MEETING THE CHALLENGE

new questions? new initiatives.

foothills RESEARCH INSTITUTE
research growing into practice.

2010–2011 Annual Report

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President's Message

The foundation of our success lies in responding to our partners by developing new initiatives when the need arises. In 2010, FRI successfully met the challenge with four new initiatives that we believe will pay great dividends.

Alberta Land-use Knowledge Network – Our business is creating and transferring knowledge. We took advantage of an opportunity to expand our knowledge-transfer capacity by successfully bidding to host the new Alberta Land-use Knowledge Network, with major start-up funding from the Alberta Land-use Framework Secretariat. This gives FRI a tremendous expansion of our knowledge-transfer reach. I'm particularly excited by the opportunity to grow the Knowledge Network into a premier one-stop location for any subject related to land use in Alberta and beyond. Dr. Kirby Wright is leading this initiative.

Water Program – Partners asked for an increased focus on water quantity and quality research, expanded to at least an Alberta-wide scale. We responded by retooling the existing Fish and Watershed Program and naming Dr. Axel Anderson to lead the resulting new Water Program. Former Fish and Watershed Program lead Dr. Rich McCleary will work with Dr. Anderson on projects under the Water Program.

"When FRI partners are successful, FRI is successful."

Yellowhead Ecosystem Group – FRI has relationships with several external associations with mandates that closely align with our interests. The YEG is exploring ways for land and resource managers to work together on issues that cross jurisdictional boundaries, specifically between protected areas and broader landscapes. The initial focus is on access management in a large area straddling the eastern boundary of Jasper National Park and bordering protected areas and provincial lands.

Climate Project – FRI received funding from Alberta Innovates – Bio Solutions to support climate change research. We decided to focus on understanding the effects of climate change on environmental, social, and economic values important to our partners. The new project, titled "Impacts of climate and landscape change on forest resources," will investigate the effects of climate change on water supply, key grizzly bear foods, and mountain pine beetles. The Water, Grizzly Bear, and Mountain Pine Beetle Ecology Programs are collaborating on this project.

These examples illustrate our ability to grow and adapt to new challenges proposed by our partners. We connect the questions that our partners ask to our research and provide the information our partners need to achieve success.

FRI's accomplishments reflect the dedicated efforts of our partners, staff, researchers, and collaborators. On behalf of the board, I extend my heartfelt thanks to you all for another successful year.

Rick Bonar
President
Foothills Research Institute

General Manager's Message

At the end of each fiscal year we reflect on our past year's accomplishments and challenges as part of our process to ensure continued improvement.

Reviewing our successes and challenges has been even more important this year because our Board of Directors and staff began the process of developing our next business strategy for 2012–2017—a plan that will set the stage and provide a guide for the future success of the institute and our partners. As we begin this process, this year's annual report theme, "Meeting the Challenge," seems appropriate.

At FRI, we pride ourselves on working closely with and listening to our partners so that we can assist them in identifying research needs. Our goal is to ensure that we continue to deliver world-class, science-based solutions and tools that help our partners meet their specific challenges.

Moving forward, our organization is building new collaborative relationships with like-minded organizations provincially, nationally, and internationally. We continually review our research programs for relevance, increase collaborative efforts, and strive to bring the best science and the best products to our partners.

We recognize that many of the tools and solutions we provide are applicable provincially, nationally, and internationally. With this in mind, FRI is eliminating the notion that we operate regionally or within a specific boundary or geographic area. Instead, we are supporting our partners in their geographic areas of interest—once again meeting the challenge!

Tom Archibald
General Manager
Foothills Research Institute

NEW QUESTIONS? NEW INITIATIVES.

Every discovery raises compelling new questions for our partners. We respond with innovative programs designed to unearth solutions, generating knowledge, tools, and more questions that will take us even further.

Water Program

Delivering science-based, practical cumulative effects management strategies and tools

Across the province, people are concerned about the potential cumulative impact of recreation, forestry, oil and gas development, and other land uses on water values in natural areas.

"Almost four years of working closely with Watershed Planning and Advisory Councils (WPACs) has shown me how important these landscapes are for water values. The public and stakeholders want to know that the benefits they release from Alberta's natural resources do not inadvertently impact water," says Axel Anderson, program lead of the new Water Program.

The goal of the Water Program is to provide practical applied research that will enable stakeholders to improve management of the land and resources to ensure that water values are sustained.

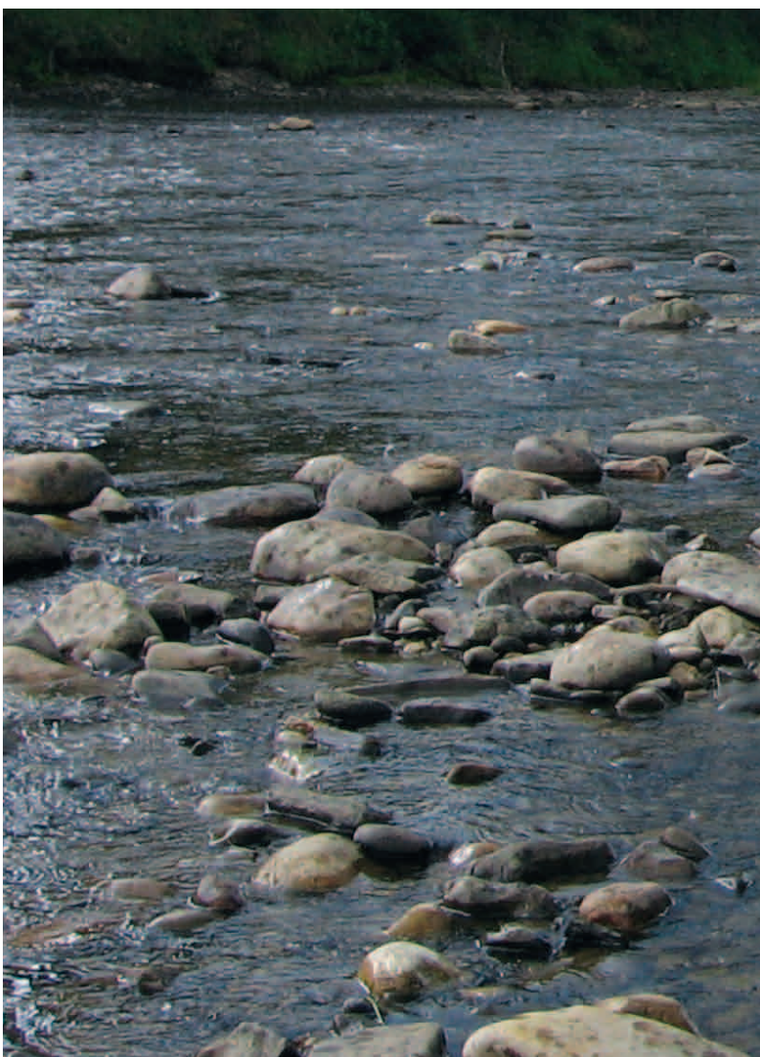
Many agencies have spent much effort and money on research and projects designed to understand the potential impacts of disturbance on water values and how best to balance the management. "Many parts of the cumulative effects puzzle are already there. All I am proposing to do is pick up all the pieces, fill in the gaps, and provide a coordinated approach to guide current efforts," Anderson explains.

The Water Program is not proposing to set thresholds that may limit development or disturbance. Instead, it will partner with WPACs to identify values and use the cumulative effects management concepts to identify potential hazards to these values. Finally, it will make recommendations on how to direct efforts to mitigate risks to values.

The program will take a two-tiered approach, with the science community, industrial sectors, and other stakeholders working on research projects designed to address the needs of individual sectors. This knowledge will be used to assess conditions and pressures on a watershed. Most importantly, it provides integrated science that can be used to make recommendations on the implementation of projects that should have the best chance of improving the condition or preventing the condition from deteriorating.

"Not only is this program unique, it has the potential to be really powerful because it is based on regionally specific watershed-process knowledge and breaks a larger problem into manageable components. Conceptually this could be called the "bottom-up" approach to cumulative effects management," says Anderson.

FRI's Fish and Watershed Program is in the process of becoming a project under the Water Program. Dr. Richard McCleary, former program lead, and Anderson will work closely to develop a plan to ensure the knowledge and tools developed in the Fish and Watershed Program are used and expanded in scope.



Partner Perspective

Mark Schoenberger

Planning Forester, Hinton Wood Products, a division of West Fraser Mills Ltd.

The forest environment is very complex, and we can't expect to know everything. FRI's research improves our knowledge of the forest and the impacts of the work that we do, and helps us to better manage into the future.

