

HOW DOES RESEARCH

# Grow into Practice?



2014-2015  
Annual Report



fRI Research  
Informing Land & Resource Management



Photo credit: Kevin Gedling, Parks Canada

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## Message from the President



**DR. RICK BONAR | PRESIDENT**

In fulfilling its mandate, fRI Research has always focused on producing information that our partners need to inform practice.

In this report, you'll read about a number of interesting and practical research projects that illustrate just how fRI Research is achieving its goal of providing research that helps our partners achieve their goals. I'd like to point out a couple of examples of the work that's been going on this past year. One is the Caribou Program project looking at the analysis and restoration of seismic lines and other human disturbances in the Southern Mountain and Boreal caribou ranges in west-central Alberta. While there is still work to be done, the research has already been used to assist with prioritization of seismic lines for restoration.

Why is this so important? Because now managers have critical information they can consider in range and restoration planning, allowing them to make more informed decisions. That is science at its best, providing the knowledge our partners and stakeholders need to help solve multi-faceted "wicked" problems.

Although you won't read about it in the report, I do want to mention that members of the Canadian Boreal Forest Agreement (CBFA) are interested in incorporating the Healthy Landscapes Program concept of natural range of variation analysis into a "world-leading forestry practices" initiative. The CBFA is the largest conservation initiative in the world and is made up of environmental organizations and forest products companies. If the initiative goes ahead, the Healthy Landscapes Program research and the knowledge and tools that it has generated will have been extremely significant.

Once again, we at fRI Research are very proud of the work that our programs and associations have conducted over the past year. I hope you enjoy reading about some of our projects that are changing how our partners manage land and resources in very real and observable ways.



## Message from the General Manager

The past year at fRI Research has been another year of accomplishment and success. Our organization continues to serve its function as an enabler, providing sound, relevant science to our partners to inform their practice and help them improve their performance on the landscape.

One of my major priorities has been the implementation of the 2012–2017 business strategy, with the establishment of a Science Advisory Committee (SAC) being a key commitment over the last year. The newly formed SAC had its first meeting in December 2014 and has begun the process of evaluating our science to help us ensure that we meet the highest standards of scientific excellence as well as to provide structure and guidance to our program leads. Working with the SAC has been enlightening, and I thank the committee's members for their contribution to date, as well as in the future.

We have improved our work plan review and progress-reporting structure, specifically the way program leads inform the Board about the status of their projects. As a result, the Board is developing a better understanding of the individual programs; as one Board member put it, this improved awareness “helps clear the road” of any obstacles. This work allows us to keep our Board

engaged and informed, which is key to fRI Research's success.

Exciting changes to our brand are being realized as we move away from the descriptor “Foothills.” Our efforts to expand fRI Research's influence beyond this geographic region are paying off, with many of our programs providing our science and our services beyond the foothills area. The evolution of our name, tagline, and brand will help us reinforce awareness of our broader geographic impact and ensure that audiences beyond the foothills realize that the knowledge and tools stemming from our research may apply in their regions.

Next year, we will be sifting through the past as we compile our 25-year history. This look back at where we've been and what we've achieved will undoubtedly be engaging, enlightening, and entertaining, and I look forward to seeing the first drafts as we approach our 25th year in 2017.

To conclude, I would like to express my sincere appreciation to the staff and the program and association consultants who are the foundation of fRI Research. Their passion, focus, and commitment to their projects and their partners' interests are truly exceptional. Our success is a result of their success.



**BILL TINGE | GENERAL MANAGER**

# Partners

Partnerships are the foundation and lifeblood of fRI Research. Through the contributions and actions of partners, issues are identified and analyzed, resources are assembled, and new knowledge is created, transferred, and integrated into land and resource management in Alberta and beyond. The strength of the fRI Research organization would not be what it is today without partners' commitment, and fRI Research is honoured to have their contributions in any form. fRI Research offers and supports flexible and inclusive partnership structures and opportunities that are broadly described by the categories listed below. These are not exclusive, and many partners find a role for themselves in more than one category.

## Shareholders

Under Alberta legislation, shareholders are legally responsible for directing the affairs of the non-profit fRI Research. Shareholders provide stable core funding and in-kind contributions to support the overall operation of fRI Research.

The shareholders of fRI Research are Alberta Environment and Sustainable Resource Development (now Alberta Agriculture and Forestry and Alberta Environment and Parks); Alberta Tourism, Parks and Recreation (now Alberta Environment and Parks); ConocoPhillips Canada; Jasper National Park of Canada; Suncor Energy Inc.; Talisman Energy Inc.; West Fraser Mills Ltd.; Canfor Corporation; and Weyerhaeuser Company Limited.



Parks Canada  
Parcs Canada



West Fraser Mills Ltd.



Weyerhaeuser



## Program and Project Partners

These partners provide funding and/or in-kind contributions to directly support fRI Research programs and/or projects or collaborate on programs, projects, or other matters of mutual interest. Many of these partners are also responsible for land, resource, or forest management, and are interested in using fRI Research knowledge and tools in their businesses.

Alberta Aboriginal Relations  
Alberta Agriculture and Forestry (formerly Alberta Agriculture and Rural Development)  
Alberta Conservation Association  
Alberta Environment and Parks (William A. Switzer Provincial Park)  
Alberta Environment and Sustainable Resource Development (Land-use

Secretariat; Hinton Training Centre)  
Alberta Forest Genetic Resources Council  
Alberta Riparian Habitat Management Society (Cows and Fish Program)  
Alberta Innovates (Bio Solutions; Energy and Environment Solutions)  
Alberta Lottery Fund  
Alberta Newsprint Company  
Alberta-Pacific Forest Industries Inc.  
Apache Canada Ltd.  
Arctos Ecological Consulting  
Aseniwuche Winewak Nation of Canada  
Bandaloop Landscape-Ecosystem Services  
Banff National Park of Canada  
Blue Ridge Lumber Inc., a division of West Fraser Mills Ltd.  
Bow River Basin Council  
BP Canada Energy Company

British Columbia Institute of Technology  
Brock University  
Canadian Association of Petroleum Producers  
Canadian Cooperative Wildlife Health Centre  
Canadian Natural Resources Limited  
Canfor Corporation  
Carleton University  
Cequence Energy Ltd.  
City of Dawson Creek, British Columbia  
Climate Change and Emissions Management Corporation (CCEMC)  
Daishowa Marubeni International Ltd.  
Devon Canada Corporation  
Ducks Unlimited Canada  
Earth Systems Institute  
Edson Forest Products, a division of West Fraser Mills Ltd.

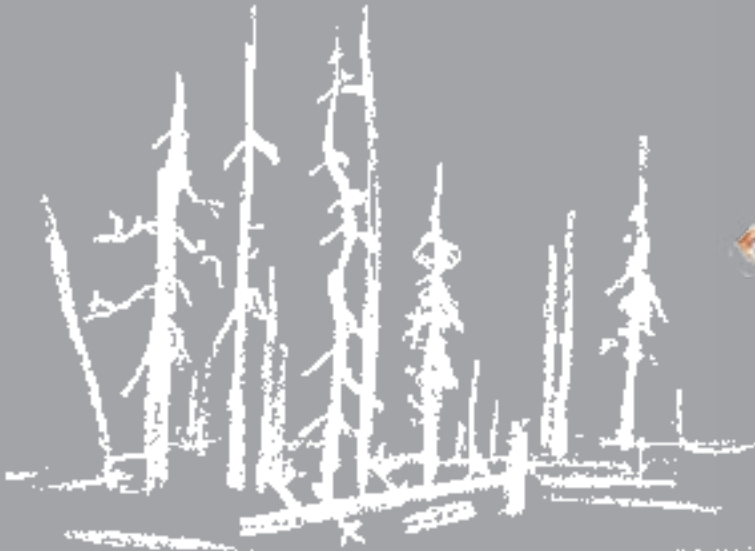
|  |  |   |
|--|--|---|
| Encana Corporation   | Millar Western Forest Products Ltd.  | Fraser Mills Ltd.                                 |
| Environment Canada (Canadian Wildlife Service)   | Millenium EMS Solutions  | Sustainable Forestry Initiative                   |
| Fisheries and Oceans Canada  | Mistik Management Ltd.   | Teck Coal Limited (Cardinal River Operations)     |
| FOLLOWIT   | Mixedwood Management Association   | Tolko Industries Ltd.                             |
| Foothills Forest Products Inc.   | National Sciences and Engineering Research Council of Canada (NSERC)   | Tourmaline Oil Corp.                              |
| FORCORP  | Natural Resources Canada, Canadian Forest Service (Canadian Geological Surveys; Northern Forestry Centre; Pacific Forestry Centre) | Town of Grande Cache (Tourist Information Centre) |
| Forest Genetics Association of Alberta   | Norbord Inc.   | Town of Hinton                                    |
| Forest History Association of Alberta  | Northland Forest Products Ltd.   | TransCanada Corporation                           |
| Forest Resource Improvement Association of Alberta   | Northern Rockies Tourism Alliance  | University of Alberta                             |
| GeoConnections – Government of Canada  | Norwegian University of Life Sciences  | University of British Columbia                    |
| Government of British Columbia (Environment; Forests, Lands and Natural Resource Operations) | Paramount Resources Ltd.   | University of Calgary                             |
| Government of Northwest Territories (Environment and Natural Resources)                      | Pembina Pipeline Corporation   | University of Guelph                              |
| Government of Saskatchewan (Environment)   | Peregrine Helicopters  | University of Laval                               |
| Grande Cache Coal Corporation  | Peter J. Murphy Forest Consulting Ltd.   | University of Montana                             |
| Grande Prairie Tourist Information Centre  | Petroleum Technology Alliance Canada (Alberta Upstream Petroleum Research Fund)  | University of Northern British Columbia           |
| Habitat Stewardship Program  | Progress Energy Canada Ltd.  | University of Saskatchewan                        |
| Hinton and District Chamber of Commerce (Tourist Information Centre)                         | Scandinavian Brown Bear Project  | University of Victoria                            |
| Huallen Seed Orchard Company   | Shell Canada Limited   | University of Western Ontario                     |
| Human Resources and Skills Development Canada (Canada Summer Jobs)                           | Slave Lake Pulp, a division of West Fraser Mills Ltd.  | Vilhelmina Model Forest                           |
| Husky Energy Inc.  | Spatial Planning Systems   | Western Boreal Aspen Corporation                  |
| Louisiana-Pacific Canada Ltd.  | Spray Lake Sawmills  | Westmoreland Coal Company (Coal Valley Mine)      |
| Manning Diversified Forest Products Ltd.   | Sundre Forest Products, a division of West   | Wildlife Genetics International                   |

## Alignment Partners

These partners do not provide direct financial or in-kind support to fRI Research, but they have specifically expressed their support for and alignment with fRI Research vision and goals.

|   |  |  |
|---|--|--|
| Alberta Chamber of Resources                            | Defenders of Wildlife  | NAIT Boreal Research Institute                     |
| Alberta Forest Products Association                     | EMEND (Ecosystem Management Emulating Natural Disturbance) Project | Nature Conservancy of Canada                       |
| Alberta Biodiversity Monitoring Institute               | Ember Research Services Ltd.                                       | NatureServe Canada                                 |
| Alberta Stewardship Network                             | Forest History Society, Durham, NC                                 | Oldman Watershed Council                           |
| Athabasca Watershed Council                             | Forest Products Association of Canada                              | Ontario Ministry of Natural Resources and Forestry |
| Canada Centre for Remote Sensing                        | FORREX   | Palisades Stewardship Education Centre             |
| Canadian Institute of Forestry (Rocky Mountain Section) | FP Innovations (Wildfire Operations Research)                      | Silvacom Consulting                                |
| Canadian Model Forest Network                           | Golder Associates  | Sustainable Forestry Initiative                    |
| College of Alberta Professional Foresters               | Grande Yellowhead Public School Division                           | TECO Natural Resource Group                        |
| College of Alberta Professional Forest Technologists    | Greenlink Forestry Inc.  | Tourism Jasper                                     |
| Conservation Biology Institute                          | Hinton Fish and Game Association                                   | Town of Edson                                      |
| Council of Forest Industries                            | Hinton Historical Society  | Trout Unlimited Canada                             |
|   | Inside Education   | University of Montana                              |
|   | Integrated Ecological Research                                     | University of New Brunswick                        |
|   | International Model Forest Network                                 | University of Waterloo                             |
|   | Jasper-Yellowhead Museum and Archives                              | Wildlife Habitat Canada                            |
|   | KBM Resources Group  | Woodlands Operations Learning Foundation           |
|   | Laval University   | World Wildlife Fund Canada                         |
|   | Municipality of Jasper   |  |

What will happen if the mountain pine beetle moves into boreal forest?



