Conservation Impact Project Summaries

May 2021

Background

Formally announced at the World Conservation Congress in September of 2016, The Conservation Impact Project aims to quantify the conservation benefits of SFI's work, and the connection between SFI's forest certification programs, sustainable supply chains and important conservation outcomes. The Conservation Impact project consists of numerous smaller projects, generated by partnerships within the academic, conservation and research communities, and including SFI's own Certified Organizations. Quantifying the critical contributions of these managed forests will enable the SFI community to understand and promote the conservation values associated with SFI's certification programs, and associated sustainably managed forests, and will facilitate continual improvement. Current investigations are focused on climate change, biodiversity, and water.

Summary reports describing the status of Conservation Impact projects have been developed by SFI, based on project reports and the most current updates. These reports are included below. Final reports for concluded projects are available upon request.

Table of Contents

CLIMATE CHANGE PROJECTS

Active Projects

Linking SFI Certification to Climate-Smart Forestry - MICHIGAN STATE UNIVERSITY

Funding Year: 2019

Project Objective: To create e-learning content linking working certified sustainable forest management with carbon management and associated climate benefits.

Project Description: The project aims to increase knowledge of forest carbon management and climate change mitigation as a means of increasing the demand for certification and certified sustainable products. Researchers at MSU Forestry are developed a qualitative framework to assess the SFI standard, training material, and stakeholder perspectives to be used as the foundation for an online learning module.

Why It Matters: Global climate change impacts many aspects of forests with such effects as increased insect outbreaks, changes in water cycles and biodiversity adaptation, increased wildfires, and storm severity. There is a need to better understand forests in terms of both climate change mitigation and adaptation. Climate-smart Forestry (CSF) is an emerging approach that aims to directly link forest management and climate change targets to ensure the future health and vitality of our forests.

How The Project Helps Forest Managers: This project aims to assess linkages between climate-oriented forest principles with existing best practices and guidance found in certified sustainable forests and certification standards, respectively. There is a growing need for forest managers to adapt forest management plans to incorporate climate-smart forestry. Developing an adaptation plan to address priority climate change risks will facilitate implementation of climate-adapted practices and enhance ecosystem resilience for managed forests. This will help mitigate the potential effects of increased severity or frequency of disturbance, invasive pests or diseases, and the combined effects of all disturbances.

Partners:
Project Lead: Michigan State University

Outcomes To Date: The Michigan State University Forest Carbon and Climate Program (FCCP) undertook a preliminary study which included a qualitative analysis of SFI programmatic documents, interviews with key informants, and observations of SFI training activities. Since 'climate impacts' can be broadly defined, the study identified three primary categories through which to analyze climate-carbon forest benefits of certification:

Category 1: Core Carbon and Climate Concepts
Category 2: Management and Carbon Storage
Category 3: Best Practices with Climate Benefits

The analysis found that while SFI guidance does not explicitly reference carbon or climate in detail (note that this study was conducted against the 2015 to 2019 Standard. The newly revised SFI 2022 Standards and Rules, include more specific references and requirements relative to Climate Smart Forestry). Nonetheless, 'climate-smart forestry' concepts, management practices, and other best practices with climate benefits were prevalent throughout the standards, training materials, and certified organization interviews. Climate-smart forestry language and concepts were consistent across all three SFI standards, affecting different aspects of the forest sector, including land management, procurement, wood products, and end-product marketing.

MSU is currently advancing these findings by aiming to publish papers in academic journal articles that highlight the framework developed for this project and applying it in 2-3 examples of SFI certified projects. With the analysis of the SFI standard complete, further work requires framing the findings in line with existing literature and applying the framework to existing examples by reviewing project documentation and completing a number of additional interviews with certified organizations.

Assessing and Monitoring the Influence of Forest Management Practices on Soil Productivity, Carbon Storage and Conservation in the Acadian Forest Region - UNIVERSITY OF MAINE

Funding Year: 2018

Project Objective: To examine the impact of the SFI Forest Management Standard and SFI Fiber Sourcing Standard on enhancing climate adaptation and carbon-related conservation values.

Project Description: This project uses empirical soils data from across the Acadian Forest Region to inform SFI objectives and measures related to soil productivity, carbon storage, and conservation. Specifically, the project evaluates the influence of different forest management practices and site qualities on short-term soil carbon stocks as well as on soil health and conservation of the soil resource across research installations in Maine.

Why It Matters: Well-managed forests have a major role to play in creating a planet that is resilient to a changing climate. Forests absorb about one-third of the world's annual carbon dioxide emissions from the burning of fossil fuels, accounting for as much as 45% of the carbon stored on land, and providing the principal means for mitigating the effects of greenhouse gases. How well-managed forests contribute to climate change mitigation is an important and ongoing question. Clarification of these values helps make the case for sustainable forest management and carbon storage, regardless of whether a given forest is participating in carbon markets. Increasing our knowledge related to forests and climate change has the potential to make a real difference in forest management practices implemented on the ground, and in mitigating one of the most pressing global environmental challenges.

How The Project Helps Forest Managers: Climate change has the potential to diminish forest ecosystem services and productivity. This project identifies forest management practices, soils, and geographic regions that most influence soil productivity, carbon storage, and related conservation values in the Acadian Forest Region. By integrating a network of existing and new sites for monitoring the effects of forest management practices on soils, continual research-based refinements can be made to forest management practices or guidelines.

These results enlighten our understanding of best forest management practices for added carbon, which is a compelling story and valuable to SFI Certified Organizations who want to communicate their contributions towards climate change mitigation strategies. Future potential certification of additional sites in Maine could contribute to the creation of new demonstration sites and teaching tours relative to this work and other SFI objectives related to the University of Maine's University Forest.

Partners:
Project lead: University of Maine
Cooperative Forestry Research Unit
Center for Research on Sustainable Forests
Northeastern Soil Monitoring Cooperative
University of Toronto

Outcomes To Date: Two peer-reviewed publications have been published on the results of this conservation grant project thus far:

Puhlick, J. J., I. J. Fernandez, and J. W. Wason. 2021.Non-native earthworms invade forest soils in northern Maine. *Forests, 12, 80. doi:10.3390/f12010080*.

A surprising discovery was made when non-native earthworms were found at two study sites, which was the first account of non-native earthworms in the Northern Maine forests. The sites showed similar impact of the characterization of soil composition. This discovery was important because non-native earthworms can change the soil carbon and the rates of carbon sequestration in the forests and can also influence forest health and biodiversity. To reduce the introduction and spread of non-native earthworms, cleaning of logging equipment between sites and reporting and monitoring of species presence to natural resource managers is recommended.

Puhlick, J. J. and I. J. Fernandez. 2020. Influence of mechanized timber harvesting on soil compaction in northern hardwood forests. *Soil Sci. Soc. Am. J.* doi: 10.1002/saj2.20127.

The study evaluated harvesting methods on soil compaction by comparing soil bulk density between logging trails and non-trafficked areas. The results revealed that soil compaction on logging trails was most impacted when soils had low bulk densities and for locations close to landings. These results can help determine potential impact in the context of climate change as there is a shifting increase to summer logging activity. More logging in frost-free periods could cause a greater degree of compaction and longer soil recovery times over a larger forested landscape. Techniques such as slash layering on skid trails were found to be effective at reducing compaction.

Completed Projects

Quantifying Forest Contributions to Landscape Connectivity under Global Change - NORTH CAROLINA STATE UNIVERSITY

Funding Year: 2020

Project Objective: To quantify changes to landscape connectivity across a large area in North Carolina (including various SFI-certified tracts) as a result of climate change and quantify the relative contribution of SFI lands to maintaining connectivity.

Project Description: The goal of this project is to forecast the trajectory of forests in the Piedmont and Sandhills ecoregions of North Carolina under high and low climate and land use change. The project quantified how these forests, especially restored longleaf pine and managed forests, contribute to landscape connectivity. This research is crucial to understanding forest contributions to connectivity under global climate change. It helps prioritize and incentivize forest restoration and sustainable forest management to promote biodiversity.

Why It Matters: Maintaining and enhancing landscape connectivity is an essential strategy for combating the effects of climate change and preventing biodiversity loss. Landscape connectivity represents the extent to which a landscape supports the ability of plants and animals to move across it. Some species with a limited mobility, like salamanders or pitcher plants, depend on connected landscapes to maintain healthy populations.

How The Project Helps Forest Managers: This project quantifies the contribution of SFI-certified forests toward increasing connectivity in central North Carolina, which is a widely accepted conservation goal in an area prioritized for its high biodiversity and conservation needs. Weyerhaeuser, an SFI-certified company, is interested in using the results of this study to inform outreach to private landowners to help enhance their forest management practices. Domtar, an SFI-certified company, is interested in learning more about longleaf pine restoration under climate and land use change, and how these efforts will advance landscape connectivity in the study area.

