

# State of Biodiversity Mitigation 2017

Markets and Compensation for Global Infrastructure Development Executive Summary

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### Foreword

The last two decades have seen humankind go on the biggest infrastructure building spree in history. Around the world, new roads, dams, mines have rapidly proliferated, primarily in developing countries and often in wilderness areas with high biodiversity values and little management of environmental impacts. There is still more on the way: by 2030, we'll need to roughly double current infrastructure spending to keep pace with demand.<sup>1</sup>

This infrastructure boom has been devastating for biodiversity values worldwide.<sup>2</sup> Habitat destruction and loss, often linked to new roads, dams, mines, and other large-scale infrastructure projects, is a major driver of this decline.

The trouble is that traditional approaches to biodiversity conservation can only do so much to address this problem. In the Andes-Amazon region, for instance, significant progress in establishing protected sites and recognizing indigenous territories in recent years has been all too easily undermined by infrastructure development outside of these areas.<sup>3</sup>

The *State of Biodiversity Mitigation 2017* report focuses on a new set of tools beyond traditional approaches to conservation. It reviews the scale, scope, and performance of a new class of policy mechanisms, biodiversity offsets and compensation, that use market instruments to respond to negative impacts of infrastructure development. Such market instruments can help us meet the ambitious goals set out in the Convention on Biological Diversity Aichi Targets<sup>4</sup> and UN Sustainable Development Goals.<sup>5</sup> They will also be indispensable in maintaining biodiversity values in the face of rapid infrastructure development.

These tools include biodiversity offsets and compensation mechanisms, which channeled at least \$4.8 billion (B) toward ecological rehabilitation and protection in 2016—representing roughly a doubling of transaction value in five years. The majority of funding comes from the private sector, with the energy, transportation, and mining/ minerals sectors dominating demand. On the supply side, the private sector is also a key actor. We find signs of a flourishing ecological restoration industry in the United States, for instance. Meanwhile, private investors report that 87% of mitigation banking investments are on track to meet or exceed projected internal rate of return.

At the same time, the public sector remains as important as ever for biodiversity conservation. Traditional tools like protected areas are still essential to safeguard biodiversity values. But the public sector must take the lead on mainstreaming biodiversity conservation goals and mitigation frameworks into sectoral strategies and infrastructure development planning outside protected areas and Indigenous Territories. Also, as this report illustrates, market mechanisms such as offsets and compensation require clear guidance and strong public oversight to deliver on their promise.

I want to thank project developers and investors who have contributed data to Forest Trends' Ecosystem Marketplace, and the donors and sponsors who continue to support our work. Tracking and transparency is an indispensable undertaking in this field—not only to catalyze growth in environmental markets and conservation finance, but also to serve the public interest in making information about these mechanisms freely available.

**Michael Jenkins** Founding President and CEO Forest Trends

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## Introduction: Mainstreaming Biodiversity Conservation into Global Infrastructure and Development

Biodiversity, broadly understood as the variety of life on earth, is in the midst of a mass extinction event. Between 1972 and 2020, we will likely see the average population size of vertebrate species decline by two-thirds.<sup>6</sup> Entire species are going extinct at rates never seen before in human history.<sup>7</sup>

Not coincidentally, we are also living through a global infrastructure boom. In approximately the next decade and a half, we can expect to spend \$90 trillion on new and updated power grids, roads, telecommunications, water systems, and other infrastructure. That is more than the value of the entire existing global infrastructure stock, and nearly double our current spending rate (\$6 trillion a year is needed; at present, investment stands at about \$3.3 trillion). Two-thirds of it is needed in developing countries.<sup>8</sup>

The challenge now becomes how new infrastructure development can actually work to preserve our natural capital and meet human needs at the same time? This requires, among other things, that biodiversity be considered early in the planning and design stages of development projects, including the explicit consideration of alternative locations or approaches, and that steps are taken to first **avoid**, then **minimize**, **rehabilitate**, and finally **offset**\* negative impacts every time that new development occurs—a process known as the **mitigation hierarchy** (Figure 2)—so that there is **no net loss** (NNL) of biodiversity in the end, and even a **net gain**.