From my perspective as a forester, the Water Program is a response to industrial needs; we need roads to get to our resources, and those roads sometimes have to cross watercourses. Understanding how hydrology works, and perhaps using information to devise better ways of planning for and building roads to improve, or at least limit the impact that we have on the water resource, is important. On a personal level, I want to make sure that we're doing a good job with our water resource, and the key to knowing whether we're doing a good job is through information gathered through study and good science.

Hinton Wood Products has supported the Fish and Watershed Program, which will become a project under the Water Program. One tool developed through the Fish and Watershed Program was a model to predict the probability of fish presence or absence. That, for me, has been very useful. When I'm planning on building roads or doing any stream-crossing work, I can refer to that model and outputs to determine what type of structure needs to go in and the sensitivities around protecting and maintaining fish habitat. I see that as a really big win.

The Water Program will be broader and will encompass most of Alberta. Water is such an essential part of our ecosystem and of life itself that we want to learn everything we can in order to do a better job of minimizing those key impacts.

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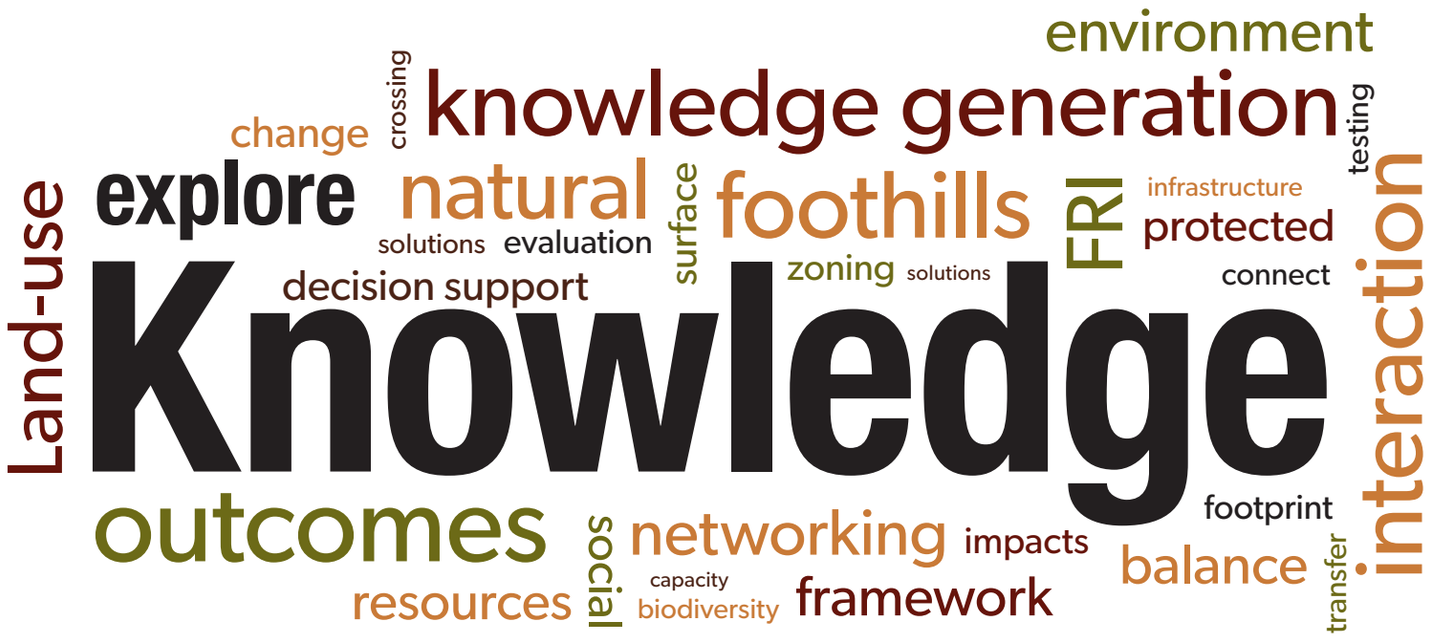
Alberta Land-use Knowledge Network

Moving knowledge into practice



The challenges the institute's partners face are not simple and require a high degree of collaboration and interaction in order for us to explore and find solutions. "The Land-use Framework calls for the establishment of a land-use information, monitoring, and knowledge system," says Dr. Rick Bonar, president of the Foothills Research Institute. The new Alberta Land-use Knowledge Network will start the conversation, supporting land-use planning and decision making by moving knowledge into practice.

Through the network, researchers, policy makers, practitioners, and organizations will share knowledge and connect with one another to work on solutions. It will be a source of leading-edge land-use information and best practices for issues that affect policy formation and decisions.

"The environmental, economic, and social dimensions of land-use issues are complex problems for which there is no perfect solution," says program lead Kirby Wright.

"We are and will continue to be grappling with an emerging, evolving knowledge base, and we're going to have to talk about the balance."

The network will have a strong virtual online presence that includes a library of information visitors can access and use, and it will also bring people together in workshops and other settings. "The most important parts of a network are the interactions, the opportunity to talk and share ideas, and ideally to work together to move forward," says Wright. In turn, this will generate new ideas, knowledge, and practices to land-use planning.

The Foothills Research Institute will manage and support the Alberta Land-use Knowledge Network, which is expected to launch in 2011 and will be available to all Albertans.

Yellowhead Ecosystem Group

Providing support for linking policy, planning, and implementation across jurisdictions

Caribou don't care about the lines on maps. Consequently, jurisdictions with the common goal of keeping caribou on the landscape realize that it is important to collaborate when developing caribou management strategies.

The Yellowhead Ecosystem Group (YEG) is an executive-mandated, locally implemented landscape partnership that works to identify opportunities for cross-jurisdictional bodies to meet common goals such as caribou management. Although the YEG has been in existence since the 1990s, it has now partnered with the Foothills Research Institute, which provides administrative and geographic information system support, as well as communications and extension support for research projects.

A strategic planning session in fall 2010 resulted in the identification of access management as a common issue for YEG members. Two projects designed to provide knowledge related to access management are now underway.

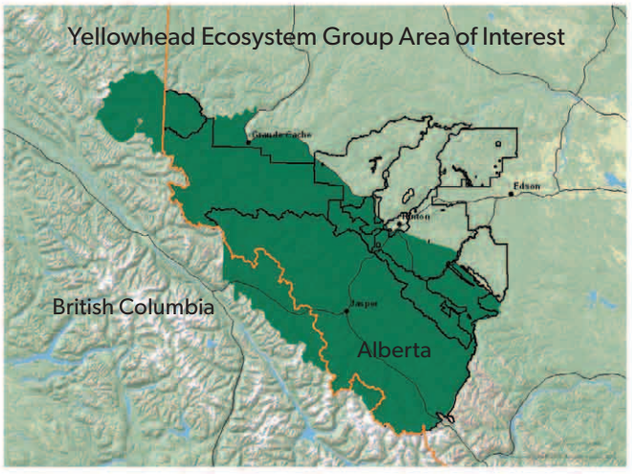
The Grizzly Bears and Park Users Project will look at the effects of humans on grizzly bear activity, movement, and behaviour in an area located at the interface between the foothills and eastern slopes of the Rocky Mountains in Alberta. The 10,000 km^2 area is centred on the Cheviot, Luscar, and Gregg River open-pit coal mines and the Hamlet of Cadomin (south of Hinton).

Information on both human use, gathered through field cameras, and bear activity will be merged so that we can understand how creating access for humans impacts the grizzly and what can be done to manage access in such a way that effects are mitigated.

A second project is a policy review and analysis of cross-jurisdictional issues that looks at the gaps in policies and determines what needs to be done to fill the gaps.

The institute also manages a mapping database for the YEG. "We identified the hotspots—areas of concern with respect to access—in each jurisdiction, and created the mapping database," explains Wayne Thorp, program lead. "Now, if one jurisdiction wants to build a road, it can see on the map if the road might impact a hotspot for another jurisdiction and put controls in place before the road is built, rather than after."

The database opens up communication between the jurisdictions, allowing for more effective collaboration when it comes to access management.



Partner Perspective

Steve Otway
Resource Conservation Manager
Jasper National Park

We're in an intensely used regional landscape that has the potential to be even more highly used by the blossoming oil and gas sector and by the forestry sector. There is a lot of disturbance on the landscape, whether "natural," through fire, or "anthropogenic," through people's commercial or recreational activities. This beautiful and valuable landscape requires a commensurate level of detailed thinking about research and management.

In a tangible sense, a lot of good work has been done in the Natural Disturbance and Grizzly Bear Programs that has produced data at a scale appropriate to the issues. Managing issues related to grizzly bear and natural disturbance is best achieved on a larger, multi-jurisdictional scale, and the Foothills Research Institute gives us that forum, as well as providing impartial, research-based advice.