Partners:
Project Lead: North Carolina State University
Southeast Climate Adaptation Science Center
South Atlantic Landscape Conservation Cooperative
U.S. Fish and Wildlife Service
Weyerhaeuser (SFI-certified organization)
Domtar (SFI-certified organization)

Outcomes To Date: The project was completed in March 2021. The region of the study landscape with the largest SFI-certified area is a major focus of regional conservation and connectivity efforts, in large part because of an emphasis on restoring longleaf pine habitat for threatened and endangered species like the red-cockaded woodpecker (*Dryobates borealis*). Creating corridors between large, protected areas like the Uwharrie National Forest and the Sandhills Gamelands/Ft. Bragg is a major conservation objective.

In comparing the connectivity contribution of SFI lands to restored forest in this important landscape, SFI lands provided equivalent connectivity compared to a 3% rate of forest restoration. SFI-certified forests consistently had greater parcel sizes across all scenarios when compared to all restoration rates (1,3,5, and 6%). SFI-certified forest lands are scattered consistently throughout the study area in larger parcels, which would prove beneficial for species with larger habitat area requirements relative to restored parcels. While a lower rate of restoration (3% or 5% of the scaled landscape) often facilitated connectivity as well as SFI-certified forests, restoration is limited by costs, whereas certified forests maintain connectivity while providing the wide range of services and outcomes required by forest certification. Further study would benefit from a cost/benefit analysis to quantify the dollar value of connectivity provided by SFI lands compared to that of restoration including the cost of implementation.

A Practice-Based Approach to Increasing Forest Carbon Mitigation through Forest Soils - AMERICAN FORESTS

Funding Year: 2018

Project Objective*:* To create understanding and tools that help landowners protect and enhance forest soil carbon.

Project Description: The project developed an approach to include soils in forest carbon calculations, to better understand whole-ecosystem carbon dynamics, as well as the impacts of forest management on the entire forest carbon pool. American Forests helped created decision support tools for project partner, Maryland DNR Forest Service, to identify areas of high vulnerability and opportunity for soil carbon impacts in Maryland's forests. They interpreted national and regional data on forest soils and differential impact of forest management practices to determine potential applicability of these data and findings to the forest soils of Maryland.

Why It Matters: Soils are a frequently overlooked component of forest carbon pools, but they often hold more carbon than a forest's aboveground biomass. Soil is a critical component to include when discussing climate mitigation, and to incorporate into climate action plans. However, soil carbon is difficult to account for in management objectives because of the limited availability and expense to capture data at the site level, which is most relevant to individual landowners and site-specific management decisions. Further, the impacts of different kinds of forest management and disturbance (e.g., harvesting, reforestation, or fire) on soil carbon balances are dependent on individual site and regional location.

How The Project Helps Forest Managers: The project proponents constructed a menu of forest management practices and guidelines that are beneficial for soil carbon, allowing landowners and land managers to better protect their existing forest soil carbon and enhance it as a climate mitigation tool.

Partners:
Project Lead: American Forests
Northern Institute of Applied Climate Science
University of Michigan
Maryland Department of Natural Resources Forest Service (SFI Certified Organization)

Outcomes To Date: Project was completed in December 2020. The project team performed a literature review and meta-analysis on soil profile datasets and found that harvesting had no significant overall effect on soil carbon in forests. However, variation of harvest impacts on soil carbon depends upon landform and soil order, and soil horizons. Harvest practices in some places can also influence the magnitude and variability of soil carbon change. Reforestation of cultivated soils increases soil carbon. Biomass and soil carbon recover concurrently during reforestation. Fire causes variable and potentially large Soil Organic Carbon decreases.

Based on the analysis, American Forests created Central Appalachian and Mid-Atlantic ecoregional guidance documents that recommend best practices to address different management strategies (e.g. harvest, fire, etc.) to protect forest soil carbon. They linked these approaches to specific sections of the SFI Forest Management Standard as a support tool for forest managers in the region.

The Forest Climate Resiliency Project - MANOMET

Funding Year: 2017

Project Objective: To develop and test a scalable approach for assessing forest resilience to climate change, demonstrating the adaptation and mitigation value of SFI managed lands, and incorporating climate opportunities and risks in planning and management.

Project Description: Manomet produced a scalable framework for the assessment of forest resilience using forest health and productivity metrics. This framework facilitates measurements against baseline conditions to assess contributions of SFI certified forestlands.

Benefits include the ability to:

- Quantify the characteristics of lands certified to SFI that confer climate resilience.
- Highlight where these certified lands illustrate high levels of performance in ensuring ecosystem resiliency.
- Provide management insight through enhanced understanding of the changing context of regional climate and forest trends.
- Facilitate climate awareness and proactive responses on the part of the SFI community.

Results were compared to regional data sources such as USDA Forest Inventory and Analysis, Moderate Resolution Imaging Spectroradiometer, Landsat, and where available, LIDAR data. The status and trends observed on the SFI sites are established through existing forest monitoring data and new information collected by Manomet in conjunction with forest managers.

Why Tt Matters: Managed forests have a major role to play in creating a planet that is resilient to a changing climate. Forests absorb about one-third of the world's annual carbon dioxide emissions from the burning of fossil fuels, accounting for as much as 45% of the carbon stored on land, and providing the principal means for mitigating the effect of greenhouse gases. Its important to understand how forest management can be used to promote resiliency to climate stressors and continuation of ecosystem services in lieu of potential changes.

How The Project Helps Forest Managers: The project provides SFI certified organizations and others with a simple approach to establishing baseline conditions, assessing overall resilience of forests to a changing climate, and monitoring the effects of a changing climate over time. These steps enable forest managers to include climate change mitigation in forest planning and management. As our climate changes, actively managed forests provide an extraordinary mechanism for humans to assist ecosystem adaptation to climate change. In addition to maintaining ecosystem health, vigorously growing forests act more effectively as a carbon sink to help mitigate rising CO2 levels.

Partners:
Project lead: Manomet
Hancock Timber Resource Group (SFI Certified Organization)
Lyme Timber Company (SFI Certified Organization)
Maine SFI Implementation Committee
Resource Management Service, LLC (SFI Certified Organization)

Outcomes To Date: The project was completed in October 2020. The project developed checklists, recommendations on tools and techniques for monitoring climate change and forest response, and a structure for the integration of climate factors into forest management plans. Two versions of the checklist were provided, a detailed version and a streamlined version that took into consideration economical and long-term plot approaches. In both cases, regional context for the four different study areas of Michigan, New York, Vermont, and North Carolina were evaluated followed by an assessment of local conditions. The checklists developed by Manomet provides a stepwise approach to the evaluation of forest management vulnerabilities to changes in climate, disturbance regimes and vegetation. Recommended variables, analyses and data sources simplify the evaluation process, but retain flexibility to tailor to site-specific circumstances.

Carbon Stocks and Stock Changes on SFI-Certified Landscapes in Canada - SASKATCHEWAN RESEARCH COUNCIL

Project Title: Carbon stocks and stock changes on SFI-certified landscapes in Canada

Funding Year: 2017

Project Objective: To initiate a spatially explicit estimate of carbon stocks and stock changes on SFI-certified landscapes in Canada.

Project Description: This project quantified carbon storage in different forest ecosystems using national and regional data. This project developed best available forest-carbon inventories for parts of British Columbia, Alberta, Saskatchewan, Manitoba, and parts of New Brunswick. SRC, working with carbon accounting teams from NRCan CFS ran the model from 1990 to 2016, and included historical annual disturbances by fire, harvesting and, where applicable, land-use change to and from forests. In total, the project provided a detailed assessment of approximately 18.3% of the SFI certified footprint in Canada, approximately 22.3 million hectares. For a large forest landscape made up of forest management areas certified to SFI, the team provided estimates of carbon stocks, stock changes, annual emissions, and removals of carbon to and from the atmosphere, and carbon transferred annually to meet society's needs for timber, fiber, and energy. This data was generated using the Canadian Carbon Budget Model of the Canadian Forest Sector, a tool developed by the Natural Resources Canada. Data, methods, and results from this project help improve Canada's National Forest Carbon Monitoring, Accounting and Reporting System, which ensures consistency of national and international reporting.

Why It Matters: Over the past 40 years, forests have absorbed about a quarter of the carbon dioxide emissions from human activities, according to Natural Resources Canada. In addition to quantifying the carbon values and changes across a large sample area, this project provides a roadmap for conducting a more comprehensive carbon-stock assessment for the entire land base certified to SFI across Canada and the U.S. With SFI's vast footprint, this project offers land managers carbon stock data that can be applied to forest management at grand scales.

How The Project Helps Forest Managers: The data generated by the project will provide information to forest managers to help them better understand the role of SFI forests in the global carbon cycle, and their contribution to mitigating climate change. Better and more consistent data enables forest managers across Canada to build understanding of how forest practices mitigate greenhouse gases in the atmosphere. The project model is designed to respect the need to account for the impacts of growth, mortality, decomposition, and disturbances such as fire, insects, and harvesting. Better understanding of these contributions help managed forests gain recognition as a vital tool in increasing carbon stocks, which in turn will help address climate change.

