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the newsletter of the foothills research institute

Beetle rearranges researchers' study plans

But highly-productive field season rated another success

This summer's sudden migration of Mountain Pine Beetle into new territory within Alberta obliged the Foothills Research Institute to juggle its field work priorities in at least a couple of program areas

Luckily, the weather was generally good and the season's work was completed.

Researchers identified and scheduled for measurement some permanent sample plots in newly-infested areas, and particularly where vegetation data had already been gathered prior to infestation. Analyzing the vegetation response over the next few years will help partners as they continue developing a decision support system for those responsible for a management response once an infestation occurs.

Both the Mountain Pine Beetle Ecology Program and Foothills Growth & Yield Association were actively involved in gathering data in newly infested areas.

For Fish and Watershed Program and Stream Crossing Program researchers, the 2009 field work saw the chance to apply some new tools and techniques. Grizzly Bear program researchers visited sites in the Kakwa to better understand the relationship between food sources and the bears' habitat use and selection.

The Stream Crossing Program

team helped coordinate and demonstrate the successful installation of a new system to re-establish fish passage. The "geotextile reinforced soil arch" could be used by partners to replace many culverts that need remediation work.

A common theme for field work conducted under the Natural Disturbance Program, the Foothills Land Management Forum and the Aboriginal Involvement Program was gathering data to support new directions in land use management.

Please read on for more details of this season's work!

New system helps match forestland operations to stream type

A new naming system for stream channels developed by Foothills Research Institute aims to improve on the current Ground Rules Watercourse Classification system. The new system was given a roadtest in the study area last spring when four participants gave it their thumbs up and encouraged its further development.

The new naming system classifies stream channels in six different categories based on assessment of eight different criteria, as compared to the current system that classifies channels simply on width and permanence of flow.

"We wanted to develop a more risk-based approach so that a land manager would be able to look at the stream class, look at some attributes of the adjacent hill slopes as well as the forest and then come up with a risk rating for how different harvesting practices could affect the basic ecological functions in that channel," says Fish and Watershed Program lead Rich McCleary.



A midnight swim in a foothills stream? See page 2

Stream Crossing group tackles ambitious program

Jerry Bauer, leader of the Stream Crossing Program, says this season's field work focused on preparatory work for four more watershed remediation projects, supervision of the installation of a new geotextile reinforced soil arch to replace a culvert that acted as a barrier to fish passage on Hardisty Creek near Hinton, and documenting the progress and results of two other watershed remediation projects already under way.

Research staff also conducted 15 stream crossing inspections for Imperial Oil — a new Foothills Research Institute member.

Bauer says a good start has been made on stream crossing remediation work within the study region, and the institute will continue to work with members to set priorities for future projects.



Intrepid snorkelers on the trail of Arctic Grayling

Hands-on way to find the fish

A new technique called night snorkeling was used successfully to estimate the number of Arctic Grayling in mid-size streams. Fish and Watershed Program lead Rich McCleary says night snorkeling is a new skill set for the Hinton-based researchers, and it's done in teams of three. Two researchers enter the water in dry suits, masks and snorkels, while one remains on shore for safety reasons. The snorkelers crawl up the smaller streams, shining bright lights into the water and counting the fish.

The reason this approach works so well is that fish don't hide under banks or logs to avoid predators during the night, as they do in the daytime. They swim in the open stream, making them easy "prey" for the snorkeling fish counters.

Arctic Grayling has been classified as a "sensitive" species in Alberta, and is susceptible to over fishing, disruptive stream barriers and sediment from runoff. The information gathered this season will help decision-makers with angling regulations, crossing restoration and ways to minimize road runoff in sensitive areas.

A new map-based software tool called NetMap was used to complement field work conducted as part of the annual Operational Fish Inventory program, which is aimed at confirming whether or not a stream is fish bearing.

"This tool allows us to automatically generate a profile of a stream so that we can see if the channel is too steep for fish," says McCleary. By combining field data with NetMap output and Alberta's new high resolution (LiDAR) digital elevation model, researchers will develop a new, more accurate fish habitat map layer for the region.

Kakwa grizzlies collared

The field season saw capture of seven new bears within the Kakwa study area, meeting the goal of keeping 10 radio-collared bears to track for the next two years. Important biological samples were also collected from each bear to increase the data available to understand and monitor grizzly bear health.

The focus of this capture effort is to continue the collection of detailed movement data and habitat use information for grizzly bears within an area which has been impacted by mountain pine beetle.

This year the team led by program lead Gordon Stenhouse also focused a great deal of effort on the collection of known bear foods (plants and berries) at each bear location visited. "When this food energy and quantity data is combined with the movement data from collared bears we will prepare energy budget equations which should allow us to understand the theoretical carrying capacity of the habitat within the area," Stenhouse says. "In our view this is a critical step in the recovery and long-term conservation of this species."



The much publicized flight of the Mountain Pine Beetle this past summer, into central and northern Alberta as well as north of Calgary, was a strong driver behind the Mountain Pine Beetle Ecology Program's field work season.

Program lead Don Podlubny says researchers are gathering data on what happens to an infested area's vegetation over a period of time without any trees being salvaged. This information will be compared to vegetation data gathered from these areas prior to infestation. The preliminary findings, expected next summer, will help with development of a decision support system for resource managers wanting to take the right approach in managing future infestation problems.