The single biggest value of FRI is its ability to foster connections with other responsible land managers and people outside our national parks, allowing us to establish trust and working relationships and to solve issues together. Although it is formally a research forum, it's a chance for us to meet and to really understand each other's point of view.

We can't successfully manage landscape disturbances or species at risk in isolation, and that's why the Yellowhead Ecosystem Group is important. FRI will assist us in taking the YEG to a new level, providing us with a forum and a background of existing relationships, organizational structure, and database management that should allow the YEG to flourish.

Climate Project

Integrating research to understand the future

When Alberta Innovates – Bio Solutions agreed to provide funding for Foothills Research Institute, the board, made up of the institute's partners, issued a challenge: create a project that could integrate results for existing research initiatives. Future of Alberta's Forests: Impacts of Climate and Landscape Change on Forest Resources is a new initiative that will do just that.

"The overarching goal is to have a better understanding of potential future landscape conditions as it contributes to long-term management of forest and resources in Alberta," explains Joan Simonton, extension specialist.

A research team is focusing on future forest conditions using current and new data from three individual research programs: the newly created Water Program, the Grizzly Bear Program, and the Mountain Pine Beetle Ecology Program (MPBEP).

Dr. Nicolas Koop and his remote sensing team out of the University of British Columbia are mapping landscape disturbances, including fire patterns, climate variables, and harvesting conditions, to give insight on the changes, by type and location, occurring over the study area and to determine how forest resources are impacted by change.

The intent is for the water, plant phenology, and mountain pine beetle sub-projects to use a common data set of future forest conditions and climate scenarios. Each project will then integrate this new dataset with existing data that directly links to water impacts, plant phenology for grizzly bear habitat supply, and mountain pine beetle predictions.

"You're integrating between different research program areas. Now you're seeing the effects that mountain pine beetle has on grizzly bear or that grizzly bear has on water. You can start building up linkages, which has always been an ultimate goal of the institute," says Don Podlubny, program lead, MPBEP.

The MPBEP will look at the productivity of the mountain pine beetle in novel pine forests, predicting impacts in a warming climate. The Water Program will examine potential impacts of climate change and vegetation dynamics on monthly and annual water budgets, and the Grizzly Bear Program will explore what future temperature regimes and climate patterns might mean to bear foods on the landscape.

Partner Perspective

Keith McClain

Director, Science Policy and Strategy, Alberta Sustainable Resource Development

Alberta Sustainable Resource Development (SRD) supports the institute's programs because they provide science that informs our decisions and supports policy development. As public land managers, we strive to achieve sustainability through the decisions we make. These decisions are informed by science to ensure that we don't "wreck" the bio-system; instead, we ensure that the bio-system retains its resiliency and its ability to provide the values that the public has come to expect, for example, clean water, wildlife, fibre, and recreational opportunities. The science that the institute provides allows us to understand the natural processes and relationships that are fundamental to supporting good decisions. It is crucial that our decisions be defensible, and having sound science is paramount to being good stewards of the province's resources.

Integration is important scientifically. Individual research programs tend to be focused on the specific topic or issue, but as land managers, we have to take a broader view. It would be extremely helpful to see how various projects and the results that they produce interact with one another. With the new Climate Project, we're trying to bring approaches together so that we have a better and clearer understanding of how our ecosystems function now and how they will likely respond in the face of climate change.

"It is crucial that our decisions are defensible, and having sound science is paramount to being good stewards of the province's resources."

The importance of this cannot be overemphasized. This information is essential as we need to ensure the competitiveness of the forest industry in a new and changing climate. We want to know what species of trees will grow best in the future and what threats we will face from invasive species. Integrating the scientific outcomes of our research programs will provide extremely important information that will prepare forest resource managers to meet the challenges that lie ahead.

In an effort to look at the integration of knowledge, the Yellowhead Ecosystem Group was established to consider matters of policy from a policy perspective across multiple jurisdictions. We often develop management strategies for specific landscapes regardless of the impact that our strategy might have on the achievement of management objectives in neighbouring jurisdictions. An excellent example of this is that we share a concern for grizzly bears, but differing approaches might be adopted in an operational landscape in Jasper versus British Columbia. The Yellowhead Ecosystem Group provides an opportunity to view multi-jurisdictional policies and seek alignment to ensure that these policies are not mutually exclusive but support one another to achieve common goals for resource management.

To assist us in our collective effort in managing sustainably, the Foothills Research Institute has undertaken the task of delivering the Alberta Land-use Knowledge Network. This newly formed initiative is spearheaded by Dr. Kirby Wright, who is well grounded in knowledge management, dissemination, and technology transfer. Managing knowledge is essential to effectively fulfilling our role as resource managers. It will allow corporate knowledge and new science-based knowledge to be captured in a readily useable format and in a location that is easily accessed to support resource decision making. Such access and use will be unsurpassed.

In sum, Foothills Research Institute programs are essential in our effort to manage Alberta's natural resources. Resource management is complex and challenging. Science promotes our understanding and guides our decisions. Even if mistakes are made, we learn, we adapt, and we improve.

Partners

Partnership is the lifeblood of the Foothills Research Institute. Through our partners' contributions, our tools and knowledge are integrated into land and forest management policy, planning, and practice, hence the advancement of forest and land management in Alberta. The strength of our organization would not be what it is today without our partners' commitments, and we are honoured to have contributions of all shapes and sizes.

Sponsoring Partners

Alberta Sustainable Resource Development, ConocoPhillips Canada, Encana Corporation, Jasper National Park of Canada, Suncor Energy Inc., Talisman Energy Inc., and West Fraser Mills Ltd. are shareholders of the Foothills Research Institute.

West Fraser Mills Ltd.

Parks Canada Parcs Canada

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Management Partners

Management Partners provide financial and in-kind support to the Foothills Research Institute. They are also responsible for land, resource, or forest management, and are interested in using research institute knowledge and tools in their businesses.

Ainsworth Engineered Canada LP
Alberta Energy
Alberta Newsprint Company
Alberta Pacific Forest Industries Inc.
Alberta Tourism, Parks and Recreation
Banff National Park of Canada
Blue Ridge Lumber Inc., A division of West Fraser Mills Ltd.
BP Canada Energy Company
Canadian Natural Resources Limited
Canfor Corporation
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Devon Canada Corporation
Fisheries and Oceans Canada
Foothills Forest Products Inc.
Government of British Columbia
- Environment
- Forests, Lands and Natural Resource Operations

Government of Saskatchewan
- Environment

Grande Cache Coal Corporation
Husky Energy Inc.
Imperial Oil Limited
Manning Diversified Forest Products Ltd.
Millar Western Forest Products Ltd.
Nexen Inc.
Paramount Resources Ltd.
Shell Canada Limited
Sherritt International Corporation
- Coal Valley Resources Inc.

Slave Lake Pulp, A division of West Fraser Mills Ltd.
Spray Lake Sawmills
Sundance Forest Industries Ltd.
Sundre Forest Products, A division of West Fraser Mills Ltd.
Teck Coal Limited, Cardinal River Operations
Tolko Industries Ltd.
Tourmaline Oil Corp.
TransCanada Corporation
Waterton Lakes National Park of Canada
Weyerhaeuser Company

Program and Project Partners

Program and Project Partners provide financial and in-kind support to specific programs or projects. These organizations believe in and support Foothills Research Institute.

Alberta Aboriginal Relations
Alberta Conservation Association
Alberta Environment
Alberta Forest Extension Network (AFEX)
Alberta Forest Products Association
Alberta Infrastructure
Alberta Innovates – BioSolutions
Alberta Transportation
Apache Canada Ltd.
Aseniwuche Winewak Nation of Canada
Bandaloop Landscape-Ecosystem Services
British Columbia Institute of Technology
Burning Ecologic
Canadian Association of Petroleum Producers
Canadian Cooperative Wildlife Health Centre
Defenders of Wildlife
Dennis Quintilio and Associates
Earth Systems Institute
Environment Canada, Canadian Wildlife Service
Foothills Ojibway Society
Forest History Association of Alberta
Forest Resource Improvement Association of Alberta
FP Innovations – FERIC
Fred Pollett
GeoConnections – Government of Canada
Hinton Training Centre
Laval University
Mistik Management Ltd.
Mixed Wood Management Association
Moose Mountain Environmental Fund
National Sciences and Engineering Research Council of Canada (NSERC)
Natural Resources Canada, Canadian Forest Service
- Northern Forestry Centre
- Pacific Forestry Centre

Nature Conservancy Canada
Norwegian University of Life Sciences
novaNait Boreal Research Institute
Peregrine Helicopters
Peter J. Murphy Forest Consulting Ltd.
Petroleum Technology Alliance Canada – Environmental Research Advisory Council
Robert Stevenson
Scandinavian Brown Bear Project
Silvacom Consulting
Tay River Environmental Fund
TECO Natural Resource Group
The Forestry Corp
Tom Moore
Tom Peterson
Town of Hinton
Trout Unlimited Canada
University of Alberta
University of British Columbia
University of Calgary
University of New Brunswick
University of Saskatchewan
University of Victoria
University of Waterloo
Vanderwall Contractors (1971) Ltd.
Vilhemina Model Forest
West Athabasca Watershed Bioregional Society
Wildlife Genetics International
Wilfred Laurier University
Yellowhead to Yukon Conservation Initiative

Other Partners

The following associations, businesses, and communities support the vision and goals of the Foothills Research Institute.