Partners:
Project lead: Saskatchewan Research Council
Natural Resources Canada Carbon Accounting Team
Forest Products Association of Canada
Saskatchewan Ministry of Environment's Forest Service
Saskatchewan Meadow Lake OSB (Tolko) (SFI Certified Organization)
Manitoba Sustainable Development, Forestry and Peatlands Management
Louisiana-Pacific Canada Ltd. Swan Valley Forest Resources Division (SFI Certified Organization)
Weyerhaeuser (SFI Certified Organization)

Outcomes To Date: Project results have been provided in a summary report to the project partners, and document the carbon stocks and carbon stock changes across roundly 22.3 million hectares of SFI certified forests in BC, AB, SK, MB and NB.

Key findings include:

- An observed increase in older forests, over 100 years, between 1990-2015, and a decline in the area of forests less than 100 years. This is after accounting for wildfires and harvesting.
- Total ecosystem carbon stocks increased over the study period – dead organic matter, soil, and above and below ground biomass." [even after accounting for wildfires and harvest.]
- With respect to the annual carbon stock change, overall there has been an increase in carbon, with a change in the rate in recent years due to fire."
- Generally, total biomass has been increasing, with decreases in dead organic matter, with the exception of years with big fires.

Preparing for the Carbon Market in Forests Certified to the SFI Standard - KEEPING MAINE'S FORESTS

Funding Year: 2015

Project Objective: To investigate how carbon credit programs might better account for the carbon sequestration inherent in sustainably managed forests.

Project Description: KMF studied current carbon credit programs to determine the degree to which forests managed to the SFI Standards meet their criteria, and developed recommendations to carbon credit programs to improve alignment. KMF illustrated the unique role of large contiguous forested areas in contributing to carbon sequestration and examined the value SFI certification adds in comparison to other forests.

Why It Matters: Growing concerns about climate change have highlighted the role of forests in the carbon cycle and created opportunity for engagement in carbon credit markets. Recent studies have found that forests globally offset up to 30% of all greenhouse gas emissions and that improved forest management may increase the carbon sequestration potential of forests. If management regimes are compatible, participation in carbon markets could provide an incentivizing income stream for forest managers.

How The Project Helps Forest Managers: This project helps SFI Certified Organizations' meet objectives to understand the role of well-managed forests in mitigating and improving resiliency to climate change. It supports SFI Certified Organizations in their efforts to monitor the relationship between regional climate models and resiliency of their own well-managed forests.

Partners:
Keeping Maine's Forests
Maine TREE Foundation
Maine SFI Implementation Committee
Appalachian Mountain Club
Plum Creek Timber (SFI Certified Organization)

Outcomes To Date: KMF and partners published a report on their findings and conducted outreach to encourage carbon market policy makers to augment the incentives of SFI certification, and reward current SFI participants for practices that contribute to carbon sequestration. KMF found that although SFI Certified Organizations have resources and systems in place for designing and maintaining a carbon project, the auditing processes for SFI certification and carbon verification are not similar and represent additional costs for landowners.

Additionally, landowners are at risk of having to pay back credits, sometimes with an additional penalty, if the land's carbon stocks decline due to harvests. Sixteen to nineteen percent of a project's credits are automatically transferred into an insurance pool which fully covers carbon losses due to unintentional declines in carbon stocks from weather events; wildfire; and insect, disease, and pathogen outbreaks. It is not clear, however, whether pre-salvage harvests related to spruce budworm infestation would be covered. Pre-salvage harvests may require landowners to surrender credits and possibly incur penalties. Given that landowners in Maine can expect two to three spruce budworm outbreaks over the course of a 100-year project, this lack of regulatory clarity represents a substantial risk to current and potential carbon program participants.

Carbon credits are a viable option for landowners whose forestland portfolios have areas with high carbon stocking that can be maintained over the long term. Higher credit prices or poor wood markets could also tip the balance of considerations in favor of improved forestry management projects, relative to carbon.

Investigating Carbon Sequestration in Boreal Upland Forests and Wetlands - SASKATCHEWAN RESEARCH COUNCIL

Funding Year: 2015

Project Objective: To develop a draft wetland carbon quantification protocol, and to implement a preliminary sampling program for wetlands in LP's Forest Management License Area to test the draft protocol.

Project Description: The Saskatchewan Research Council (SRC) developed practical methods for quantifying carbon sequestration in upland boreal forests and wetlands. The project developed implementable protocols which are affordable, based on internationally accepted methods, and applicable across other SFI-certified landscapes. Tools were created to both sample carbon in the field and calculate carbon based on vegetation and soil field data. Additionally, SRC conducted a case study on forestlands managed by Louisiana-Pacific Canada Ltd., a SFI Certified Organization, to ensure the accuracy of tools and protocol.

Why It Matters: Forests and forested wetlands provide critical carbon storage and may play an important role in mitigating climate change, but the quantification methods for boreal wetlands are poorly understood.

How The Project Helps Forest Managers: This project helps SFI Certified Organizations to better understand carbon storage in forested wetlands. It also supports SFI Certified Organizations in their efforts to monitor the relationship between regional climate models and resiliency of their own well-managed forests.

Partners:
Saskatchewan Research Council
Ducks Unlimited Canada
Louisiana-Pacific Canada Ltd. (SFI Certified Organizations)
Spruce Products Ltd. (SFI Certified Organizations)

Outcomes To Date: The project resulted in the development a guidebook for sampling peat in forested wetlands, undertaking the lab analysis, and analyzing the data. It was developed to be general enough that it can be modified for other forested wetland landscapes. Over 250 million Tonnes of soil organic carbon is estimated to be stored within FML 3’s wetlands. Wetlands make up only 25% of the surface area of the study area, but account for almost 75% of the total C stocks. Wetlands are protected in this landscape.

BIODIVERSITY PROJECTS

Active Projects

Studying Culturally Significant Plant Regeneration Post-harvest in the Splatsin Territory - SPLATSIN INDIAN BAND

Project Objective: To measure the presence and regeneration success of select culturally sensitive plants pre- and post-harvesting on SFI certified lands.

Funding Year: 2019

Project Description: The project's aim is to improve understanding and ensuring the maintenance of biodiversity in the forest by providing data on how culturally significant plant species, with a specific focus on huckleberry, regenerate after harvesting. Splatsin, with the assistance of Tolko, an SFI-certified organization, and a professional Biologist, are measuring the presence and regeneration success of select culturally sensitive plants pre- and post-forest harvesting. Study areas and sample plots located in Splatsin traditional areas were established to measure pre- and post-harvest plant presence, health and vitality of selected plants.

Why It Matters: Indigenous Peoples in the U.S. and Canada have long relied on forests for cultural, spiritual, and material needs. The SFI Program recognizes forest operations may have an impact on Indigenous communities in a variety of ways, including culturally significant ones. Understanding and maintaining biodiversity in the forest, while also respecting culturally significant plants, is critical for both the Splatsin Indian Band and Tolko Industries in their management of forest lands in the south-central interior of British Columbia.

How The Project Helps Forest Managers: SFI builds partnerships with Indigenous communities and improves awareness of SFI and its community involvement requirements. This project enhances these efforts by testing the effects of forest harvesting on culturally significant plants, developing best practices to ensure their persistence, and ensuring sustainably managed forests are both environmentally and culturally sustainable. This project also helps support forest managers in their efforts to manage forestlands in ways that respect Indigenous values.

Partners:
Project lead: Splatsin Indian Band
Yucwmenlucwu (Caretakers of the Land) LLP.
B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Ecora Engineerng and Resource Group Ltd.
Mountain Labyrinths Inc.
Sicamous Model Forest
Tolko Industries Ltd. (SFI Certified Organization)

Outcomes To Date: Preliminary review of the data reveals that most plots (14 of 16 plots) have huckleberry plants still present and growing within plots post-harvest. Literature on pre- and post-harvest vegetation assessments and research on effects of changes in light and regeneration on the project's focal plants is underway and will be ongoing throughout the term of the project.

Enhancing Caribou Habitat with Active Forest Management - FRI RESEARCH

Funding Year: 2018

Project Objective: To investigate whether timber harvesting regimes and silvicultural practices can be used to reduce the occurrence of primary prey (deer, moose, elk) in cutblocks. This will in turn inform understanding of predator populations, and potential impacts on caribou, a species at risk.

Project Description: Working towards caribou conservation on a shared working landscape, this project investigates the role of silvicultural practices in reducing habitat for species that destabilize predator-prey systems, ultimately to the detriment of woodland caribou in forested ecosystems. This project provides a method of directly measuring how the application of the SFI Forest Management Standard provides better habitat for wildlife and species at risk. Specifically, this work delivers spatial habitat models that forest managers can use to measure how silviculture decisions contribute to deer, moose and elk habitat, which in turn affect predator populations. In addition, these habitat models can help inform how timber harvesting and silviculture planning could impact caribou. Results are scalable from the stand level to the landscape scale, where the potential benefit of multiple age-classes and structure in managed forests are quantified for the regional landscape of western Alberta.