This report shows how mitigation policies can leverage new financial resources and momentum in pursuit of NNL of biodiversity. The policy approaches and mechanisms detailed in this report also suggest how a clear, well-designed, and predictable framework for achieving NNL can increase regulatory certainty, speed up the pace of planning and permitting, and improve ecological outcomes.

We focus on the final step of the mitigation hierarchy: **offsets and compensation** (also referred to in this report as "compensatory mitigation"(Figure 1)). Although offsets and compensation should only be used as a last resort to address residual negative impacts of infrastructure and other development, they can be a powerful tool. In the United States, for example, where market mechanisms have been used since the 1980s in pursuit of NNL of wetlands, compensatory mitigation supports a \$4 billion (B)-a-year ecological restoration industry, hundreds of thousands of jobs, and billions more in spin-off long-term economic benefits.<sup>9</sup>

#### Figure 1: Compensatory Mitigation Mechanisms Tracked in This Report



At the same time, this report also illustrates that too often, the mitigation hierarchy is being implemented improperly or without adequate public oversight. Our findings that offset programs often operate with little transparency, billions of dollars in compensation funds are sitting unspent, and that regulations designed to ensure NNL are not always being enforced are extremely concerning and provide fuel to criticisms that offsets enable inappropriate development projects. Offsets can only serve biodiversity conservation goals when they are used as a last resort, implemented correctly and subject to public notice and evaluation. In this report, we focus on three primary mechanisms for implementing biodiversity offsets: mitigation banking, financial compensation, and permittee-responsible offsets. Mitigation banks are projects that develop offset credits for purchase by parties responsible for environmental damage. Credits are an example of advance mitigation, e.g., when mitigation actions occur prior to any negative impacts from development. Financial compensation occurs when the party responsible for environmental damage makes a financial payment, usually to a government agency or designated environmental fund, which, in turn, funds and oversees biodiversity management and protection programs to compensate for the biodiversity loss. In the United States, this method is also called "In-lieu fee" mitigation. Permittee-responsible offsets occur when the party responsible for negative biodiversity impacts carries out its own offsets or compensation, either directly or through a subcontractor. Offsets can either be on- or off-site, depending on the offsetter's preference and regulatory requirements.



#### Figure 2: The Mitigation Hierarchy Concept

## **Key Findings**

- An estimated \$4.8B in mitigation bank credits and financial compensation was transacted globally in 2016, more than doubling annual transaction values since 2011. That year, Forest Trends' Ecosystem Marketplace tracked 99 regulatory programs in 33 countries that used compensatory mitigation to achieve biodiversity conservation goals.
- Mitigation banks transacted an estimated \$3.6B in 2016 in compliance markets, or more than seven out of every ten dollars transacted in mitigation markets globally. Banking is concentrated in just a few countries; the largest markets are in the United States, Australia, Germany, and Canada.
- The largest banking market in the world is by far the US Aquatic Resources Compensatory Mitigation program focused on wetland and stream offset credits, which transacted an estimated \$3.3B in bank credits in 2016. By volume of credits transacted, wetland and stream banks in the United States have posted an average annual growth rate of 18% since 2010.

- Compensation funds accepted a reported \$1.2B in 2016 with 35% of programs reporting transactions, led by programs in India and the United States. But funds also reported that at least \$7.1B in total compensation funds collected to date remained unspent as of 2016, suggesting that a tremendous amount of offsetting activity has yet to be implemented, even though negative impacts to biodiversity have already taken place.
- Virtually all capital committed to mitigation banks by private investors had expected internal rates of return (IRR) between 10 and 25%.<sup>10</sup> Mitigation banking investments had significantly higher projected yields than other habitat conservation investments tracked by Ecosystem Marketplace. Investors reported that 67% of capital committed in 2009–2015 delivered on projected IRR while 20% exceeded expectations. Mitigation banking's IRR outperformed the broader category of habitat conservation investments tracked by Ecosystem Marketplace.
- Permittee-responsible offsets by area of habitat restored, protected, or created each year comprised an estimated 97% of overall global compensatory mitigation activity in 2016. However, permittee-responsible offsets typically operate with far less public transparency than banking or financial compensation. This makes it extremely difficult to track the economic value, ecological success, or adherence to regulatory objectives for permittee-responsible offsets.
- The energy, transportation, and mining/minerals sectors were responsible for more than 97% of offsets and compensation measured by cumulative land area under management.

