

CLIMATE FORESTS

Growing rural prosperity in the Canadian Maritimes
through forest carbon offsetting



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Climate forests: growing rural prosperity in the Canadian Maritimes through forest carbon offsetting

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Executive Summary

For ten years, Community Forests International (Forests Intl.) has worked to protect and restore Atlantic Canada's unique Acadian Forest. As the Intergovernmental Panel on Climate Change (IPCC) urgently warns that a goal of limiting global warming to 1.5 degrees Celsius will now require rapid and unprecedented changes in all aspects of society (IPCC, 2018), efforts to regenerate the Earth's natural ecosystems have become increasingly important. A recent study shows that natural climate solutions—land conservation, restoration, and management initiatives that increase carbon storage and avoid greenhouse gas emissions—could make the repairs we need this decade to avoid climate breakdown (Griscom et al., 2017).

Canada is home to 3.48 million square kilometers of forest—almost 9% of the world's forests (National Forest Inventory, 2013). Today, the forests that we dwell in and that surround our towns and cities could be one of the most powerful solutions to climate change. Unfortunately, these same forests are increasingly threatened by human activity such as logging, fragmentation, and development. When forests are removed from the landscape, they become dangerous sources of emissions rather than sinks. This is the situation in the Maritime provinces especially, where rates of destructive clear-cut forestry are exceptionally high and unsustainable forest management has turned a potential climate solution into a pressing ecological problem.

Today, the forests that we dwell in and that surround our towns and cities could be one of the most powerful solutions to climate change.

As nations around the world place increasing value on healthy forests for the climate regulation services they provide, a significant opportunity to protect and restore Atlantic Canada's unique Acadian Forest has arisen. One of the most diverse forest types in Canada, the Acadian Forest can provide significant climate services from local to global scales. Additionally, emerging markets for carbon offsets can provide the financial incentive for forest-dependent communities to conserve their properties, thereby improving the health of the entire Acadian Forest Region ecosystem for climate security. That is our vision: for the forests of the Maritime provinces to be restored as a global climate safeguard by optimizing them for emissions reductions and carbon storage.

Since 2015, Forests Intl. has worked towards this ambitious vision through the *Acadian Forest Carbon Initiative*. Funded through Environment and Climate Change Canada's Atlantic Ecosystems Initiatives, the project demonstrated the potential of forest carbon offsetting and laid the groundwork for greater private forest protection and restoration across the Maritime provinces. The project allowed for the protection of 8,570 acres of endangered forest for emissions reductions and carbon storage. In this report, we share learnings from the course of that project and avenues for the future.

The Maritime Context

While much of Canada has become decidedly urban, the Maritime provinces continue to support a significant rural population. The rural population ranges from 48% in New Brunswick; 43% in Nova Scotia; and 53% on Prince Edward Island (Statistics Canada, 2011). The economy in these rural areas is closely tied to natural resources, including forestry, agriculture, and fishing. Forestry, in particular, has a unique history in the region. Unlike any other jurisdiction in Canada, 45% of forestland in the Maritimes is stewarded by over 80,000 small forest operators (New Brunswick Federation of Woodlot Owners, n.d., Nadeau et al., 2011, Nova Scotia Department of Natural Resources, 2008). These forest operators struggle with a variety of challenges, including shifting global markets, aging demographics, and increasing economic marginalization, which put unique Acadian forests at risk.

The Acadian Forest Region (AFR) spans all three Maritime provinces and is one of the most diverse and endangered forest types in Canada (World Wildlife Fund, 2005). Home to 32 native tree species, the AFR is a unique transition zone between the boreal spruce-fir forest to the north and the deciduous forest to the south. The Acadian Forest has a naturally low fire cycle, with stand-replacing fires occurring upwards of every 1000 years (Wein & Moore, 1977). The AFR provides critical habitat to 225 bird species and to a diversity of mammals, including moose, black bear, red fox, and lynx (World Wildlife Fund, 2019). It's widely accepted that intact Acadian forest provides important ecosystem services like flood mitigation to rural communities, towns, and cities by slowing snow melt and rain runoff into waterways and built environments.