Alberta Caribou Committee
Alberta Chamber of Resources
Alberta Forest Genetic Resources Council
Alberta Biodiversity Monitoring Institute
Alberta Stewardship Network
Arctos Ecological Consulting
Athabasca Watershed Council
AVID Canada
Canada Centre for Remote Sensing
Canadian Institute of Forestry
Canadian Model Forest Network
Canadian Wood Fibre Centre
Climate Change Central
College of Alberta Professional Foresters
College of Alberta Professional Forest Technologists
Conservation Biology Institute
Council of Forest Industries
Cows and Fish Program
Ember Research Services Ltd.
Encompass Strategic Resources Inc.
ENFORM
EoS Management and Research
Forest History Society, Durham, NC
Forest Products Association of Canada
FORREX
Golder Associates
Grande Alberta Economic Region
Grande Yellowhead Public School Division
Greenlink Forestry Inc.
Hinton Fish and Game Association
Hinton Historical Tracks and Trails Society
Inside Education
Integrated Ecological Research
International Model Forest Network
Jasper-Yellowhead Museum and Archives
KBM Forestry Consultants
Municipality of Jasper
NatureServe Canada
Ontario Ministry of Natural Resources
Palisades Education Stewardship Centre
Telemetry Solutions
University of Montana
West Central Caribou Landscape Planning Team
Wildlife Habitat Canada
Woodlands Operation Learning Foundation
World Wildlife Fund Canada

PROGRAM UPDATES

news from the institute

Foothills Stream Crossing Program

Sharing a successful solution

The Foothills Stream Crossing Program (FSCP) shares information about what's possible to help its partners keep water flowing.

Interpretive signage installed at a stream crossing over Hardisty Creek just south of Hinton tells industry, government, the public, and university students about geotextile-reinforced soil arches.

Sharing the information should speed up adoption of the technology. "This is the first crossing of that type in Alberta," says Ngaio Baril, project coordinator. "But there are more being constructed now, and that is due to the industry tours we've done to that site."

Geotextile-reinforced soil arches keep the integrity of the stream bottom intact. They have many benefits: they are less expensive to construct and require less long-term maintenance than culverts, and their open-bottom structure doesn't interfere with fish passage and sediment transport.

The signs describe the construction of an arch and tell the story of life in a creek so that visitors understand the importance of stream crossing technology.

An independent, industry-driven program focused on stream management, the FSCP is made up of nine resource-based companies, as well as government agencies that collaborate to set priorities and plan crossing repairs. The program aims to create gains in habitat quality, connectivity, and sediment reduction while ensuring industry meets its regulatory obligations.

"FSCP provides its members with the knowledge and planning tools required to make smart, landscape-scale mitigation decisions, so they can improve the greatest amount of fish habitat in an economically sound manner."

The FSCP inspects and remediates stream crossings. In 2010–2011, inspections and re-inspections were conducted in West Fraser's forest management area (FMA). "We did some 300 inspections in the Grande Cache area by working closely with the Foothills Landscape Management Forum. This work will continue this summer, both in the FMA and in the area covered by the forum," says program lead Jerry Bauer.

A number of remediation plans for several priority watersheds have been updated and submitted, and the FSCP's inadequate data management system is being upgraded so that data can be collected using a tablet in the field. How data is stored and how it will be made available to members is also being improved.

Natural Disturbance Program

Building tools to make management and planning easier

"The process of planning Natural Disturbance Program projects is very organic, beginning with a list of research, communication, and tool priorities from the partners, but staying consistent with our long-term plan."
– David Andison

The Natural Disturbance Program (ND Program) has been focusing on providing decision-support tools to managers and planners of all types, at all scales.

OnFire is an online searchable database of fire regime research in and near Alberta. Available in summer 2011, the database includes all available information on natural disturbances, including articles published in journals and an exhaustive list of unpublished work done by consultants.

A disturbance regime expert compiled the papers and entered brief summaries and information about how to access each paper. Some papers can be immediately downloaded, while others require author permission.

"Knowledge of historical disturbance regimes has become important for forest and park management and land-use planning. The current one-off literature review strategy is not particularly efficient. This tool will allow anyone to search and access, online, all available fire regime research in the province," says David Andison, program lead.

The online version of another ND Program decision-support tool is also almost ready to be launched. NEPTUNE creates virtual disturbance events from spatial input files, and then compares the patterns of those events to the natural range of variation from forest fire pattern data across western boreal Canada. This tool can be used for both operational and strategic planning, depending on the size and scope of the question, and on the input data.

NEPTUNE is run as a non-profit shareholder agreement and now includes seven partners across two provinces. The design and functionality of the model has been driven by partner needs over the last five years. The decision to move from the original desktop version to an online tool was made to increase access, avoid compatibility problems, and save costs.

The processes of working with partners to develop OnFire and NEPTUNE will be used as models for the next decision-support challenge. In collaboration with the University of British Columbia, the ND Program has invested significant resources in the past five years to study the dynamics and function of large woody debris in streams. As the research winds down, program researchers will be working with other FRI researchers to determine how to translate this ground-breaking research into decision-support tools.

In another project completed last year, a comprehensive literature and technical review gave the Government of Alberta background information on the historical and current disturbance patterns for the North Saskatchewan landscape. The project provided a scientific backdrop for land-use planning for this landscape.

Grizzly Bear Program

Looking from mountains to molecules

This year marked the 12th year of the Grizzly Bear Program, a large-scale multidisciplinary research effort. It also marked a significant step in the evolution of this program.

FRI completed a five-year project funded through a Natural Sciences and Engineering Research Council / Collaborative Research Development grant that focused on understanding the links between environmental conditions, grizzly bear health, and landscape change. Researchers developed new techniques and approaches to measure and quantify grizzly bear health and to delineate and quantify landscape change within grizzly bear range in Alberta. Mountain landscapes were part of this research, and at a molecular level, this work investigated new methods of monitoring chronic or long-term stress in the study animals. A series of research papers is now in progress.

"The scientific team has shown relationships between environment and health, stress and health, and stress and the environment. These findings will have far-reaching implications and applications for those interested in monitoring wildlife populations where anthropogenic landscape change is occurring," says program lead Gordon Stenhouse.

Research efforts in the Kakwa study area (between Grande Cache and Grande Prairie) are concluding for projects looking at grizzly bear response to mountain pine beetle and how environmental conditions relating to climatic factors influence grizzly bear denning behaviour and habitat selection in the non-denning period. Data collection continues in this study area—researchers are now trying to understand how oil and gas activity may influence grizzly bears that share the landscape.

International collaboration with the Scandinavian Brown Bear Project has continued, and two new scientific papers are now in review. This research examines differences in growth and cortisol levels between bears in Sweden and Alberta. In addition, work is ongoing to compare how forestry practices in these two countries may impact bear habitat use and selection.

G. Stenhouse and M. Sundins in Sweden, April 2010

Mountain Pine Beetle Ecology Program

Supporting decision making with knowledge and tools

This year, the Mountain Pine Beetle Ecology Program has been enhancing an innovative decision-support tool developed in 2009–2010 to meet its partner needs.

The tool is designed to help resource managers mitigate or manage various infestation scenarios and project outcomes. "We asked the forestry industry and government to provide input on the kind of information and capabilities they'd like to see added," says program lead Don Podlubny.

Data from two projects, one that looks at the effects of mountain pine beetle attack on hydrology and post-attack vegetation in lodgepole pine and one beginning this year that explores how long standing-dead-pine lasts in Alberta's various eco-sites, is being incorporated into the tool.

Data gathered from monitoring sample plots that have been infested are also used in the tool; more will be added in the coming year. "It's the extra information you need to build more realistic scenarios," says Podlubny.

