of five sequential steps: first, avoid negative impacts on nature to the greatest extent possible. Next, minimize any unavoidable damages. Then restore and rehabilitate what remains, and only as a last resort, turn to offsets and compensation after all the prior steps have been taken. Finally, biodiversity credits enter the picture in step five: making further investments to ensure net positive gains for nature.

Rigorous adherence to this process must be a bedrock principle of nature positive, the authors explain. To do otherwise (that is, to purchase biodiversity credits before undertaking the previous steps) is to enter greenwashing territory.

"Companies should not be able to use biodiversity credits to say they are nature positive if they haven't first fully addressed their negative impacts through the mitigation hierarchy," says Maron. "There are no shortcuts."

Engage the full value chain.

Historically, biodiversity credits and compensation have been used to address impacts to ecosystems or specific species related to a specific development project, such as a mine, highway, or housing development.

But nature positive requires us to take a broader view, says Amrei von Hase, a co-author of the Nature (2024) paper and Programme Director at the Wildlife Conservation Society.

"Nature positive by definition requires us to increase our ambition to include entire value chains and financial portfolios, and to include land, water, and climate – not just biodiversity," she says.

That is no small task. Companies will need to trace and evaluate their nature impacts along their full value chains or portfolios. Then they'll need to take steps to avoid, minimize, and rehabilitate impacts. And then finally, identify strategies to invest in nature restoration to compensate unavoidable impacts in a "like for like" fashion (i.e., negative impacts on coastal wetlands in Australia should not be compensated by planting trees in Kenya), and additional investments to achieve a nature-positive outcome.

"Accounting for and managing a company's impacts on nature across complicated, globe-spanning value chains is tricky, but not impossible," says Maron. Tools and frameworks to achieve

A two-horned chameleon in the Amani Nature Reserve, Tanzania. Credit: Roshni Lodhia for The Nature Conservancy.

"nature positive" are emerging to guide the private sector on that path (Taylor et al. 2023).

Still, ensuring like-for-like compensation can be extremely difficult. That further underscores the need for the mitigation hierarchy, and looking first to avoid and minimize impacts as much as possible. This can be done in part through sustainable sourcing, say the authors.

Biodiversity credits can get companies over the line to nature positive.

Achieving nature positive status by 2030 is an immense goal. Consider that while the Paris Agreement gave us 35 years to reach net zero carbon, the Kunming-Montreal Global Biodiversity Agreement, ratified in 2022, set a timeline of just eight years to do something similar for biodiversity —and biodiversity is inarguably more complex to measure and mitigate than greenhouse gas emissions.

"Nature positive means more nature in the future than at the present," says Fabien Quétier, a co-author of the Nature (2024) paper and Head of Landscapes at Rewilding Europe. "That means that we need to reverse past impacts, not just address impacts going forward."

This is where well-designed biodiversity credits hold their greatest potential, say the authors. They can provide a vetted, high-integrity, off-the-shelf option for companies and other buyers to contribute to ecological restoration projects and thereby align themselves with a nature-positive future. Ideally, emerging market governance will help drive investments into high-value, hard-to-restore ecosystems, and not only the lowest-cost options when it comes to restoration, says von Hase.

Building the architecture for demand-side integrity

Integration of the mitigation hierarchy is just one piece of the overall integrity infrastructure that needs to be put in place to ensure biodiversity credits can't be used for greenwashing. The Biodiversity Credit Alliance, together with the International Advisory Panel on Biodiversity credits and the World Economic Forum, plan to release a set of high-level principles later this year for a high-integrity biodiversity credit market, and are convening stakeholders around producing a potential Claims Code of Conduct, as the Voluntary Carbon Market Integrity Initiative (VCMI) has done for carbon markets, as well as other market guidance.

"We can draw on 25 years of experience in biodiversity compensation that have given us best practice like the mitigation hierarchy, as well as looking to other markets for lessons learned and useful models," says Maron. "We're not beginning from scratch."

