

Value Report

2012-2013

Prepared for
Achievements Supporting Government



This value report is a collection of accomplishments of Foothills
Research Institute (fRI) Programs and Associations

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Research Growing Into Practice



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Alberta Environment and Sustainable Resource Development, Alberta Tourism, Parks and Recreation, and Parks Canada all benefit from the activities of fRI's programs and associations. fRI brings value to government in numerous ways, providing knowledge and tools that assist in managing public lands, forests, fish, and wildlife; protecting our resources; ensuring economic and biodiversity benefits; enhancing the experience of park visitors; and enriching quality of life. This report showcases the achievements made from April 2012 to March 2013.





Alberta Forest Growth Organization

The Alberta Forest Growth Organization (AFGO) is expediting and coordinating the development of a recognized, secure, well-funded forest growth and yield sector in Alberta. The goal is to be able to effectively and efficiently address emerging issues in all of the province's natural resource management sectors that require growth and yield knowledge and expertise.

A partnership between forest management companies, AFGO is member-driven, addressing the challenges its forestry partners face as they practise sustainable land management under provincial guidelines. At the same time, it brings significant value to the Government of Alberta by providing a venue for government and industry collaboration on technical questions and facilitating cooperative data collection for growth model development.

Achievements

- Re-established priorities and set direction with a continued focus on higher-level strategic forest management questions that other organizations may not be asking
- Identified two initiatives to focus on
 - The first is a provincial growth and yield initiative that cooperatively collects data that is used for developing growth models and yield cycles. Government will have additional data for developing the growth and yield model GYPY.
 - The second initiative is a strata subcommittee that provides recommendations for how to use data collected through the Reforestation Standards of Alberta in the forest management planning process. This initiative facilitates development of forest management plans by developing procedures and making recommendations to government that might influence policy.
- Began discussions with Alberta's three other growth and yield associations to explore how all the associations might be restructured to allow for a more coordinated and effective approach to managing growth and yield research





Alberta Land-use Knowledge Network

Launched in 2011, the Alberta Land-use Knowledge Network is an online resource that contributes to effective land-use planning, analysis, and decision making across the province. It provides access to high-quality, relevant, trusted information and resources and sparks conversations about land-use challenges and issues. It also supports the many networks, organizations, and individuals involved in land-use issues and provides them with technologies, resources, and information management.

The Land-use Knowledge Network provides information on a broad range of topics of interest to government, such as integrated land management, species at risk, urban agriculture, and regional planning. By attending conferences and recording presentations that are then posted in video format, arranging events, and sourcing information from the

Internet, it delivers insight and emerging ideas about today's challenges.

"We try to cover topics of interest to our stakeholders, such as air-quality monitoring for oil and gas companies and urban agriculture for government. By gathering the information, we provide a source of high-quality knowledge that people can use as a reference when making decisions."

—Terri McHugh, program lead

Achievements

- Developed and launched a Flipboard magazine to give land-use managers an easy way to find online resources
- Information is pulled from thousands of sites and delivered to users in a way that allows them to scan and review important recent news and insights in as little as 10 minutes a day.



Caribou Program

Launched in January 2013, the Caribou Program undertakes research to generate solutions-oriented caribou-related research that can be used to recover this at-risk species. It will provide science-based knowledge to support policy for landscape management and caribou conservation, helping government improve the management of Alberta's public lands, forests, fish, and wildlife; maintain the social licence to operate; and ensure Alberta continues to benefit from economic development while demonstrating environmental stewardship.

The program will be using innovative technologies, such as LiDAR, to better understand the landscape from the caribou perspective. Government will be able to use the information in range planning while forestry and oil and gas can use it to inform science-based restoration of caribou habitats across their ranges and minimize disturbance to existing caribou habitat.

Achievements

- Interacted with individuals and groups currently researching caribou in Alberta, met with partners, and attended workshops, meetings, and conferences to determine partner needs, priorities, and questions
- Selected and secured funding for two projects to be done in collaboration with the Grizzly Bear Program to begin in May 2013
 - The first will assess the effect of forest regeneration of seismic lines on animal movements.
 - The second will assess the effect of forest regeneration of cutblocks on animal movements, and initiate non-invasive population monitoring of caribou herds using fecal collections.
- Hired Dr. Laura Finnegan, who has done leading-edge research on caribou and worked with academics, industry, and government, to lead the program



Foothills Growth and Yield Association

The Foothills Growth and Yield Association (FGYA) works to continually improve the assessment of the growth and yield of lodgepole pine in managed stands. Understanding growth and yield is critical for effective management and the long-term sustainability of forests. By helping to ensure that forests in the province and beyond are managed sustainably, the FGYA contributes to the creation of healthy ecosystems and the protection of our forest resources so they continue to provide economic, social, and recreational benefits to Albertans.