Will it persist in native lodgepole pine and jack pine after the initial outbreak?

Initial results show that it may not be able to persist in jack pine after an epidemic.



Photo credit: Allan Carroll, University of British Columbia

Project of the Mountain Pine Beetle Ecology Program ([mpbep.fRIresearch.ca](http://mpbep.fRIresearch.ca))



# Dynamics of Endemic Mountain Pine Beetle Populations in Novel Pine Habitats

There is a significant probability that the mountain pine beetle will move eastward into the boreal forest, and it's impossible to predict how quickly it will spread and what the impacts of infestation in novel habitats might be.

This four-year project, launched in 2014, is working to address this lack of knowledge by assessing the ability of mountain pine beetle to persist in native lodgepole, lodgepole and jack hybrid, and jack pine forests.

"The question we're attempting to answer is, once the mountain pine beetle arises in these new pine habitats, and after it's finished killing large-diameter trees, which it only does when it's in outbreak mode, can it persist in its sub-outbreak state—the endemic state?" explains Allan Carroll, associate professor, University of British Columbia. "To do that, we need to survey as many areas as possible to determine whether there are differences associated with different stand conditions."

Last year, Carroll and PhD candidate Stanley Pokorny assessed two stands of native lodgepole pine and two stands of jack pine,

with the research team examining every single tree in the stands. The sample size is too small to draw any conclusions, but the results were interesting. While mountain pine beetle were behaving in sub-outbreak fashion in new lodgepole pine habitats, they were not in jack pine forests.

"It could be that the jack pine forests are just not able to support an endemic population," says Carroll. While more stands need to be tested, further support for this finding would be exceptionally good news. "We have evidence over the past five years or so of the mountain pine beetle killing jack pine, but that's the epidemic behaviour. This could mean that after it's finished killing its favourite trees in an epidemic, it won't be able to persist and will go extinct."

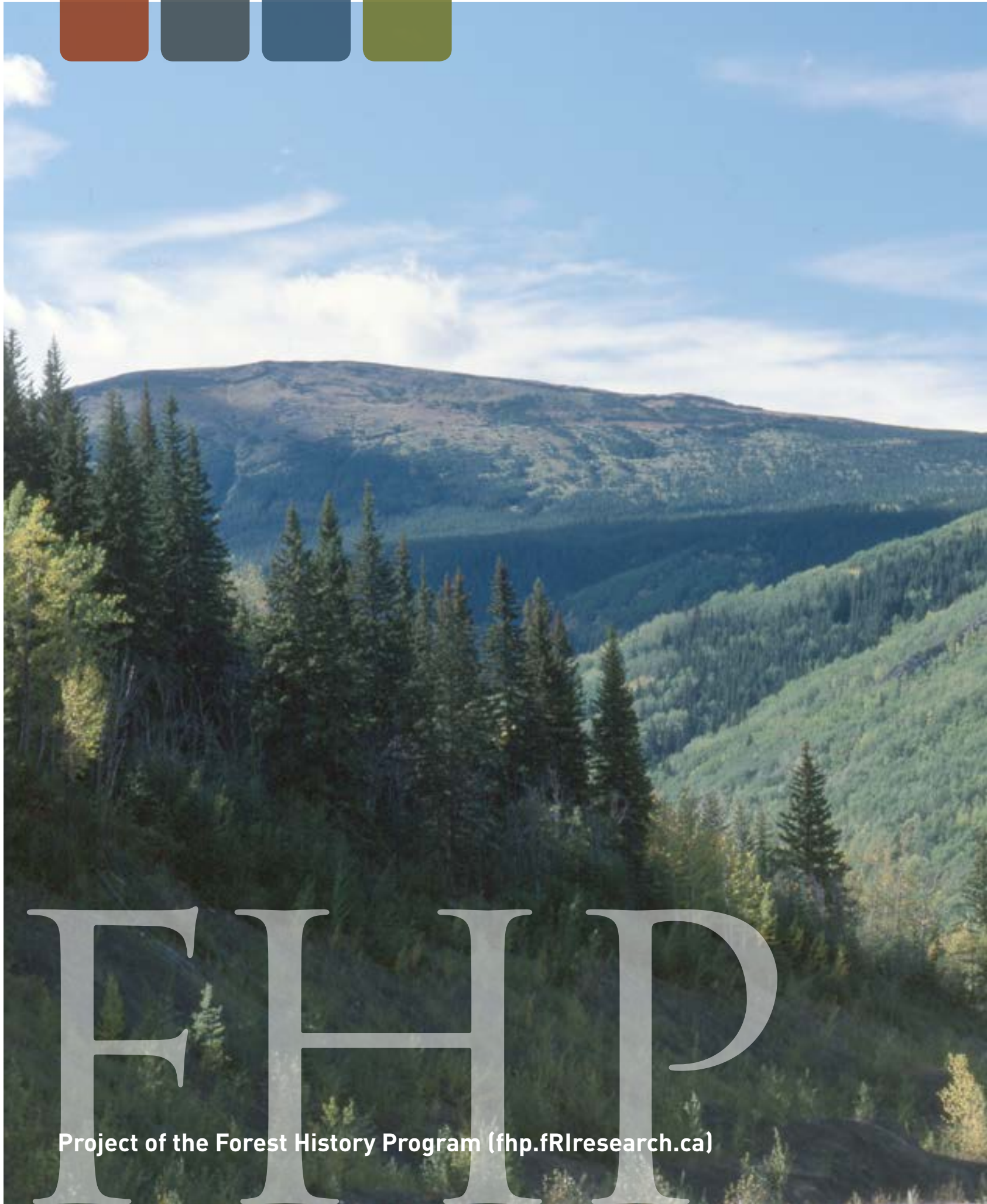
Carroll is also leading a project assessing the efficacy of treatment options for slowing

the beetle's eastward spread. Phase one is complete, and so far, the project has found that Government of Alberta management efforts significantly slowed the spread.

Carroll is grateful to fRI Research, its partners, and TRIA-Net, an NSERC initiative working to protect forests through science-based strategies to control spread of the mountain pine beetle in Canada, for providing research capacity that otherwise wouldn't be possible.

"The aspects of the work that we've got going on represent an incredibly well-developed and functioning collaborative system," he says. "Through TRIA-Net, for example, I can collaborate with geneticists, so we're actually collecting samples from trees that they are analyzing to determine whether or not some areas are genetically predisposed to support an endemic population better than others. I never would have been able to address that by myself."





# FHP

Project of the Forest History Program ([fhp.friresearch.ca](http://fhp.friresearch.ca))

# 25-Year History

In 2017, fRI Research will celebrate 25 years of contributing to the advancement of sustainable forest resource management in Alberta, on the Canadian landscape, and internationally.

To mark the occasion, in 2014 the Board of fRI Research encouraged the Forest History Program to research and write a new book on this history. Robert Udell, president of the institute from 1992 to 2004, and current Forest History Program lead, is one of two primary authors of this project, along with Bob Bott, a well-known Alberta writer who was the lead author of the first book in the Forest History Program, *Learning from the Forest* (2003).

“It’s a chance to reflect on the people, events, and focus that shaped the program from the beginning to where it is today,” says Udell. “We’ll also zero in on a few feature programs that have moved fRI Research forward and discuss how they’re being adopted into forest management, not only in this immediate

area but also in other parts of Western Canada and even internationally.”

Since the beginning, fRI Research’s emphasis has been on developing knowledge and tools that can be used to improve practice on the ground to help sustain the broad range of values dependent on the forested landscape. “That emphasis has been sustained through the first 25 years and is showing big results,” says Udell. “For the partnership, it will be useful to reflect on what fRI Research has done. For people who are unaware of our work, the report will give them some insight into what fRI Research has been doing, and how they too might be able to apply these learnings and tools to their own stewardship responsibilities.”

This is a two-year project, with the book to be produced in 2017. First steps in 2014 involved developing a project outline and establishing the project team. Going forward, work will include extensive searching through files and archives at fRI Research and elsewhere, and conducting interviews and asking people who have been involved over the years to fill out questionnaires. The team will then develop a timeline and identify turning points that were significant in the evolution of fRI Research and its relevance to the advancement of sustainable management. Drawing on all this, the writers will produce an overview of the institute through the years, and select and further explore feature programs to highlight in the book, which will be available in print and as an ebook.

## Who’s Involved

Funding from Alberta Agriculture and Forestry via the Mountain Pine Beetle Ecology Program

Robert Udell – Project lead and writer  
Bob Bott – Writer  
Peter Murphy – Reviewer

Bob Stevenson – Reviewer and photographer  
Bruce Mayer – Reviewer  
Fran Hanington – Researcher





# CP

Projects of the Caribou Program ([cp.fRIresearch.ca](http://cp.fRIresearch.ca))

# Linear Feature Restoration in Caribou Ranges

In two related projects, the Caribou Program is uncovering information that will help industry and government determine where implementing restoration strategies will be the most beneficial for caribou recovery.

The first, on analysis and restoration of seismic cutlines in Southern Mountain and Boreal caribou range in west-central Alberta, is in its second year. The second, on analysis and improvement of linear features to increase caribou functional habitat in west-central and northwestern Alberta, started in 2015, with planning done this past fiscal year.

“Many factors interplay when we’re trying to determine when previously disturbed habitat area is functional for caribou,” says Laura Finnegan, Caribou Program lead. “The area would have to be no longer used by other ungulates so it won’t attract predators anymore, it won’t be used as a movement corridor by predators, and it would have to be an area where caribou and their calves don’t die.”

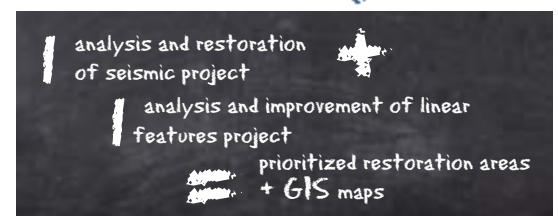
Researchers are using existing animal location data, LiDAR measurements of tree regeneration on linear features, and field data to help prioritize areas of restoration. Over the past year, they’ve been using GPS data to look at the movement rates of grizzly bears and

wolves in the southern mountain and boreal caribou range and determining the height of vegetation at which those movements are impeded.

They’ve now determined that the movement rates of wolves and grizzly bears decrease when vegetation is at about 1.5 metres. That information has been integrated with existing probability maps of caribou, grizzly bear, and wolf occurrence to help researchers identify low-vegetation seismic lines where there’s likely to be an overlap between the three species. These areas are considered high-priority restoration areas.

“Based on this analysis, about 45 percent of the existing seismic line footprint in west-central Alberta was classified as high priority,” says Finnegan.

