



Seminar

5

**Ecosystem Services
in Practice:**

**Market-Based ES—
From Theory
to Application**

Speaker

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Ecosystem Services in Practice: From Theory to Application

Introduction and Conclusion by Adam Davis, Solano Partner, Inc.

INTRODUCTION

The fifth seminar in this series, moving from theory to practice, examines new ways in which payments are being targeted at conservation and restoration objectives. As scientifically verifiable measures of water-, carbon-, and biodiversity-related benefits improve, they are increasingly being aligned with payments to landowners and land managers to create incentives for desired outcomes.

This seminar explores three innovative examples of market-based ecosystem services approaches that address quite disparate issues, but have in common the use of a cutting-edge measure of ecosystem performance as the basis for payment. These examples come from Brazil, Malaysia, and the state of Washington in the United States, and describe forest protection and restoration activities as well as a broad suite of watershed restoration actions for salmon habitat.

Market mechanisms that reward land managers have improved in reach and sophistication over the past decade. Quantitative assessment of the ecosystem services that result from specific protection and restoration actions are now the basis of credits in wetland, stream, water quality, and endangered species habitat markets in the United States. As a result, significant private and institutional investors are now able to recognize compensatory mitigation credits as an asset class, and the pool of capital available for conservation is expanding.

The stories related in this seminar, however, are not about the most developed and predictable of the environmental markets. Rather, they are about pioneering efforts to apply what is known about measurements of carbon, water, and biodiversity benefits to new forms of conservation activity. These new efforts broaden the application of ecosystem service theory beyond specific regulatory-driven compliance markets to address other, more complex buyer motivations, political structures, and the needs of conservation projects that have multiple objectives.

The first case presented here describes an innovative public financing structure known as a watershed investment district (WID). The WID mechanism essentially coordinates and integrates public funding to reduce conflict and unintended consequences from individual restoration and infrastructure projects.

The watershed of the Green and Duwamish rivers in King County, Washington, is home to over 600,000 people, and the rivers continue to support one of the largest runs of endangered Puget Sound chinook salmon remaining anywhere, despite tremendous disruption and ongoing development pressure. It is also managed by a confusing and overlapping set of jurisdictions that includes 16 cities, the County, the Port of Seattle, and various state and federal agencies.

This case study, presented by David Batker, executive director of the Tacoma-based non-profit, Earth Economics, provides an example of the use of ecosystem services-related insights and metrics to organize funding mechanisms at a significant scale. These mechanisms provided decision-makers with a clearer window into the benefits and costs of various management alternatives, and enabled them to overcome political and organizational boundaries to create an ecosystem service approach to watershed restoration.

The second case is described by Dr. Ben Guillon, who served as manager of mitigation investment and policy for New Forests, a fund and account manager for timberland and associated environmental markets headquartered in Sydney, Australia.

New Forests' Eco Products Fund has committed US \$10 million to the Wildlife Habitat Conservation Bank located in the Malaysian state of Sabah, in the northeast region of the island of Borneo. The investment thesis here depends on the sale of voluntary biodiversity conservation certificates that represent certified offsets for impacts resulting from palm oil production or through the sale of voluntary carbon credits from REDD-compliant activities.

Sabah's forests were heavily logged in the 1980s and 1990s, but the forest is now under much more direct threat from the expansion of palm oil plantations. If successful, the "biobank" model for rainforest conservation will use private finance to enable a link between



agricultural commodity production and forest conservation through the sale and purchase of biodiversity credits that respond to the needs of the oil palm industry to “green” its supply chain.

The third and final example comes from the Brazilian states of Rondônia and Mato Grosso , and represents one of the largest projects to date under the international Reduced Emissions from Deforestation and Forest Degradation (REDD and REDD+) incentive programs enabled by the United Nations Framework Convention on Climate Change.¹ It involves a management plan for indigenous land belonging to the Suruí people, and describes a structure to offer financial support based on the exchange of carbon credits that can be generated through REDD+ compliance activities.

This case is presented by Ricardo Bayon, a partner and co-founder at New York–based Eko Asset Management Partners, a specialized investment and advisory firm focused on monetizing environmental assets. Eko Asset Management Partners is interested in investing in Suruí carbon that would be generated under an all-inclusive 50-year strategic plan. The project would reward the Suruí for more sustainable land-use practices that promote and sustain community and environmental health.

While the case studies presented here necessarily reflect the complex risks inherent in all pioneering efforts, they also provide important insights to the community of scholars, practitioners, and potential investors interested in the value proposition at the core of the ecosystem services theory. We present them here for the lessons they offer in order to inform future efforts.