## **Biodiversity Offsets and Compensation Worldwide: 99 Programs**

Globally, Ecosystem Marketplace tracked 99 regulatory programs that use biodiversity offsets and compensation to achieve conservation goals (Map 1).\*\* A program is the overarching system facilitating transactions between buyers and sellers, linked by a common administrator, policy or regulation, and/or market infrastructure. More than half of the active programs tracked in 2016 are national in scale. Approximately one-third are subnational, operating at the regional, state, or provincial level. Some programs operate on a local or community level.



Map 1: Compliance Offsets and Compensation: Countries with Active Programs, 2016

\*\* Excluding 63 subnational programs that implement a national policy or regulation on a state, regional, or provincial scale.

## Mitigation Banks Transacted an Estimated \$3.6B in 2016

Banking is concentrated in just a few countries; the largest markets are in the United States, Australia, and Germany. Pilot banks in France also were active in 2016. Banks transacted credits representing a reported 6,491 ha in 2016. These figures likely underestimate actual activity, since several major offsets and compensation programs that permit mitigation banking (namely in Germany and Canada) make relatively little data publicly available on banking activity in terms of land area.

The largest banking market in the world is by far the US Aquatic Resources Compensatory Mitigation program focused on wetland and stream offset credits, which transacted an estimated \$3.25B in bank credits in 2016. By volume of credits transacted, wetland and stream mitigation banks have posted an average annual growth rate of 18% since 2010; the conservation banking market (trading species and habitat credits) has grown an average of 10% per year during the same period.

Interest in third-party and advance mitigation in France, Spain, the Netherlands, the United Kingdom, Colombia, and Brazil suggests that banks may see growth in geographic scope in the future. The number of regulatorapproved mitigation banks rose from 53 in 2005 to more than 1,500 as of 2016. To date, banks have restored, protected, or created more than a cumulative 324,000 ha of habitat worldwide.



Figure 3: Projected Internal Rate of Return for Mitigation Banking and Other Habitat Conservation Commitments

Notes: Based on responses by 35 organizations reporting on \$503,719,750 in investments in habitat conservation. Source: Hamrick 2016.

## Most Mitigation Banks (87%) Met or Outperformed Investor Expectations in 2009–2015

According to data collected for Ecosystem Marketplace's *State of Private Investment in Conservation* report,<sup>11</sup> virtually all capital committed by private investors in mitigation banking had expected internal rates of return (IRR) between 10 and 25% (Figure 3). Mitigation banking investments had significantly higher projected yields than

other habitat conservation investments tracked by Ecosystem Marketplace, which is likely a reflection of the high risks associated with banking. In terms of actual performance, two-thirds of capital committed to mitigation banks in 2009–2015 delivered on projected IRR while 20% exceeded expectations. Mitigation banking outperformed the broader category of habitat conservation investments tracked by Ecosystem Marketplace.

Private investors reported \$1.1B in already raised but uninvested capital ready to be deployed for habitat conservation in the 2016–2018 period. A sizeable share of this could conceivably flow to mitigation banking, given the sector's IRR and historical share of capital investments (banks received 28% of total private investments in habitat conservation for the 2009–2015 period—or \$314M out of a total of \$1.1B). However, barriers to increased private investment in mitigation banking persist, primarily due to credit sale risks from delays in permitting and the credit release schedule, competition from public sector-sponsored mitigation projects, and uneven implementation of regulatory preference for mitigation banking.

## Financial Compensation Funds Collected \$1.2B in 2016, but Some Are Slow to Spend it

While mitigation banking primarily operates in only a few countries (the US, Australia, Canada, Germany, France) compensation funds are more widespread. They are found in 19 countries in all regions of the world. Compensation funds accepted a reported \$1.2B in 2016 (Table 1), led by programs in India and the United States. Our figure almost certainly underestimates actual activity, since only 35% of programs reported payment data in 2016.