Why It Matters: Boreal caribou, a type of woodland caribou, live in Canada's boreal forest. Like many wide-ranging forest species, caribou rely on Canada's network of protected areas, unmanaged areas, and well-managed forests to meet their habitat needs. Woodland caribou are listed as threatened under the federal Species at Risk Act (SARA), as well as under provincial legislation in some provinces (e.g., Manitoba, Ontario, Quebec). The federal recovery strategy for woodland caribou specifically recommends the management of prey and predators and to mitigate the threat of high predation rates through habitat restoration and management. There are several factors that negatively impact woodland caribou and may contribute to their decline. For example, roads, powerlines, pipelines and forest harvesting contribute to conditions which may give predators like wolves and bears easier access to caribou habitat. Younger forests that grow after disturbances like fire or harvesting also initially attract deer and moose, which in turn can increase the number of predators.

How The Project Helps Forest Managers: SFI is helping forest managers manage for healthier caribou populations by focusing on important themes such as habitat changes, nutritional needs, and the effects of climate change. SFI's work with its partners recognizes the complexity of forest management planning when it comes to managing for multiple conservation objectives involving a myriad species. The SFI community shares a goal of using responsible forest management practices to proactively manage risks to caribou and other species. SFI Certified Organizations in this region have the opportunity to support specific research indicated in the caribou recovery strategy, and to directly incorporate the results of this research in forest management practices in caribou ranges. The study area is in a region where threatened caribou herds occur within forests managed by five companies with forestland certified to SFI: ANC Timber, C&C Resources Inc., Weyerhaeuser, West Fraser, and Canfor. The region also has an established federal caribou recovery strategy.

Partners:
Project lead: fRI Research
Canfor (SFI Certified Organization)
Weyerhaeuser (SFI Certified Organization)

Outcomes To Date: Results revealed that white-tailed deer habitat selection, in response to forest type and habitat disturbance, was highly variable across seasons, between sexes, and among different individuals. In general, deer were more likely to select areas with more conifer forest during winter, but selected areas with less conifer forest during other seasons. Deer also responded to habitat disturbance, generally selecting areas closer to wellsites and industrial sites, and during summer, selecting areas closer to cutblocks <25 years in age. However, response to linear features was more variable; deer in one study area selected areas farther from or with lower densities of pipelines, roads and seismic lines, but deer in different study area selected areas closer to seismic lines and areas with higher densities of pipelines during the rut and winter. Deer response to linear disturbances is likely driven by a combination of predator avoidance and access to forage habitat.

The individual variation in habitat selection patterns observed is not unusual for deer. It is also possible that deer shift their habitat selection based on time of day, depending on localised human and predator activity. Future data analysis for the final report will consider time of day, attributes of cutblocks (site preparation, planting densities, herbicide application, etc.), and additional variables describing vegetation availability and habitat heterogeneity.

Completed Projects

Managed Forests for the Birds - AMERICAN BIRD CONSERVANCY

Funding Year: 2019

Project Objective: This project has 4 primary objectives: to further strengthen estimates of the conservation value of managed forests for birds; to refine and document methodology using existing data and data collected specifically to inform conservation value; to develop tools and approaches that link forest management decisions with bird habitat and population response; and to communicate these estimates, methods and tools effectively with certified organizations and their companies, customers, forestry and wildlife professionals, and other stakeholders in the Southeast and nationally.

Project Description: This project examines the needs of a wide variety of birds to help build understanding of broader ecosystem health and sustainable forest management. The project builds on and further refines estimates of conservation values in the American Bird Conservancy's (ABC) five pilot areas in the U.S. Southeast. It also incorporates robust bird and habitat data from the Cornell Lab of Ornithology's eBird citizen-science database. This project is refining methods from ABC's past research, supported by SFI, in the U.S. Southeast and Pacific Northwest and expanding this work into a new pilot areas. This demonstrates how research methods can be transferred to regions with different ecological conditions. SFI staff work with both ABC and the Boreal Avian Modelling Project (BAM, another SFI conservation partner and grantee), based at the University of Alberta, to ensure dovetailing of their respective approaches and results across North America. Strengthening collaboration between ABC and BAM effectively links work across the U.S.-Canada border while advancing knowledge at a continental scale.

Why It Matters: Forests provide important habitat for sustaining bird biodiversity. Forests, particularly in the Southeast US region, are also an integral part of the economy providing everyday products and jobs related to the forest sector. It is important to understand the intersection of how managed forests create habitat for high-priority bird species that need a mosaic of different habitat conditions for breeding success. This project aims to improve that understanding and quantify the value of managed forests for birds of conservation concern and identify opportunities to enhance habitat conditions and therefore increase that value.

How The Project Helps Forest Managers: Forest managers benefit from a range of tools to help guide forest management decisions. For example, managers can estimate the value of young forest habitats to the associated bird species and in turn link decisions to forest cover and species management. The strength of this project hinges on combining the modeling power of BAM with ABC's experience engaging SFI Certified Organizations. This partnership capitalizes upon ABC's relationship skills and BAM's modeling skills to advance SFI Certified Organization implementation of recommended forest management practices. This project also helps SFI to translate the conservation value of forests certified to SFI to brand owners seeking to communicate the positive qualities of their supply chain choices. This work provides credible, defensible assurances that customers are supporting the sustainability attributes they desire when buying SFI certified forest products.

Partners:
Project lead: American Bird Conservancy
University of Alberta Department of Renewable Resources, Boreal Avian Modelling Project
NatureServe
National Council for Air and Stream Improvement (NCASI)
Hancock Timber Resources Group (SFI Certified Organization)
International Paper Company (SFI Certified Organization)
Rayonier (SFI Certified Organization)
Resource Management Service (SFI Certified Organization)
The Westervelt Company (SFI Certified Organization)
Weyerhaeuser (SFI Certified Organization)

Outcomes To Date: The project was completed in February 2021. SFI Certified lands in the Southeastern US creates habitat that supports a diversity of birds, as well or better than the surrounding landscape. They found high avian diversity and abundance on SFI certified lands and all 11 of the project's focal species with represented in the study areas. For focal species (particularly Prairie Warblers), SFI certified lands provided as good and, in several cases, better habitat than did surrounding landscapes. Distribution maps and corresponding data layers were created for 9 focal species as a support tool to aid in forest management decisions in the Southeastern SFI focal geography. The layers can be incorporated into forest management plans to identify areas that management can enhance habitat for species of conservation concern.

Operationalizing Conservation Value Through Multi-Species Evaluation on Lands Certified to SFI - BOREAL AVIAN MODELLING PROJECT

Funding Year: 2019

Project Objective: To determine and enhance ways to operationalize conservation value in terms of bird species diversity that encompasses rare species and distinctive communities.

Project Description: This project, led by the Boreal Avian Modelling Project (BAM), employs metrics that estimate the contribution of forest stands and landscapes to regional bird biodiversity. A key feature of these metrics is that they emphasize rare species and distinctive communities in addition to species richness. These metrics can also be modeled in different types of forests and at different scales.
This research project is an extension of an existing project supported by SFI: Applying Data-Driven Measures to Evaluate and Improve the Conservation Value of Managed Forests for Birds. It is also linked to another research project led by the American Bird Conservancy (ABC) and supported by SFI: Managed Forests for Birds.

Why It Matters: The diversity of bird communities acts as an indicator of an ecosystem's overall biodiversity. While single-species assessments are important, evaluating forestlands in terms of the composition of larger bird communities can show how they contribute to regional biodiversity. This project provides explicit measures of conservation value, allowing project partners to determine and report on the direct contributions to regional biodiversity made by lands certified to SFI. The ultimate goal is to facilitate on-the-ground implementation of conservation measures by SFI Certified Organizations. Because this project represents a collaborative effort with ABC, it is effectively taking both bird population science, and SFI Certified Organization engagement, to a continental scale.

How The Project Helps Forest Managers: This project gives forest managers methods, based on bird community diversity, to define and measure conservation value. Metrics combining species richness and rarity will quantify the contributions of forest stands and landscapes to overall regional biodiversity. It also strengthens SFI's collaborative framework by working directly with partners in the co-production of the research. Co-production facilitates results translated into actionable recommendations that can be implemented on-the-ground by SFI Certified Organizations.

Partners:
Project lead: University of Alberta Department of Renewable Resources, Boreal Avian Modelling Project
American Bird Conservancy
Boreal Ecosystems Analysis for Conservation Networks (BEACONs) Project
Canadian Forest Service
Canadian Wildlife Service
Center for Northern Forest Ecosystem Research
Environment and Climate Change Canada
Forest Products Association of Canada
fRI Research
Fuse Consulting
Nature Canada
NatureServe
Université Laval
University of British Columbia
Central Sustainable Forestry Initiative Implementation Committee
Western Canada Sustainable Forestry Initiative Implementation Committee
Canfor (SFI Certified Organization)
Daishowa-Marubeni International Ltd. (SFI Certified Organization)
EACOM (SFI Certified Organization)
Interfor Corporation (SFI Certified Organization)
Resolute (SFI Certified Organization)
Tolko (SFI Certified Organization)

Outcomes To Date: This project was completed in September 2020. The developed models and analysis found that avian species richness was higher on SFI certified lands compared to uncertified forestlands. The diversity of habitat that managed forests provide can be positive in supporting biological diversity. They also developed an online SFI Conservation Value Assessment tool to help understand the value of sustainable forest management on bird biodiversity:

https://borealbirds.ualberta.ca/2020/12/03/conservation-value-assessment-tool/

Measuring the Conservation Value of Forests Certified to SFI in Bi-national Pilot Areas of the U.S. and Canada - NATURESERVE

Funding Year: 2019

Project Objective: To develop metrics for quantifying the condition of species, ecosystems, landscapes, and ecological pressures in forests certified to SFI.