Today, less than 5% of the AFR remains in a pre-colonial condition (World Wildlife Fund, 2019). The composition, age structure, and distribution of Acadian forest species are now considerably changed compared to its original pre-settlement condition, and old-growth patches are now small and scattered. Acadian forest degradation is primarily caused by intensive forestry practices such as clear-cut harvesting and plantations. New Brunswick, in particular, has the highest forest use intensity in Canada and is removing forests from the landscape faster than they can be replaced (Conference Board of Canada, 2016). For the last 21 years, an average of 80,788 acres of private forest and 94,520 acres of Crown forest have been clear-cut every year in New Brunswick (de Graaf, 2017). This acreage is far above the province's annual allowable cut and has caused a decline in the ecosystem services provided by the Acadian forest.

New regenerative opportunities that reverse these trends and build prosperity in both rural communities and the forests that surround them are urgently needed. At the same time, the climate crisis is accelerating and the global community is increasingly demanding solutions that our forests can provide.

Carbon Markets

Several market incentives have been designed to limit carbon emissions. Today, 46 countries and 28 subnational jurisdictions have implemented a price on carbon in an effort to meet global targets (The World Bank, 2019). There are two main market tools for limiting emissions: creating a cap-and-trade program or applying a carbon tax. Cap-and-trade programs set a limit on the amount of greenhouse gas emissions that companies can emit, which typically declines over time. Governing bodies then grant a certain amount of tradable emissions allowances, which allow companies that can reduce emissions at a lower cost to be paid to do so by companies with a higher cost of reduction, decreasing the overall cost of reducing emissions (UNDP, 2016). Carbon taxes are typically charged per the tonne and apply to use of fossil fuels such as coal, oil, and natural gas. Carbon taxes are designed to increase the price of fossil fuels, therefore making renewable energy more competitive.

Carbon offsets are credits for emission reductions achieved by an entity in a sector that is often not covered by a carbon pricing system; however, it is also possible to include carbon offsets in both cap-and-trade systems and carbon tax programs (Goulder and Schein, 2013). Two types of markets exist for the sale of carbon offsets: the compliance market and the voluntary market; the interaction between these two markets drives the supply and demand of offsets (Ecosystem Marketplace, 2017a). The compliance market is driven by government regulations that require emitters to either reduce their emissions or purchase carbon offsets. In contrast to compliance markets, the voluntary market is driven by institutions looking to voluntarily demonstrate climate leadership.

There is substantial variation in the price of carbon offsets depending on the market in which they are sold and the way projects are managed. The quality of offsets traded in the voluntary market, in particular, can vary significantly (David Suzuki Foundation and Pembina Institute, 2009); for example, carbon offset prices ranged from less than USD \$0.50 per tonne of CO₂e to more than \$50 per tonne of CO₂e in the voluntary market in 2016 (Ecosystem Marketplace, 2017a). Offsets sold on the voluntary market cost less on average than the compliance market because the compliance market is much larger (Stockholm Environment Institute and Greenhouse Gas Management Institute, 2011). The average price paid for forest carbon offsets, in particular, traded on the voluntary market was USD \$5.2 per tonne of CO₂e in 2016 (Ecosystem Marketplace, 2017b). The Ecosystem Marketplace reported that the average price paid for forest carbon offsets in the California-Québec Compliance Market was USD \$9.7 in 2015 (no data available for 2016).

Carbon Markets in Canada

Since the Paris Agreement was signed in 2015, countries have begun to enact domestic carbon reduction strategies in a collective effort to hold global temperature rise to well below 2 °C above pre-industrial levels. In 2017, the Government of Canada developed the Pan-Canadian Framework on Clean Growth and Climate Change (Government of Canada, 2017a). This framework lays out a plan to grow the country's economy while meeting emissions targets and building resilience to climate change. From the framework, the Government of Canada then developed a backstop carbon pricing program for provinces that either chose to follow it or were unable to create robust in-province carbon pricing solutions (Government of Canada, 2017b). The Government of Canada will apply the Federal backstop to the provinces of Saskatchewan, Manitoba, Ontario, and New Brunswick in April 2019. The backstop has two components: a fuel charge and an output-based pricing system for emissions-intensive trade-exposed industries (Government of Canada, 2018).