There is still much work to be done, including looking at human use of seismic lines and other animal use in relation to revegetation. The research to date has led to the creation



of GIS maps with 100-metre segments of seismic lines across the range of west-central Alberta’s caribou herds that are prioritized for restoration. This information has been given to the Caribou Program’s industrial partners, range partners, biologists, and the Province for consideration when conducting range-planning exercises and making restoration plans.

For more details on these and other projects, watch for the Caribou Program’s annual report in mid-2015.





# GBP

Project of the Grizzly Bear Program ([gbp.friresearch.ca](http://gbp.friresearch.ca))

Photo credit: Sylvie's Photography

# Effects of Pipelines on Grizzly Bears

This project, completed in 2014–2015, sought to understand the impact of oil and gas pipelines on grizzly bears so that those involved in planning pipeline development can minimize the impacts on this threatened species.



The study found both positive and negative impacts, and most importantly, this research has provided scientific knowledge that pipeline companies are putting into practice.

Researchers monitored the presence and use of pipelines of various ages and found that pipelines do not displace grizzly bears, which use them frequently for travel and food. Last year, it was thought that one of the potential consequences of grizzly bear use of these

corridors might be an increase in predation on caribou. This work has shown that this isn't the case. Bears do not seem to be using pipelines to prey upon caribou.

The study also found that younger pipelines are attractive to bears because they usually contain more abundant sources of food. On the negative side, pipelines make grizzly bears more vulnerable to poaching because of the visibility along an open stretch of habitat.

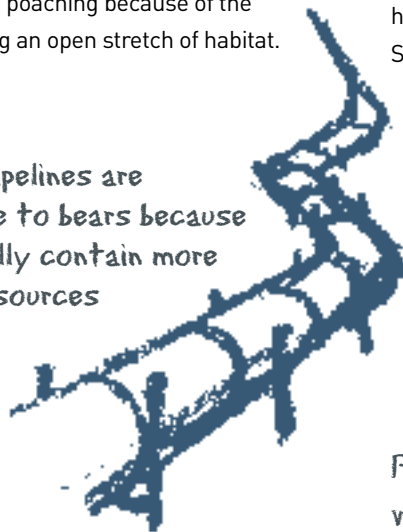
“Now the pipeline companies that supported this work are using this research in active pipeline planning. For example, because pipelines increase grizzly bear vulnerability to poaching, they are looking at things like incorporating visual screening to protect bears or changing the layout of the line to prevent people that might be poaching bears from having a direct line of sight. Operationally, they have a use for this research,” says Gordon Stenhouse, Grizzly Bear Program lead.

## Findings:



Bears do not seem to use pipelines to prey upon caribou.

Younger pipelines are attractive to bears because they usually contain more abundant sources of food.



Pipeline companies are actively using the results in pipeline planning!



Pipelines make grizzly bears more vulnerable to poaching.



Photo credit: Sylvie's Photography



# FHP

Project of the Forest History Program ([fhp.fRIresearch.ca](http://fhp.fRIresearch.ca))



# Logging up the Whirlpool River

The forest provides us with economic, environmental, and recreational benefits, but just as importantly, it holds stories of the past from which we can learn. One such story is that of a logging operation for railway ties up the Whirlpool River that was active between 1920 and 1927.

With scant documentation left behind, Dr. Peter J. Murphy and colleagues Tom Peterson and Mike Dillon (Parks Canada) have been piecing together a history of the operation so that this important piece of Jasper National Park's past is not forgotten.

Their research has involved exploring the area where the camps are located and the Jasper archives, as well as mining archives and forest history contacts in Ontario. They determined that the Austin Nicholson Lumber Co. of Cochrane, Ontario, owned the Timber Berth and contracted the logging to local families.

"It's characteristic of this operation that there is a lack of archival material, but the few documents we found were very helpful," says Murphy. "We know that they started logging in January of 1920, building their first camp about 18 kilometres up from the Forks—and that the last log drive was in the summer of 1927. We knew the location of three logging camps, then found a fourth camp for a sawmill on the riverbank, and located two other isolated

cabins. The exciting part of this project is that the more we search, the more we find."

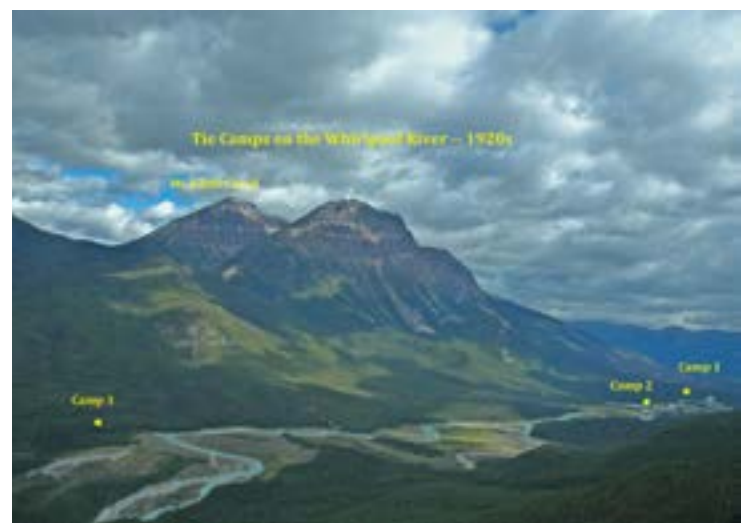
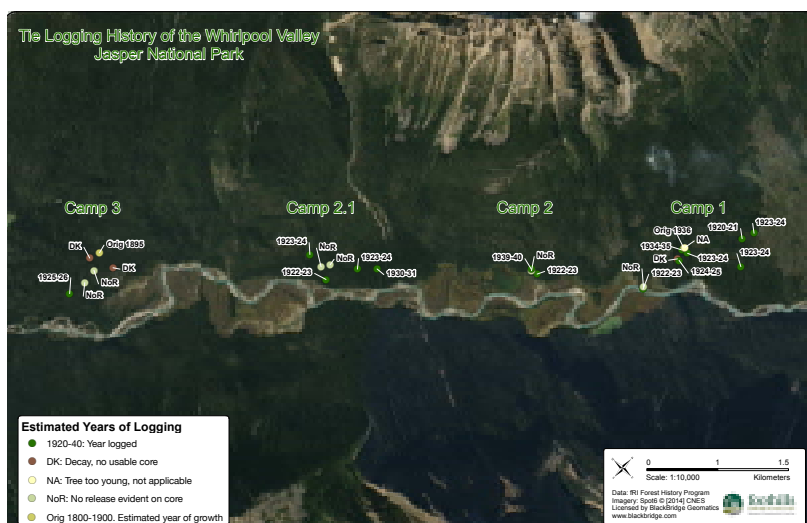
The most recent find was an original hand-hewed tie that had been preserved in the mud at a landing, found at low water and dug out. "It would have been a Class 1 tie, measuring 12 inches (30 centimetres) in diameter, eight inches (20 centimetres) thick, and eight feet (2.4 metres) long. The broad axe marks are still clearly visible," says Murphy. The tie was hewed about 90 years ago.

To determine when the camps were built, Murphy and his team took cores from trees. When logging began and the tie-quality trees were cut down, trees left behind received more sunlight, so the next growth ring would be wider. A living tree from the cutting area of the first camp clearly showed a wider ring in the growth year of 1920. Murphy estimates that the second camp was built in 1922 while the third was constructed within two years. The sawmill camp may have been added in 1925.

fRI Research's Geographic Information Systems (GIS) Program has provided maps and imagery used in fieldwork and has now begun plotting GPS data on colour air photos to show the locations of such features as camps, logging areas, landings, booms, and even locations of sample trees. These will be labelled to use as effective interpretive displays.

The project is useful for interpretation and enhancing public understanding, illustrating what was possible with only hand tools, horses, hard work, and ingenuity. The data also provide a record of how forest products were used to support the railway, the lifeline of Jasper before roads were built.

The history clearly shows the resiliency of the forest. "There is a new forest out there, with trees that are up to 90 years old. The log-built camps are decaying back into the ground, and the clearings are all overgrown. You'd never know it had been logged except for the scattered decaying stumps," says Murphy.





Lifetime views of videos  
on the YouTube channel:

**112,000**

Views in 2014-2015:

**53,731**

Some of the countries  
viewers came from in  
2014-2015

United Kingdom: 1,887

Australia: 1,617

India: 1,598

Germany: 1,044

Spain: 993

Philippines: 961

South Africa: 447



LUKN

A project of the Alberta Land-use Knowledge Network (landusekn.ca)

## LanduseKN YouTube Channel

Thanks to the Alberta Land-use Knowledge Network (LuKN) YouTube channel, LanduseKN, people across the province and around the world have access to the knowledge being shared in Alberta. By March 31, 2015, there were almost 900 videos on the channel, and it received 53,731 views this year. Viewers watched an estimated 244,768 minutes of video last fiscal alone.



LuKN creates the videos, attending conferences, workshops, lectures, and seminars across Alberta to record presenters. The video and audio are edited with the presenter's PowerPoint presentation so that viewers get the same experience as those attending the event. "It's just like being at the conference, only it's more comfortable," says Terri McHugh, program lead.

LanduseKN was started in 2011 as one way for LuKN to contribute to effective land-use planning, analysis, and decision making. "The videos allow us to spread good land-use-related information and ideas to a broader audience," says McHugh. "We also do it as part of our budget so that the organizations

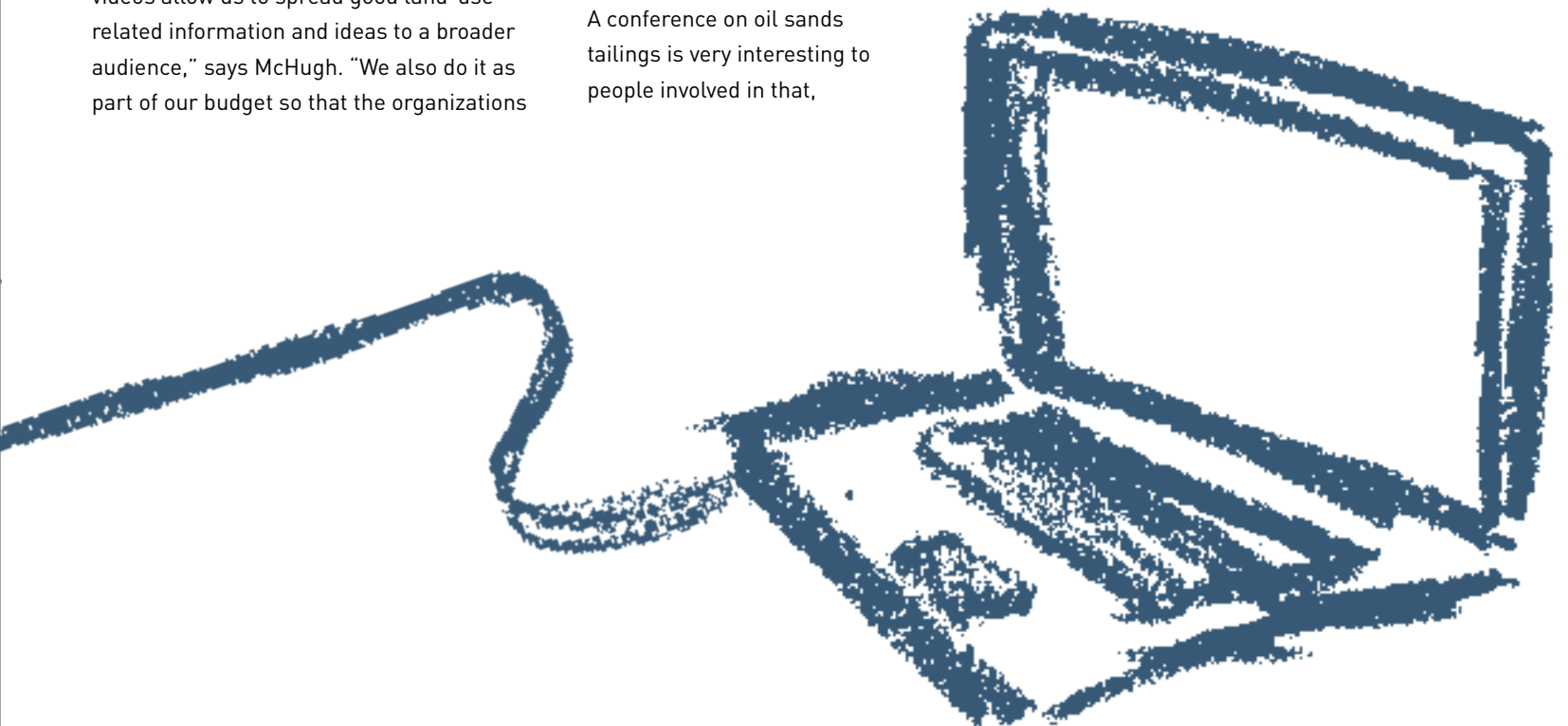
who put on these events, mainly non-profits and professional organizations that don't have funding for videography, can benefit."