The FGYA's main project is the regenerated lodgepole pine trial, which began in 2000 and continues today. It tracks tree growth from harvest and provides the forestry industry with knowledge to help improve the management of Alberta's forests.

Achievements

- Released *Regenerated Lodgepole Pine Trial: 10-Year Crop Performance Report*, prepared by Dick Dempster, research and development associate, FGYA, to provide forestry companies and other interested parties with knowledge about trends in natural regeneration and the mortality of planted seedlings
- Did field work and analyzed data for the ongoing regenerated lodgepole pine trial
- Completed updates to the regenerated lodgepole pine model
- Held a field tour and invited all four of the province's growth and yield associations to talk about the results of the trial and how they can be applied to improve forest management
- Held a workshop with FGYA members that focused on specific questions related to the results of the trial and the implications for best practices in management
- Prepared a draft discussion paper describing suggestions for how the trial results can be applied to forest management
- With the Mountain Pine Beetle Ecology Program, completed a decision support tool to help forest managers make decisions about treating stands that have been attacked by the mountain pine beetle, and monitored 42 permanent sample plots attacked by the beetle



Foothills Landscape Management Forum

An association made up of forestry and oil and gas companies, the Foothills Landscape Management Forum (FLMF) is advancing integrated land management in the province. Through the FLMF, industry and government work together to collectively reduce the impact of resource extraction on values such as recreation, watersheds, woodland caribou, and grizzly bear in order to maintain social licence and access to resources.

For the Government of Alberta, the FLMF helps to ensure that resource revenues and royalties continue to benefit Albertans without negatively impacting other things that Albertans value.

“As a result of FLMF activities, we will continue to benefit economically knowing that development is done in a more sustainable manner and in ways that look after other values. Ultimately, integrated land management will contribute to maintaining Albertans’ high quality of life while improving how we manage the forest.”

—Wayne Thorp, managing director

Achievements

- Implemented integrated land management planning to reduce industrial footprint, “planning as you go,” and “one-off” approvals
- Completed phase one of the Berland Smoky Reclamation Plan, a landscape-level plan that outlines a process to manage access within caribou and grizzly bear ranges over time and space
- Developed a proposal for innovative management of issues (e.g., caribou, grizzly bear, anthropogenic footprint) for one million hectares in west-central Alberta—the Berland Smoky Regional Access Development Plan, which was submitted to Alberta Environment and Sustainable Resource Development in April 2013
- Provided an up-to-date dataset of lineal disturbances for the Berland Smoky region so that government and industry have factual information on which to base decisions and effectively manage cumulative effects
- Developed the methodology and collected a vegetation inventory for all historical lineal disturbances for the A La Peche and Little Smoky caribou range using LiDAR technology
 - This work will inform Government of Alberta caribou-range planning projects and help forest and wildlife managers determine the natural recovery rates of vegetation on lineal disturbances and the effect on animal behaviour.
 - It will also be used to determine what types of restoration activities should be carried out and where.
- Provided data management services to Alberta Environment and Sustainable Resource Development to report on “open route” densities for reporting on grizzly bear targets
- Continued to advance integrated land management in the province of Alberta

As of 2013, the FLMF has inventoried 45,799 roads in west-central Alberta, giving industry and government factual information for making decisions.



Foothills Stream Crossing Partnership

An independent, industry-driven program, the Foothills Stream Crossing Partnership (FSCP) focuses on improving the management of stream crossings to ensure fish passage. The FSCP provides government with technical expertise and works with government representatives to create watershed remediation plans based on the Province's priorities.

Through the tools and knowledge it provides, the FSCP helps ensure healthy ecosystems and fosters open land management as well as innovation. It helps protect our natural resources so that all Albertans can continue to derive economic, social, and recreational benefit from them.