¹ REDD is a financial mechanism that creates incentives for countries and landowners to limit the conversion of forests into other land uses by valuing the carbon sequestered in the trees. In some cases, carbon offsets can then be produced through REDD and sold on the carbon markets. REDD+ is a variation of REDD; it goes beyond REDD to include forest carbon stock enhancement, sustainable management, and conservation.

CASE STUDY: GREEN/DUWAMISH RIVER AND CENTRAL PUGET SOUND WATERSHED

by David Batker, Earth Economics

Overview

The Green/Duwamish River and Central Puget Sound watershed is located in King County, Washington State, and includes Seattle and 15 other cities. There are over 600,000 residents within the watershed. It has the highest assessed property value of any in the state and is a major national manufacturing, transportation, and shipping area. The upper watershed is owned by private timber companies and Tacoma Water, providing forest-sourced and filtered water for the cities of Tacoma, Renton, and others. The Middle Green subwatershed is zoned agricultural and residential, with major transportation corridors. The Lower Green is highly industrialized, terminating in estuary and the Port of Seattle.

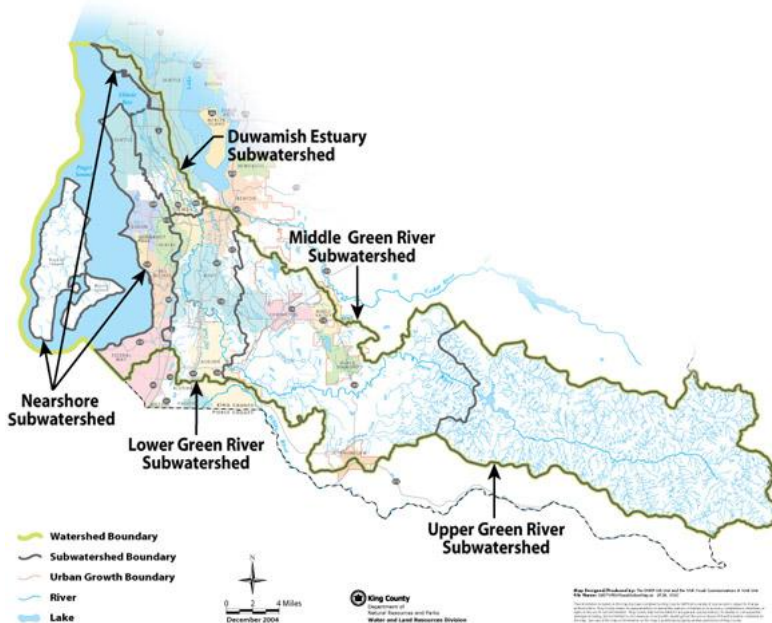


Figure 9: Map of King County Watersheds. Source: King County 2010.

The Green River is part of the federal Endangered Species Act (ESA) habitat listing for Puget Sound chinook salmon. Despite tremendous disruption, this river has one of the largest chinook runs in the Puget Sound basin. Once suggested as a “write-off zone” for wild salmon, the Green River watershed may actually lead the way for adopting ecological economics and ecosystem services as an approach to restoring salmon and establishing new funding mechanisms for restoring natural capital on a large scale. This approach has cut through polarized political barriers to implement restoration projects.

The Green/Duwamish River and Central Puget Sound (WRIA 9) Watershed Ecosystem Forum represents the 16 cities, King County, the Port of Seattle, Boeing, the Army Corps of Engineers, Washington Department of Fish and Wildlife, Washington State Department of Natural Resources, Washington State Department of Ecology, the King Conservation District, and several other citizen, business, and environmental entities.

Over a period of six years, Earth Economics and the Forum worked together to develop viable funding mechanisms and an ecosystem service approach to watershed restoration. The approach included: 1) examining the provisioning, beneficiaries, and impairments of ecosystem services in the Green River watershed, such as salmon habitat, flood protection, and recreation; 2) valuing those ecosystem services using benefit transfer methodology; and 3) identifying funding mechanisms of sufficient scale to protect, restore, and enhance natural capital.

Discussion of Outcomes

On May 13, 2010, the 70-member representative Forum took two remarkable steps:

- 1) The Forum voted unanimously to pursue US \$300 million in funding over the next ten years to create the world's first salmon restoration funding mechanism of sufficient size to fully fund a salmon habitat plan.
- 2) The Forum determined to advance an integrated approach to investing in stormwater management, flood protection, and salmon habitat restoration to improve the health of the Green/Duwamish River and Central Puget Sound watershed.

At the core of this case study is the need to rationalize major expenditures within the watershed to provide greater services at far lower cost. By coordinating storm water, flood, potable water and salmon restoration investments, goals for recharging groundwater, restoring salmon, securing water supply and flood protection can be achieved. Securing levee setbacks in the transition zone provides greater salmon benefits and can create parks, increasing public benefits and private property values.