The videos cover a range of topics, including agrology, watershed issues, mountain pine beetle issues, and topics related to the oil sands. The two topics that generate the most interest are LiDAR and urban agriculture.

"I suspect that's because they have the broadest appeal and reach. Some of the topics are really specific to Alberta or even to particular parts of Alberta. A conference on oil sands tailings is very interesting to people involved in that,

but it doesn't necessarily draw a broader audience, whereas something like LiDAR has application anywhere," says McHugh.

The videos can be found by searching YouTube, or you can subscribe to LanduseKN to receive notifications when new content is added. They are also catalogued in the resource library on [landusekn.ca](http://landusekn.ca).





The directive will be implemented in 3 regions:

Work will include:

- Inspecting member crossings
- Sequencing all watersheds for remediation planning
- Prioritizing candidate sites for remediation
- Creating watershed remediation plans
- Reporting annually to government and the Alberta Energy Regulator

# FSCP

A project of the Foothills Stream Crossing Partnership ([fscp.friresearch.ca](http://fscp.friresearch.ca))

# Roadway Watercourse Crossings Remediation Directive

Signed in March 2015, the Roadway Watercourse Crossings Remediation Directive outlines a new Government of Alberta strategy for identifying and repairing stream crossings based on the prioritization of watersheds. The strategy is informed by and recognizes the proactive

watershed approach to remediation developed and implemented by the Foothills Stream Crossing Partnership (FSCP).

The FSCP was formed in 2006 to address a long-standing issue around out-of-compliance stream crossings, specifically impediments to fish passage and fragmentation of fish habitat. Historically, this issue had been handled through an individual stream crossing approach, with little or no coordination between the regulators and the crossing owners.

“Over two years ago, we started talking with Alberta Environment and Sustainable Resource Development and the Alberta Energy Regulator about getting a directive in place that would clearly spell out our relationship with the regulators, but also the benefits of membership in our association,” says Jerry Bauer, FSCP lead. “Last summer, George Robertson, executive director for the Upper Athabasca Region at ESRD, got involved, and things moved quite quickly after that.”

The directive will be implemented in phases in the foothills, boreal, and white area regions of the province. The first phase will begin in summer 2015 in an area stretching from Grande Prairie to southern Alberta. The work of the FSCP will expand and include inspecting member crossings, sequencing all watersheds for remediation planning,

prioritizing candidate sites for remediation, creating watershed remediation plans, and reporting annually to government and the Alberta Energy Regulator.

Bauer expects the directive will result in new members as crossing owners see the benefit of managing liability across an entire watershed over a period time rather than taking a piecemeal approach to crossing remediation; it has already led to two new members joining the association in early 2015, and Bauer believes it will be key in growing the FSCP across the province, especially along the east slopes. While the association doesn't have a monopoly on the process, it has developed a robust database to keep track of the thousands of stream crossings in an area, which is critical to doing inspections, setting priorities, and conducting remediation planning.

Remediation planning is just the first step. “We have hundreds of crossings that need to be fixed, and it will take time and resources to do it all. You can have a remediation plan for a watershed, but it may take five to ten years to fix every crossing. That's that managed approach. But as a result of the directive, the regulators recognize that, and once a remediation plan is in place, they won't do inspections and say we're out of compliance as long as we are meeting the targets,” says Bauer.

## Team Members

**Jim Steele,**  
Compliance Manager,  
Alberta Environment and Parks  
(Chairperson of the Team)

**Steve Bradbury,**  
South District Manager,  
Alberta Environment and Parks

**Dani Walker,**  
Provincial Aquatic Habitat Specialist,  
Alberta Environment and Parks

**Dave Hugelschaffer,**  
South District Manager,  
Alberta Environment and Parks

**Darren Fearon,**  
Provincial Operations Monitoring  
Forester, Alberta Agriculture and Forestry

**Wayne Boyd,**  
Senior Compliance Assurance Advisor,  
Alberta Energy Regulator

**Jerry Bauer,**  
Managing Director, FSCP

**Ngaio Baril,**  
Project Coordinator, FSCP

**Jesse Kirillo,**  
External Relations, Talisman Energy Inc.

**Garth Davis,**  
Senior Coordinator – Land Management,  
ConocoPhillips Canada

**Leslie Proudfoot,**  
Forestry Supervisor – Planning,  
Canfor Corporation



How do harvesting patterns compare to natural wildfire patterns when other activity is occurring on the landscape?

Disturbance isn't a problem. The problem is how disturbance is distributed in time and space.

3 journal articles published +  
1 more scheduled for publication

HLP

A project of the Healthy Landscapes Program ([hlp.fRIresearch.ca](http://hlp.fRIresearch.ca))

# Cultural Landscape Patterns

For the past four years, Paul Pickell, a PhD student at the University of British Columbia, has been conducting the Cultural Landscape Patterns study with the goal of answering a question raised by three of fRI Research’s partners. The project wrapped up this year, and while the

findings weren’t surprising, they do have important implications for land managers.

Wanting to better understand the impact of their harvesting activities, Alberta-Pacific Forest Industries; Hinton Wood Products, a division of West Fraser Mills Ltd.; and Alberta Newsprint Company asked researchers to look at how their harvesting patterns compared to natural wildfire patterns on their respective landscapes. The project went a step further, also looking at the impact of energy-sector activities, as well as cumulative cultural activities.

Pickell used NEPTUNE, a decision-support tool developed by the Healthy Landscapes Program, to compare baseline information about natural wildfire patterns with cultural disturbance patterns in areas of northeast Alberta and the foothills.

“Harvesting patterns—particularly more recent ones—shared a limited number of basic characteristics with natural wildfires,

but the footprint from the energy sector was almost entirely foreign” says David Andison, Healthy Landscapes Program lead. “Cumulatively, although the forestry sector has begun to use the natural pattern of wildfires as models for their activities, when you add all the activity from the energy sector, the landscapes are still moving away from their historic range.”

Andison says that the amount of disturbance isn’t the problem. Disturbance is a natural, necessary process in the boreal. The issue is how that disturbance is distributed in time and space. While most cultural disturbance features aren’t big, they are numerous and ubiquitous. The other challenge is duration. Energy-sector features in particular last for years, or even decades, which is very unnatural.

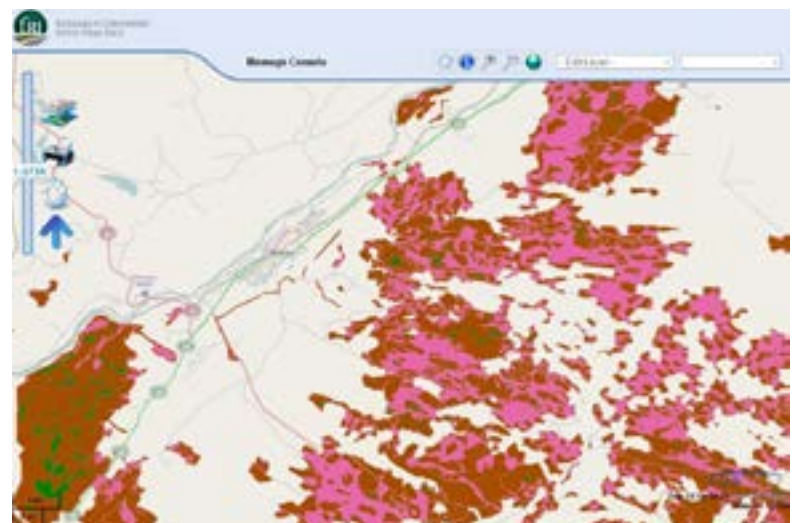
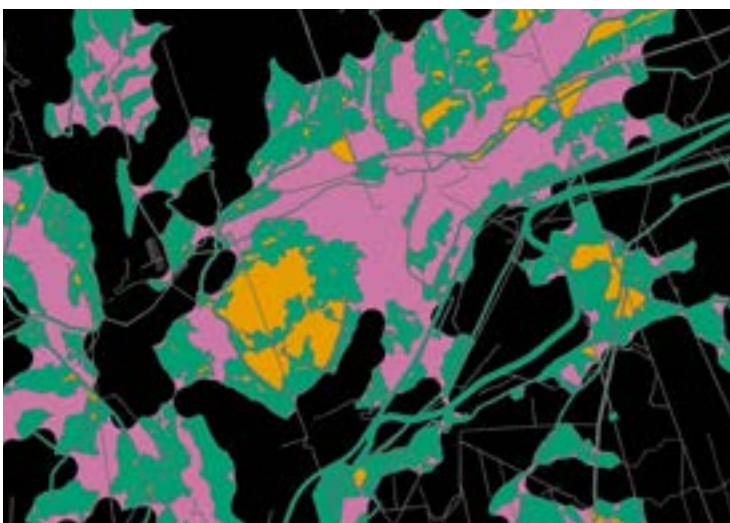
The findings point to the need for a higher degree of collaboration, with forestry and energy companies sitting down together to create what Andison calls a disturbance plan.



Photo credit: Paul Pickell

“A disturbance plan would involve looking at where you plan to be active in the next five, ten, or twenty years, and more importantly, where you are not going to be, because that’s where you’re going to get your high-quality habitat,” says Andison.

Pickell is expected to defend his thesis in September and has had three journal articles about the project published, with one more scheduled for publication.





1 formal agreement

between Alberta Environment and Sustainable Resource Development and the University of Alberta



2 post-docs +  
3 PhD students +  
1 master's student



1 Emerald Award



1 Federation  
Excellence in  
Water Stewardship  
Award

WWP

Projects of the Water Program ([wp.fRIresearch.ca](http://wp.fRIresearch.ca))



# Growing the Water Program

## New Partnerships

In October 2014, a formal agreement between Alberta Environment and Sustainable Resource Development and the University of Alberta was signed to allow Axel Anderson, Water Program lead, to supervise graduate

students and hold grants as an assistant professor. "That's a major milestone that allows the program to grow," says Anderson.

With this partnership, the program now has two post-docs, three PhD students, one

master's student, several support staff, and contractors working to achieve the science and tool goals identified in its 2012–2017 business strategy.

## Watershed Assessment Procedure to Address Cumulative Effects

Addressing the cumulative effects of multiple activities on a watershed level is a major focus of fRI Research's Water Program because it provides a more holistic way of managing forested landscapes. Since 2011, the program has been providing the science and tools to develop and conduct watershed assessment in the eastern slopes, and it continues to do so.

