



COMPARING AN OFFSET FRAMEWORK TO ALTERNATIVE FUNDING MODELS

A Linear Restoration Case
Study

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1 Introduction

Conservation offsets are considered a market-based approach to conservation that allows proponents to offset adverse environmental impacts arising from development.¹ One of the first offset programs that garnered significant public attention was the Western Climate Initiative, which was launched by five western U.S. states in the mid 2000's. The initiative was an innovative approach to use market-based instruments to reduce greenhouse gas emissions. In 2007 British Columbia joined the initiative, followed by Quebec and Ontario in 2008. Since then, there has been increasingly more interest in using market-based approaches to protect biodiversity, wildlife, wetlands, and more.

Much of the discussion surrounding conservation offsets in Canada, and Alberta specifically, has stemmed from biodiversity loss, preserving wildlife habitat, and species at risk.² In 2013, the Alberta government released the new wetland policy for the province, showing significant interest from policy makers to shift towards market-based conservation. The wetland policy was the first of its kind to recognize that not all wetlands are created equal. It harnessed the mitigation hierarchy as a center point of the policy, where wetlands must be avoided by developers, and when avoidance is not feasible, impacts must be mitigated then offset.

Conservation offsets is one tool that allows development to continue on the landscape, while also protecting biodiversity, species at risk (e.g. sage grouse, woodland caribou), and other ecosystem services. The province has two distinct acts in place that allow the use of conservation offsets to meet ecological goals: The Land Stewardship Act and the Water Act. The Water Act enables the wetland policy, as discussed above, and the Land Stewardship Act references a number of market-based instruments to meet ecological goals, including conservation offsets.³

¹ Alberta's New Wetland Policy as a Conservation Offset System (2013). Retrieved from from: <https://ablawg.ca/2013/09/25/albertas-new-wetland-policy-as-a-conservation-offset-system/>

² Environmental Law Centre (Alberta) (2016). Buying a Better Environment? Market-based Instruments & the Alberta Land Stewardship Act. Volume 3: Conservation Offsets under the Alberta Land Stewardship Act. Retrieved from: http://elc.ab.ca/wp-content/uploads/2016/12/MBI_Volume-3_Conversation-Offsets-under-the-Alberta-Land-Stewardship-Act.pdf

³ Ibid



2 Linear Restoration

Linear restoration of legacy seismic lines on public land provides a unique opportunity for the Government of Alberta to extend conservation offset policies. It is well known that legacy seismic lines in the boreal forest are a contributing factor to the rapid decline in caribou populations.⁴ To counter this, the private sector has invested heavily in research and innovation and pilot projects to encourage revegetation of seismic lines. Despite the learnings and successes of these pilot projects, restoration on a large scale has not advanced beyond discussions. Conservation offsets may provide the necessary incentive for the private sector to begin large-scale restoration as a way to ensure development can continue in resource-rich areas.

There are a few examples where companies have worked with the government to-date to establish early action offsets or formalized offset agreements.

2.1 Nova Gas Transmission Case Study

Nova Gas Transmission worked with the province to formalize an agreement to restore legacy seismic lines in the Dillon Wildlands in an effort to offset their system expansion project through the Chinchaga, West Side Athabasca River (WSAR) and East Side Athabasca River (ESAR) boreal caribou ranges. To-date 54 ha of legacy seismic lines have been restored as part of this project.

As one of the first formalized offset agreements, Nova Gas developed their own multipliers to adjust how much restoration was required to offset their development. The multipliers focused on:

- Reducing risk of project failure by increasing the required amount to be restored when the certainty of the restoration technique was less;
- The time required for the restoration technique to achieve a natural state; and
- The distance the restoration project was from the impacts of development on the caribou ranges.

2.2 Algar Case Study

The Algar Caribou Habitat Restoration Project was the first large-scale linear restoration project in the province where over 350 km of legacy seismic lines were restored over four years in the East Side Athabasca River range. Follow-up analysis was completed looking at how much linear restoration would be required to offset future development considering additional ecosystem services including, but not limited to:

- Caribou habitat
- Carbon sequestration
- Timber supply

⁴ Environment Canada (2012). Recovery strategy for the woodland caribou (*Rangifer tarandus*, caribou), Boreal population in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. Retrieved from: <http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=33FF100B-1>



In 2016 the Algar project funders applied for an early action offset for the work completed. Early action offsets are meant to recognize companies who have completed a voluntary offset before an offset system has been put in place.