Earth Economics analysis demonstrated that single-purpose approaches to watershed management often create “infrastructure conflict,” where one infrastructure investment frustrates the single-purpose goals of other infrastructure investments. For example, the cities in the Green River watershed have built stormwater systems to direct water more quickly into creeks and the river system. This has increased peak flows and flood damage, including damage to levees. Both higher levees and current stormwater systems have contributed to a reduction in water quality, damaging Puget Sound.

Out of this integrated approach, we developed the concept of a new institutional framework and funding mechanism in Washington State, called the WID. In late 2010, the Forum began reaching out to other watershed resource inventory areas (WRIAs) in the Puget Sound and across the state. A formal cross-WRIA working group was established in 2011, and work drafting the proposed legislation was led and completed by King County. King and other counties will be pursuing the legislation in the 2013 legislative session. The creation of a WID enables watershed-specific funding mechanisms selected from a large suite of possibilities, including private and public payment for ecosystem services (PES) schemes.

SUCCESSFUL ELEMENTS

- Conducting an ecosystem service valuation of 12 ecosystem services for the watershed, showed that the group has a large set of capital assets worthy of restoration and maintenance.
- Writing the award-winning economics chapter of the WRIA 9 Salmon Habitat Plan set out goals for “solutions at the scale of the problem,” and demonstrated the need for dependable, sufficient, fair, and rational funding mechanisms.
- Performing economic analysis for specific salmon restoration projects that included ecosystem service co-benefits resulted in unanimous approval of projects worth millions of dollars, “dirt moved,” and salmon restoration projects completed. This pragmatic application strengthened and unified the commitment of public and private participants to a more comprehensive solution.
- Provisioning assets, beneficiaries, and impairments — the three ingredients needed to structure a sustainable funding mechanism — were mapped.
- A two-year review of 25 potential funding mechanisms to achieve the target of a US \$300 million funding mechanism was an arduous but outstandingly productive process involving public and private stakeholders.
- Agreement was reached to create a WID, to be funded by several taxes: first an incremental property tax, then, as mapping and modeling allows, payments from beneficiaries and impairers, with investments back into the provisioning assets. Reports outline the details of the 25 proposed mechanisms, the top eight, and final three selected.
- In 2011, legislation was drafted to allow for WID creation in watersheds statewide by voters within the watersheds.

Enabling Conditions

The WRIA 9 Salmon Habitat Plan outlines US \$300 million in projects required to secure viable and healthy chinook salmon populations to meet ESA targets. Grants cannot supply this scale of funding. The Forum identified the funding needs, and Earth Economics assisted in developing a suite of specific funding mechanisms that would raise US \$300 million within 10 or 20 years, with the jurisdictional framework to house a new WID.

WRIA 9 elected officials, Democrats and Republicans, spent one year recruiting legislators and other WRIAs to support the WID. The fact that the WID moves funding from downstream beneficiary cities such as Seattle into up-stream areas (which are more conservative and resource-dependent, and have lower household incomes), helped secure rural, conservative community support. To date, legislation has been drafted and counties and legislators have been brought on board as a result of the effort of elected officials committed to the WID proposal.

ENABLING CONDITIONS

- Having a regulatory driver (ESA)
- Having all significant stakeholders at the table
- Initial valuation of ecosystem services (benefit transfer), which convinced all stakeholders that natural capital within the watershed is a tremendous capital asset, which enables economic development
- Having a completed project-level case study to illustrate success in securing funding and consensus using ecosystem service framework
- Having bold, politically savvy elected leaders, both Republicans and Democrats
- Having a few bold bureaucrats who became convinced and were willing to propose new ideas
- Having enlightened and forward-thinking private industry actors who were willing to consider multiple benefits and helped corral into collaboration business leaders who were more skeptical
- Having a very competent implementation and management team in King County that embraced ecological economic analysis, handled funding responsibly, and implemented salmon restoration projects effectively

Textbox 3: Enabling Conditions.



CHALLENGES

Challenges have been primarily the time it takes to communicate with and respond to all the questions and concerns of both public and private stakeholders. The vetting of funding mechanisms took two years, but was thorough. It secured the support of Democrats and Republicans, the Master Builder's Association and environmental groups, businesses and federal agencies. A lesser challenge is that King County and WRIA 9 have strong ownership, which has created a good core of support but set a slow and conservative pace for the pursuit of the WID legislation. Outreach to neighboring watersheds from Olympia to Everett has been strong, but statewide it has been slow, due to concerns about introducing the legislation in tough budget times, although there is great applicability in both rural and urban watersheds.