Cap-and-trade systems can create new regenerative opportunities for woodlot owners through the sale of forest carbon offsets; however, for that opportunity to be realized, policies are required that allow companies to purchase offsets and allow landowners to sell *forest* offsets specifically. The Pan-Canadian Framework on Clean Growth and Climate Change was supposed to be used to dissolve barriers between provinces so that offsets can be issued from projects in one province to offset emissions generated in another. However, the federal government has not yet produced a protocol for forest carbon offsets. At this time, these interprovincial policy ingredients do not exist to allow for the sale of carbon offsets between provinces, and forest carbon offsets specifically.

The federal backstop and corresponding demand for offsets creates opportunities for pre-compliance offset transactions, whereby projects can be developed using a voluntary standard and transition to a compliance protocol when those become available. In the next section, we discuss the readiness project that Forests Intl. has undertaken to ensure that forest-dependent communities across the Maritimes are well-positioned to benefit from these emerging opportunities.

Readying Rural Communities

Forests Intl. has been working for over ten years on climate change mitigation projects in the Maritime provinces, including developing the process by which small private woodlot owners could access carbon offsets markets. The organization piloted its approach to voluntary carbon offsetting through Improved Forest Management (IFM) on a unique 693-acre Acadian forest woodlot and certified organic farm in South Branch, New Brunswick, called Whaelghinbran Farm & Forest. Working with project partners, Forests Intl. measured and quantified carbon storage on 693 acres of forest land. These emission reductions were then certified by third-party standards and carbon offsets were sold to private clients, which allowed for the purchase of the land and to place a working lands conservation easement on the property. This project has offset 20,000 tonnes of CO₂e and generated nearly \$400,000 since 2012.

This project served as the proving ground for the methodologies laid out in the *Acadian Forest Carbon Initiative*, which took a holistic, ecosystem-based approach to restoring and protecting private forest lands using innovative conservation financing mechanisms. The *Acadian Forest Carbon Initiative* involved establishing a baseline ecological assessment of the Acadian Forest Region, otherwise known as a Common Practice Scenario. This assessment revealed the extent of Acadian forest degradation due to intensive forest management practices. Significantly, it also helps forest operators estimate of how much carbon storage can be increased on their lands through climate-smart forest management.

This project also involved working alongside stakeholder groups, including long-standing forest product cooperatives, to develop carbon storage inventories and management plans on 8,570 acres of private forestland. These management plans outline how much carbon is currently stored in each forest property, how that carbon can be managed using deliberate silviculture techniques, and how much carbon storage potential exists on each hectare of land. These plans were customized to individual conservation properties and lay out a detailed road map for restoration of the Acadian forest in each case. By implementing these plans across all 8,570 hectares of forest, an estimated 334,312 additional tonnes of carbon dioxide emissions will be reduced. These reductions will help mitigate climate change while laying the ground-work for further emission reductions over time as conserved forests continue to sequester carbon.

This readiness project delivered key knowledge products and re-skilling opportunities to regional forestry professionals, ensuring that rural Maritime communities and surrounding forests are well-positioned to benefit from the emerging national and international compliance carbon markets. As we await compliance protocols to come into effect, Forests Intl. continues to aggregate small private woodlot owners across the region to improve access to the voluntary market.

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forests across the Canada
Maritimes

8,570

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Managing Forests for Carbon Storage

There are several approaches to developing forest carbon offsets; however, Improved Forest Management (IFM) projects are regarded as the most compatible protocol for the Acadian Forest Region. IFM carbon offset projects increase the amount of carbon stored in managed forests through improved, ecologically-based forest management practices. This involves maintaining, on average, older and larger trees in a forest while at the same time ensuring sufficient regenerating saplings and supplies of dead wood remain to maintain ecological function. Trees are still harvested, but are harvested on a selective basis, by removing trees that are declining in health or to make space for other trees that have a greater carbon-sequestration potential. The end result is a healthy forest that can store enormous amounts of carbon and very stably over time, all while operating as a diverse and fully-functioning ecosystem.