Project Description: This project quantifies the conservation impact of SFI-certified lands by developing scalable metrics to measure biodiversity and other important conservation values. This project is building on previous work by taking several major steps towards quantifying conservation values at a large spatial and ecological scale. NatureServe is collaborating with project partners to produce a metrics-based evaluation of the conservation value of lands certified to SFI that straddle the New Brunswick–Maine border. Developed metrics can be scaled up to for use by any SFI Certified Organization across the vast SFI footprint. Eight current metrics have been developed for three U.S. pilot areas, divided among themes of species, ecosystem, and landscape conservation. Since the geographic scope of this project is specifically designed around attaining 100% inclusion of lands certified to SFI in the project analysis footprint, this is the first comprehensive assessment of SFI contributions to biodiversity values across a given region. Based on work already completed by NatureServe in the continental U.S., previously developed metrics of biodiversity and conservation value were re-deployed and modified where needed. This work directly responds to the goal of quantifying the contribution of forests certified to SFI toward the attainment of broadly accepted conservation goals in landscapes of conservation interest.

Why It Matters: The conservation value of managed forests can be poorly understood and is often negatively perceived by people outside the forest sector. Even for experts working within the forest sector, the ability to quantify and express the conservation values associated with managed forests is challenging. Managed forests are known to provide ecosystem contributions to biodiversity, including species of conservational concern and at-risk habitats. The need to assess biodiversity of sustainably managed lands is critical. Developed metrics to quantify and demonstrate biodiversity and ecological values would aid as supportive tool to represent biodiversity contributions of managed forests.

How The Project Helps Forest Managers: This project allows the application of existing conservation value metrics to all lands certified to SFI within an area, so land managers can report, for the first time, the collective SFI conservation impact within a given area. Reporting products include metrics definition, development, application, results, interpretation, and testing and refinement for expansion into new geographies and new forest ecosystems, emphasizing replicability and transferability. Visually intuitive maps and metric report cards contribute important outreach materials for communicating project results and inspiring other SFI Certified Organizations to pursue metrics development for their managed forest lands.

Partners:
Project lead: NatureServe
Boreal Avian Modeling Project
American Bird Conservancy
National Council for Air and Stream Improvement (NCASI)
Resource Management Service (SFI Certified Organization)
Hancock Natural Resource Group (SFI Certified Organization)
J.D. Irving (SFI Certified Organization)

Outcomes To Date: This project was completed in January 2021. The project developed and tested biodiversity metrics on SFI certified lands within the cross-border area of Main and New Brunswick. The final report found that SFI-certified lands provide important biodiversity and conservation values:

1. SFI-certified lands support confirmed occurrences of critically imperiled or other species of conservation concern.
2. SFI-certified lands support a mix of ecosystem types within their boundaries, providing a diversity of vegetation conditions to support the suite of animal species that rely on these various ecosystem types.
3. SFI-certified lands contribute to large, connected areas of relatively undeveloped lands in good landscape condition, with positive implications for the many species that depend on extensive, contiguous landscapes.
4. SFI-certified lands play an important potential role in meeting conservation goals that have been independently developed at regional scales by a wide range of stakeholders.

Investigating Biodiversity Impacts of Forest Management on Vernal Pools in the Kenauk Reserve, Nature Conservancy of Canada - NATURE CONSERVANCY OF CANADA

Funding Year: 2015

Project Objective: To compare the ecological effects of two popular silvicultural approaches (even-aged and uneven-aged forest management) in order to provide a deeper understanding of forest dynamics, and to support the decision-making process in determining the silvicultural treatment approaches to be implemented in the Kenauk Reserve in Quebec, Canada.

Project Description: To improve the understanding of the ecological effects of even- and un-even aged management on vernal pools on the Kenauk property, NCC and Kenauk Canada U.L.C. (SFI partner) worked with three groups of researchers. First, ISFORT (www.isfort.uqo.ca) studied the of effects of silvicultural practices on regeneration, biodiversity and soil dynamics, UQAM (www.geotop.ca) researched aspects related to the effects of silvicultural practices on hydrology, hydrogeology and water supply of vernal pools. CERFO (www.cerfo.qc.ca) used Lidar detection of vernal pools and how they contribute to the implementation of new scientific knowledge in forestry and forest management.

Why It Matters: Amphibian populations have been declining worldwide for nearly two decades, but little is definitively known about why. But we do know that vernal pools — temporary water bodies that form in forests during periods of high precipitation or spring snow melt — provide important habitat for a variety of plant and wildlife species of concern, including frogs, salamanders, and other amphibians. A key feature of vernal pools is the absence of fish, which means amphibians' eggs do not get eaten by them. Research on vernal pool habitats, on the Kenauk Nature property, will help forest managers identify and conserve these important sites.

How The Project Helps Forest Managers: Study results play a role in improving silvicultural practices across the range of vernal pools in North American deciduous forests. Methodologies developed here can help land managers identify which vernal pools are likely to be important sources of biodiversity richness or rareness. The project provides data to support responsible forest management practices including:

- Scouting for potential vernal pools using wetland maps, aerial photographs and local knowledge
- Documenting vernal pools found in the area
- Avoiding vernal pools when planning resource roads
- Protecting the pool perimeter during harvesting
- Preventing slash and sediment from entering the pool

Project Partners:
Project lead: Nature Conservancy Canada
Centre d'enseignement et de recherche en foresterie de Sainte-Foy
Centre GEOTOP, Université du Québec à Montréal
Institut des sciences de la forêt tempérée
Kenauk Canada (SFI Certified Organization)

Outcomes To Date: The project was completed in November 2017. Results of the project found the following:

1. LiDAR Investigation: The study found that vernal pools can be accurately and rapidly detected with the use of areal LiDAR and temporal high resolution spatial satellite imagery in a forested landscape. This is significant as LiDAR technology has not been previously used to map vernal pools, and there is an increasing need to cost effectively locate these ecologically significant features as climate change is rapidly altering hydrological dynamics across the forest landscape.
2. Hydrology of Vernal Pools: NCC sought to refine understanding of the relationships between hydroperiod, pool morphology, and hydric location to understand the hydrological processes regulating these isolated forest wetlands. One key finding was the degree to which vernal pools vary in area. The studied wetlands have areas ranging from 26.4 to 753.6 m^2. Their maximum water depths varied between 0.16 and 1.80 m, and the pools were active between 32 and 86% of the time. Another key finding was the hydrologic regimes of vernal pools were influenced mostly by precipitation and evapotranspiration, and to a lesser extent by infiltration, surface outflow, and ground water levels.
3. Biodiversity and forest resilience: NCC's results show that even-aged silviculture generally results in a higher tree species diversity than uneven-aged stands. In regeneration, the most important result is that uneven-aged silviculture appears to favor beech understory development. For herb species, NCC's analyses shows very distinct responses among families: i) some families do not seem affected by forest management; ii) some families are affected by both approaches or by one of them; iii) when affected some families seem to recover through time while others do not.

Remote-Sensing LiDAR to Measure Biodiversity on Lands Certified to the SFI Standard - UNIVERSITY OF NORTHERN BRITISH COLUMBIA

Project Title: Remote-Sensing LiDAR to Measure Biodiversity on Lands Certified to the SFI Standard

Funding Year: 2015

Project Objective: This project addressed four issues – to use quantitative algorithms to detect important attributes from LiDAR data, to link LiDAR and forest biodiversity metrics, to accurately assess timber volumes and forest growth potential using LiDAR, and to identify the optimal "spatial grain" for forest diversity and timber supply for LiDAR.

Project Description: University of Northern British Columbia (UNBC) assessed biodiversity values on SFI certified lands using LiDAR. LiDAR is a remote sensing technology that measures distance by illuminating a target with a laser and analyzing the reflected light. UNBC investigated the relationships between LiDAR-derived metrics of forest structure, forest biodiversity indicators and tree density in sub-boreal forest of central British Columbia. They developed protocols and guidance for using LiDAR data to rapidly evaluate forest structure and biodiversity at the stand and landscape level. The resulting information enables future use of LiDAR data sets to study forest carbon sequestration, water quality, riparian health, and other conservation values of concern. Specifically, they advanced a methodology for using Aerial Laser Scanning (ALS) data to rapidly assess forest structure and estimate forest diversity in the Central Interior Plateau of British Columbia.

Why It Matters: Optimizing forest management for biodiversity across large scale landscapes presents the challenge of understanding baseline conditions across large and often remote areas. Using emerging technologies, such as LiDAR, allows detailed analysis of areas of variable topography at a large scale in areas regardless of ground access. LiDAR datasets provide high quality information on forest ecosystems and biodiversity and used to optimize management and conservation plans in respect to important ecosystem areas.