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Beetles in a pay stack: Stacking and bundling in biodiversity credit markets

JULIA MCCARTHY and RYAN SARSFIELD

> "There are only two ways to make money in business: bundling and unbundling."
>
> — Jim Barksdale, ex-CEO of Netscape and AOL

What good is an ecosystem? Or rather, what goods are an ecosystem? Clean water and air, climate regulation, flood and erosion management, biodiversity, and on and on. Can we value just one enough to get the rest for free? Should we put a price on each one and sell them separately? Or is that like taking a fresh-from-the-oven pizza and selling the cheese and toppings to different customers?!

Smart land managers and potential biodiversity market participants alike know that creating multiple revenue streams is often the difference between financial viability and bankruptcy. A forest manager can sell hunting access to the same land they sell timber from, or may sell some of the land's development value later on. A restored hectare of land with excellent biodiversity outcomes can sell biodiversity credits, but may also have carbon credit value. Emerging biodiversity markets will inevitably coexist and compete with other nature markets and "registered" credits, including voluntary carbon markets, water quality trading, and others, each with their own rules, jargon, and registries.

The conversation around how to generate multiple revenues from ecosystem credits is continuously evolving. The most straightforward way thus far seems to be to generate different ecosystem services (units or credits) from different, discrete supply areas of a project site. But what happens when you want to generate more than one credit from the same supply area of the property? Do you bundle? Do you stack? The debate goes on; stacking, bundling, or other terms have their champions and critics. What's risky, what's theoretical or unproven, and what's the best way forward? How do we find the beetle in the pay stack?

Here we'll have a crack at untangling how bundling and stacking fit into the growing biodiversity credit market using examples from the US and UK, which serve as an interesting contrast between long-established markets and an emerging nature market landscape.

Clarity on definitions

The terms bundling and stacking are raised quite frequently. Not surprisingly, there are differences in how the terms are interpreted and applied and nuances around whether ecosystem functions or services are sold together or separately. The Business and Biodiversity Offsets Program provides a deeper dive into the bundling and stacking approaches that have been attempted globally, highlighting how additionality, ecological complexities, and transaction costs have largely prevented some stacking approaches from developing in practice (von Hase and Cassin 2018). Finding a general consensus on the basic terms can refocus the conversation to help ensure that emerging approaches

in biodiversity markets avoid "double-counting" (aka "double-dipping" or selling the same outcome twice) and lead to genuine outcomes for biodiversity.

First, what is bundling and stacking?

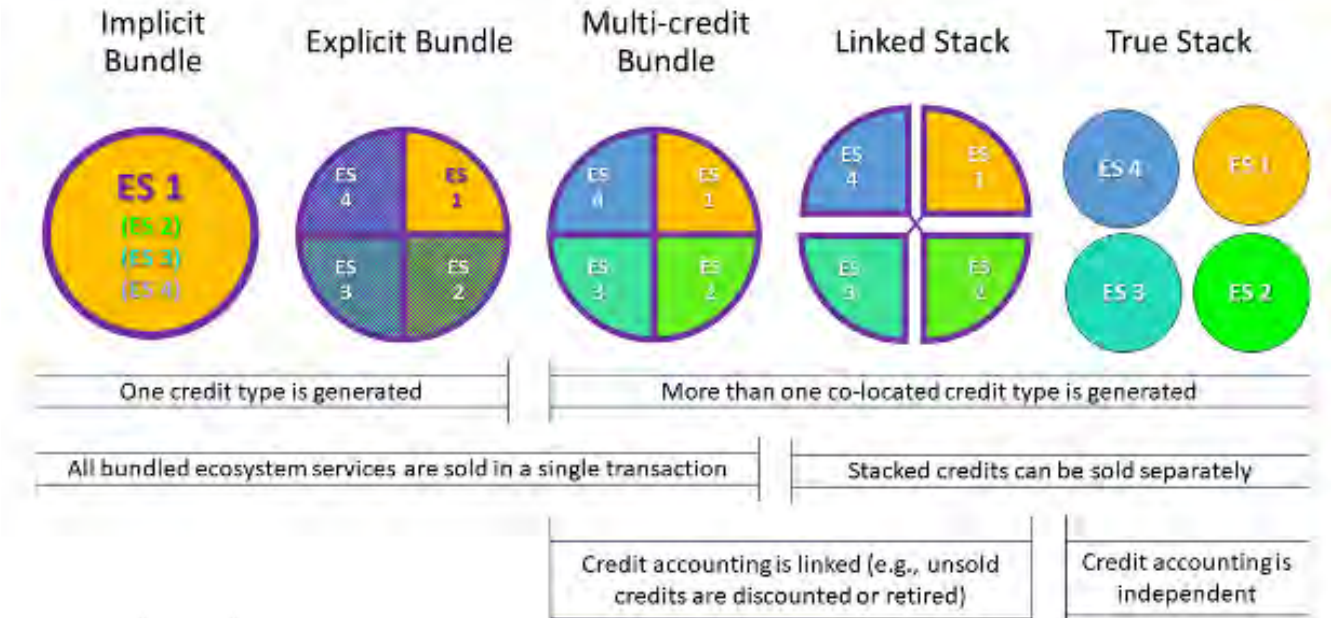
"Bundling refers to when more than one ecosystem service produced on a piece of land is sold as a single trade or credit to a single buyer" (Institute of Environmental Management and Assessment 2023). A bundle may represent multiple overlapping co-benefits within a supply area, and the level of quantification of each discrete function/service can vary. For example, an implicit bundle represents multiple, overlapping functions/services that are not individually quantified or measured, whereas an explicit bundle defines and measures functions/services more explicitly, and thus may more closely resemble a stack (von Hase and Cassin 2018). Arguably, when the biodiversity benefits of carbon credits (or other credits) are implied, e.g., through marketing with images of nature or descriptions of biodiversity, this should be considered an implicit bundle, as the implied biodiversity value affects both sales volume and price.