Achievements

- Advised Alberta Environment and Sustainable Resource Development during the creation of its stream crossing inspection protocol
- Collaborated with government to create watershed remediation plans
- Expanded capacity by training a crew from Aseniwuche Winewak Environmental Services in inspection protocol so they can carry out crossing inspections for companies that are members in the Foothills Landscape Management Forum's Berland Smoky Regional Access Development Plan
- Completed 500 stream crossing inspections between January 2012 and July 2013
- Expanded the partnership's operational area into the Swan Hills region
- Completed a database for creating a tool to show the impact of crossing repair on watershed habitat and risks to fish over time



Forest History Program

Guided by the idea that we can shape our future by learning from our past, the Forest History Program examines landscapes and people's relationship with them from before scientific management began to the present. It has produced four books and a series of reports about the history of forest management in west-central Alberta. The latest is the *TransCanada Ecotours® Northern Rockies Highway Guide*, a well-illustrated driving guide to the landscapes, geology, ecology, culture, people, and history of the Northern Rockies region of Alberta.

The work of the Forest History Program provides park managers and others in tourism with tools and information for enhancing the visitor experience and public appreciation. Most recently, the Northern Rockies ecotour raises public awareness of ecological issues and how some of these are being addressed by land managers in the Northern Rockies region.

"Our program provides information for policy makers, practitioners, and the general public on historical use and the evolution of adaptive management on the landscape."

—Bob Udell, program lead

Achievements

- Published the *TransCanada Ecotours® Northern Rockies Highway Guide*, which enhances the visitor experience as well as public appreciation and understanding of land management issues and successes
- Supported the work of Dr. Peter Murphy, who is uncovering historical information about logging up the Whirlpool River
- Produced *A 50-Year History of Silviculture on the Hinton Forest 1955–2005: Adaptive Management in Practice* to provide practitioners and decision makers with historical information about the area
- Supported the work of Dr. Peter Murphy, Tom Peterson, and other volunteers who are relocating and mapping the original route of the Columbia Trail used by Express brigades in the 19th century
 - The Columbia Express was recently declared a National Historic Event, so it is important to pin down exactly where it went through Jasper National Park.
 - This work is also supported by fRI's Geographic Information Systems Program.



Geographic Information Systems Program

The Geographic Information Systems Program (GISP) works with fRI researchers and partners, applying innovative technologies to store, manipulate, analyze, and communicate data collected by projects. As the spatial scope of some projects now extends beyond the initial land base, the GISP manages ever-larger spatial datasets, including imagery as well as GPS data and general data management. Its work includes data management, spatial analysis, maintaining fRI tools and applications, relational database management, programming, and obtaining datasets for programs and partners.

“We turn data into information that can be used to make better decisions. Having this capability in-house allows us to develop an in-depth understanding of fRI programs and partners, which is very valuable to ensuring knowledge is transferred so it can be used effectively.”

—Deb Mucha, program lead

The GISP supports fRI’s researchers and partners and does not typically do its own project. This year, however, the team completed *Acquiring an Improved Understanding of Willmore Wilderness Park Visitors*, a three-year project sponsored by Alberta Tourism, Parks and Recreation.