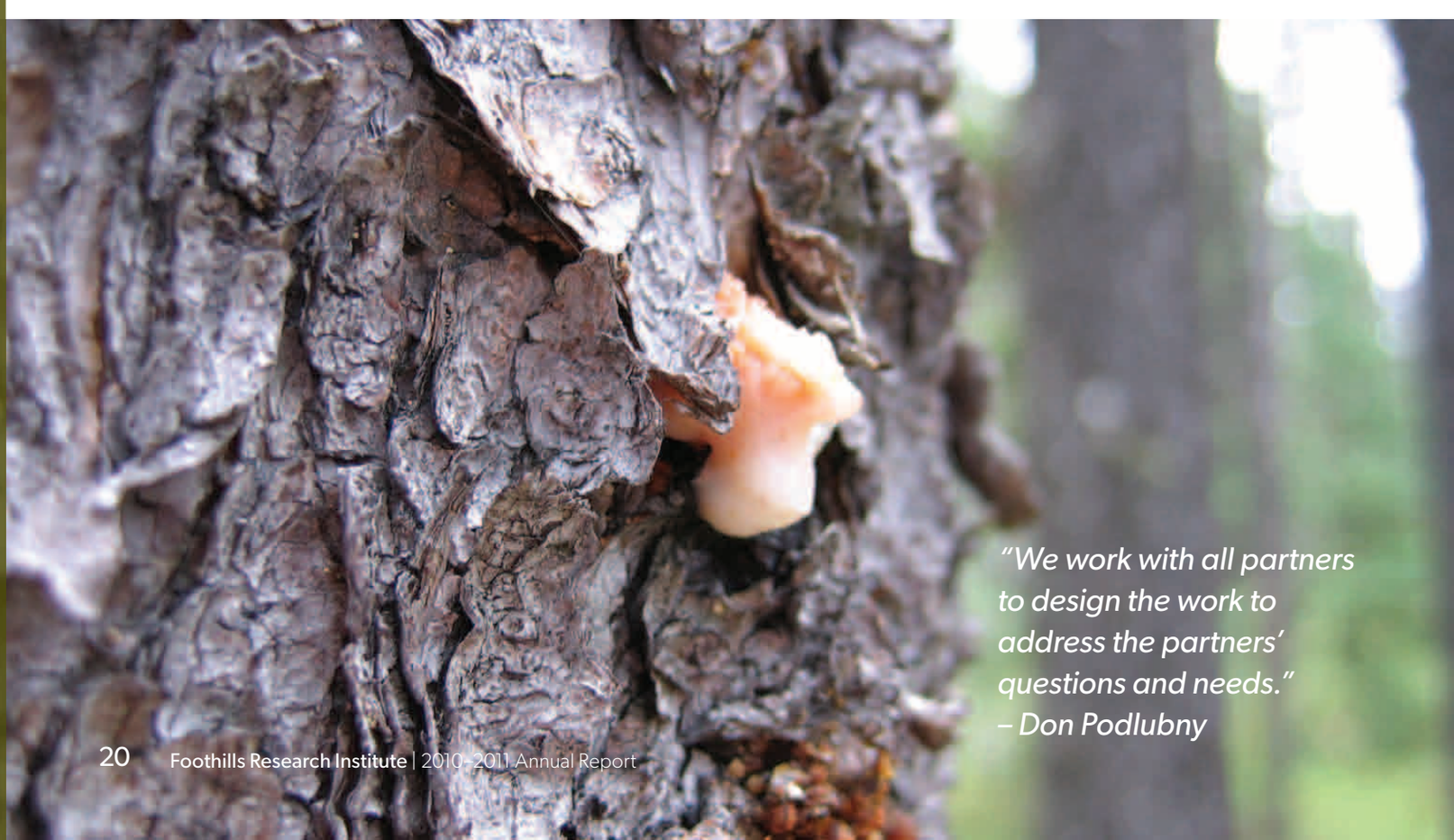
Partners will be able to use the tool to see, for example, what happens to vegetation on stands with varying degrees of infestation or what will happen to the groundwater over a period of time. It will also eventually be used to help resource managers prioritize stands for salvage.

Another project that began this past year looks at how the beetle is adapting to Alberta's climates in areas where there have been no previous infestations. Plots have been established and will continue to be monitored. The program also began exploring the effects of prescribed burn on the beetle last year and will continue to monitor sites.

A new project beginning in 2011 will compare the success of pine regeneration after prescribed burn and after mechanical treatment. The data will be used to build computer-modelling systems that can be used by resource managers to assess the best and most cost-effective treatment for pine stands.

The goal of all the projects is more effective management, and the program aims to give partners extra information for assessing what is happening with the mountain pine beetle and how it affects stands.

"All these projects are supported by industry and government, in some cases by funds and in all cases by interest and discussions and getting involved in how the projects are designed," says Podlubny.



"We work with all partners to design the work to address the partners' questions and needs."
– Don Podlubny

Foothills Landscape Management Forum

Pushing the envelope of integrated land management

For industry, landscape management that mitigates the effects of the human footprint and ensures sufficient habitat for wildlife is critical to maintaining the social licence to operate.

The Foothills Landscape Management Forum is helping to address that challenge with an innovative regional access development (RAD) plan that will hopefully set the stage for future projects designed to improve integrated land management.

The RAD plan, created jointly by industry and government, will help reduce the number of access roads constructed in the province, thereby reducing the impacts roads have on animals and vegetation, because it offers a way to coordinate access development. The hope is to reduce the amount of roads built by 30 to 35 percent.

"Unlike plans that have been done in the past, the RAD plan doesn't just define where main corridors are on a map," says forum director Wayne Thorp. "It sets out mitigation strategies, saying these are the effects of creating access and this is what we're going to do about them, collectively between industry and government."

The plan was completed during 2010–2011 and presented to the provincial government in summer 2011. If it is approved, the forum will begin acting on commitments embedded in the plan this year, including developing a restoration program and an online monitoring and reporting program, and undertaking the Foothills Land Stewardship Project (FLSP).

"There are four pieces to integrated land management that need to be managed simultaneously. Industry is responsible for managing the first two—the potential footprint and vegetation—while government is responsible for managing human use and wildlife population," says Thorp.

The FLSP will determine and describe how industry and government can work together. The goal is to provide a way for the Government of Alberta and industry to collaborate to apply innovative solutions for resolving issues, expedite the granting of access, and develop and advance integrated management of footprint mitigation and habitat condition.

For the 16 members of the forum, who come from the energy and forest sectors and include one Aboriginal community, the RAD plan and the future initiatives it spawns provide the opportunity to improve on integrated land management and to be part of the implementation of land management.

Foothills Growth and Yield Association

Ten years and still counting

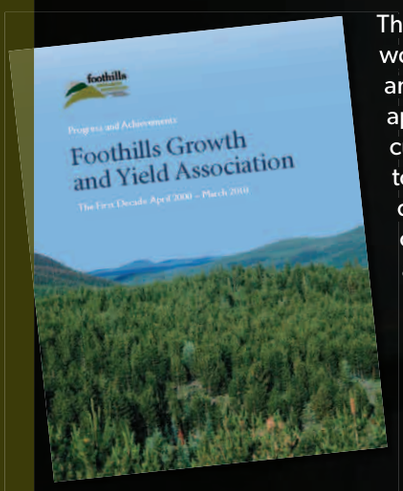
It's been 10 years since the Foothills Growth and Yield Association (FGYA) started working to expand understanding of how lodgepole pine grows in natural and regenerated stands, and to develop tools to support the application of that knowledge in forest management. Now the association is releasing a 10-year report summarizing what's been learned so far, and where the FGYA will focus its efforts.

"We've implemented a number of projects over the last 10 years, and some results are challenging traditional attitudes toward reforestation practices and growth and yield," says Bob Udell, operations director, FGYA.

The report provides an overview of the membership, mission, and role of the association; it highlights the knowledge gained over the last decade and the applications of that knowledge to management decision making; and it discusses new and ongoing research.

"If you accept that healthy and renewable forests underpin all the other resources and values inherent in the FRI program, then the work of the FGYA is critical," says Dr. Dick Dempster, research and development associate of the FGYA.

Dempster offers the example of climate change, which presents both positive and negative implications for forest regeneration. "We are seeing apparently conflicting increases in forest health problems and in forest productivity that are probably influenced by both climate change and forest management. The trick will be to make sure that the management influence ameliorates, rather than aggravates, the effects of climate change," says Dempster.



The FGYA is undertaking research and working closely with other researchers and operational foresters to develop approaches for identifying risks and how current practices and assumptions need to be adapted in response to climate change. Some key findings to date are outlined in the report, which is now available from the FRI.

One important FGYA project discussed in the report is an ongoing regenerated lodgepole pine trial that began in 2000. The project measures crop performance against the Alberta regeneration standards, and is the first such trial to do so in Alberta.

Each year, the association measures, monitors, and forecasts the development of lodgepole pine regenerated after harvesting, under different management regimes, on 408 field plots. The results are being used to enhance and expand a preliminary regeneration model the FGYA has developed.

The association continues to work with the Mountain Pine Beetle Ecology Program to monitor and predict the impacts of beetle attack on stand development and regeneration.