"Stacking is 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" (von Hase and Cassin 2018). A prerequisite to stacking is ecosystem unbundling, or representing an ecosystem as its discrete and divisible functions and/or services, which can be particularly challenging when it comes to interlinked functions or services (Robertson et al. 2014).

Is it really that simple? Well, no.

As we dive in further, the lines seem to blur, and what is emerging in practice does not always fit neatly into the boxes of a bundle or a stack. The variability in practice can be distilled into 1) whether ecosystem services are defined as separate credits, 2) whether those credits can be sold separately, and 3) whether stacked ecosystem services are unbundled and accounted for independently (Figure 5).

Figure 5. Bundling and stacking approaches



Source: Julia McCarthy, 2024.

Status quo in the US and UK

In the US, the primary biodiversity-related ecosystem markets generally allow for "bundling" and some types of stacking, but they draw the line at "true stacking." Clean Water Act (CWA) regulations allow for stream/wetland mitigation projects to be "designed to holistically address requirements under multiple programs and authorities for the same activity" (Army Corps of Engineers and EPA 2008). As such, joint banks have been developed which sell co-located wetland/stream mitigation credits (CWA) and conservation/species credits (Endangered Species Act), and, where agreed, these compensatory mitigation credits can also be sold to meet requirements under water quality or nutrient trading programs as well. However, the CWA regulations mentioned above are also quite clear that credits can only be sold to offset one impact. In other words, credits (e.g., ESA and stream/wetland credits) can be sold to a project needing to offset impacts to one or more resources, but these credits cannot be unbundled and sold separately for two different projects (e.g., for ESA/wetland impacts of one project and then again for water quality later). For a rundown of the updated rules in species markets, see Becca Madsen's (2023) (of the Environmental Policy Innovation Center) explanation. There are also examples from water quality trading programs, where the sale of one credit type results in a proportional reduction of credits from other co-located credit types (e.g., the Willamette Partnership General Crediting Protocol [2017]), although specific policies vary state-to-state. But in practice, co-located credits are generally either sold in a multi-credit bundle or a linked stack, where unsold stacked credits are discounted or retired after a single transaction. Note that compatible uses that could generate payments for landowners, such as duck hunting, can be approved at a bank site, but this is not considered a form of stacking.