2.3 Government-Led Restoration

Mandatory restoration of legacy seismic lines has not yet been implemented by the province. However, it is well recognized that large-scale restoration is needed to set caribou ranges on a path to recovery. Because of this, the province has committed to restoring over 10,000 km of legacy seismic lines in the Little Smoky/A La Peche caribou ranges over the next five years.⁵ It is expected that as other caribou range plans are released, similar initiatives will be launched in other ranges as well.

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⁵ Denhoff (2016). Setting Alberta on the Path to Caribou Recovery.



3 Limiting Factors

The caribou recovery efforts need to happen quickly and over a short timeframe to increase the probability of herd survival according to Environment Canada’s recovery strategy. Recovery efforts are also extremely expensive, with cost estimates ranging from \$8,000/km to \$17,000/km⁶ depending on the landscape characteristics of the ranges (e.g. lowland areas, remote locations, etc.). If the Government of Alberta required industry to pay for restoration upfront, it may unintentionally force some operations to slow or stop due to low cash flows.

Furthermore, with the Government of Alberta committing to restore over 10,000 km of legacy seismic lines in the Little Smoky and A La Peche Caribou ranges over the next five years, a sustainable funding model is imperative. The government has taken the lead on the restoration work, providing the investment funds needed to complete such large-scale restoration. However, as outlined in Eric Denhoff’s report, *Setting Alberta on the Path to Caribou Recovery*, it is expected that industry will pay back these funds over time.

Broadly speaking there are three options available to fund conservation programs similar to linear restoration (Figure 1).