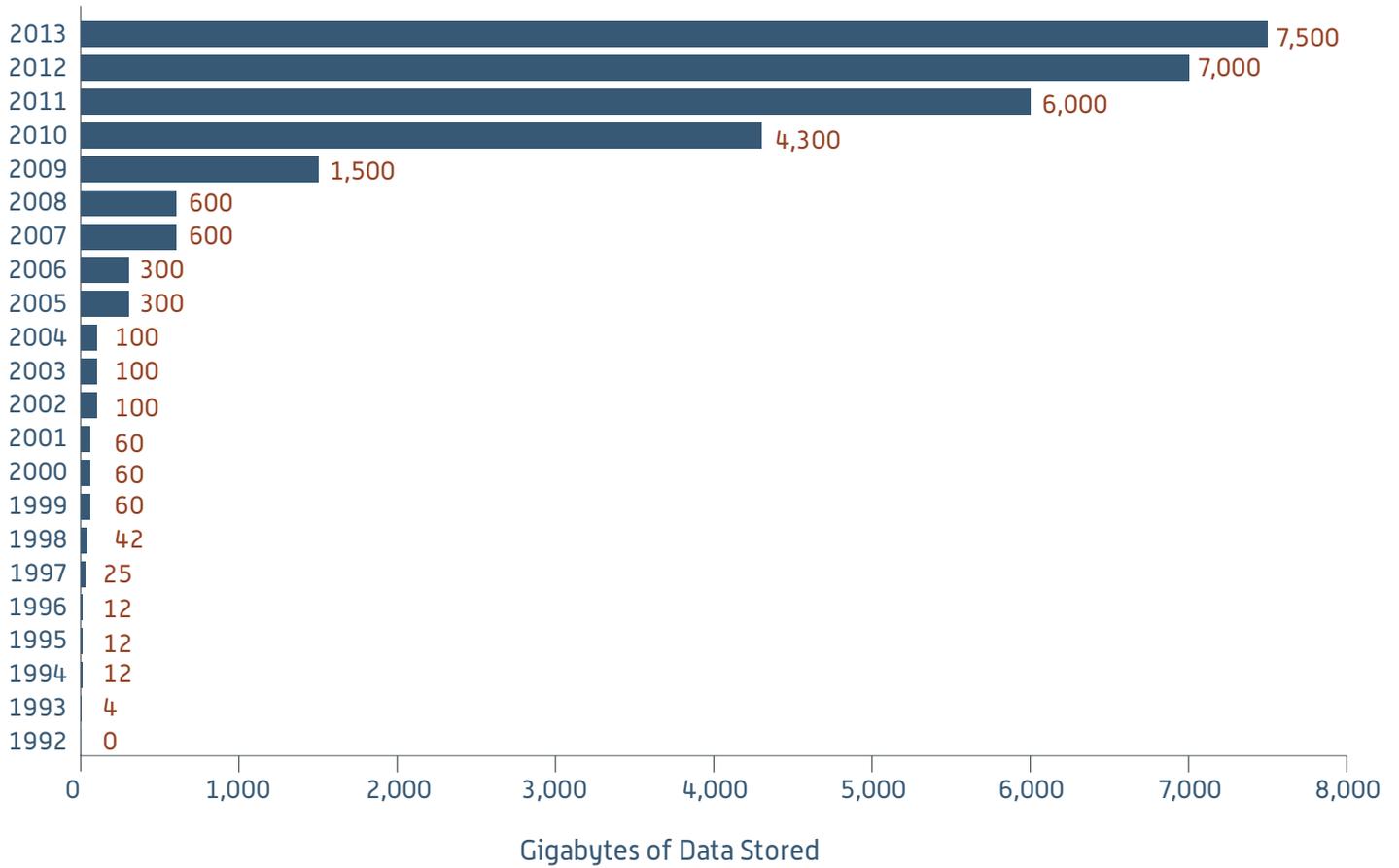
The project gives the government a better understanding of Willmore Wilderness Park visitors and of innovative, emerging technologies that can be used in outdoor recreation areas across Alberta and around the world. It provides park managers and staff with a tool for making stronger park management decisions and may inform policy.

Achievements

- Completed the Grizzly Bear Research Database and worked on the Grizzly Bear Program’s pipeline project using LiDAR technology to support the recovery of grizzly bears in the province with science-based data
- Maintained and updated grizzly bear tools in Python
- Worked closely with the Communications and Extension Program on the Forest History Program’s *TransCanada Ecotours® Northern Rockies Highway Guide* app to support the enhancement of visitor experience and public appreciation and understanding
- Updated fRImap data layers and metadata
- Assisted the Water Program with the Oldman watershed cumulative environmental assessment to help ensure healthy ecosystems and protect resources
- Provided data management and reporting to the Foothills Landscape Management Forum to improve the management of Alberta’s public lands
- Provided day-to-day GIS and data management support for fRI staff and researchers



fRI Data Holdings through Time





Grizzly Bear Program

The research conducted by the Grizzly Bear Program and the data generated by the many projects within this program will guide and impact grizzly bear recovery efforts in Alberta. The research team is working on three primary projects that will provide science-based tools, models, and knowledge that can be used by those in land management and policy creation to help recover grizzly bear populations to a sustainable level and minimize the impacts of human activities on this provincially threatened species.

The Grizzly Bear Program brings significant value to government by improving the management of Alberta's public lands, forests, and wildlife. Its work will help ensure that resource development is undertaken in a sustainable fashion to provide Alberta with economic benefits while protecting a species that is important to the province and the public.