In 2011, at least one member company will undertake a pilot operational testing program of modifications to silvicultural practice, based on the association's regeneration research. It is hoped that this will give others a model to follow.

Communications and Extension Program

Harnessing the power of evolving technology

The Communications and Extensions Program is continuing to strengthen FRI's online capabilities in order to ensure that partners have access to the information generated by the institute's research.

The growth of the institute's online presence has been steady. Since the FRI website re-launched in September 2009, it has received nearly 20,000 unique visitors. The Communications and Extension Program (CEP) plans to engage this large community of interested stakeholders with new projects and initiatives.

The new IT system that incorporates cutting-edge technology developed in 2009 has resulted in a stable pipeline to data housed in Edmonton and the ability to provide partners with access to this data through a dedicated intranet. The system will be launched in stages with initial user accounts created in 2011–2012.

Next year's focus will be on finding ways to make information easily accessible for partners, particularly through the website, intranet, and its monthly electronic newsletter, which now reaches nearly 1500 users per month and can take credit for five percent of FRI's total website traffic. "We have some of the highest readership rates when compared to other organizations using a similar service. The results speak for themselves: we are providing engaging content to the larger FRI community and that content is consistently driving traffic back to our website."

Access to secure data isn't the only benefit of the new system. "Every year, there is a big push to complete your work plan at a particular time. Programs use different templates, and the plans are cumbersome to review," explains program lead Sean Kinney. "We've created a new process and in the coming year we'll be putting the work plans online so they can be continuously updated and partners can quickly see what's happening." A live view of the work being done will allow CEP to gather information quickly and report on research results sooner.

Faced with challenges of time and cost of developing new online tools and components, FRI and the Alberta Land-use Knowledge Network agreed to jointly redevelop web resources using an open-source content management system. An open-source system gives anyone access to tools created by developers—tools that can be quickly customized for specific needs. "Centralizing such administration will reduce overhead, save time, and provide easier access to knowledge transfer activities," says Kinney. Work is expected to begin in the fall of 2011 with the sites evolving over time.

Extension and outreach continues to play a critical role in transferring FRI research, knowledge, and tools to partners, practitioners, students, and teachers. In 2010–2011, CEP provided some key support to the Canadian Institute of Forestry Conference with online registration and field tours. We hosted 'outdoor classrooms' for Lakehead University forestry and NAIT bio-sciences students and Alberta teachers. They came to learn first-hand about forest ecology, the forest industry, and the complexities of sustainable forest management in Alberta. Information forums were held in Peace River, Edmonton, and Hinton to communicate research findings and demonstrate tools developed by the Wildfire Pattern Study and grizzly bear research in the Chinchaga area.

Geographic Information Systems Program

Filling the gaps with innovative tools

Partners and the public can now view spatial data pertaining to the Foothills Research Institute online with FRImap.

FRImap is a new open-source mapping portal that is the result of regional partnerships and collaboration between FRI, GeoConnections, Alberta Sustainable Resource Development, Jasper National Park of Canada, Hinton Wood Products (a division of West Fraser Mills Ltd.), and the Town of Hinton.

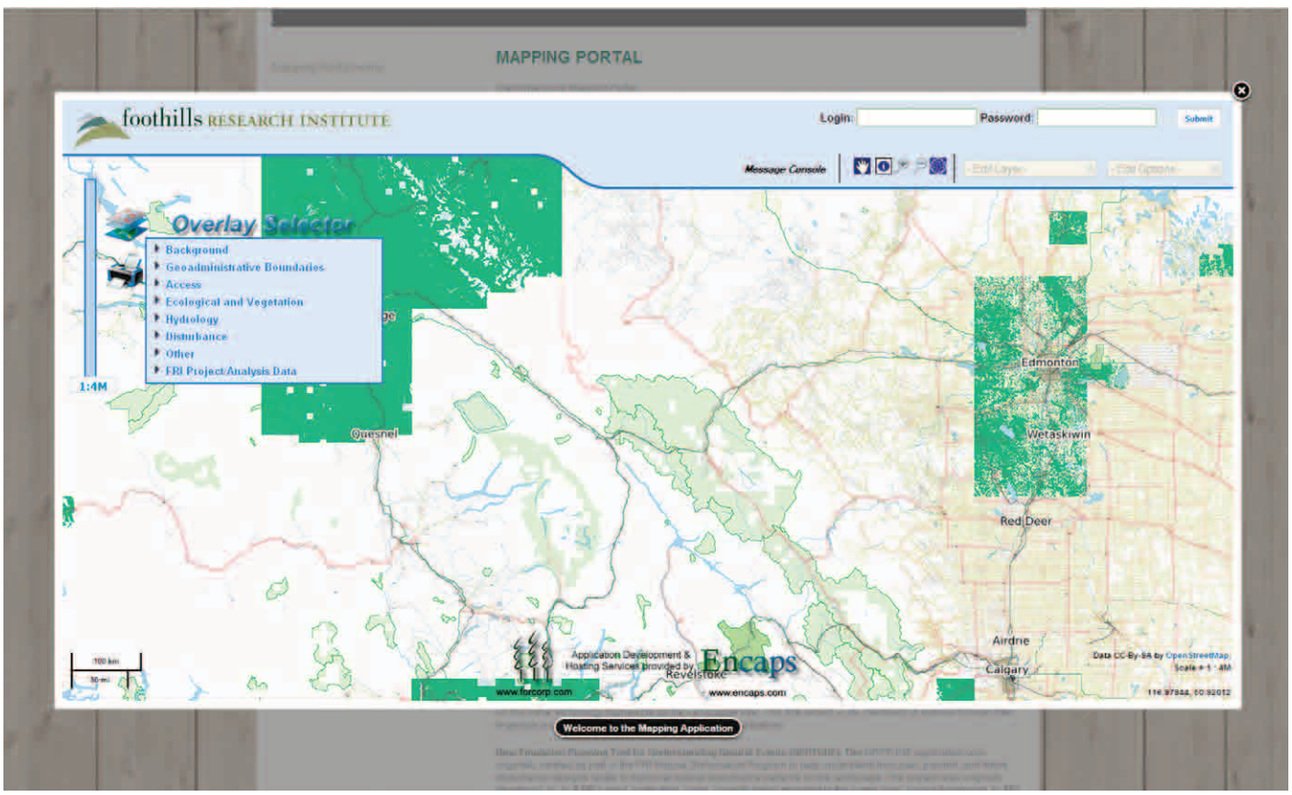
The idea for such a tool arose from a user needs assessment funded by GeoConnections in 2006. That assessment identified the need for improved sharing of information products between Foothills regional land partners and for a framework application for disseminating information. GeoConnections funded the creation of FRImap to fill those gaps.

Using FRImap, people can interactively view data over various background data layers such as open street map, relief, and a Landsat image. They can view geo-administrative boundaries, access, ecology, hydrology, disturbance, and FRI project and analysis data. User layers can be created and edited, and maps can be created as pdf documents. The FRImap also includes a density calculator function that can be used to do things like calculate a road density for an area of interest.

Due to data-sharing agreements, restrictions, and sensitivities, not all data is shared with everyone. Only partners can access all datasets, use the density calculator tool, and create and edit custom layers.

It took more than a year to develop the system in an open-source context. "Open source is a worldwide community where developers work on coding that is then freely available," explains Debra Mucha, program lead of the Geographic Information Systems Program. "We did not have to pay for the software, which was a more cost-effective way to get this done."

There are more than 50 layers of data in the FRImap. These will be kept up to date over time, and FRImap will grow as help files and videos are added.



Fish and Watershed Program

Putting accurate, comprehensive information in the hands of partners

When foresters, petroleum developers, and the Government of Alberta expressed the need for a comprehensive map of the provincial stream network, the Fish and Watershed Program got down to work.

S. Kinney, *2006*

The program wrapped up this year with program lead Richard McCleary's successful PhD dissertation. "FRI partners presented me with their dream stream layer," says McCleary. They wanted accurate maps showing the location of every watercourse, as well as the type, size, and fish-bearing status of the streams. My challenge was to see how far I could take this."

The first project involved identifying and mapping the threshold locations where streams became large enough to support fish. "This was the fun part," says McCleary. "Over a number of years, we used electrofishing to determine fish presence in small foothills streams. We literally had to fight our way up the streams, and many turned out to be too small to support fish."

Using the data, McCleary developed a model using geographic information systems (GIS) to predict which stream sections were large enough to support fish. The model was published in 2008 in the *Canadian Journal of Fisheries and Aquatic Sciences.*

Next, a technology called LiDAR was used to develop a model for predicting headwater channels and was proved to be 95 percent accurate over a small area. Recognizing the potential for products generated from LiDAR data to support watershed conservation in the province, partners invested in extrapolating it over a 10,000 km^2 area.