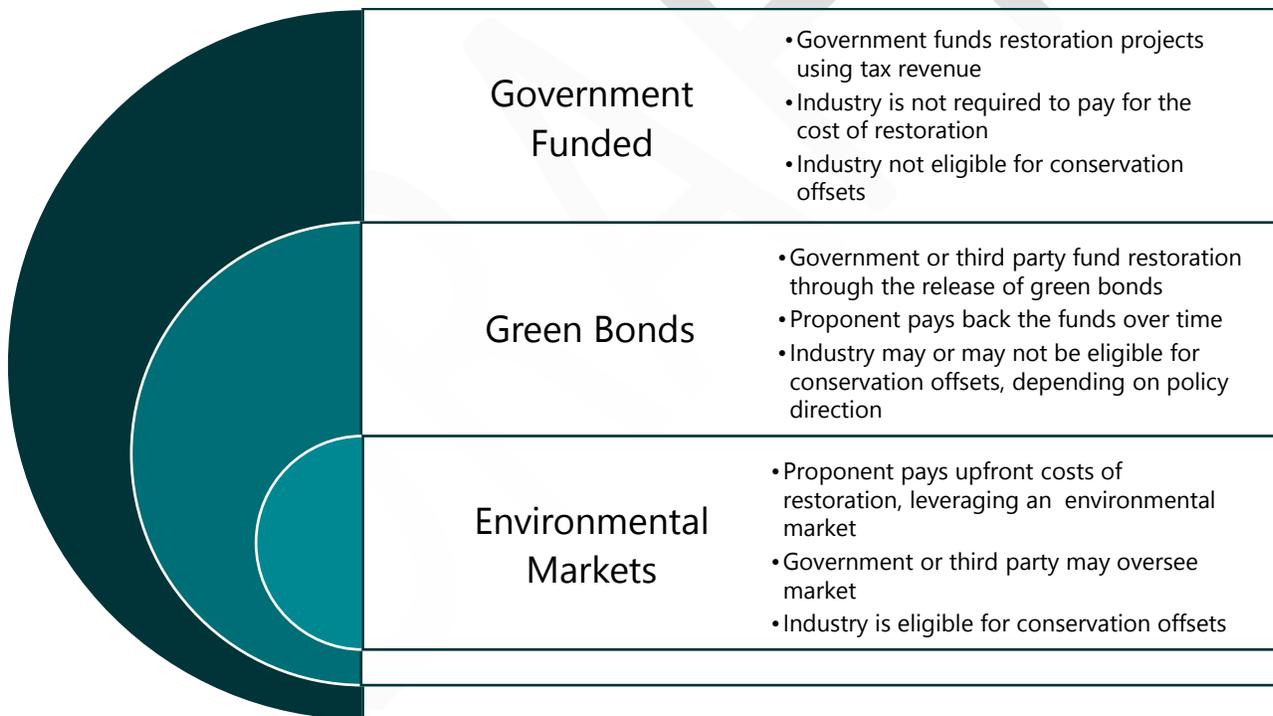


Figure 1. Types of funding mechanisms for conservation programs

⁶ Fuse Consulting (2014). Linear Feature Restoration in Caribou Habitat: A summary of current practices and a roadmap for future programs. Downloaded from: http://www.cosia.ca/uploads/documents/id24/COSIA_Linear_Feature_Restoration_Caribou_Habitat.pdf



4 Funding Options

4.1 Government funded

The government has the option to pay for restoration efforts using general tax revenues. This option relieves industry of the obligation but lays the burden on taxpayers with either increased tax rates, decreased services in other areas, or a combination of both. Unless regulation limits development, proponents would likely have fewer reasons to limit development or invest in industry-led restoration programs.

Examples of government-funded restoration programs vary. However, the majority are focused on non-point source pollution. For example, water pollution in a lake may result from agricultural runoff, industrial disposal, residential sludge, or others. As a result, it can be more difficult to pinpoint appropriate industries to invest in restoration efforts.

Table 1. SWOT analysis of government-funded restoration as a tool for linear restoration funding.

Strengths	Weaknesses
<ul style="list-style-type: none"> Development is unhindered by costs and risks associated with linear restoration. Restoration is easily tracked as the government would oversee all restoration efforts. Ability to implement standardized restoration protocols 	<ul style="list-style-type: none"> Potential lack of innovative solutions Potential lack of incentives for proponents to limit footprint Costs taxpayers, not politically attractive Government may not have the capacity to oversee such a large initiative
Opportunities	Threats
<ul style="list-style-type: none"> Implement a province-wide monitoring program 	<ul style="list-style-type: none"> Loss of funding due to changing government priorities

4.2 Green Bond

Denhoff recommended “an innovative Government-backed, energy industry-paid Green Bond program to reduce cash flow impacts to affected companies.”⁷ Green bonds use debt capital to fund projects that have a positive environmental benefit. The demand for green bonds is on the rise, with the market totaling approximately \$82 billion according to a report issued by RBC Capital Markets.⁸

If this approach was taken, the bond would be issued by the Government of Alberta to cover the full cost of restoration. Private investors would then have the opportunity to purchase the 30-year bond at regular

⁷ Denhoff, E. (2016). Setting Alberta on the Path to Caribou Recovery. Downloaded from: <http://aep.alberta.ca/fish-wildlife/wildlife-management/caribou-management/caribou-action-range-planning/documents/OnThePathtoCaribouRecovery-May-2016.pdf>

⁸ Smith (2017). Canada government could kick its green bond market into high gear. Reuters. Business News. Downloaded from: <http://www.reuters.com/article/us-canada-bonds-green-idUSKBN17K268>



rates. Over the 30 years, industry would make payments to the government, ear-marked for the repayment of the bond plus interest at maturity. This would reduce the impact of reduced cash flows for companies operating in caribou ranges, while also providing an investment opportunity for the private sector.

4.2.1 Pay for Performance Bonds

A spin on traditional green bonds that are released on a fixed term, fixed rate, is pay for performance bonds that have a rate of return tied to the success of the project. This shifts the risk from the taxpayer to the private investor, who is compensated for bearing the risk via a contingency payment. This approach is very similar to outcome-focused regulation, where the government pays for results rather than services.

For performance-based bonds to work, accurate monitoring data is essential. Modeling, along with baseline data, sets the initial price of the bond (e.g. the expected outcome) and then the investor gets a return based on the true outcome. Bonds have a higher rate of return if the program performs above the expected outcome, less if the project underperforms.