How The Project Helps Forest Managers: The project intersects with SFI certification standards through conservation of biological diversity, and requirements for wildlife habitat conservation. The project provides a practical toolkit for forest, habitat and timber managers to us utilize LiDAR data sets as the forest stand and landscape level. This helps in spatial conservation and timber planning efforts and are scalable at regional levels.

Partners:
University of Northern British Columbia
Dunkley Lumber (SFI Certified Organization)
Aleza Lake Research Forest Society
UNBC Geography
Ministry of Forests: Lands and Natural Resources Operations Government of British Columbia

Outcomes To Date: The project produced two key findings with respect to best LiDAR methods to evaluate forest biodiversity. First, Aerial Laser Scanning (ASL) metrics need evaluation at multiple spatial scales to best model forest vegetation diversity. The models that were found to be the best predictors of below ground vegetation diversity, and biodiversity in general, were ones that combined metrics from the large and small end scale spectrums. Second, the project demonstrated that biodiversity estimates are more accurate when using a combination of high-resolution Digital Elevation Model (DEM) derived metrics, and metrics that reflect the height distribution and variance of forest canopy vertical structure. Specifically, for the research area in the central interior of British Columbia, topographic variation was reasonably low, and therefore small edaphic changes can induce substantial shifts in vegetation diversity and community structure. Further, small changes in the estimated water holding capacity of the soil and modeled surface roughness can influence species richness. These fine grain landscape changes were revealed through use of ALS data and provide a means of assessing these fine grain drivers of ecological structure at a landscape scale.

WATER PROJECTS

Active Projects

Examining the Role of Forest Certification in Advancing Conservation Outcomes in the U.S. Southeast - UNIVERSITY OF GEORGIA

Funding Year: 2020

Project Objective: To define the impacts of the SFI Sustainable Fiber Sourcing Standard on water quality and biodiversity conservation for ensuring the sustainability of forest resources at the ecoregion level.

Project Description: This project analyzes the impact of the SFI Fiber Sourcing Standard on water quality and biodiversity best management practices to establish the effectiveness of the SFI Fiber Sourcing Standard as a conservation tool in the Southern Coastal Plain ecoregion located within South Carolina, Georgia, Florida, and Alabama. The first aim of the project is to establish the relationship between the implementation rates of forestry best management practices and adoption of the Fiber Sourcing Standard in the Southern Coastal Plains Ecoregion. The second aim of the project is to ascertain the degree of overlap between wood baskets of certified mills and habitats of at-risk species and explore the relationship between the rate of increase in the implementation rate of forestry best management practices within and outside the habitats of at-risk species across the Coastal Plains Ecoregion. Analysis will compare BMP survey data and biodiversity data in combination with a spatial analysis of certified mills and their wood basket range.

Why It Matters: The Southern Coastal Plain ecoregion is home to many imperiled species including the gopher tortoise and red cockaded woodpecker. SFI is collaborating on research with the University of Georgia (UGA) to assess the positive impact of the SFI Fiber Sourcing Standard on water quality and biodiversity in the region. The SFI Fiber Sourcing Standard promotes sustainability on a wide range of ownerships and helps ensure that managed forests provide habitat for many species at risk in the region. In 2015, an SFI Conservation Grant led by UGA showed that 20 years of implementation of the SFI Fiber Sourcing Standard had a significant positive influence on non-certified forestlands across Georgia. Additional research from UGA has shown that the compliance rate of forestry best management practices for water quality was higher within the fiber sourcing areas of SFI-certified mills. This is important because these millions of acres of managed forests provide watershed protections that directly benefit aquatic species and provide for the needs of millions of people downstream.

How The Project Helps Forest Managers: The project illustrates the value of the SFI Fiber Sourcing Standard on water-quality and biodiversity related sustainability on a wide range of forest lands in Georgia and surrounding states. The methods developed for this study are applicable to measuring the environmental benefits associated with application of the SFI Fiber Sourcing Standard in other states. UGA and partners are disseminating their findings to local and regional stakeholder groups and the general public. The project helps prove the value of SFI objectives to protect water resources through the utilization of best management practices and promotion of logger training programs.

Partners:
Project lead: University of Georgia
NatureServe
Georgia SFI Implementation Committee

Outcomes To Date: Using Georgia's BMP Survey data, the research team examined the relationship between BMP implementation rates within critical habitats of four states (Alabama, Georgia, South Carolina, and forestlands of Florida) within the wood baskets of SFI and non-SFI mills. The certified mills and area within their wood baskets expand almost over the entire study area. BMP compliance rates were high (<90%) across the region indicating that all forestland, regardless of biodiversity, receive the same level of environmental protection. The chief finding from this research is that high BMP adherence rates across the Southeastern United States, with very little perceived difference in adherence occurring across various categories of biodiversity areas, suggest the SFI Fiber Sourcing Standard's mandate to comply with BMPs in exchange for certification equally protects forestland across the biodiversity value spectrum.

Development of a Carbon and Water Calculator for SFI Lands - NATIONAL COUNCIL FOR AIR AND STREAM IMPROVEMENT (NCASI)

Project Year: 2019

Project Objective: To develop an online tool that will estimate and display forest carbon stocks, forest carbon stock changes, and water resources on SFI certified lands across the conterminous US.

Project Description: NCASI staff will analyze relevant data from databases such as the national FIA Database (FIAdb) for the 48 conterminous US states, forested land cover, and watershed data to estimate regional carbon and water-related data as they intersect with SFI-certified forestlands. Regional estimates of forested land that is under SFI certification are applied to the water and carbon storage data to estimate the ecosystem services of SFI-certified forestlands.

Why It Matters: The water and carbon calculator tool helps quantify the environmental benefits that managed forests contribute to nature-based solutions and ecosystem services across the vast footprint of SFI-certified area. It numerates the benefits of forests in relation to carbon sequestration in the face of climate change and assesses the quantity of water that forests contribute/filter through certified forests. In addition, quantifying this information on public land is difficult due to accessibility. By using the SFI and NCASI network, the tool will identify and quantify these benefits on private forests at scale. This tool allows the public to interactively view the contribution of private lands, and SFI-certified forests in particular, to achieving environmental objectives such as the provision of clean water and mitigating climate change through carbon sequestration in forests.

How The Project Helps Forest Managers: The publicly available tool can be used by forest managers to examine the carbon and water benefits within their area of operation. The qualitative data can be used in communications to the public about the benefits of managed forests to carbon sequestration and water resources.

Partners:
Lead Partner: NCASI
NAFO

Outcomes To Date: Across 66 million acres of SFI-certified area in the US, the forest management standard acts to protect and conserve over 250,000 miles of water courses, which is equivalent to the distance of the Earth to the moon. In terms of water running though SFI certified land, it equates to a minimum of 165.9 billion cubic yards of water every year. To put this in perspective, Niagara Falls has a flow rate of approximately 118.2 billion cubic yards of water per year.

Monitoring and Quantifying the Effects of State Forestry BMP Programs on Soil Erosion and Sediment Delivery for the Southeastern U.S. - VIRGINIA TECH

Funding Year: 2018

Project Objective: To comprehensively compare and contrast the implementation and effectiveness of forestry best management practices for water quality.

Project Description: This collaborative project, led by Virginia Tech, compared and contrasted the implementation and effectiveness of the 13 Southeastern states' forestry best management practices (BMPs) for water quality. This required monitoring sediment delivery ratios, erosion rates, and BMP-implementation scores across multiple regions. This comprehensive multiregional and multi-sponsor study collected, analyzed, and interpreted data using seven major objectives, including:

- Estimating sediment-delivery ratios (i.e., soil eroded and the amount of sediment deposited into streams) by forest region and forest operation
- Quantifying the relationships between BMP implementation percentages and sediment delivery and/or soil erosion
- Estimating the impact that state and regional BMP programs have had on sediment reduction

Why It Matters: Sediment is the largest stream water pollutant from forest management in the southeastern U.S. Currently, relationships between actual soil erosion and sediment delivery are poorly understood. Results allow state forestry organizations and other stakeholders to quantify sediment protection provided by state BMP programs and highlight the related benefits of sustainable forest management. Results are delivered on the ground through logger training programs and professional conferences. The collaboration across multiple states represented by this project is advancing both understanding and the ability of researchers and practitioners to compare and quantify the efficacy of BMP implementation across broad geographies and disparate ownerships.

How The Project Helps Forest Managers: This project directly relates to the SFI priority area of quantifying the impact of SFI Certified Organization activities relative to improving stream habitat and/or water quality. Project results have benefits across the U.S. South regarding helping to document the effects of BMP implementation on sediment delivery to streams on lands managed by SFI Certified Organizations. This information helps compare forestry to other land uses and demonstrates the benefits of sustainable forest management and BMP implementation. The data generated by the project helps refine and develop best practices and provides information to forest managers that help enhance water quality.