For the intervention of the nonprofit community as catalysts in the process, funding to enable more time to work with stakeholders, rural and urban, public and private actors is crucial, to build knowledge, commitment, and momentum. It seems that initial funding is best provided by foundations, and as the benefits are perceived, cities and counties will contract independently for the services, with nonprofits or with consulting companies as they expand into this field.

In this case, the intervention by Earth Economics was first enabled by grants from the Russell Family Foundation and Bullitt Foundation in 2004; then WRIA 9, King County, the King Conservation District, and other public funding was provided on a contract basis, with some additional gap funding support from foundations. In 2010, after contract funding for identifying the funding mechanisms and structure of the WID had been completed, the Gordon and Betty Moore Foundation provided key bridge funding when requests for briefings and information subsequently ballooned statewide.

LESSONS LEARNED

Solving the problem of how to secure funding at the scale required was an early goal. The first step toward success was identifying the key ecosystem services for the watershed, including salmon habitat, flood protection, and drinking water. By answering the concerns of decision-makers quickly and thoroughly, and communicating in both ecological and economic languages, we were able to engage political leaders, agency staff, and the non-governmental organization (NGO) community. Private and public partners were increasingly unified around the economic efficiency of an ecosystem service approach that could establish a permanent and sufficient funding mechanism for natural capital restoration and maintenance.

Success was secured by gaining approval and funding for specific salmon restoration projects, and by the implementation of those projects, which provided additional ecosystem service benefits. Salmon habitat was improved in the highest-priority areas (transition zone). Greater funding was secured through traditional grants, which was a success but clearly seen as insufficient to achieve ecological goals. This unity was made possible by the project's multiple benefits, including salmon restoration, flood protection, stormwater conveyance, water quality, parks, and property values.

Moving Forward

The WID needs to be passed into state law. The application to other watersheds has already begun with the rural Nisqually Watershed (WRIA 12) and several others. The funding mechanism in WRIA 9 will reflect the economic prowess of an urban watershed and be focused on the population size, the industrial beneficiaries of increased flood protection, and the shift to mapping-based ecosystem service billing. The Nisqually's funding mechanism will be focused on Tacoma Power, which owns a dam in the watershed and benefits from sediment reduction, and the city of Olympia, which draws its water supply from the Nisqually basin, as well as a small property tax so that every citizen contributes to the restoration of the watershed's natural capital. Every WID will have a tailored suite of funding mechanisms that depend on its specific ecological, economic, and political conditions.

The WID must be complemented by other institutions, both public and private. Earth Economics, with the Washington State Department of Natural Resources, is developing two PES schemes involving private actors in the Nisqually (rural) and Snohomish (urban) watersheds. Overall public funding for watersheds in Washington State will be derived from the four counties that hold most of the state's income.

SIGNIFICANT OPPORTUNITIES

- Release of an ecosystem service appraisal tool, SERVES (simple effective resource for valuing ecosystem services), to increase accessibility for showing the value of watershed-based PES systems
- Capacity for outreach to states and counties ripe for implementation of WIDs
- National accounting standards improvements that include ecosystem services
- Modification of national benefit/cost analysis requirements to include the value of ecosystem services
- A guidebook for applying ecosystem service analysis, valuation and PES structuring

Textbox 4: Significant Opportunities.



This means there is a need for meta-institutions to provide funding across the state. The Puget Sound Partnership (PSP), one such institution, still needs a funding mechanism. Earth Economics is engaged with PSP to develop funding mechanisms that are complementary to the WID and allow funding of work in rural watersheds. A state-level mechanism is also needed, and discussions are underway with the State Department of Natural Resources and Department of Ecology.

Critical to success is understanding the physical nature and distribution of ecosystem services and required enhancements, which determines how well markets or public institutions can embrace PES systems. Markets perform best where excludable goods are produced; a public utility structure is better where non-excludable services are provided. How these production and distribution systems fit with existing land ownership, culture, tax jurisdictions, and institutions is critical to the design of watershed-based ecosystem service funding mechanisms.

There is great promise for expanding this model at the watershed scale nationally and internationally. In regard to flood protection, drinking water, floodplain function reduction, hazard reduction, and mitigation, the idea of a watershed-scale institution charged with maintaining and enhancing natural capital is increasingly well-received. A strategy is needed for moving this work to a national and global scale.

In addition, there are complementary efforts that would greatly strengthen the application and effectiveness of PES systems at the watershed level. These include improving national accounting standards to include potable water provisioning and quality, flood protection, and habitat. Improvements to traditional benefit-cost analysis (required by all federal, state, and local agencies) to include the value of ecosystem services would shift billions of dollars from less-effective "hard" solutions, such as higher levees, to more resilient solutions that provide greater ecosystem service benefits, such as moving levees out and expanding the floodplain. There is a significant list of actions that would improve economic decision-making and allocation of private and public resources, enhancing PES schemes and the allocation of capital.