Table 2 How Performance Based Bonds Work (for example purposes only)

Scenario	Actual Outcome	Contingency Payment	Expected Likelihood
Low Performance	Seedlings reach a height of 1.3m by year 30	Investors make a "shared risk payment" of \$2.25 million ⁹ to the government	2.5%
Expected Performance	Seedlings reach a height of 1.3m between year 10 and year 30	No contingency payment is made	95%
High Performance	Seedlings reach a height of 1.3m by year 10	The government makes an "outcome payment" of \$2.25 million to investors	2.5%

4.2.1.1 Washington DC Water Case Study¹⁰

DC Water was facing a large-scale infrastructure upgrade to manage stormwater runoff in the city. Because green infrastructure is typically less expensive to build but the outcomes are less well-known, the water and sewer authority issued a 30-year municipal bond which it sold privately to Goldman Sachs for \$25 million to fund the green infrastructure pilot project.

Before issuing the bond, DC Water modeled the estimated reduction in stormwater runoff from the green infrastructure alternative. Once the infrastructure is built, performance will be measured five years later to see if it manages stormwater as expected. If it does, the investors (e.g. Goldman Sachs) will receive the

⁹ 3% of the estimated \$75 million it will cost to restore the LSALP caribou ranges

¹⁰ Martin (2017). A pioneering environmental impact bond for DC Water. Conservation Finance Network.

Downloaded from: <http://www.conservationfinancenetwork.org/2017/01/02/pioneering-environmental-impact-bond-for-dc-water>



typical return on investment of a 30-year municipal bond (e.g. 3.43% + principal). If the green infrastructure does better than expected, DC Water will pay an “outcome payment” of \$3.3 million to investors (similar to a dividend) in year five, and the bond will be restructured to a 25-year bond.

The idea behind paying for performance is that even though DC Water will be paying more to investors if the infrastructure does better than expected, they will still be saving money because the new green infrastructure is more efficient than anticipated and can handle more stormwater than predicted. It may even reduce the overall anticipated investment in the infrastructure upgrade.

If the solution under performs, investors must pay \$3.3 million to DC water as a “shared risk payment”. The shared risk payment covers interest payments the water and sewer authority will make over the first five years of the bond.

Transparency, along with strong monitoring data is essential for the success of this type of funding model. The project was successful in obtaining funding because investors clearly understood the risks associated with the rate of return and the environmental performance was monitored by third-party experts.

4.2.2 Forest Resilience Bonds

Forest resilience bonds are a new funding mechanism currently being piloted by Blue Forest Conservation to pay for forest restoration programs in California. The purpose of these restoration programs is to reduce the risk of future forest fires events in the region.

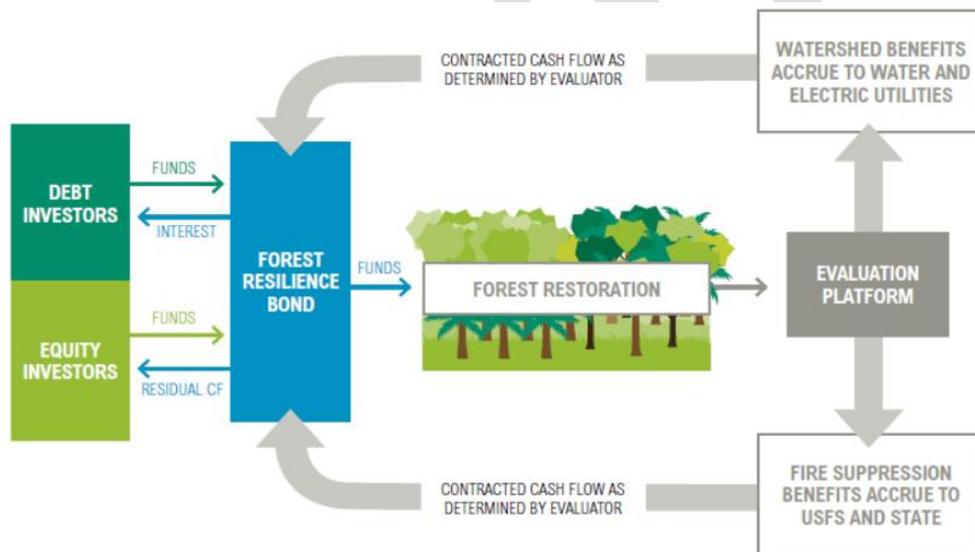


Figure 2 Forest Resilience Bonds: Blue Forest Conservation

Similar to the above performance-based bonds, this type of bond also focuses on the success of the restoration project as a means for payment. Bonds are defined by the benefits generated by restoration activities. In the Californian example, forest restoration to suppress wildfire also improves water quality and storage, reduces the risk of pests and disease, provides wildlife habitat, and so on. These benefits translate into direct profit for several sectors including:



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- Water utilities (fewer treatment costs)
- Electric utilities (reduction in reservoir sedimentation, increase in hydropower generation)
- US Forest Service (less money spent on fighting fires)

The bond is developed so the beneficiaries (i.e. the above sectors who benefit from the restoration effort) become the payees. Over time the beneficiaries make payments back to the bondholders which is a portion of the profit they have gained from restoration activities. For example, if the restoration project improves water quality and the utility treatment costs are reduced, a portion of the bond is paid back each year from a portion of the extra cash flow the utility company has from reduced treatment costs. The better the restoration project improves water quality, the more the utility would pay per year, directly tying the performance of the restoration project to the return on investment to the private investor.

Forest resilience bonds work as a public-private partnership to enhance environmental resilience. Governments determine necessary environmental efforts and release bonds associated with funding those efforts. From here, private enterprises purchase the bonds and over time, industry pays back the bonds.

For forest resilience bonds to work in the case of linear restoration, we need to establish:

- What the benefits of linear restoration are.
 - Leveraging the work completed to-date, we know linear restoration benefits caribou habitat, carbon sequestration, and timber supply.
- Identify what sectors benefit from restoration.
 - Forestry (more Annual Allowable Cut)
 - Oil & Gas – reduced risk of Emergency Protection Order or public pushback
 - Government – meeting the federal requirements for caribou habitat

Table 3. Strengths, weaknesses, opportunities, and threats (SWOT) analysis of green bonds as a tool for linear restoration funding.

Strengths	Weaknesses
<ul style="list-style-type: none"> • Distributes costs over time for industry • Encourages investment in green economy • Encourages innovation 	<ul style="list-style-type: none"> • Requires government intervention or third-party involvement • Uncertainty around green bonds may discourage participation • One group may still end up paying for the majority of restoration efforts
Opportunities	Threats
<ul style="list-style-type: none"> • Potential for creation of new tools and innovations for restoration • Potential to participate in an offset market, depending on policy direction 	<ul style="list-style-type: none"> • Potential for financial institutions to restrict number of bonds (limit funding) • Market could become saturated with green bonds (low demand for green bonds) • Early recall of bonds



4.3 Environmental Markets & Conservation Offsets

Environmental markets refer to any market in which the transactions taking place are aimed at either improving or maintaining environmental quality or minimizing environmental degradation.¹¹ There are typically two ways in which these markets can work; either by limiting anthropogenic impacts or by rewarding protection, restoration or rehabilitation. Both of which are applicable when talking about caribou habitat, however, this discussion will focus on how linear restoration may work in an environmental market.

By measuring and quantifying values associated with caribou restoration not normally traded in the marketplace, the restoration credits can be bought and sold like traditional goods and services. This provides proponents with the incentive to complete voluntary restoration. The type of market considered here is one where proponents incur an upfront cost associated with restoration in return for the ability to continue development elsewhere on the landscape. Environmental markets provide the opportunity to help manage ecological risks from industrial development (linear disturbance) while also providing a new revenue stream for proponents who are more efficient at completing restoration. They support green investment and potentially help diversify the economy. If markets for restoration are created, it may advance business opportunities, and improve caribou habitat and other ecosystem services. Markets can be linked to local or regionally defined outcomes like those in the Land Use Framework regional plans.

Environmental markets are more and more commonly used to generate desired environmental outcomes without burdening the taxpayers as heavily as traditional government-funded programs.

4.3.1 Mitigation Banking

A mitigation bank, or conservation bank, is when restoration, enhancement, or the preservation of a resource occurs for the purpose of providing compensation for impacts to natural resources caused by development.