Partners:
Project lead: Virginia Tech Department of Forest Resources and Environmental Conservation
Virginia SFI Implementation Committee
National Council for Air and Stream Improvement
Southern Group of State Foresters
Virginia Department of Forestry
North Carolina Forest Service
Texas A&M Forest Service

Outcomes To Date: A portion of the study focuses on site characterization and BMP audits with no silt fence installation in the southeastern portion across 13 states. The researchers examined multiple operational features (skid trails, decks, haul roads, stream crossings, harvest areas) in three topographically different harvest regions in the S.E. U.S.: Coastal Plains, Piedmont, and Mountains. Significant differences were found in harvest area and deck size between the regions with Mountains having significantly smaller landings. Harvest areas in the Piedmont were greater than Coastal Plains and smallest in the Mountain region.

Completed Projects

Exploring the Financial Value of Ecosystem Services on SFI Certified Lands - COALITIONS & COLLABORATIVES, INC.

Funding Year: 2019

Project Objective: To explore the value of a pilot SFI certified forest for ecosystem services valuation and to determine what lessons can be learned for the larger SFI community.

Project Description: The conservation group, Coalitions & Collaboratives, Inc. (COCO) and its strategic partner RenewWest, a Colorado company specializing in forest-based ecosystem services, led the investigation into generating conservation-focused returns through the monetization of carbon, water, and conservation markets. Results were examined and extrapolated to show potential for other forests certified to SFI. The team assessed the potential of applying the California Compliance Offset Protocol for U.S. Forest Offset Projects for both afforestation/reforestation projects and improved forest management carbon offset projects. The project provided a quick and relatively inexpensive analysis of the financial values of both carbon and water for Fruit Growers Supply Company, an SFI Certified Organization. The project included elements of forest restoration, as some 30,000 acres of the subject area lost forest cover in a wildfire.

Why It Matters: Ecosystem services refer to things that the natural world provides to sustain life, such as water, air and climate change mitigation. An ecosystem services perspective offers a way of looking at the collective value of nature. Placing a financial value on these services provides a tool for policymakers and conservationists to evaluate management impacts and conduct a cost-benefit analysis of potential policies. This project explored the financial value of ecosystem services in a California forest, owned by Fruit Growers Supply Company and certified to SFI. It demonstrated the unique role that forests certified to SFI can play in achieving returns through climate change mitigation, watershed improvement, and habitat conservation. Demonstrating the potential for generating value from ecosystem services helps align forest management objectives with the full-spectrum of services that working forests provide society.

How The Project Helps Forest Managers: Results increased understanding of which SFI forest management practices have the most significant impact on carbon, water, and other conservation outcomes. This data created the opportunity to replicate the most beneficial practices, when appropriate, across certified forests. Demonstrating the financial value of ecosystem services helped to align forest management objectives with the full-spectrum of services that working forests provide society. The motivations to measure conservation values are diverse: brand owners seek to understand the impact of their sourcing; conservation stakeholders can engage more effectively if they understand the values that certification can provide; and improved tracking will better equip SFI to provide sustainability related metrics and contribute meaningfully to conservation outcomes.

Partners:
Project lead: Coalitions & Collaboratives, Inc.
RenewWest
DenverWater
Colorado Springs Utilities
Fruit Growers Supply Company (SFI Certified Organization)

Outcomes To Date: In the final report, they analyzed standard water outcomes to determine the water values on reforested lands that were affected by fire. For the 12,292 acres considered for reforestation, the final, best estimate of reduced runoff is 3,687,000 Liters / 2,990 acre-feet of increased aquifer recharge per year. A similar sized aquifer recharge project would be likely valued at $1,166,100 per year. Additionally, 4,917 metric tons of avoided erosion/stream sedimentation per year will be created by the reforestation.

A report by project contractor TerraCarbon demonstrated a qualitative but not quantitative value in SFI certification, based upon reporting standards. That is, adhering to SFI standards will make practicing foresters and landowners well acquainted with best practices of forestry and forestry accounting, which translates well to participation in carbon markets, but that there is not an identifiable carbon benefit from standard adherence above what the market common practice shows.

Investigating the Relationship between BMP Implementation and SFI Certification through Time - CONSERVATION MANAGEMENT INSTITUTE AT VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Funding Year: 2018

Project Objective: To develop a scalable method for estimating the total impact SFI standards have had on water quality applicable across North America.

Project Description: This project focused on scalable methods for collecting and preparing integral data for conducting robust analyses of coupled forestry and water quality metrics. A sampling of single and repeat harvest locations in Virginia that are within 200m of water gauging stations were located. The boundaries of the upstream watersheds from these harvests were delineated using ArcGIS Pro. The project team manually delineated (from aerial photography) harvest operations, and related water quality best management practices (BMPs) within harvest boundaries in selected watersheds and then quantified BMP implementation and harvest operations metrics such as harvest area, number of logging decks, SMZ length, and slopes of roads. Automated methods for wall-to-wall identification of SMZ implementation across multi-state landscapes and over decadal time spans were developed.

Why It Matters: Developing direct relationships between SFI standards and metrics of water quality at present is difficult given that few, if any, datasets exist that record water quality data in landscapes where forest practices alone are affecting surface runoff, sedimentation, and other factors. However, there are numerous programs collecting water quality information for specific basins that can be used to better understand water quality within those basins. Forest management and harvest occurs in many of these basins, and a history of land use and harvest may be accurately reconstructed using available geospatial information (i.e., remotely sensed images) and harvest data provided by state agencies and from private SFI Certified Organizations. This project attempted to use this information to evaluate the relative importance of SFI-managed forest lands in maintaining or improving water quality. While direct causation could not be demonstrated, it may be able to employ other methods to develop estimates of water quality metrics affected by the adoption of standards and provide confidence bounds for those metrics.

How The Project Helps Forest Managers: Developed metrics can directly support sustainability accounting and corporate responsibility reporting. This information can be incorporated into forest management sustainability plans and programs.

Partners:
NCASI
International Paper Company (SFI Certified Organization)

Outcomes To Date: Time series maps of metrics related to water quality, including rainfall, land cover, harvest intensity, age class diversity, and reforestation rates were created. Maps of SFI-certified Fiber Sourcing likelihood and SFI-certified Forest Management density were created to further analyze the relationship between BMP implementation and SFI Forest Management and Fiber Sourcing certification across time in Virginia.

Validation of the automated SMZ implementation metrics was explored, along with further investigation of the availability of water quality measurements in close proximity to harvest locations in Virginia and throughout the Southeastern United States. The methods developed result in stronger results with a greater availability of data. In some regions, data limited the usefulness of methods. Although a phase II project is not currently being developed, next steps would include an analysis on the cost, feasibility, and potential for acquiring enough data from multiple states to successfully evaluate the specific relationship between SMZ implementation and water quality.

Monitoring Water Temperatures for Steelhead in Relation to Forest Management Practices - FRASER BASIN COUNCIL SOCIETY

Funding Year: 2018

Project Objective: To monitor water temperatures in portions of the Thompson watershed where steelhead spawn and rear to help identify areas of groundwater influence and compare and contrast different disturbance types, including high and low intensity fires and forest management interventions around small, upper elevation streams.

Project Description: In order to build understanding of the relationship between steelhead and forest management practices, the project monitored water temperature in portions of the Thompson watershed, where steelhead spawn and rear. Findings will complement work underway in the Deadman and Nicola watershed. Outcomes will help forest managers adjust activities in locations that may provide the greatest aid to steelhead habitat, and to manage temperatures for steelhead.

This work will also address climate change adaptation through the identification of habitat enhancement or restoration opportunities in small, lower-order, upper-elevation streams, which could improve habitat for fish and other aquatic life experiencing changes to water temperatures. These ecosystems now receive less precipitation as snow and more as rain, increasing the need for sustained water flows during longer lasting summer droughts.

Why It Matters: Steelhead are an endangered species in many parts of North America and they are at risk of becoming endangered in the Fraser Basin in British Columbia. Steelhead trout (aka steelhead salmon) are an iconic symbol of the Thompson River and region in British Columbia. Having long sustained Indigenous people, steelhead are also central to the region's world-class recreational fishery. Unfortunately, this species is in decline, and today Thompson steelhead are classified a species of extreme conservation concern by the provincial government.

How The Project Helps Forest Managers: The project quantifies the impact of SFI Certified Organization activities relative to improving stream habitat and water quality by comparing water temperatures between areas of variable forest disturbance, and between areas with and without underground flows. Because steelhead are an indicator of the biodiversity values within a watershed, analysis of these metrics will help build understanding regarding the contribution of sustainable forest management to conserving species at risk.

Partners:
Project lead: Fraser Basin Council Society
West Fraser (SFI Certified Organization)
British Columbia Timber Sales (SFI Certified Organization)
Secwepemc Fisheries Commission
Simon Fraser University
BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Outcomes To Date: The project was completed in February 2021. Forest management in the Bonaparte river watershed showed no differences to stream temperature in fire-affected or unaffected areas. This work also helped identify and protect cold-water sources that are needed to mitigate potentially lethal temperatures (approaching 25 C) that can occur in late summer that may be lethal to fish populations.