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THE MALUA BIOBANK

by Dr. Ben Guillon, WRA Environmental Consultants and New Forests (formerly)

The Malaysian state of Sabah is located in the northeast region of the island of Borneo. It is home to one of the world's most extraordinary assemblages of wildlife species, including the orangutan; the Bornean gibbon; a variety of large cat species, including the clouded leopard; pygmy elephant; the critically endangered Sumatran rhino; sun bear; and 300 species of endemic birds. The forest of Sabah is based on towering dipterocarps that have been the basis of a significant timber industry for decades. Much of the commercial logging is now finished and the timber industry is in substantial decline; today the forest is under much more direct threat from the expansion of palm oil plantations.

The government of Sabah has actively sought innovative solutions to financing forest conservation and transforming its forest estate to a long-term model of sustainable management. It understands the significance of its biodiversity and the option value it provides both to Sabah and to the world. For example, saving and studying the animals, plants, and fungus living in the forest could potentially lead to the discovery of new drugs to treat diseases like cancer. The Malua Wildlife Habitat Conservation Bank creates an incentive for the government of Sabah to forgo revenues from logging licenses and fees though the monetization of the biodiversity harbored in the Malua Forest (Malua Wildlife Habitat Conservation Bank 2010). The idea behind the Malua BioBank is that the forest produces ecosystem services of higher quantity and quality when intact, and therefore its preservation will provide greater value than the benefits derived from the marginal expansion of palm oil plantations.

Overview

The Malua BioBank covers 34,000 hectares (80,000 acres) and encompasses the watershed of the Malua River, a tributary of Sabah's longest river, the Kinabatangan. Malua lies within the Heart of Borneo boundary, is surrounded by palm oil estates on two sides, and acts as a critical buffer zone for the pristine Danum Valley conservation area to the south (Brunei Forestry Department 2003). The predominant vegetation type in Malua is lowland dipterocarp forest that has been selectively logged for high-value commercial timber species while retaining its outstandingly high conservation values. The project goals are:

- To restore and protect populations of endangered and protected species in the reserve
- To restore a functioning lowland dipterocarp ecosystem in the reserve
- To create a new model for rainforest conservation, using private finance and linking increasing agricultural commodity production with the expansion of forest conservation through the sale and purchase of biodiversity credits

The Malua BioBank is a joint venture between the Malua BioBank Company — established and wholly owned by the Eco Products Fund (EPF) — and the Sabah state government. The Sabah state government has been supportive of efforts to make the project a commercial success. The Sabah Forestry Department implements the conservation work on the ground, while EPF develops the BioBank's marketing program. The EPF is a private U.S. equity fund that invests primarily in terrestrial carbon markets and wetland and stream mitigation banks in the United States. EPF committed US \$10 million to the Malua BioBank in August 2008.²



Figure 10: Map of Malaysia and Indonesia. The Malua BioBank is located in the Malaysian state of Sabah. The Malaysian state of Sabah is at the northeast tip of the island of Borneo.

² EPF is managed jointly by New Forests and Equator LLC. New Forests (www.newforests.com.au) is a forestry and ecosystem services investment management firm based in Sydney, Australia, with offices in San Francisco and Kota Kinabalu (Malaysia). New Forests manages forest plantations, carbon



The investment thesis of the Malua BioBank is predicated on the increasing need of the palm oil industry to "green" its supply chain. Malaysia and Indonesia are the largest global producers and exporters of palm oil, which is used in a large number of food items and cosmetics, and increasingly as a feedstock for biofuels. The production of palm oil in Malaysia and Indonesia has increased significantly in recent decades, but most often by plantations on lands converted from rainforest to oil palm. The conversion of rainforest has had significant environmental effects, including loss of habitat, destruction of biodiversity (including significant impacts on globally recognized species like the orangutan), and emissions of carbon dioxide from forest destruction.



Figure 11: The Malua BioBank is adjacent to the palm oil frontier. Source: Sabah Forestry Department.

Consumers in Europe and the United States are increasingly concerned about the environmental sustainability of palm oil, and are demanding that products containing palm oil be certified as coming from sustainable sources. In response, the Roundtable on Sustainable Palm Oil (RSPO) has been created to incorporate producers, consumers, and NGOs in a process to develop and implement sustainability certification for the supply chain (Roundtable on Sustainable Palm Oil 2009a).