Achievements

- Completed the first year of a three-year project titled "Research to Support Recovery and Long-Term Conservation of Grizzly Bears in Alberta"
 - Results will allow resource managers to understand the capacity of the current landscape to support grizzly bear populations so science-based recovery targets can be set while recognizing the social components of setting these targets.
 - The project will also result in new tools to assess the reproductive performance of grizzly bear populations, enhance our understanding of the potential impact of long-term stress on reproduction, and lead to new knowledge and models to aid in linking changing landscapes to grizzly bear reproduction, stress, and demographics.
- Completed the first year of a two-year project titled "Research and Applied Tools to Enhance Forest Management Linkages to Grizzly Bear Conservation and Recovery in Alberta," which is exploring how bears use forest cutblock edges and retention patches
 - The results will help direct the design and planning of cutblocks and retention patches to enhance grizzly bear habitat and potentially reduce human-caused mortality for population recovery, and aid in forest management and planning in Alberta's grizzly bear range.
- Completed the first year of a project titled "Grizzly Bears and Pipelines: Response to Unique Linear Features," funded by the Alberta Upstream Petroleum Research Fund
 - Results will help the energy sector and resource managers understand and predict how grizzly bears may use and respond to pipeline rights-of-way.
 - Research findings will serve to inform those planning and building pipelines of possible mitigation strategies to minimize impacts on grizzly bears and their habitats.





Healthy Landscapes Program

The Healthy Landscapes Program (HLP) proposes that the ultimate high-water mark for ecosystem sustainability, health, and resilience is that provided by Mother Nature. The premise is that by aligning our collective cultural activities with those of Mother Nature, we are less likely to lose valuable ecosystem services, and more likely to maintain a sustainable flow of all values.

The concept is a game-changing natural resource management paradigm. It is a gathering mechanism for all land management activities, including forest management; energy sector management; and water, wetlands, and wildfire management. In the end, it offers a strategic and scientifically defensible baseline for everyone, which translates into a defensible biological foundation, social licence, access to markets, and the ability to meet biodiversity targets and the goals of Alberta's Land-use Framework.

Achievements

- Prepared the first draft of a comprehensive communications and education plan and the first draft of a natural pattern demonstration co-op proposal
 - This work paves the way for HLP activities designed to increase understanding of ecosystem-based management and demonstrate its effectiveness.
- Completed the first full field season for the Fire, Water, and Climate Project to understand historical disturbance dynamics in Alberta's foothills
 - The hypothesis is that the current forest is vastly different than at any time during its preindustrial state, largely due to fire-control impacts. If so, proactive policies might help mitigate the increasing risks of water quality, wildfire risk, or mountain pine beetle infestation.
- Published papers on subjects that give government a greater understanding of natural disturbance patterns, which is being used to inform policy related to issues such as integrated planning, cumulative effects, and ecosystem health
- Made NEPTUNE available to shareholders online, offering those involved in reclamation the opportunity to see how human disturbance activities compare to natural disturbances that took place in the past
 - NEPTUNE captures and compares disturbance patterns of any spatial input file at any scale with NRV for 10 key metrics.
- Began defining a closer relationship with Ecosystem Management Emulating Natural Disturbance (EMEND)

This innovative concept has thus far attracted 13 industry, government, and NGO partners across four provinces and territories.

"So-called *cumulative effects* are an artifact of our current management policy framework, in which natural resources are allocated to various stakeholders via various disconnected tenure policies. By artificially separating naturally linked ecosystem elements, such as timber, caribou habitat, and water, we created the responsibility to manage cumulative effects. The healthy landscapes approach suggests imposing natural pattern benchmarks as the ultimate measure of sustainability across all jurisdictions, and across all managers. Understanding and testing the veracity of natural patterns allows us to do that."

—Dr. David Andison, program lead



Mountain Pine Beetle Ecology Program

The Mountain Pine Beetle Ecology Program engages in research, knowledge transfer, and collaboration to better understand emerging aspects of the effects of mountain pine beetle infestations in the foothills and mountainous areas of the province. It supports the Government of Alberta's short- and long-term strategies to manage infestation and protect forest health for the benefit of all Albertans by providing science-based knowledge and tools, and by staying on top of the rapid developments in mountain pine beetle infestation to help government address emerging issues more quickly.