The Active River Area - NATURE CONSERVANCY CANADA

Funding Year: 2018

Project Objective: To create a geomatic tool to map riparian zones in Maritime Provinces to aid in prioritization of watershed conservation and restoration.

Project Description: The Active River Area framework is a tool to measure the contribution of forests to freshwater ecosystem function and health. The first of its kind in Atlantic Canada, the framework classifies all riparian areas associated with freshwater ecosystems while recognizing the range of hydrological conditions typical of natural aquatic systems. Completed for New Brunswick, Nova Scotia and Prince Edward Island, it will bring an integrated hydrogeological-ecological approach to freshwater modelling, management, and climate change mitigation.

Why It Matters: Well-managed forests conserve sources of clean water. Over half the drinking water in the U.S. and nearly two-thirds in Canada comes from forests. In addition, intact watersheds support habitat and ecosystems. This tool helps to guide freshwater conservation and management at multiple scales and ensure protection of watersheds important to biodiversity and ecosystem services.

How The Project Helps Forest Managers: The Active River Area project provides a novel framework to measure the potential impacts that forestlands certified to SFI may have on water quality, climate change resilience and biodiversity. By delineating and mapping the various components of a complete freshwater ecosystem, forest harvesting plans can be assessed against their potential impact. The Active River Area framework can inform management plans by directing lower-impact harvesting toward areas within the Active River Area to minimize the ecological and hydrological impacts in sensitive areas. Floodplain mapping allow SFI Certified Organizations to demonstrate the contribution of managed forests to floodwater retention and control. The framework will inform where ecological restoration will improve floodplain connectivity to better mitigate the impacts of flooding on downstream communities, particularly in relation to climate change.

Partners:
Project lead: Nature Conservancy of Canada (Atlantic Region)
Maritime SFI Implementation Committee
New Brunswick Department of Energy and Resource Development
World Wildlife Fund Canada
Wildlife Conservation Society Canada
Dalhousie University
Nature New Brunswick
Government of Nova Scotia

Outcomes To Date: The project created the Active River Area ArcGIS toolkit and can be used as a decision support tool for riparian areas and freshwater conservation and restoration strategies and actions. NCC also provided the Freshwater Resilience to Climate Change analysis which identifies priority watersheds for conservation and restoration. This analysis assessed all rivers and streams in the study area for their functionally connected length, gradient and temperature diversity, intactness of the ARA, and watershed imperviousness. This will help resource managers identify those networks most highly resilient to current and future changes in climate.

Conservation / Restoration Prioritization Dashboard: https://ncc-gis.maps.arcgis.com/apps/webappviewer/index.html?id=5e5ad38102304f70bfa761215c6941cc

Climate Change Resilience Databasin Page:
https://2c1forest.databasin.org/datasets/c3b6f4176558444a85f0218b4487749c

Quantifying Impacts of SFI's Fiber Sourcing Standards in Georgia - UNIVERSITY OF GEORGIA

Funding Year: 2015

Project Objective: To quantify impacts of SFI's Fiber Sourcing Standards on Georgia' s Best Management Practices (BMP's) compliance rate and hence, on the overall sustainability of forest resources on industrial and non-industrial private forestlands located in Georgia**.**

Project Description: Over the last 20 years, SFI's Fiber Sourcing Standard has been exerting a positive influence across millions of acres of non-certified forest land. To increase understanding of these beneficial impacts, University of Georgia Research Foundation (UGA) investigated Georgia's Best Management Practices (BMP) compliance rates as they relate to implementation of the SFI Fiber Sourcing Standard. Specifically, UGA researched the Georgia Forestry Commission's Silvicultural BMPs Implementation and Compliance database to determine BMP trends at the landscape scale over time. UGA also investigated utilization of Georgia's Master Timber Harvester Program, a requirement under SFI's Fiber Sourcing Standard. This research included determining timber volume and area harvested by loggers who have completed the program, as well as investigating loggers' perceptions regarding BMP policies.

Why It Matters: The role of forestry BMPs is to ensure protection of water quality on forest management lands. However, only 18% of forestland in Georgia is under formal forest management certification. The majority of sourced wood comes from family forest landowners where certification may be unattainable due to cost. SFI's fiber sourcing standard requires that wood consuming mills must include an obligation to follow forestry BMP's in their procurement agreements, serving to drive BMP compliance on harvested uncertified forestlands, and particularly family ownerships.

How The Project Helps Forest Managers: The project illustrates the water-quality related sustainability of forest management practices on industrial and non-industrial private forest lands in Georgia. The methods developed for this study are applicable to measuring the environmental benefits associated with application of the SFI Fiber Sourcing Standard in other states. The project supports SFI objectives to protect water resources through the utilization of Best Management Practices and promotion of logger training programs.

Partners:
University of Georgia Research Foundation
Georgia SFI Implementation Committee
Southeastern Wood Producers Association

Outcomes To Date: As a first outcome, this project analyzed the role of SFI's Fiber Sourcing Standard in influencing the implementation rate of forestry best management practices within the wood baskets of mills certified to the standard. Results suggest that the implementation rates are on average higher on those harvested sites which were located within the wood baskets of mills certified to the fiber sourcing standard at 95% confidence level, as compared to those harvested sites located outside the wood baskets of mills certified to the Fiber Sourcing Standard. Please refer to Dwivedi et al. (2018 - Forest Policy and Economics) for more details.

The second outcome involved analyzing the percentage of total wood harvested by mills certified to SFI's Fiber Sourcing Standard in Georgia. Initial results suggest that 72% of the total wood harvested in Georgia is consumed by mills certified to the Fiber Sourcing Standard. Results also indicated that about 90% of total wood supply from 79 Georgia loggers who responded to the survey goes to mills certified to Fiber Sourcing Standard.

As a third outcome, this project analyzed the perceptions of stakeholder groups about forestry best management practices in Georgia, finding that agency and landowners share very similar perceptions about forestry best management practices, with a principal focus on education and training needs. Though the perception of loggers differed somewhat, overall stakeholder groups perceived forestry best management practices positively in relation to ensuring sustainability of forestry resources in Georgia. For more details, please refer to Chantal et al. (2018 - Journal of Environmental Management).

COMMUNICATIONS:

Completed Projects

Addressing Brand Owner Sustainability Goals Through the Responsible Sourcing of Forest Products - GREENBLUE INSTITUTE

Funding Year: 2017

Project Objective: To educate brand owners with the message that buying products derived from responsibly managed forests can have extraordinary environmental benefits, like enhancing biodiversity, creating clean air and water, supporting renewable resources, and reducing impacts of climate change.

Project Description: GreenBlue, with support from its project partner, Sappi North America, designed and executed a communications campaign to educate brands about the benefits of responsible forest management and how these benefits support their sustainability goals. The campaign was delivered through four webinars: 1) Responsible forest management in the U.S. and Canada, 2) The role of forest certification, 3) Supporting family woodland owners, and 4) Clean water, climate change and biodiversity.

Why It Matters: There is an incredible opportunity to educate the North American marketplace about responsible forest management and how it serves to meet business' sustainability goals. Today, there is a gross commonly held misunderstanding that not using forest products equates to saving trees. The harm in the "save trees" message is one of unintended consequences. Devaluing the use of forest products means that forest owners and managers may be forced to choose more economically viable options. If managing and replanting trees is not a viable economic choice – the potential alternative is to sell that land for urban or agricultural development – not coincidentally, the two most common causes of deforestation.

How The Project Helps Forest Managers: Brand owners can use these materials to develop their internal stakeholder messaging as well as consumer outreach, to develop better understanding of the values built into sustainable packaging and other forest products. Resources are all available on individual web pages for each module, accessible through the campaign's main webpage:

http://greenblue.org/work/forests/.

Partners:
SAPPI North America (SFI Certified Organization)

Outcomes to Date: GreenBlue completed the delivery of four webinars of a marketplace education campaign in 2018, including the live webinars and dedicated webpages with supporting materials. The webinars were recorded and made available online through a dedicated webpage, complimented by a slide deck, downloadable infographics, web-based informational primers, and printed brochures. Brand owners can use these materials to develop their internal stakeholder messaging as well as consumer outreach, to develop better understanding of the values built into sustainable packaging and other forest products. Resources are all available on individual web pages for each module, accessible through the campaign's main webpage: http://greenblue.org/work/forests/.

GreenBlue has created a Responsible Forestry Education Resource that is valuable to any stakeholder seeking to learn more now and in the future by equipping them with a high-level, yet comprehensive view included in each module. This resource makes it much easier for users to communicate to stakeholders about the benefits of using forest products.

GreenBlue provided a communications report to SFI on audience reached and continues to market the campaign webpage. In total, the campaign reached 49 organizations directly through live webinars. Brands represented the largest stakeholder group reached by the campaign, including 28 companies. Each attendee was also sent a copy of the recording and directed to learn more on the dedicated webpage for this campaign. Many of those who registered but could not attend the webinar in person were able to catch up on what they missed through the email follow up. As of December 7, 2018 the website had 608 pageviews and continues to get additional traffic as GreenBlue and SFI market the campaign.