"We continue to provide support to Mike Wagner, forest hydrologist at Agriculture and Forestry. But we've taken the model we developed in southwest Alberta and transferred it to the foothills, in partnership with Alberta Environment and Parks, Fisheries staff, Canfor, and the city of Dawson Creek. We are building off what we did in one natural region to see how we can do the same thing in another region," says Axel Anderson, Water Program lead.

Faye Hirshfield officially started as a post-doctoral fellow after completing her PhD in river hydraulics in spring 2015. This year, Hirshfield is starting research projects that

support the development of an office-based assessment procedure in the foothills.

"There is also a Forest Resource Improvement Association of Alberta project with Canfor that I hope will capitalize on the LiDAR coverage for the province to move beyond indicator-based approaches for erosion and sedimentation and riparian mapping," says Anderson.

In that project, the program is partnering with the U.S. Forest Service, the Earth Systems Institute, the University of New Brunswick, Alberta Agriculture and Forestry's Forest Management branch, and Canfor to test GIS tools in the Simonette. A field-based graduate student project will start this fall, with the objective of validating and calibrating GIS tools and models developed for use in mountainous regions.

The Simonette is also the site of Bryan Maitland's MSc thesis work. Co-supervised at the University of Alberta with Mark Poesch,

### Procedure to Address Cumulative Effects

Providing the science and tools to develop and conduct watershed assessment

Conducting research projects

Validating and calibrating GIS tools and models

Investigating fish communities

Maitland is investigating the fish communities above and below culverts and bridges, and in reference sites. The second half of his thesis investigates the use of stream connectivity metrics and culvert priority removal strategies.

## Groundwater / Surface Water Interactions and Hydrological Response to Disturbance

Sheena Spencer, a PhD student co-supervised by Axel Anderson, Water Program lead, and Uldis Silins at the University of Alberta, is one of many students working at the Southern Rockies Watershed Project (SRWP), which is a large watershed experiment investigating the impact of different harvest treatments. The Water Program provided assistance with the development of the second phase of the

project, which is funded by Alberta Innovates and the Government of Alberta, and recently won an Emerald award and the Council of the Federation Excellence in Water Stewardship Award.

Spencer is specifically investigating groundwater / surface water interactions in the headwater streams to determine

their impact on the hydrological response to disturbance. "The idea behind her project is that if there are large amounts of groundwater influencing the hydrology, the area is relatively insensitive to disturbance compared to an area with less groundwater," explains Anderson.



A project of Tree Improvement Alberta ([tia.fRIresearch.ca](http://tia.fRIresearch.ca))

Photo credit: Sally Johns, HASOC

# Climate Change and Emissions Management Corporation (CCEMC) Tree Species Adaptation Risk Management

Projections from various models show that climate change is going to result in a warmer, drier Alberta. This has significant implications for the province's

forests, as tree species may not continue to grow as well in the areas that suit them today due to drought, and potential insects and pathogens that might come with drought conditions. Through this project, researchers have been laying the groundwork for testing through breeding and maintaining genetic diversity of families and species of trees to find those that can naturally adapt to adverse conditions.

The three-year Tree Species Adaptation Risk Management project finished this year. Tree Improvement Alberta (TIA) spent the final year of the project developing four coniferous adaptation test sites and located an additional four deciduous test sites that have been surveyed but not yet developed. Development of the coniferous test sites consisted of site preparation and fencing. TIA will now seek funding to proceed with planting the sites.

The project also included conducting risk assessments of current breeding programs in the province. TIA remeasured trials from genetic

test sites and analyzed the data to see how tree species are performing in the areas where they are currently planted—the areas from which the seed was taken. They then projected a future where those sites were warmer and drier to develop guidelines with respect to how tree species could be performing in the future, to predict whether trees should be deployed to an area other than the one the seed was taken from due to maladaptation caused by changes in the environment.

TIA has prepared two manuscripts for publication to share the results of the risk assessments. "With respect to those results, I can say that there is opportunity to move materials outside of their current breeding region, but there has not been any indication that deploying back into the region they were selected from would cause maladaptation," says Daniel Chicoine, program manager, TIA. "It seems that the risk of maladaptation is low."

A final report on the project will be published on the CCEMC's website.



Laying the groundwork for finding families and species of trees that can naturally adapt to adverse conditions over the last three years:

- 4 coniferous adaptation test sites developed
- 4 deciduous test sites located and surveyed
- 24 controlled parentage programs inventoried
- 2 manuscripts prepared for publication to share the results of risk assessments done on current breeding programs
- 3 stakeholder workshops conducted
- 2 field visits undertaken



Photo credit: Deogratias Rweyongeza, Agriculture and Forestry

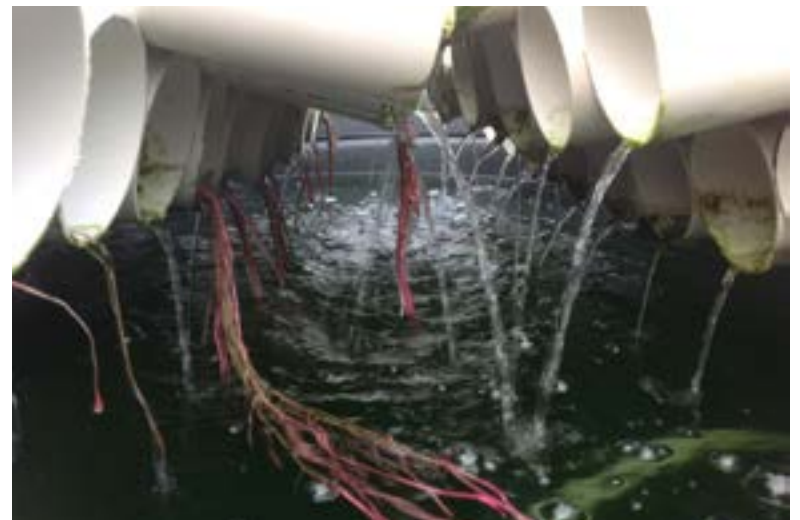


Photo credit: Daniel Chicoine, Program Manager, TIA



# HLP

A project of the Healthy Landscapes Program ([hlp.fRIresearch.ca](http://fRIresearch.ca))

# Stony 800 Landscape Restoration Study

Is it possible to take a landscape that has been modified by human activity and restore it to more natural conditions based on our understanding of natural patterns?

In this landscape restoration study, researchers used scenario modelling to see if collaborating on a disturbance plan and using Mother Nature as a template could result in the restoration of even heavily culturally modified landscapes.

Funded by the Cumulative Environmental Management Association (CEMA) in Fort McMurray, the study used a 330,000-hectare area south of that city as its model site. The landscape features many signs of human activity—roads, seismic lines, well sites, and harvest blocks.

Although there is no shortage of old forest in the study area, it is heavily fragmented; there are no old-forest patches larger than two or three thousand hectares. For this reason, researchers used an increase in the proportion of large old-forest patches as a primary indicator of landscape health.

“We used two tools for influencing the landscape. First, we could use forest harvesting as a restoration tool on the areas most severely affected by human activity—we would create a natural disturbance pattern and erase whatever footprint was under it. Anything but a permanent feature would be erased by harvesting. The second tool was linear feature restoration,” says David Andison, Healthy Landscapes Program lead.

Researchers tested four strategies for harvesting and four for linear feature restoration, each one with different assumptions about collaboration levels, and different philosophical approaches. The amount of area that could be harvested or restored was held constant. The only thing that changed between scenarios was where, how, and when harvesting and restoration activities could take place.

For one scenario, the study defined a series

of small zones in which disturbance activities would be allowed (Where you are), and those where they would not be allowed and linear feature restoration activities would concentrate (where you are not, or Wyn), for a period of 20 years. The proportion of Where-Wyn zones was based on natural wildfire patterns.

“Our hypothesis was, if we use the Where-Wyn approach to distribute disturbance over time and space, rather than spreading it out spatially in an uncoordinated manner as we do now, we will create more natural landscapes,” says Andison.

Initial results were encouraging. The number and size of the resulting old-forest patches were directly proportional to both the degree of inter-agency coordination required and the degree to which natural pattern principles and indicators were integrated.

The final report will be out in the summer of 2015.



## Can we restore heavily culturally modified landscapes?

**330,000-acre site**  
with roads, seismic lines, well sites,  
and harvest blocks

**4 strategies**  
for harvesting and

**4 for linear  
feature  
restoration**

tested under different scenarios



## Shh. Don't wake the bears.

Waking from hibernation too early impacts the health and survival of grizzly bears. But where are they denning?

### Project results:

Bears prefer to den in high-elevation dry conifer stands with a lot of high-quality spring food and areas with low road density.



- Females with very young cubs are the most heavily affected by road density.
- Threshold road densities have been determined to help guide the stabilization of grizzly bear populations. They will be used to inform the Government of Alberta's grizzly bear recovery plan.

# GBP

Projects of the Grizzly Bear Program ([gbp.fRIresearch.ca](http://gbp.fRIresearch.ca))

## Den Selection by Grizzly Bears

Grizzly bears hibernate to avoid the harsh conditions of winter, including less access to food and water. But they're easily woken, and becoming active too early can impact their

health and ultimately their survival. Oil and gas pipelines get built year-round, and companies doing winter construction want to avoid disturbing denning bears. Mitigating the impacts on bears is difficult when we don't understand how they select their dens.

In a recently completed seven-year project, PhD student Karine Pigeon identified where grizzly bears are likely to den and developed models for use in pipeline planning and land

management. Pigeon and fRI Research Grizzly Bear Program staff found that both male and female bears prefer high-elevation dry conifer stands with a lot of high-quality spring food. They also tend to den in areas with low road density.

The project was completed this year, and the models developed are being actively used on the ground by those involved in natural resource extraction activities.



Photo credit: Sylvie's Photography

## The Effect of Road Density on Grizzly Bears

One of the main reasons that grizzly bear populations have declined is related to unsustainable human-caused mortality rates that have been linked with the creation of roads for resource development—roads that provide human access to grizzly bear habitat.

This project attempted to determine the impact of roads on grizzly bear survival rates and reproductive rates.

In a major scientific paper published in 2014, the research team showed how certain age and sex groups of bears were impacted by roads and demonstrated that females

with very young cubs are the most heavily affected. They also determined threshold road densities that would help guide the stabilization of grizzly bear populations. This information will be used to inform the grizzly bear recovery plan that the Government of Alberta is currently preparing.

"This is another example of the fact that the work that we are doing is applied research and is being used by the people who manage and use the landscape," says Gordon Stenhouse, Grizzly Bear Program lead and a member of the Province's grizzly bear recovery planning team. "That, to me, is what our research activities are about."



Photo credit: Sylvie's Photography

**5** years after mountain pine beetle attack...  
What are the hydrologic and vegetation responses in lodgepole pine stands?

Testing the effectiveness of  
rehabilitation strategies

What will the forest look like in 20 or 50 years if we do this?

W  
W  
P

Projects of the Water Program ([wp.fRIresearch.ca](http://wp.fRIresearch.ca))





# Water and Mountain Pine Beetle

## Mountain Pine Beetle and Hydrology

In 2009, large plots of lodgepole pine stands were treated with herbicide to simulate 50% and 100% mountain pine beetle attack. The hydrologic and vegetation responses in small

clear-cuts and untreated control stands were monitored until 2012, providing data for understanding the before-attack and red-attack phases of stands. This past year, the stands were revisited to gain further information about the hydrologic and vegetation responses five years after an attack to understand the grey-attack changes.