Region	Number of Active Programs	Fund Revenues Received in 2016	Fund Balance as of End of 2016	Cumulative Project Area Reported
Africa & Middle East	5	\$4.1M	\$4.1M	9k ha
Asia	2	\$935.3M	\$6,635.0M	708k ha
Europe	11	\$8.7M	\$155.3M	n/a
Latin America & Caribbean	6	\$0.4M	\$49.8M	762k ha
North America	70	\$251.2M	\$163.0M	48k ha
Oceania	9	\$16.3M	\$58.8M	3k ha
TOTAL	103	\$1.2B	\$7.1B	1.5M ha

#### Table 1: Compensation Funds in 2016: Information about Active Programs

Data on compensation fund expenditures (e.g., value *spent* on conservation projects in a given year rather than value *paid into* the fund by compensatory mitigation buyers that year) was very difficult to obtain. Less than one in ten projects (9.2%) provided information on their 2016 expenditures; total value reported was only \$78M globally. This paucity of data makes it difficult to directly compare the annual ratio of revenues to expenditures, which in turn could suggest whether significant temporal loss is occurring (e.g., if there is a long lag time between negative impacts and mitigating activities).\*\*\* But funds did report that at least \$7.1B in total compensation funds collected to date remained unspent (with 42% of programs reporting on this data point), suggesting that a tremendous amount of offsetting activity has yet to be implemented, even though negative impacts to biodiversity have already taken place.

<sup>&</sup>quot;Temporal loss refers to the deficit in biodiversity values that exists for a period of time after negative impacts from development and before an offset site is mature, e.g., reaches full ecosystem function or desired species composition/habitat structure. Temporal loss may be addressed through advance mitigation, discounting, or other risk mitigation approaches.

## Offsets and Compensation Conserved 8.3M ha Globally, Led by Permittee-Responsible Offsets—but Transparency Remains a Problem

Permittee-responsible offsets are still the only option for compensatory mitigation in many countries. In the 33 countries tracked in this report with active compliance offsets and compensation programs in 2016, more than one-third of programs did not accept third-party compensatory mitigation as a compliance option, but rather only permittee-responsible offsets. Permittee-responsible offsets by area of habitat restored, protected, or created each year comprised an estimated 97% of cumulative global compensatory mitigation activity in 2016 (Figure 4). In other words, the \$4.8B in transactions to third-party mitigation providers documented in this report is only a fraction of actual spending on compensatory mitigation. Yet, permittee-responsible offsets typically operate with far less public transparency than banking or financial compensation and often enjoy lower standards set by regulators in terms of public notice during project design or reporting later on implementation and long-term outcomes. This makes it extremely difficult to track the economic value, ecological success, or adherence to regulatory objectives for permittee-responsible offsets.



Figure 4: Compliance Offsets and Compensation: Cumulative Land Area by Mitigation Type and Region, 1990–2016

Notes: Data on permittee-responsible offsets land area for wetland and stream compensatory mitigation in the United States could not be obtained for the years prior to 2012. Thus "cumulative" figures only reflect the 2012–2016 period for this subset of the data. This figure includes Oyu Tolgoi, a massive 5M ha project in Mongolia.

## Infrastructure Projects Drive Global Growth

On the demand side, the energy, transportation, and mining/minerals sectors were responsible for more than 97% of offsets and compensation measured by cumulative land area under management (Figure 5).

#### Figure 5: Demand in 2016 – By the Numbers



## Conclusion

The full *State of Biodiversity Mitigation 2017* report offers a more detailed exploration of these topics. The report also includes a review of accepted best practice for offset policy and project design and a "roadmap" for governments seeking to achieve Net Gain of biodiversity. We hope this report will serve as a useful benchmark to monitor future growth and activity, and that it suggests offsetting's promise as well as its practical challenges. Biodiversity loss is too serious a challenge not to employ all tools available to us that can help reverse ongoing declines. The challenge in the coming years will be to perfect these tools and their implementation.

## **Citations**

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