To date, we aren't aware of examples in the US where true stacking approaches have been allowed or implemented within biodiversity-related credit markets or where stacked services/functions are inextricably connected. However, there are other market-based approaches that stack multiple ecosystem services but sit outside the construct of "registered" credit markets. For example, bi-lateral trading models exist where landowners are paid for the services generated and the resulting gains are used to meet insetting requirements, risk reduction targets, etc. An example of this type of approach is the Soil and Water Outcomes Fund, where they provide the landowner a combined ecosystem service payment for all benefits produced, and use the resulting gains towards carbon sequestration and water quality insetting requirements of market participants (note that biodiversity is not explicitly identified as a co-benefit). While this seems to fall within the definition of bundling (i.e., all ecosystem benefits are purchased together in a single transaction), it also seems to allow for the unbundling of these benefits in subsequent transactions between the intermediary and market participant. Further discussion of these market approaches is outside the scope of this blog, but it should be noted that the same double-dipping issues can arise, and transparency is needed.

Unlike in the US, where the primary markets have drawn a clear line on whether they allow "true stacking," the direction of emerging markets in the UK is less clear. As England kicks off their ambitious Biodiversity Net Gain policy, new guidance has been released allowing for stacking across biodiversity-net-gain (BNG) and nutrient markets (provided eligibility criteria are met for each market) (Department for Environment, Food & Rural Affairs and Natural England 2023). The guidance defines stacking as selling multiple credits or units from different nature markets separately from the same activity on a piece of land —a definition which appears to leave the door open to a range of stacking approaches, including "true stacking" models. The guidance also discusses how BNG and nutrient mitigation could align with voluntary carbon credits or the use of other environmental payments on the same land, although this does not appear to be considered stacking. Emerging voluntary biodiversity markets in the UK sometimes also allow for stacking. For example, PlanVivo (n.d.) notes that biodiversity credits can be stacked with carbon (assuming additionality criteria are met), but only with approved carbon codes, which to date includes only the PlanVivo Carbon Standard.

Recently, the British Standards Institute (2024) put out a new "flex standard" for nature markets for consultation, with definitions of bundling and stacking that generally align with the ones above. This standard also appears to leave the door open to a range of stacking approaches, so long as there is "robust measurement and verification of additionality in place for each type of unit in the stack." The flex standard also specifically addresses double-counting, with requirements that are intended to build on additionality and bundling/stacking trading rules. It's possible these requirements could serve as guardrails to prevent the unbundling and separate sale of interlinked ecosystem functions/services. However, it's still unclear in both the UK compliance and voluntary biodiversity markets how well eligibility, additionality criteria, and requirements on double-counting will address ecological complexities, and whether there will be clear limits on how stacked credits can be sold, as we've seen in the established markets in the US.

Charting a low-risk path forward

Here are four recommendations to make bundling and stacking less of a risk:

1. There needs to be clear guardrails and governance mechanisms in place to prevent double-dipping. For example, in implicit bundles, we need to ensure that biodiversity credits are not subsequently sold from a property on which nature benefits have already been marketed to a different type of credit buyer. And in stacking, we need to acknowledge that ecosystem unbundling has its limits —interlinked functions should not be unbundled and sold to separate buyers.

2. There needs to be transparency in credit accounting that allows for credit integrity evaluation. Credit sellers, methodology developers, and registries need to be specific about what they're doing, and this information needs to be clear and understandable. It should not take an investigative journalist or an exhaustive technical review to uncover the details of how credits are generated, marketed, and sold.

3. When buyers are engaging in markets as a way to address their impacts, whether in compliance offset markets or through voluntary markets, the equivalence of impacts and uplift needs to be considered. The same ecosystem services/functions need to be accounted for on each side of the equation. Buyers need —and regulators or equivalent project validators must require —absolute clarity on when selling stacked credits to different buyers is appropriate, and whether re-selling of unbundled credits is allowable. Let's not let vague guidance create a policy gap.

4. Emerging biodiversity markets, and especially voluntary markets, should aim for simplicity and legibility, recognizing that attempts at bundling or stacking may add layers of risk and complexity. Early transactions will work out better if complex additionality determinations or ecosystem accounting approaches aren't necessary. There is value in building from established practice elsewhere with well-considered pilots of new approaches, and within new markets.

As with so many other debates in the biodiversity crediting world, the hard-earned lessons of existing markets —habitat mitigation and species banking, wetlands, carbon, and others —give us the tools for success. Let's not ignore them.

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