By protecting intact Acadian forests, the emissions that would be released if they were destroyed are instead avoided. These conserved forests then act as deepening carbon sinks with countless co-benefits. Together with responsible companies, we are transforming the Acadian Forest Region into one of the world's greatest carbon storehouses, while empowering rural communities to share in the financial benefits of providing this critical service. We follow strict procedures for quantifying and protecting the carbon stored in healthy forests, upholding a combination of world-class verification standards including Verra's IFM protocol and Forest Stewardship Council (FSC) certification.

By protecting intact Acadian forests, the emissions that would be released if they were destroyed are avoided.

To access carbon offsets markets, projects in the Maritime region will most likely have to adhere to IFM protocols. IFM protocols dictate the conditions under which IFM projects may be accepted and registered for carbon offset sales in a given offset market. Such protocols have been developed for both voluntary and compliance markets. These protocols describe the procedure by which IFM projects can become registered in one of the carbon offsets markets, including methodology for proving sufficient carbon sequestration, and rules guiding validation, verification, and penalties for reversing GHG emissions reductions.

Several IFM protocols exist, but three stand out as most suitable for the AFR at this time. These protocols include two compliance and one voluntary market protocol: Climate Action Reserve Forest Project Protocol, the Regional Greenhouse Gas Initiative, and Verra (formerly Verified Carbon Standard – VCS) Improved Forest Management Through Extension of Rotation Age. Each of these protocols and their associated methodologies approaches the key components of forest carbon offset project development somewhat differently. Despite the variation between protocols, there are several critical components to all protocols that landowners should be aware of when considering managing their woodlot for carbon storage.

Baseline Carbon Stocks

The quantity of carbon stored in the forest under the status-quo or “business-as-usual” scenario represents the baseline of carbon stocks. Knowing this baseline allows for comparisons of the project’s likely impacts with what would otherwise have occurred under “business-as-usual” management. Similarly, the Common Practice Scenario describes the most common widespread forest management practices that occur in the region of the project area. In the case of the Acadian Forest, the conversion of mixed-species, native forest to conifer plantation is the most common forest management practice. These plantations—most often of a single species—are intensively managed and clear-cut by the time they are 60 years old. Forest carbon models are used to determine how much carbon is stored in this type of forest, which becomes the baseline of carbon storage. Not all of the carbon stored under a project qualifies for sale as a carbon offset; only the carbon stored over and above the baseline counts as a carbon offset. This ensures that the carbon offset credits sold are truly above and beyond what is most common within the region in question.

Permanence Buffer

The permanence buffer acts as insurance for the carbon offset sales. Emissions reductions and removals can be “reversed” if the stored carbon associated with them is released (back) to the atmosphere, so protocols typically identify some portion of a carbon project’s offsets that must be set aside as insurance in the buffer pool to cover reversals. There are two kinds of reversals: unavoidable reversal (such as by natural agents like fire, insects, and wind) and avoidable reversal (like land conversion and over-harvesting), and the number of offsets set aside by a given project depends on the risk level associated with the project for either type of reversal.

Additionality

IFM projects are required to store additional carbon above what would be stored in the baseline carbon stocks of the common practice scenario. To qualify as a carbon offset, the reductions achieved by a project need to be additional to what would have happened if the project had not been carried out. In this way, buyers can rest assured that their carbon offsets are unique and attributable to their own actions.

Aggregation

Verification and validation costs are very high for carbon offsets projects, but costs per acre tend to decline with larger land areas. There is, therefore, appetite for aggregating smaller parcels and multiple landowners into a single offsets project, to keep the per-acre verification and validation costs as low as possible.



Leakage

Leakage refers to the requirement that eligible IFM projects must not result in increased CO₂ emissions caused by the shifting of harvesting activities from the project area to other forestlands.