"As the beetle moves eastward through hybrid jack-lodgepole pine and, eventually, jack pine, it is increasingly important for resource managers and scientists to understand the population dynamics of the mountain pine beetle in these novel environments. That will assist in making effective management decisions to control further spread of beetle populations."

—Keith McClain, program lead

Achievements

- In consultation with activity team members, governments, research providers, and practitioners, identified four research themes and specific questions to answer under each theme, which will ensure that the program is providing highly relevant information to guide decision making and support policy development
- Completed a study at the University of Alberta describing how mountain pine beetle attack affects processes that reflect the tight coupling of vegetation and hydrologic dynamics, to assist government and industry in making decisions about resource allocation as damaged sites are rehabilitated
- Compared the environmental and biological processes that drive or influence mountain pine beetle population dynamics in B.C. and northern Alberta
- Held the 2012–13 Research–Practitioner Information Exchange Forum, giving practitioners and scientists an opportunity to discuss their respective questions and leading-edge research relative to the control and management of the mountain pine beetle



Tree Improvement Alberta

Tree Improvement Alberta (TIA) brings together the provincial government and forest companies involved in forest genetics and tree improvement to deliver the Tree Species Adaptation Risk Management Project funded by the Climate Change and Emissions Management (CCEMC) Corporation. TIA is determined to address climate change adaptation in Alberta's forest management policies and practical work on the ground to maintain healthy forests.

By doing so, the project will help ensure the sustainability of fish and wildlife, tourism and recreation, biodiversity, and water, and help ensure the long-term success of industries that rely on these values. It also brings government, private companies, and other stakeholders together to view climate change through the same lens, a success that the Province can build on when addressing climate change issues.

"There is tremendous value in achieving our long-term goals of sustaining fibre productivity, maintaining healthy forest ecosystems, and conserving species and populations that may be threatened by climate change."

—Daniel Chicoine, program lead

Achievements

- Consolidated regional field-test growth data into a provincial database and did preliminary data analyses from the perspective of climate change and climatic adaptation
 - Results will inform policy related to deployment of material for reclamation and reforestation, determine the appropriateness of current breeding regions, and inform government of the potential need for revised breeding-region boundaries.
- Developed a risk assessment template and applied it to evaluate the climate change risk exposure of 25 tree improvement programs; completed 23 of the 25 programs
- Identified and began developing four new provincial test sites for assessment of species survival, health, and growth in drier and colder environments than previously tested
- Through TIA, the CCEMC project hosted an annual workshop and a field tour, strengthening relationships with the University of Alberta, the Alberta Biodiversity Monitoring Institute, Alberta Innovates Bio Solutions, and the novaNAIT Boreal Research Institute to create awareness of the potential economic and environmental consequences of climate change
- Conserved genetic material of species that might be threatened by climate change
- Provided information to inform policy, allowing for consideration of assisted migration to speed up movement of genetic material into the north and to higher elevations



Water Program

The Water Program is improving the sustainable management of Alberta’s land, water, and resources. Through research, communication, and partnerships, it develops and delivers science-based tools and knowledge to help government ensure healthy ecosystems, better manage ecological issues of concern, protect our water resources, maintain social licence, and meet its commitments related to environmental sustainability.

“The value that the Water Program brings to our partners and to all Albertans is that we are providing the knowledge to improve management collectively on a watershed for all the watershed values Albertans enjoy. It doesn’t matter that everyone is working on a particular land base. By taking a cumulative effects approach, we can address management challenges.”

—Dr. Axel Anderson, program lead

Achievements

- Gained the implementation of a watershed assessment procedure the Government of Alberta is using to better understand cumulative impacts in specific watersheds
- Developed base data for the headwaters of the Oldman watershed to test the usefulness of the NetMap tool for watershed assessments
- Completed analysis and produced a paper on changes to water flow in the Eastern Slopes as a result of climate change scenarios
- Led a special session at the 2013 Joint Scientific Congress: Bridging Environmental Science, Policy and Resource Management in Saskatoon
- Held three workshops, including a riparian workshop to bring the riparian community together to share knowledge and best practices
- Worked closely with the Foothills Stream Crossing Partnership, University of Alberta, and Grande Prairie government to investigate the effect of culverts on fish communities
- Was part of an academic team that wrote a successful Alberta Innovates proposal that will bring together researchers from Ontario, the U.K., and Alberta to investigate the costs/benefits of forestry on a comprehensive range of watershed values in the Eastern Slopes