The BioBank was set up to restore and protect the Malua Forest Reserve over a 50-year period, and to finance this through the sale of voluntary biodiversity conservation certificates and/or certified offsets into the palm oil supply chain, or through the sale of voluntary carbon credits from the REDD project.³ The purchase of biodiversity certificates and offsets from the BioBank would allow end buyers to support forest conservation and support a greening of the supply chain while generating commercial returns for the investor.

The concept of biobanking has been implemented in other parts of the world. In the United States, for example, programs known as mitigation banking and conservation banking, regulated under federal law, require developers to offset impacts to wetland, streams, and endangered species habitat. This is a multibillion-dollar market. Groups like the Business and Biodiversity Offsets Program (BBOP), a program of the international NGO Forest Trends, and the Wildlife Conservation Society have been working systematically with business to standardize and broaden the use of compensatory mitigation of biodiversity impacts.

Discussion of Outcomes

To date, the project has recorded great successes on the conservation front. Logging has been stopped and poaching dramatically reduced. EPF's investment was used to establish new forest checking stations and to equip ranger teams with vehicles, motorbikes, and effective telecommunication systems. The forest department staff is conducting an outreach campaign in the neighboring palm oil plantations. The effect has been a sharp decline in poaching in the Malua Forest. In addition, the forest department, in collaboration with a prominent international NGO, is carrying out a series of research projects, including an inventory of the forest's wildlife and a study on the potential for using cable bridges to re-create connectivity in the canopy for orangutans.

The commercial side of the project, through the sale of biodiversity credits, has been more challenging.⁴ Following the global financial crisis, demand for palm oil decreased sharply and palm oil prices plummeted (Aglionby 2008). Several biofuel projects were put on hold or canceled, and the palm oil growers did not see sustainability as the industry's most pressing issue. This clearly illustrates the risk for a project that relies entirely on the voluntary market and industry self-regulation.

assets, and biodiversity assets in the United States, Australia, New Zealand, and Malaysia. Equator (www.equatorllc.com) is a timberland and environmental asset management firm with offices in New York City and Sao Paolo. In addition to environmental assets managed in the United States via EPF, Equator manages timberland assets in Brazil.

³ REDD is a financial mechanism that creates incentives for countries and landowners to limit the conversion of forests into other land uses by valuing the carbon sequestered in the trees. In some cases, carbon offsets can then be produced through REDD and sold on the carbon markets.

⁴ Credits are individually registered on the Markit Environmental Registry (they were listed on the TZ1 registry prior to its acquisition by Markit). Each credit is fully traceable and can then be transferred to a buyer account. The buyer then has the option to either retire the credit or keep it and resell it at a later date.



Enabling Conditions

The project's conservation success can be traced to the strong partnership between the Malua BioBank and the Sabah government. Sabah's chief minister, the director of forestry, and several local businessmen have demonstrated their personal commitment to conserving the forest, as well as a genuine interest in new approaches to conservation such as REDD and biodiversity certificates. This core group of champions enabled the project to be carried forward in spite of pressure to convert the area to oil palm or timber plantation. On the ground, forestry department staff who had been active in logging the Malua Forest embraced their new mission, as they understood that their jobs were closely tied to the survival of healthy forests. Finally, a strong network of local NGOs provided the project with the much-needed scientific capacity and technical support.

Moving Forward

The main challenge faced by the Malua BioBank is the absence of a clear regulatory framework for biodiversity offsets in Malaysia, as well as the lack of commitment from the palm oil industry. The project was predicated on the development of a voluntary market for biodiversity credits based on self-regulation by the palm oil industry. Indeed, the RSPO announced in 2009 that compensation for impacts to biodiversity was a priority for improving its sustainability certification (Roundtable on Sustainable Palm Oil 2009b).

In the wake of the global financial crisis, however, most palm oil growers are focused on maintaining their profit margins and see sustainability issues as a luxury they cannot afford. Consumers are trying to adapt to the effects of the crisis on their everyday lives, and are less inclined to focus on responsible products and companies. In the absence of these drivers, a voluntary market is very unlikely to start and grow. To address this lack of regulatory framework, the Sabah government has been considering the development of a "no net loss" policy for forests and the use of biodiversity offsets. Malua BioBank is well placed to provide biodiversity offsets under such a policy.

Looking back at the first three years of operation of the Malua BioBank, it is clear that the project has been particularly affected by the global financial crisis, which would have been difficult to predict at the time it began. Moving forward, the Malua BioBank needs to focus its efforts on creating a market for the biodiversity certificates, because that is the only way to ensure that successes in science and conservation are sustainable. In the shorter term, Malua BioBank is pursuing partnerships with major end users of palm oil who are interested in testing a new approach to environmental sustainability. Food processing and cosmetics companies are prime partners for this strategy. For the longer term, the biobank is working closely with the government of Sabah to develop a regulatory program for biodiversity offsets. Once the regulatory framework is in place, the business model pioneered by the Malua BioBank could be effectively scaled up.