Amy Goodbrand will start her PhD with Axel Anderson, Water Program lead, in September, working to combine this stand information with historical data on Tri-Creeks experimental watershed in a hydrological model platform. Her work is being done to gain understanding on how changing forest

conditions may impact Athabasca Rainbow Trout recruitment. This project is funded by the Forest Resource Improvement Association of Alberta (FRIAA) and the fRI Research Mountain Pine Beetle Ecology Program, and the information will be used to inform Alberta Agriculture and Forestry's Mountain Pine Beetle Rehabilitation Decision Support tool.

## Future Implications of Mountain Pine Beetle Rehabilitation Strategies

The Government of Alberta is investing \$10 million a year in rehabilitating stands targeted to improve forest condition for non-timber values. The Water Program has a FRIAA-funded

project designed to build on the collective information from fRI Research and elsewhere to help government understand the trade-off of using different rehabilitation strategies.

"We asked a simple question—what will the forest and associated values look like in 20 or 50 years under different objectives for rehab funding," says Axel Anderson, Water Program lead. "These are complex questions that we have been addressing in forest management plans, standard forest planning tools for decades, just not for rehabilitation. We are taking these tools with the new knowledge on how mountain pine beetle and stands affect ecosystem services to predict a future forest condition."

Last year, Patrick Asante started as post-doctoral fellow to lead the project. This year, Haitoa Li started assisting Asante part time while he does his PhD on tools for integrated roads network planning.



# Engaging the public to report caribou sightings through:

Email

Text

Phone

Website ([www.cariboupatrol.ca](http://www.cariboupatrol.ca))

Twitter

Instagram

Facebook

Caribou Patrol passports



# FLM

Project of the Foothills Landscape Management Forum ([flmf.fRlresearch.ca](http://flmf.fRlresearch.ca))

# Improving Response to Caribou Sightings

Each spring and fall, the A la Peche caribou herd crosses Highway 40 between Hinton and Grande Cache. For the past three years, the Caribou Patrol Program, run by the Aseniwuche Winewak Nation (AWN), has been working to reduce caribou mortality by warning

motorists when caribou are likely to be on the highway or busy industrial roads in the area. Now the program is striving to improve its ability to respond to caribou sightings.

“Although we have access to caribou collar data from collars deployed between 2002 and 2010, we don’t have that data for the past five years, and migration times may have changed during that time,” says Chantelle Bambrick, project lead with Foothills Landscape Management Forum (FLMF). “We’re collecting information to help us know when to expect the caribou so we can protect the public and the caribou from vehicle collisions.”

In 2014, the program engaged the public to report sightings by email, text, phone, website, Twitter, Instagram, or Facebook. When a sighting comes in, a crew is sent to the area to ask motorists to slow down.

Improving response time is providing new information about migration periods. Last spring, the public began reporting sightings at the end of April and continued until mid-May, with daily sightings occurring for about

three weeks. This year, there were three sightings in March, daily sightings throughout April, and continued sightings well into May, with multiple reports on the same day of different caribou crossing different areas of the highway. While one caribou was killed in a highway collision in 2014—the first fatality in the three years that the Caribou Patrol has been in operation—its remains are being used scientifically, and the AWN may receive some bone for traditional uses.

The Caribou Patrol is also collecting data about caribou with Caribou Patrol passports handed out at displays. In 2014, displays were set up at tourist and information centres in Hinton, Grande Cache, Grande Prairie, and William A. Switzer Provincial Park. They included information for the public on how to report caribou sightings, EduKits developed by the program, and passports that people can carry in their vehicles and use to record caribou sightings.

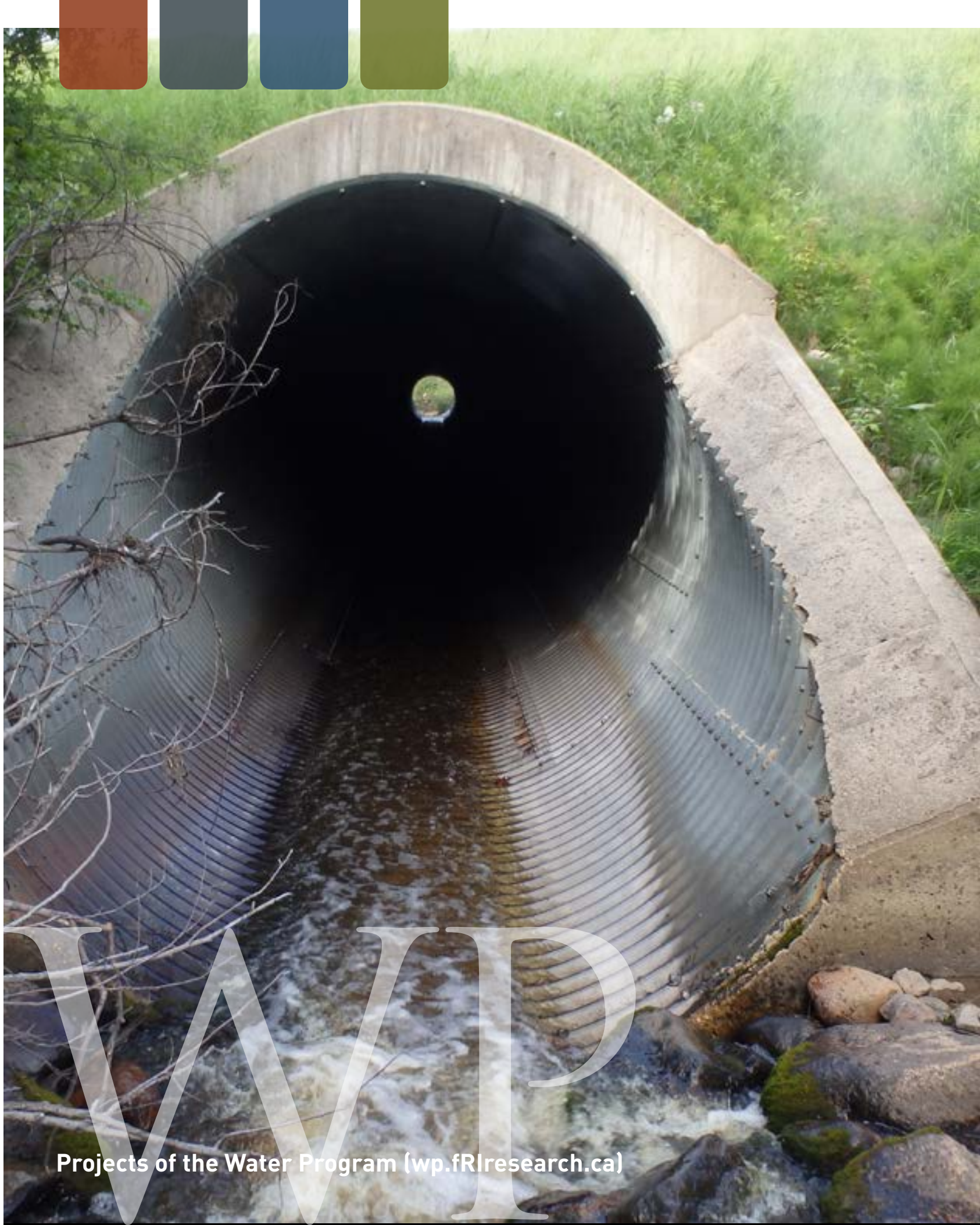
“The passports ask them for the information we want, such as date and location of sighting,



how many caribou were seen, and what they were doing. They send us the information, and I enter it into a database, and that goes back to the provincial and federal governments. It helps us plan future patrols and make the best use of our resources,” says Bambrick.

The Caribou Patrol was selected as one of three finalists for a prestigious Emerald Award, under the community group or not-for-profit organization category.





Projects of the Water Program ([wp.fRIresearch.ca](http://wp.fRIresearch.ca))

# Getting More Value from Knowledge

## State of Riparian Knowledge and Tools

What do we know about managing riparian areas in Alberta? To find out, the Government of Alberta's Forest Management branch funded a Water Program project to review the state

of knowledge for riparian management in the Alberta context, as well as to review neighbouring jurisdictions' policies, procedures, and tools, and make recommendations on current Alberta policies.

The project involves a large group of consultants led by a former fRI Research employee, Ryan MacDonald. As of June, the first two deliverables were expected to be submitted for publication in summer 2015.

"I am hopeful that the state of knowledge will be useful to practitioners and also help define research gaps," says Axel Anderson, Water Program lead.

## Capturing and Increasing Value in Long-Term Watershed Research Sites

Walt Jeffrey, who is considered the father of forest hydrology in Western Canada, died tragically in a helicopter crash at the peak of his early career. Since its inception,

the Water Program has been exploring ways to increase awareness of research sites and properly store valuable long-term datasets in a project referred to as the Walt Jeffrey Project, to honour the scientist.

"Long-term watershed research is expensive, but I think funding partners are possibly missing a substantial return on research investments," says Axel Anderson, who has been working on the project with PhD student Sheena Spencer. "For example, in the U.S. all the data are properly archived and freely available to anyone who wants it. This provides the ability to explore long-term trends and disentangle land-use signal from climate variability."

Just as important, having data freely available allows other researchers to challenge the findings and conclusions, sometimes decades later, when new techniques are available.

This year, Kalli Herlin and Jamie Hynes worked to acquire Tri-Creeks datasets from retired government staff. After a few failed attempts to archive data with private and academic platforms, the program partnered with John Diiwu, forest hydrology specialist at Alberta Agriculture and Forestry, and the Ministry of Environment and Parks database management group to load the data into WISKI, the enterprise data management platform the government uses for water and meteorological data. Its users include the groundwater network, flood forecasters, and

the wildfire meteorological network. The Water Program will work with Kevin Devito at the University of Alberta and John Pomeroy at the University of Saskatchewan on other more modern datasets in 2015–2016.

"In our case, some of the Tri-Creeks data are only left in binders, typed or handwritten. This dataset has the potential to be the backbone of Amy's thesis work," says Anderson. "If we put the effort to enter it into a digital format and archive it properly within the government database, my hope is that this data can also contribute to future science questions."

A publication summarizing all the long-term sites in Alberta dating back to the 1960s will soon be submitted to *The Forestry Chronicle* as a result of the Walt Jeffrey Project.



# Project List for the 2014–2015 Work Plan Year

The following activities and projects were undertaken by fRI Research programs and associations in 2014–2015.