There are hundreds of mitigation banks established in the United States, often focusing on species habitat protection, where habitat area is the unit most often traded.¹² Mitigation banks are often designed to provide species mitigation credits for one of three uses: internal mitigation, sales to others, or a combination of the two. Banks allow proponents to buy and sell credits, as needed, before development occurs on the landscape.

For a mitigation banking agreement to work, bank owners put the designated property into a permanent conservation easement with third party oversight, usually a non-profit or government agency. The agreement must include science-based management plans for species and habitats, operation and

¹¹ Sustainable Prosperity (2013). Environmental Markets in Canada. Downloaded from:
<http://institute.smartprosperity.ca/sites/default/files/newsfiles/Environmental%20Markets%20in%20Canada%20013%20survey..pdf>

¹² Speciesbanking.com (2008). Backgrounder: US Conservation Banking. Downloaded from:
http://us.speciesbanking.com/pages/dynamic/key_resources.page.php?page_id=pub12&category_class=books_papers_reports



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maintenance plans, as well as provisions for remedial action. These activities must be fully funded by the bank's endowment fund.

Speciesbanking.com estimates global payments for mitigation credits to range from 1.8 to 2.9 billion US dollars. Popularity in mitigation banks is increasing because of their efficiency in achieving habitat conservation goals.

Table 4. Strengths, weaknesses, opportunities, and threats (SWOT) analysis of environmental markets as a tool for linear restoration funding.

Strengths	Weaknesses
<ul style="list-style-type: none"> • Encourages innovation • Rewards efficiency • Supports the green economy • Diversifies the economy • Banking allows credits to be bought and sold before development occurs (i.e. reduces time lag) 	<ul style="list-style-type: none"> • Transaction costs may limit private investment and/or the amount of seismic lines restored • Limited understanding may discourage investment • Potential to disproportionately affect small businesses • Potential for costs to be passed on to consumers • Uncertainty around ownership and permanence of credits on public land
Opportunities	Threats
<ul style="list-style-type: none"> • Mitigation banking • Link to regional goals set out in the Land Use Framework • Additional ecosystem services can be measured, tracked, and traded in the environmental market 	<ul style="list-style-type: none"> • Development may be discouraged • Provincial regulation may disallow the private market to find an equilibrium • The price of oil and/or gas may make it more economical to develop lands rather than restore historical disturbance



5 Conclusions

Linear restoration of legacy seismic lines on public land provides a unique opportunity for the Government of Alberta to extend conservation offset policies. With the expense of recovery efforts limiting large-scale uptake to-date, some type of offset framework (e.g. coupled with green bonds or an environmental market) may provide the sustainable funding model needed. It also provides a great opportunity for the private sector to realize new revenue streams and diversify their portfolio.

Green bonds, conservation offsets, mitigation banking, and environmental markets have all been successfully implemented in other jurisdictions. Each has strengths and weaknesses; however, successful initiatives share similar principles including:

- **Scalability.** Proponents, the government, and private investors need to have the confidence that the funding mechanisms will work for any size of project, and over any given time frame.
- **Transparency.** Investors need to be able to measure the success of the restoration project and understand how their investment is funding the project.
- **Repeatability.** The mechanism needs to take success and learnings from previous projects, apply them to new projects and achieve similar results with investment grade confidence.
- **Data & Information.** There needs to be the ability to validate and disclose results using agreed upon data in an effort to mitigate risk.¹³ Full disclosure of the expectations, results and validated metrics, provides investors with the information and confidence required to make the investments designed to achieve desired environmental impacts.

Through the multiple phases of Assessing the Ecosystem Service Benefits of Linear Restoration, we have been able to identify the benefits of linear restoration in a repeatable, transparent, and scalable manner. These learnings can be applied in an offset framework to develop a world-class restoration program that accounts for the multiple benefits of linear restoration, fairly distributes the risks and costs of restoration efforts, and sparks investment in the green economy.

¹³ Conservation Finance Network (2017). Nine ideas to bridge the gap in conservation finance. Retrieved from: <http://www.conservationfinancenetwork.org/2017/04/24/nine-ideas-to-bridge-the-gap-in-conservation-finance>