The project revealed two interesting lessons: the importance of predictable demand, and the need for diversity of capital. At the project's onset, the voluntary markets seemed the best way to incorporate biodiversity considerations into the palm oil supply chain. Voluntary markets are usually quicker to develop and to adapt than regulatory markets. However, it is now clear that the demand generated by voluntary markets is less predictable than the demand created through regulation and enforcement, and therefore carries a greater risk.

Developing a biodiversity market requires a diversity of capital sources that may be different at each stage of the project. In the case of Malua BioBank, the early investment of capital to fund the research, capacity-building, and market infrastructure needed to initiate the market required patience. Most of the outcomes of these activities are common goods that will be used by all market participants and not exclusively by the original investor, and private investors are therefore reluctant to fund them. Also, other stakeholders may have concerns about the potential conflict of interest if private capital is used to finance the design of regulations and the scientific evaluation of environmental markets that the private interests will also invest in. Grants from government, international organizations, or foundations could be an effective and transparent capital source for funding these activities.

Once the regulations are in place and enforced and a demand is clearly identified, larger amounts of private capital can be channeled to projects to grow the market and achieve both financial and environmental outcomes. Private capital successes in models such as these tend to be iterative as retained capital becomes available for reinvesting in similar conservation ventures. The interdependent combination of nonprofit start-up capital and private take-out funding greatly enlarges the overall investment pool for conservation, with rewards for all parties involved.



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THE SURUÍ CARBON PROJECT CASE STUDY

by Ricardo Bayon, EKO Asset Management Partners

Overview

The Suruí Carbon Project is a carbon financing scheme to protect Terra Indígena Sete de Setembro, located on the border of the Brazilian states of Rondônia and Mato Grosso. This area belongs to the Suruí, an indigenous tribe composed of nearly 1,300 people, who have committed to reversing environmental degradation caused by harmful deforestation. In an effort to preserve their culture and ecology and improve their economic prosperity, the Suruí have committed to transitioning to more sustainable land-use practices.

With the help of Forest Trends, the Amazon Conservation Team (ACT), Ethno-environmental Defense (Kanindé), the Institute for the Conservation and Sustainable Development of Amazonas (IDESAM), and Fundo Brasileiro para a Biodiversidade (FUNBIO), the Suruí people, through their representative organization, Associação Metareilá do Povo Indígena Suruí, created the Suruí Carbon Project to complement financing of their management plan for Terra Indígena Sete de Setembro. This summary offers a high-level overview of the Suruí Carbon Project from the perspective of Eko Asset Management Partners (Eko Asset), an investment firm interested in supporting the project.

The management plan for Terra Indígena Sete de Setembro is an all-inclusive 50-year strategic plan to direct the Suruí toward more sustainable land-use practices that promote and sustain community and environment health. The plan outlines pathways to ensure economic prosperity and food security, increase capacity-building, promote sustainable land-use practices, and so forth. The Suruí Carbon Project began in 2009, shortly after the Suruí imposed a moratorium against logging on Terra Indígena Sete de Setembro. This moratorium demonstrated the community's commitment to environmental protection and provided the necessary support to move forward with the project.

The Suruí Carbon Project offers financial support based on the voluntary exchange of carbon credits that are generated by Reducing Emissions from Deforestation and Forest Degradation (REDD+). FUNBIO manages the Suruí Fund, which will collect money from the carbon project and help with the long-term financing of the management plan to support education and other community activities for the Suruí people. The Suruí Carbon Project is designed to:

- Protect 240,000 hectares of land
- Provide around 370,000 tons of carbon offsets by 2012 and 1.1 million tons by 2020

The future of Suruí Carbon may have significant implications for the future of REDD+ programs and other indigenous carbon financing schemes. This is the first REDD+ project of this scale, and its successes and failures will blaze a trail for similar projects, particularly those that involve indigenous peoples.

Discussion of Outcomes

Since the logging moratorium was first enacted in 2009, the Suruí have successfully secured investment to finance the project. While financial returns have yet to be realized, there have been significant social and environmental returns; the Suruí organizational capacity has increased, as have direct benefits to the community benefits, such as health and education. The Suruí have also received commendations from international and national agencies in recognition of their alternative forest management practices.