## Programs

### Alberta Land-use Knowledge Network

- Development and support
- Technology infrastructure
- Knowledge resources
- Knowledge transfer
- Knowledge generation

### Caribou Program

- Predator and Prey Responses to Seismic Lines
- Direct and Indirect Responses of Caribou to Dynamic Forest Landscapes
- Assessing the Role of Grizzly Bear Predation on Caribou
- Analysis and Improvement of Linear Features to Increase Caribou Functional Habitat in West-Central and Northwestern Alberta
- Mountain Pine Beetle Management and Species at Risk: Assessing Trade-Offs in Food Supply for Caribou and Grizzly Bears

### Forest History Program

- Logging History of the Whirlpool Valley
- History Database
- The Last Patrol
- The Columbia Trail
- Northern Rockies EcoTour
- 25-Year History of fRI Research

### Geographic Information Systems Program

- fRI Research map: Spatial information/knowledge management
- Research publication: Willmore Wilderness Park project

### Grizzly Bear Program

- Determining the Importance of Grizzly Bear Predation on Southern Mountain Caribou Populations
- Alberta Innovates: Research to Support Recovery and Long-Term Conservation of Grizzly Bears in Alberta
- International Collaboration – Phase Three Grizzly Bear Health
- Citizen Science and Grizzly Bear Population Inventory
- Pembina Landscape Change
- Yellowhead DNA Inventory in Bear Management Area (BMA) 3
- Jasper National Park DNA Research

### Healthy Landscapes Program

- Foothills Fire, Water, and Climate
- Natural Patterns Short Course
- Natural Wildfire Patterns – Phase IV
- Historical Event Patterns
- NEPTUNE DSS
- OnFire Natural Disturbance Research Database
- LandWeb – Western Canada Boreal Landscape Dynamics
- Healthy Landscapes demonstrations

- Natural Wildfire Patterns – Phase V
- Al-Pac Healthy Landscapes pilot
- SW forest Healthy Landscapes demo
- Stony restoration pilot study

### Mountain Pine Beetle Ecology Program

- The Interaction of Prescribed Fire and Beetle Populations
- Cold Tolerance of Mountain Pine Beetle: Impact on Population Dynamics and Spread in Canada
- Development of Monitoring Tools
- TRIA-Net: Dynamics of Endemic Mountain Pine Beetle Populations in Novel Pine Habitats
- Stand Dynamics after Mountain Pine Beetle Attack
- Assessing the Effectiveness of Alberta's Forest Management Strategies against the Mountain Pine Beetle
- Impact of Mountain Pine Beetle on Hydrology and Vegetation in Lodgepole Pine Stands Following Grey Attack
- Beyond Beetle: Natural and Facilitated Lodgepole Pine Regeneration after Mountain Pine Beetle Outbreaks in Alberta
- Comparison of Understory Burning and MSP on Pine Regeneration

### Socio-economics Program

- Action on new social and economic research priorities

## Associations

### Water Program

Watershed Cumulative Effects Assessments for the Green Area – Groundwater / Surface Water Interaction in a Headwater Catchment in the Eastern Slopes: Implications for Hydrological Response of Forestry and Forest Disturbance

Data Management and Innovative Support for Long-Term Watershed Research: Walt Jeffrey

Fish Passage through Culverts as a Part of Addressing Cumulative Impacts on Fish Communities in Areas with Mountain Pine Beetle Infestation

Watershed Cumulative Effects Assessment for the Green Area – Understanding Groundwater / Surface Water Interactions for the Foothills Including in Cumulative Effects for Drinking Water Source Protection

Impact of MPB on Hydrology and Vegetation Redevelopment in Lodgepole Pine Stands Following Grey Attacks

Riparian Review: A Review of State of Science and OGR for the Ops Division of the Forest Management Branch

Tactical and Strategic Implications of MPB Rehabilitation Strategies on Alberta Forest Values

Canfor/FMB/FRIAA Erosion Project – Combining Field and LiDAR Modelling Tools to Move Beyond Indicator-Based Approaches for Surface Erosion: Simonette as a Test Area for the Foothills Natural Region

### Alberta Forest Growth Organization

Provincial Growth and Yield Initiative  
Strata Assignment Assessment  
Vision for Alberta Growth and Yield

### Foothills Growth and Yield Association

Regenerated lodgepole pine research  
Historic research trials  
Stand Dynamics after Mountain Pine Beetle Attack in Lodgepole Pine Stands

### Foothills Landscape Management Forum

Regional access development plans for all forest management agreement holders of FLMF  
Foothills Land Stewardship Project  
Aboriginal Participation in Caribou Recovery Strategies  
Reclamation plan implementation  
FLMF grizzly bear integrated access management  
Lineal disturbance assessment  
Study of physical barriers (manned gates) effectiveness  
Integrated land management plan and its linkage to ESRD land-use framework—subregional plans; Little Smoky / a la Peche caribou range plans and implementation

### Foothills Stream Crossing Partnership

Prioritizing watersheds  
Online mapping tool maintenance  
Inspections  
Enhancements of database  
Updating of manual

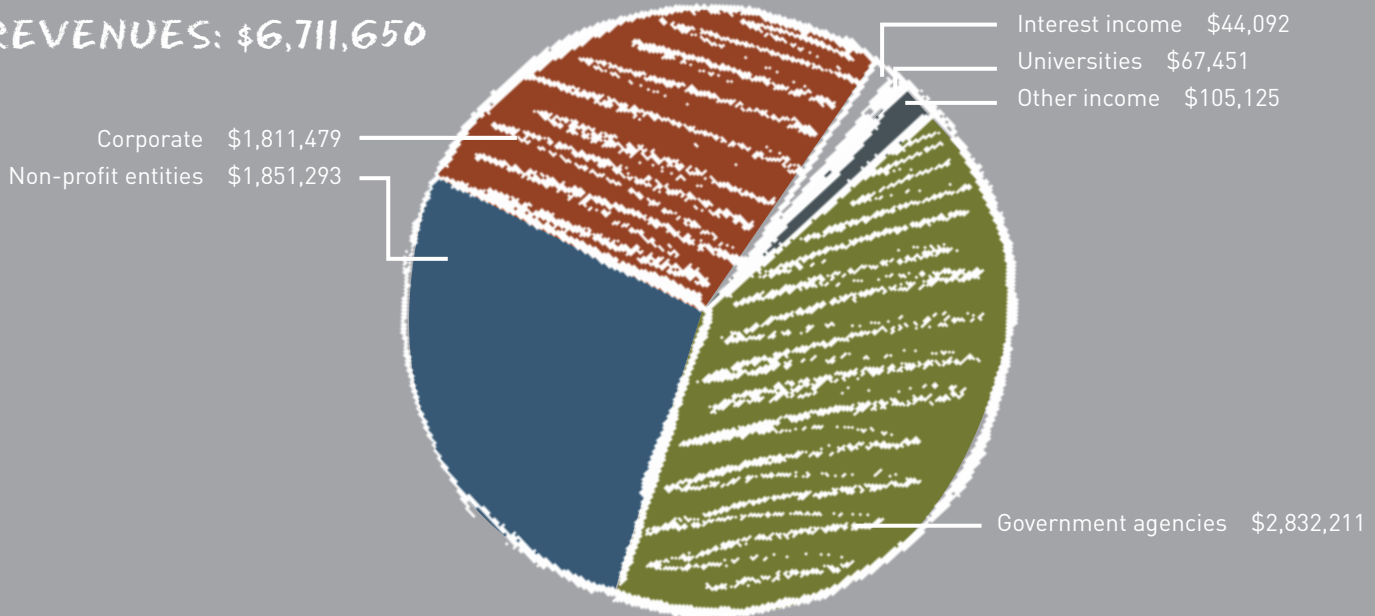
### Tree Improvement Alberta

Climate Change and Emissions Management Corporation (CCEMC)  
Tree Adaptation Risk Management Project

The Geographic Information Systems Program and the Communications and Extension Program provide support services to all programs and associations at fRI Research.

# Summary of Financial Statements

## REVENUES: \$6,711,650



## EXPENSES: \$6,807,238

### Support Services:

- Geographic Information Services Program \$209,074
- Communications and Extension Program \$261,543
- Administration Program \$215,801

### Other accounts:

- Capital fund \$8,028
- RRSP matching \$20,062

### Associations:

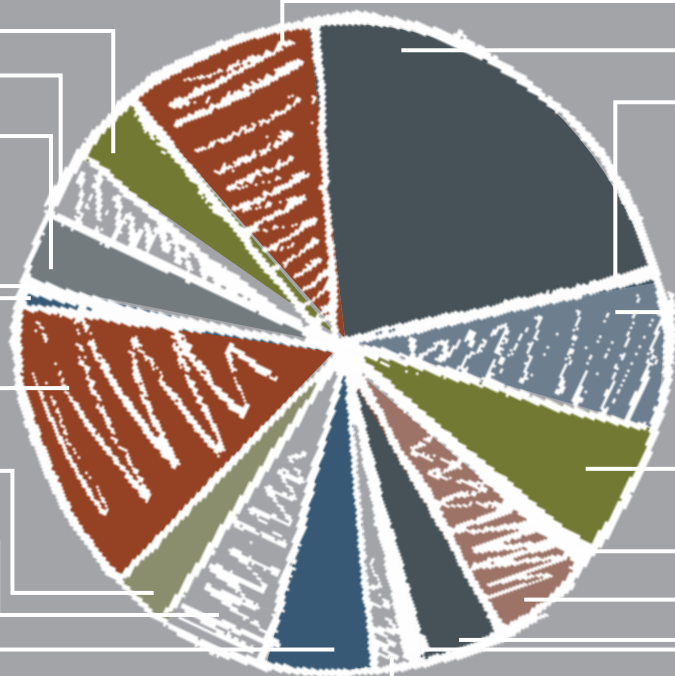
- Tree Improvement Alberta \$1,180,310
- Foothills Stream Crossing Partnership \$116,476
- Foothills Landscape Management Forum \$431,246
- Foothills Growth and Yield Association \$286,402
- Alberta Forest Growth Organization \$108,649

### Programs: Research Programs

- Caribou Program \$694,947
- Grizzly Bear Program \$1,637,634
- Harlequin Duck Program \$11,964
- Healthy Landscapes Program \$528,827
- Mountain Pine Beetle Ecology Program \$382,102
- Socio Economics Program \$9,037