The project has generated interest beyond that of participating partners. McCleary reports that Dr. John Buffington, a research geomorphologist with the U.S. Forest Service who has contributed to native fish conservation and land-use planning teams, served as McCleary's external examiner during his dissertation defence. Buffington stated that "The models and findings presented in the dissertation have practical applications for landscape classification and development of land management plans." McCleary is pleased to have achieved that objective.

The Fish and Watershed Program will now be a project under the newly created Water Program.

Adaptive Forest Management – History Program

Learning from the past

After several years of hard work, two important written works are coming out of the Adaptive Forest Management – History Program this year, each capturing a unique part of Alberta's past.

Over the last year, *The Northern Rockies EcoTour*, a travellers' guide for the Northern Rockies tourist region, has been completed. The guide, which is scheduled to be published in the fall, highlights a number of programs and projects of the Foothills Research Institute along Highway 16 through Hinton and Valemount, along Highway 40 from the Cardinal Divide in the Wildhorse Wildland Park to Grande Cache and the Willmore Wilderness Park, and from Jasper to Lake Louise along the Icefields Parkway.

them. *The Northern Rockies EcoTour* includes 3 main travel corridors, 7 side trips, 21 maps, and more than 270 photos, and it covers 133 "eco-points."

The second work is a history of logging in the Whirlpool River Valley south of Marmot Basin. It's a summary of historical research conducted by Dr. Peter Murphy, professor emeritus, forestry, at the University of Alberta.

Little was known about log driving in Alberta before Murphy began delving into the subject, but his research has uncovered many examples, the Whirlpool being the latest. The first camp on the Whirlpool was built in 1920 and logging started shortly after, with 94,000 ties cut in the first season. Ties were sent down the Whirlpool River to the Athabasca River and finally taken by wagon to be loaded into boxcars. In the seven years that the operation was running, about 500,000 ties were sent downriver.

JYMA 000.54.16.152
"Railway ties from the Whirlpool River, ca. 1920."

Users can learn about such topics as forestry, mining, reclamation, recreation, ecology, watershed, wildlife management, and climate change, as well as about the research that supports these areas.

The guide is part of the Trans Canada EcoTours® program, first conceived in the 1970s by the Canadian Forest Service, which showcases the landscapes of the tour routes and fosters understanding of the natural and human factors that shape

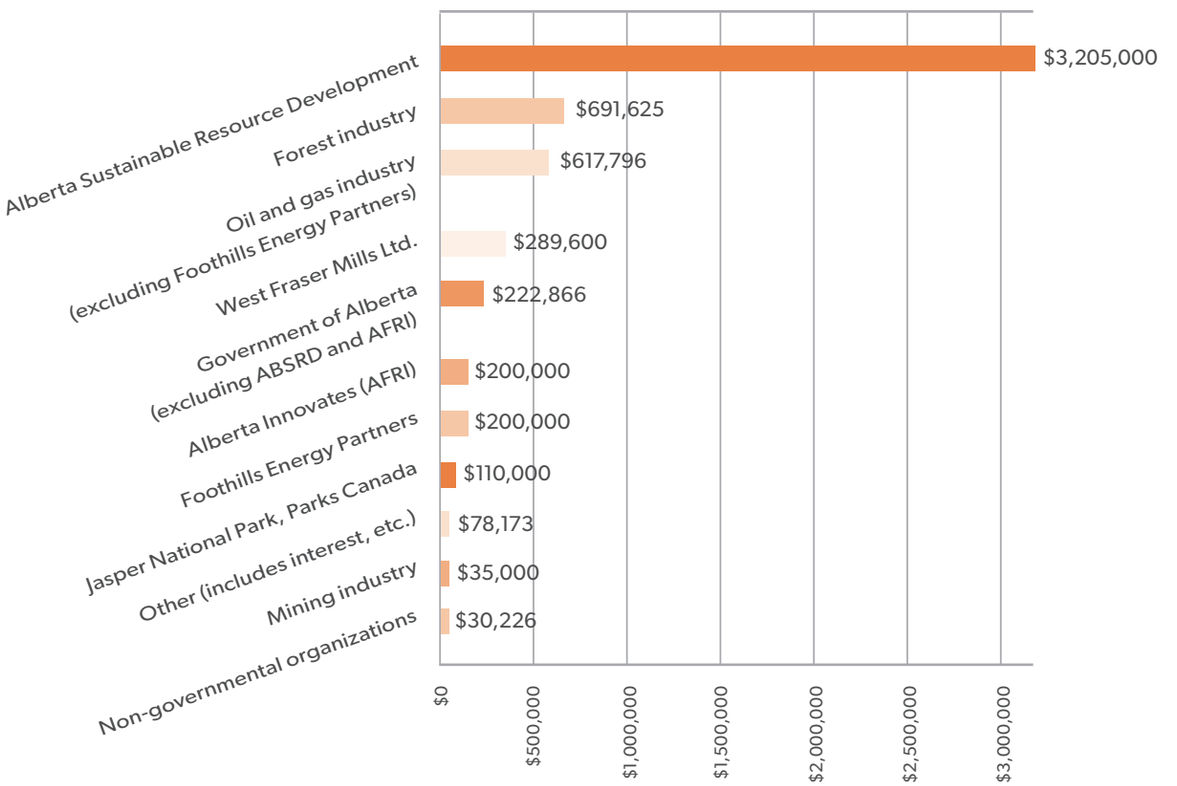
The Adaptive Forest Management – History Program takes a keen interest in understanding the events and decisions that have led to the current state of knowledge and practice in all aspects of natural resource management. A series of reports highlights learnings that can be factored into decision making today to help practitioners improve their resource management strategies and practices.