Due to the lack of market opportunities to facilitate the sale of REDD+ carbon credits beyond the scale of the voluntary market, financial returns have not met original expectations. Eko Asset, in an attempt to sustain the project, is interested in investing in Suruí Carbon. Eko Asset would offer capital to encourage the community to continue to participate in the Suruí Carbon Project, continue the moratorium, and follow Terra Indígena Sete de Setembro's management plan. The delay in receiving financial returns from REDD+ credits is causing some Suruí to question the original motivation and potential success of their moratorium, as well as the community's decision to pursue carbon financing. Eko Asset is confident that markets will allow the trade of REDD+ carbon credits, and thus is willing to front the capital



Figure 12: Map of Project Area. Source: Metareila Association of the Suruí People.



and assume the risk now, while there is a standstill elsewhere in the market. Once the markets allow for the trade of REDD+ carbon credits, Eko Asset plans to sell to prospective buyers.

SUCSESSES

Despite a lag in financial payment to the Suruí community, this project has already produced significant results that will prove beneficial to future carbon projects. They are:

- The 2009 logging moratorium
- Legal due diligence defining indigenous property rights over carbon credits
- A comprehensive informed consent process
- One of the most advanced project design documents (PDD) available to date for forest carbon projects

The community's decision to impose a moratorium on logging in 2009 represents not only a victory for conservation, but also for indigenous people's rights. Baker and McKenzie, one of the world's largest and most respected law firms, was part of this process and put out a legal opinion arguing that the Brazilian constitution does indeed give indigenous people the legal right to sell and benefit from carbon credits generated from their land (Forest Trends 2009). This analysis will have many implications for indigenous people throughout Brazil. Forest Trends, with the help of the project's partners, conducted an extensive education and prior informed consent process to establish the Suruí Carbon Project, including the associated Suruí Fund; the process will be a model for future indigenous financing projects. The success of this project will likely be groundbreaking for other environmental financing schemes in Brazil, particularly those that involve indigenous populations.



Figure 13: Members of the Suruí Community. Sources: Beto Borges (left); Metareila Association of the Suruí People (right).

Enabling Conditions

Developing this project was time-consuming and costly. Because it is a pioneering project, the upfront investments needed were large. A large component of developing a carbon credit program involves assessing the drivers and outcomes of deforestation, and the support of the Amazon Conservation Team was instrumental in fostering the gathering of technical information related to deforestation. This information was vital in order to structure the Suruí Carbon Project. Most of the work conducted to create this scheme is translatable to other projects, which will reduce the costs and time constraints of future projects.

This project benefited from the release of the Voluntary Carbon Standard (VCS) methodologies for REDD+ projects earlier this year; the methodologies were catalytic for many REDD+ projects around the world. Of utmost importance is the political will and commitment demonstrated by the Suruí community. The community's commitment to sustainable forest management is the foundation of this project.

Moving Forward

The Suruí Carbon Project is currently undergoing validation under the VCS and Climate, Community, and Biodiversity (CCB) standard; validation will solidify the credits' trading potential and hopefully generate additional revenue for the project. Until more markets begin to trade REDD+ forestry carbon the project will not meet its full potential, because voluntary carbon trading does not have the volume to support a long-term financing scheme. The community expected to see a return sooner than it has and is eager to see a payout. Eko Asset has an opportunity to offer initial purchase capital to sustain the project through credit validation and the early implementation phases. If Eko Asset were to invest, it would reassure the Suruí community that the project has a future with carbon markets.

The government of Brazil has been rather neutral concerning this project; it has neither supported nor hampered the effort. No new laws or policies have been created, but it is expected that the government will voice its position and Baker and McKenzie's analysis will influence future policies. Fundação Nacional do Índio (FUNAI), the Brazilian government agency in charge of handling indigenous issues, has closely monitored the actions and progress of this project. There is potential for FUNAI to adopt the methodologies and processes involved in the Suruí Carbon Project as a model for future carbon projects in Brazil involving indigenous communities. With the support of FUNAI and other branches of Brazilian government, the likelihood that additional markets will trade REDD+ carbon credits will greatly increase and bring this project closer to realizing its full potential.



References

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CONCLUSION

Innovation in an arena as new and complex as market-based ecosystem services programs is inherently challenging. Yet the practical application of ecosystem services theory provides an opportunity to align economics with ecology that has been long sought after in the conservation community. The case studies presented here demonstrate practices that are being applied to mitigate environmental threats in both developing and developed economies, and begin to articulate the potential scale at which these practices can be applied.

While these case studies highlight a number of governance, institutional, and equity issues for which there are still, perhaps, more questions than answers, they demonstrate the range of resources and creativity that are being harnessed. As we continue to face significant environmental threats resulting from economic incentives to harvest and mine natural resources and to otherwise develop land, structural solutions that recognize the financial value of the productivity of intact landscapes — known as ecosystem services — have never been more needed.

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