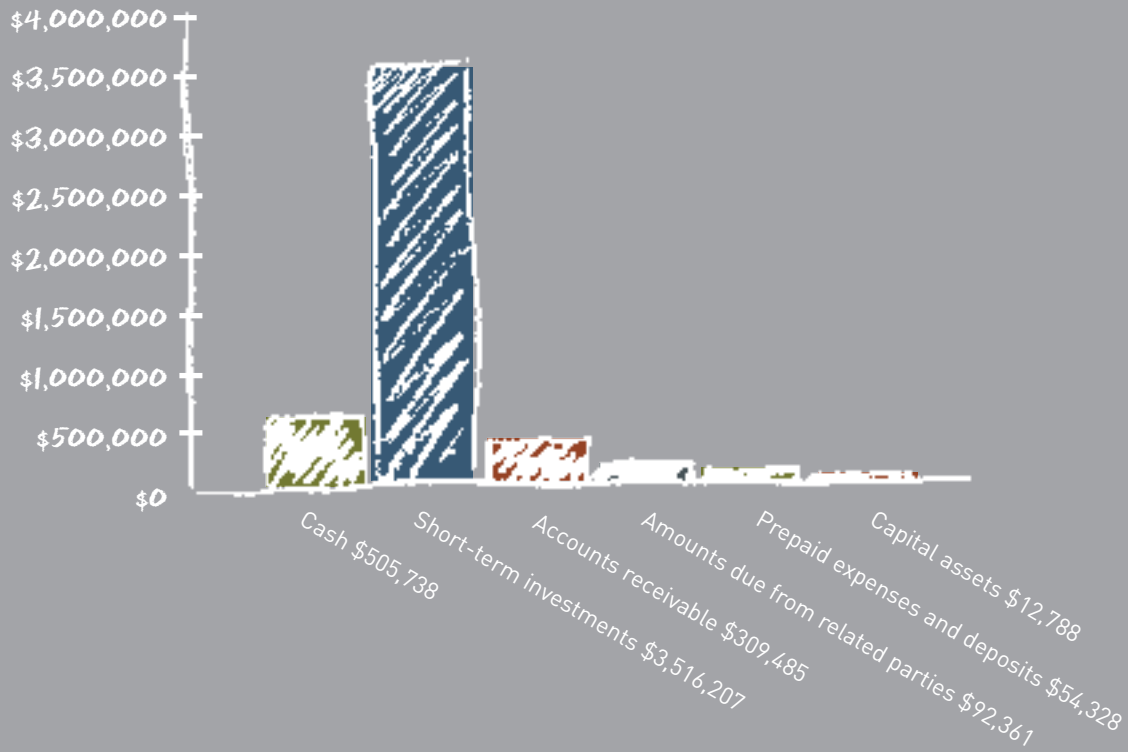
### Non-research Programs

- Alberta Land-use Knowledge Network \$276,131
- Forest History Program \$16,550

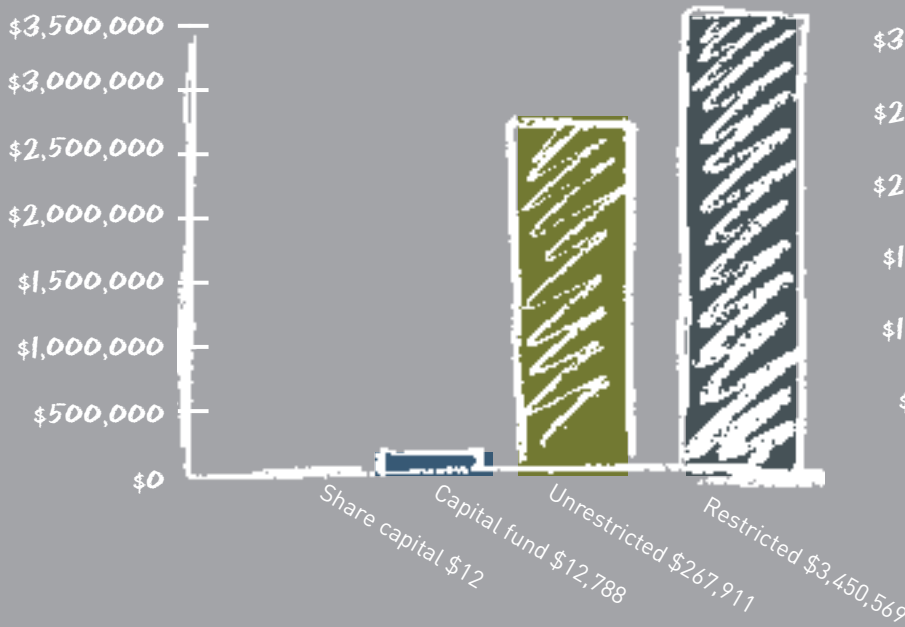




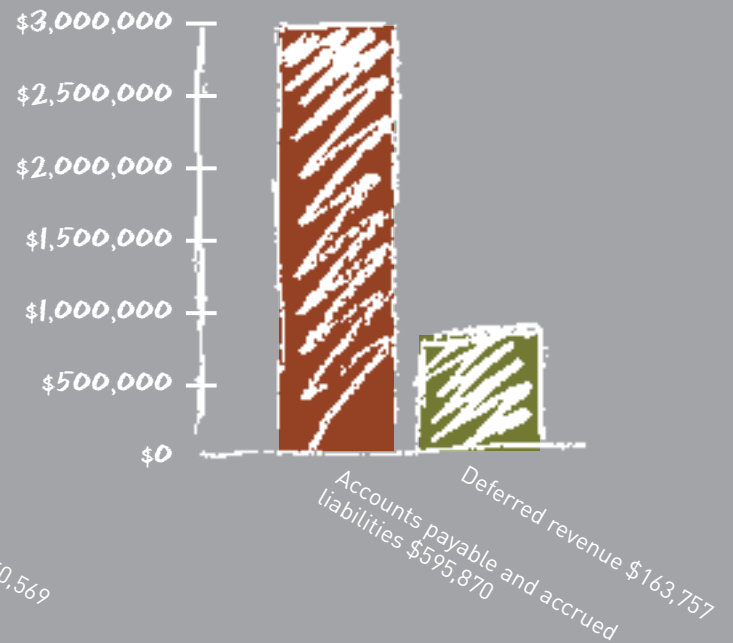
**ASSETS: \$4,490,907**



**FUND BALANCES: \$3,731,280**



**LIABILITIES: \$759,627**





## Board of Directors

2014–2015

**Rob Baron**,<sup>1</sup> General Manager –  
Hinton Wood Products, West Fraser Mills Ltd.

**Ron Borge**, Executive Director –  
Policy Division, Alberta Environment and  
Sustainable Resource Development

**Dr. Rick Bonar**, Chief Biologist –  
Hinton Wood Products, West Fraser Mills Ltd.

**Mark Cookson**,<sup>2</sup> Woodlands Manager –  
Blue Ridge Lumber Inc., West Fraser Mills Ltd.

**Wendy Crosina**,<sup>3</sup> Manager –  
Wildlife Ecology, Weyerhaeuser  
Company Limited

**Garth Davis**, Senior Coordinator –  
Land Management, ConocoPhillips Canada

**Steve Donelon**, Executive Director –  
Parks Program Coordination, Parks Division,  
Alberta Tourism, Parks and Recreation

**John Doornbos**, Manager –  
Operational Programs, Northern Forestry  
Centre, Canadian Forest Service, Natural  
Resources Canada

**Cory Enns**,<sup>4</sup> Director –  
Consultation and Land Claims,  
Aboriginal Relations

**Greg Fenton**, Superintendent –  
Jasper National Park, Parks Canada

**Earl Graham**,<sup>5</sup> Director –  
District 2, Alberta Association of Municipal  
Districts and Counties

**Ken Greenway**, Section Head –  
Forestry Policy Section, Policy Division,

Alberta Environment and Sustainable  
Resource Development

**Stan Holmes**, General Manager Alberta  
Timberlands – Weyerhaeuser Company Ltd.

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

**Jesse Kirillo**, External Relations –  
Talisman Energy Inc.

**Dr. Vic Liefvers**, Department Chair and  
Professor – Department of Renewable  
Resources, University of Alberta

**Roger Loberg**,<sup>6</sup> Timberlands Manager –  
Weyerhaeuser Company Ltd., Grande Prairie

**Bruce Mayer**, Assistant Deputy Minister –  
Forestry and Emergency Response Division,  
Alberta Environment and Sustainable  
Resource Development

**Rachelle McDonald**, Executive Director –  
Aseniwuche Winewak Nation

**Cole Pederson**,<sup>7</sup> Executive Director –  
Aboriginal Consultation,  
Alberta Aboriginal Relations

**Gordon Sanders**, Chief Forester, Alberta –  
West Fraser Mills Ltd.

**Darren Tapp**, Executive Director –  
Forest Management Branch, Forestry  
and Emergency Response Division,  
Alberta Environment and Sustainable  
Resource Development

**John Whaley**,<sup>8</sup> Director, District 3 –  
Pembina, Alberta Association of Municipal  
Districts and Counties

**Dr. John Wilmshurst**, Resource Conservation  
Manager – Jasper National Park of Canada,  
Parks Canada

## Foothills Research Institute Officers

2014–2015

**Rob Baron**,<sup>9</sup> Treasurer –  
fRI Research; General Manager – Hinton  
Wood Products, West Fraser Mills Ltd.

**Dr. Rick Bonar**, President and Chair –  
fRI Research; Chief Biologist – Hinton Wood  
Products, West Fraser Mills Ltd.

**Krista Boreen**,<sup>10</sup> Treasurer –  
fRI Research; Divisional Controller – Hinton  
Wood Products, West Fraser Mills Ltd.

**Garry Power**, Divisional Controller –  
Hinton Pulp, West Fraser Mills Ltd.

**Bill Tinge**, General Manager – fRI Research

After the 2014–2015 year, Alberta  
Environment and Sustainable Resource  
Development became Alberta Agriculture  
and Forestry and Alberta Environment and  
Parks; Alberta Tourism, Parks and Recreation  
became Alberta Environment and Parks.

1 Resigned June 2014

2 Appointed June 2014

3 Appointed June 2014

4 Appointed October 2014

5 Appointed February 2015

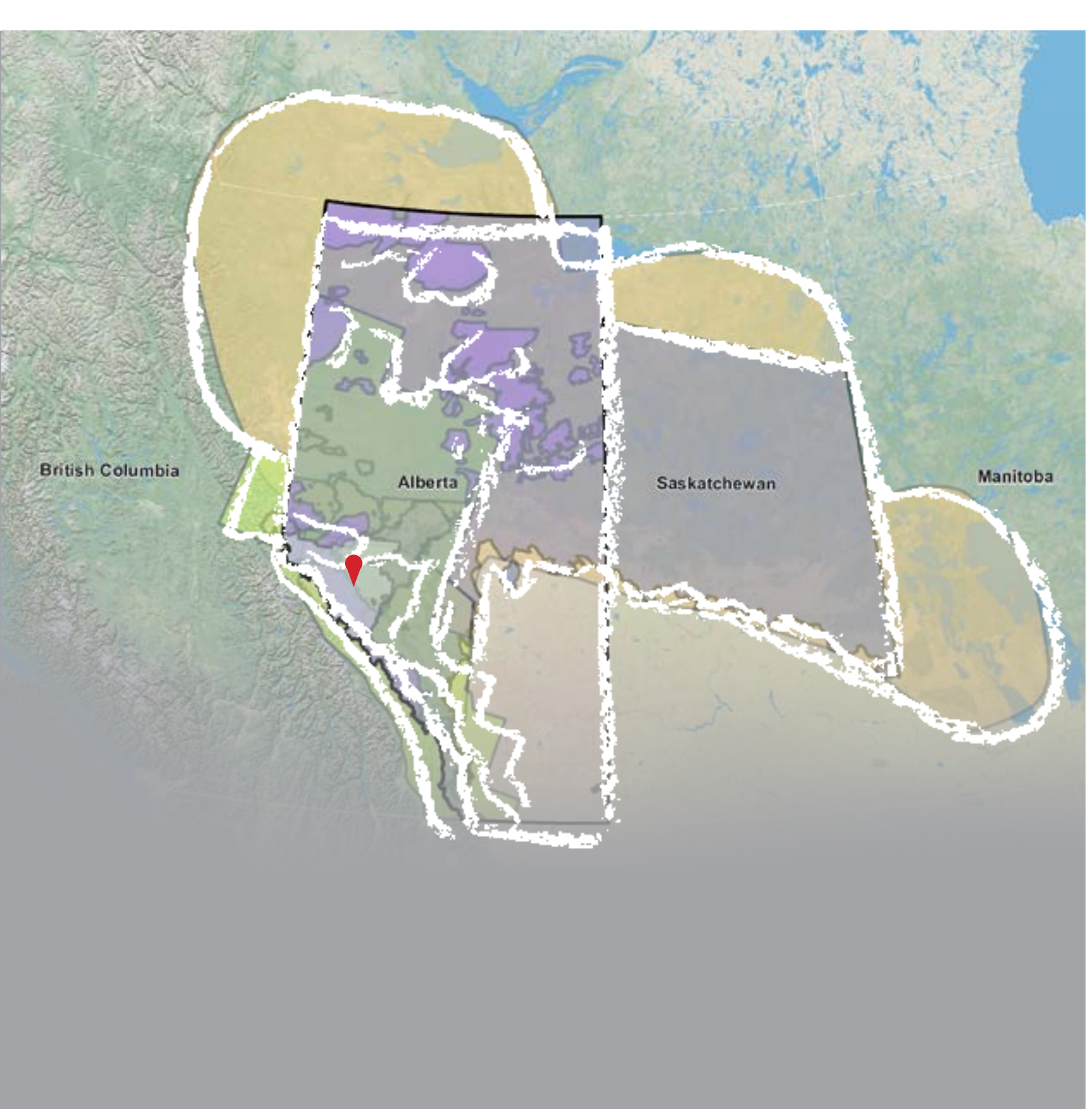
6 Resigned June 2014

7 Resigned October 2014

8 Resigned February 2015

9 Appointed June 2014

10 Resigned June 2014



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Informing Land & Resource Management



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Questions? Comments on this annual report?

**Please contact us at:**

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