FUNDS

Summary of Financial Statements

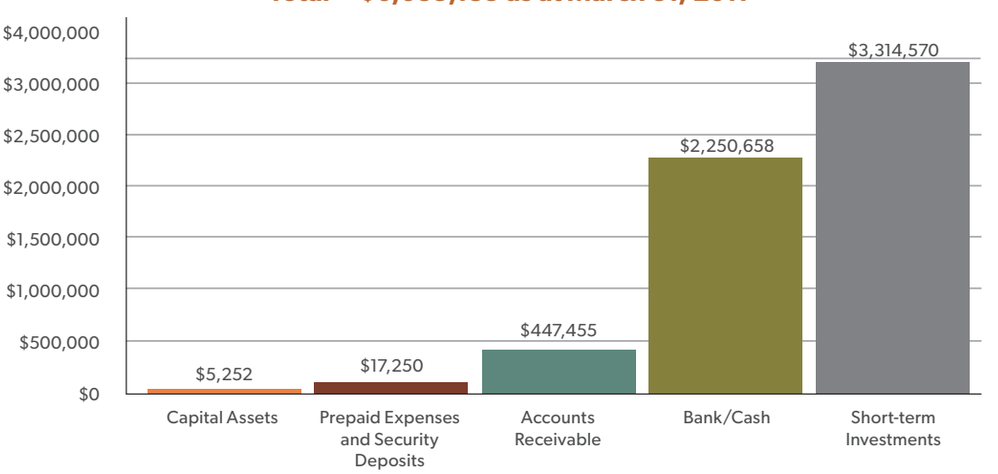
Revenue

Total = $5,680,287 as at March 31, 2011



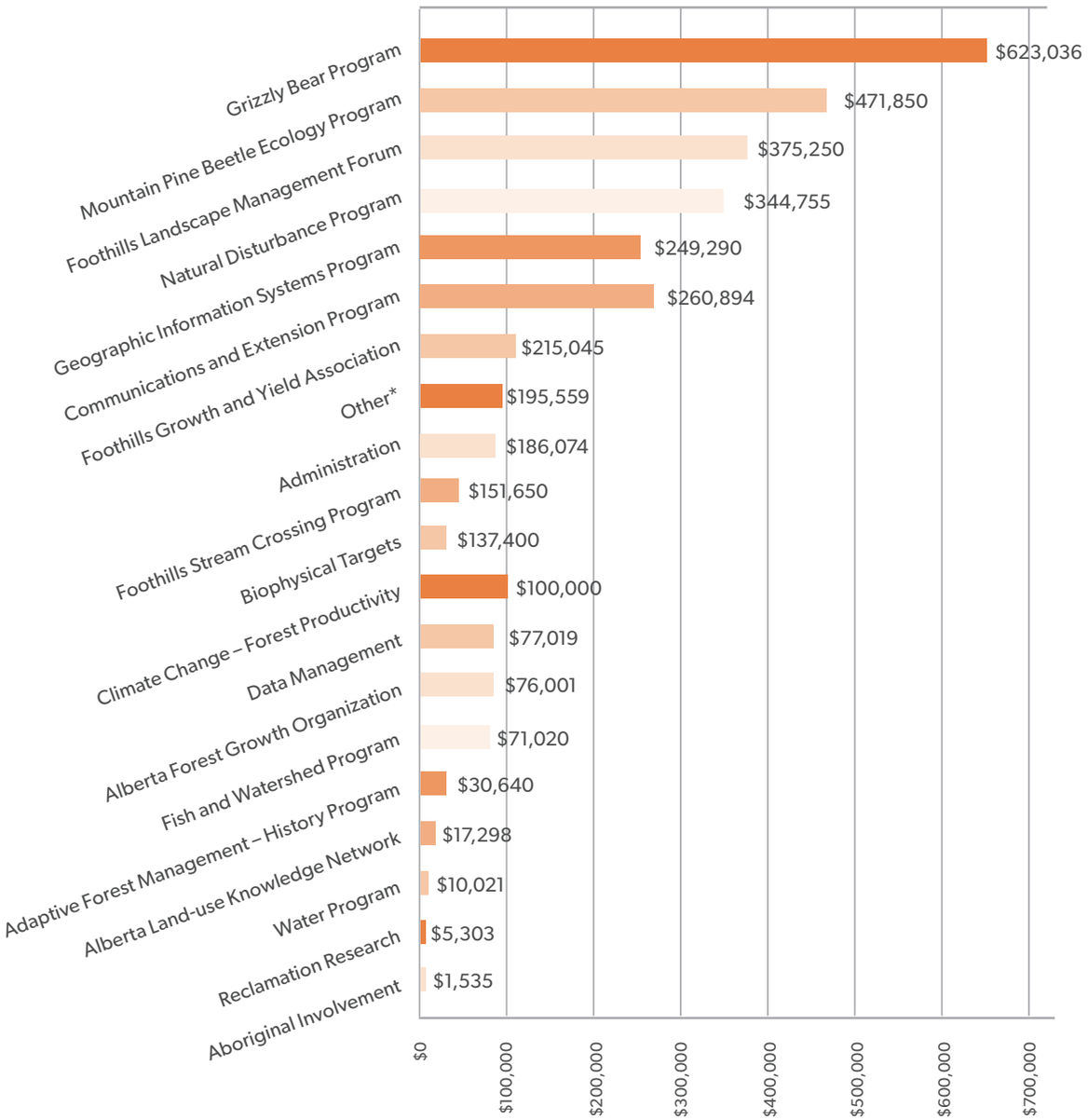
Assets

Total = $6,035,185 as at March 31, 2011



Expenses

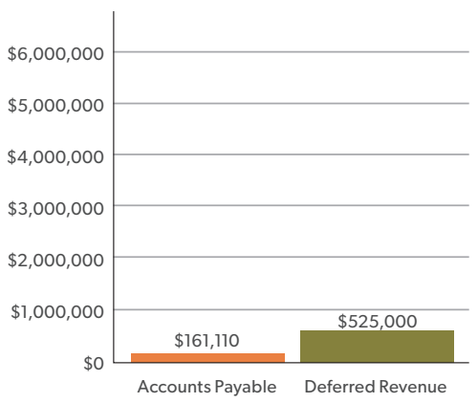
Total = $3,599,640 as at March 31, 2011



*includes Yellowhead Ecosystem Group, Circumboreal, Social Sciences, Forest Legacy, Climate Change - NRRBC

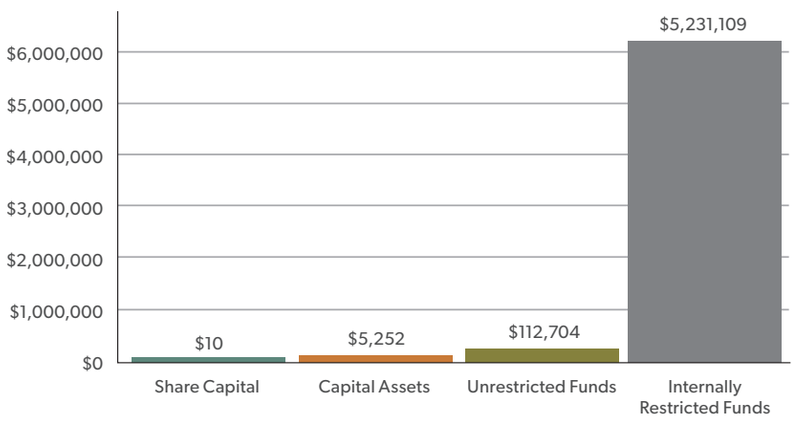
Liabilities

Total = $686,110 as at March 31, 2011



Fund Balances

Total = $5,349,075 as at March 31, 2011



Board of Directors 2010–2011

Back row, *left to right: John Wilmshurst, Dan Rollert, Jim LeLacheur, Conway Dermott, Robert Stokes*
Front row, *left to right: Steve Otway, Rick Bonar, John Spence, Keith McClain, Tim Sheldan, John Kerkhoven, Ron Bjorge*

Ron Bjorge
Executive Director, Fish and Wildlife Division, Alberta Sustainable Resource Development

Rick Bonar
Chief Biologist and Planning Coordinator, Hinton Wood Products, West Fraser Mills Ltd.

Kyle Clifford [1]
Area Manager, Parks and Protected Areas, Alberta Tourism, Parks, and Recreation

Phil Comeau
Associate Professor, Department of Renewable Resources, University of Alberta (Alternate Director)

Garth Davis [2]
Senior Coordinator – Land Management, ConocoPhillips Canada (Alternate Director)

Conway Dermot [3]
Environmental and Forestry Services

Greg Fenton
Superintendent, Jasper National Park of Canada, Parks Canada

Terry Fredin
General Manager, Teck Coal Limited – Cardinal River Operations

Edwin Francheater
Sunchild First Nation (Alternate Director)

Rob Gibb
Government and Industry Relations Senior Advisor (Land and Environment), Talisman Energy Inc.

Darcy Janko [4]
Group Lead – Land Use Planning Environment Services, Encana Corporation

John Kerkhoven
Senior Advisor, Foothills Gas, Suncor Energy Inc.

Stan Lagrelle
Sunchild First Nation

Jim LeLacheur
Chief Forester – Alberta, West Fraser Mills Ltd.

Ken Mallett
Director, Northern Forestry Centre, Natural Resources Canada (Alternate Director)

Sandra Marken [5]
Environment Group Manager, ConocoPhillips Canada

Bruce Mayer [6]
Assistant Deputy Minister, Forestry Division, Alberta Sustainable Resource Development

Keith McClain
Director, Science Policy and Strategy, Forestry Division, Alberta Sustainable Resource Development

Jimmy O'Chiese
Chief, Foothills Ojibway Society

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Woodlands Manager, Hinton Wood Products, West Fraser Mills Ltd. (Alternate Director)

Gary Sargent
Manager, Resource Access, Canadian Association of Petroleum Producers (Alternate Director)

Tim Sheldan
Director General, Northern Forestry Centre, Natural Resources Canada

Doug Sklar [7]
Executive Director, Forest Management Branch, Forestry Division, Alberta Sustainable Resource Development

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Professor, Department of Renewable Resources, University of Alberta

Graham Statt [8]
Executive Director, Parks Division, Alberta Tourism, Parks and Recreation

Robert Stokes [9]
Senior Manager, Forestry Division, Alberta Sustainable Resource Development

Mark Storie [10]
Director, Operations, Learning and Stewardship, Alberta Tourism, Parks and Recreation (Alternate Director)

Darren Tapp [11]
Executive Director, Forest Management Branch, Forestry Division, Alberta Sustainable Resource Development

Glenn Taylor
Mayor, Town of Hinton

John Wilmshurst
Ecosystem Science Coordinator, Jasper National Park of Canada, Parks Canada (Alternate Director)

Officers

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General Manager, Foothills Research Institute

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President and Chair, Foothills Research Institute; Chief Biologist and Planning Coordinator, Hinton Wood Products, West Fraser Mills Ltd.

Jim LeLacheur
Board Member, Foothills Research Institute; Manager, Chief Forester – Alberta, West Fraser Mills Ltd.

Krista Paniec
Treasurer, Foothills Research Institute; Woodlands Controller, Hinton Wood Products, West Fraser Mills Ltd.

Garry Power
Divisional Controller, Hinton Wood Products, West Fraser Mills Ltd.

[1] Resigned from the board September 2010
[2] Appointed to the board February 2011
[3] Resigned from the board July 2010
[4] Resigned from the board December 2010
[5] Appointed to the board December 2010
[6] Appointed to the board September 2010
[7] Resigned from the board September 2010
[8] Appointed to the board September 2010
[9] Resigned from the board January 2011
[10] Appointed to the board February 2011
[11] Appointed to the board February 2011

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Questions? Comments on this annual report?
Please contact us at:

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