Conservation Easements

Working lands conservation easements are an important tool that can be used as a measure of insurance for the forest carbon offset investment. These easements are a legal mechanism that are registered on the title of a property, and include covenants that describe limitations on practices that might threaten long-term carbon sequestration (and therefore the offset sales), such as over-harvesting, subdivision, clearing for development or agriculture, etc. Given that these working lands conservation easements are registered in perpetuity, they ensure the long-term protection of those lands and their carbon stocks. Forests Intl. employs working land conservation easements in partnership with the New Brunswick Community Land Trust (NBCLT). The NBCLT is responsible for the independent and third-party monitoring of these easements for infractions, and for taking remedial actions if an easement is contravened. Such Easements assure buyers that their offsets are protected long into the future.

Easements assure buyers that their offsets are protected long into the future, regardless of changes to land ownership.

Next Steps for Growth

To date, Forests Intl. has focused on readying landowners for carbon offsets markets; however, other financing mechanisms exist that can support forest stewardship in the Maritime region. For example, the organization has begun to explore the suitability of green bonds, which can finance or pre-finance projects with environmental benefits and allow investors to receive financial returns. The proceeds of green bonds can be used to support projects in areas such as renewable energy, conservation, sustainable transportation, and water management (The Nature Conservancy, n.d.). Demand for green bonds is growing quickly but to date, there are few examples of green bonds used to finance land conservation (The Nature Conservancy, n.d.). According to a study conducted by the Climate Bonds Initiative in 2016, only 2 percent of green bonds proceeds were directed to agriculture and forestry.

Not only are there creative financial mechanisms available to finance forest conservation, there are also a suite of ecosystem services that forests provide that we can collectively value and invest in. This project specifically addressed the need to protect forests for their carbon sequestration potential; however, forests provide a handful of other ecological functions that become increasingly vital in a changing climate. In addition to storing carbon, forests contribute to nutrient cycling, water and air purification, and they provide critical wildlife habitat. To avoid climate breakdown, we need to invest in conserving the host of ecosystem services that healthy forests can provide. In 2018, Forests Intl. began to explore this opportunity by launching a new project in partnership with the Intact Centre on Climate Adaption to specifically understand and value the flood mitigation services that forests provide to communities in one of New Brunswick's most flood-prone regions. This project will demonstrate scalable natural infrastructure tools that can be used across Canada for climate change adaptation.

The organization is also exploring a new avenue for achieving its mission through innovative models of community land tenure that address both climate security and rural empowerment, all while building pathways to reconciliation between rural Indigenous and settler communities. The organization will mobilize equity crowdfunding legislation to offer local impact investment opportunities to members of rural communities and the public at large. A leading concept for this is the creation of Community Carbon Forests, large forestland holdings owned and managed by members of adjacent rural and First Nation communities that achieve blended social, economic, and environmental values. The organization has begun a process of convening and movement building to advance community-owned forests across the country, demonstrating that climate action can create prosperous economies and paths to reconciliation with Indigenous Peoples.

Conclusion

Mitigating climate change requires bold thinking and acting. Together with our partners, Forests Intl. is restoring the Acadian forest as one of the planet's most important climate safeguards and empowering rural communities to share in this great opportunity. The *Acadian Forest Carbon Initiative* laid the groundwork for private forest protection and restoration across the Maritime provinces and readied family forest operators for new conservation finance opportunities. The landscape for developing projects, accessing carbon offsets markets, and the protocols that govern those markets is constantly changing. When all the necessary parts align, Atlantic Canada's rural communities and the forests they depend on will be ready.

Forests Intl. now endeavours to build a number of landscape-scale carbon offsets projects in conjunction with regional forest product marketing boards and woodlot owner associations. At the same time, the organization is collaborating with like-minded partners across Canada to develop and replicate this community-led approach to forest carbon management across the country. Our movement has the potential to drawdown more than 1 billion tonnes of carbon by 2030, more than the country's entire annual emissions. These projects not only draw down vast amounts of carbon emissions, they also conserve endangered ecosystems and create economic opportunities for the rural communities that have always relied on forests for livelihood. Today, these communities and the forests that surround them have become our best line of defense against climate change.

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