Progress was also made on determining the impact of various intensities of beetle attack on vegetation and sub-surface hydrology. Researchers have simulated the effects of a severe beetle infestation on a site 60 km east of Hinton. They will track outcomes and then hold workshops with institute partners to share findings. Very little information currently exists in this particular area of study for the eastern slopes region of Alberta.

New focus for pine trials

The unexpected inflight of Mountain Pine Beetle this summer led to an expansion of Foothills Growth and Yield Association's pine beetle research project trials.

The association has been working with the Mountain Pine Beetle Ecology Program to measure the impact of beetle infestations in these new locations. The purpose, says association manager Bob Udell, is to monitor the impact of pine beetle damage on pine and other vegetation, and develop decision support tools to inform post-impact salvage and reforestation strategies.

On another front, association researcher Dick Dempster is this fall analyzing the eight-year results on 408 long-term regenerated lodgepole pine plots across Alberta. He is examining site responses and implications of various reforestation techniques including vegetation control and thinning. In addition, he has discovered significant climate change impacts on the survival and growth of regenerated lodgepole pine.





Legwork has started on the Lineal Inventory of the Little Smoky Caribou Range, a priority project under the direction of the Foothills Landscape Management Forum.

Vegetation on lineal disturbances quantified

Staff at Greenlink Forestry spent the summer interpreting aerial photos to identify and classify all lineal disturbances within the Berland Smoky planning area.

“We know a lot of historical seismic lines have occurred in the area, which some

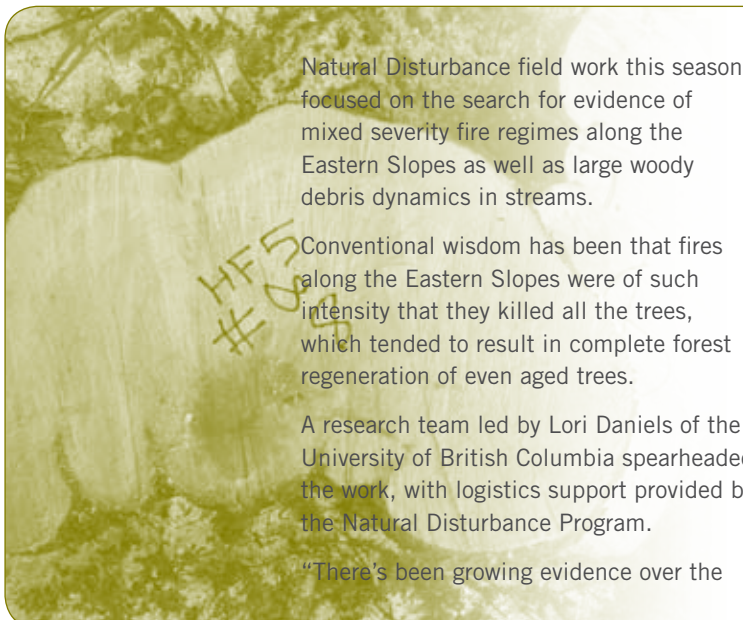
experts suggest have contributed to a decline in caribou” says the forum’s managing director, Wayne Thorp. “The problem is that current habitat models don’t factor in a natural vegetation recovery rate until after 70 years. This project will provide us with valuable information to develop restoration projects, update habitat models, and develop research projects specific to lineal disturbances and their potential effects on other values.”

Aboriginal Involvement work marks milestones

A couple of important milestones have been achieved under the Aboriginal Involvement Program. One was completion of the electronic protection technology that delineates traditional Aboriginal use sites that can be layered into development plans.

Program lead Brad Young says the technology includes a referral process that gives industry and government a way to refer development proposals to Aboriginal communities likely to be affected. It’s a way to learn what buffering or avoidance measures are needed to preserve important spiritual and cultural sites.

The first phase of field work was also completed this summer within an area near Hinton by Foothills-Ojibway and Bighorn-Chiniki representatives. They conducted traditional use studies to identify treaty and aboriginal sites, ceremonial sites and sites of cultural importance in terms of the community’s oral history.



Natural Disturbance field work this season focused on the search for evidence of mixed severity fire regimes along the Eastern Slopes as well as large woody debris dynamics in streams.

Conventional wisdom has been that fires along the Eastern Slopes were of such intensity that they killed all the trees, which tended to result in complete forest regeneration of even aged trees.

A research team led by Lori Daniels of the University of British Columbia spearheaded the work, with logistics support provided by the Natural Disturbance Program.

“There’s been growing evidence over the

past decade or so in Southern Alberta that there’s been a higher prevalence of lower severity fires than we originally suspected,” says Chris Stockdale, project coordinator for the Natural Disturbance Program.

Researchers spent part of the past season looking for evidence of trees that have survived through multiple, low intensity fires and, “we were surprised at how many multiple fire scars we found out there in the landscape,” says Stockdale. “If that is the case, it shows that disturbances in the past and perhaps in the future might be better served by having some mixture of high intensity and low intensity disturbances on the landscape, and not just high intensity alone.”

The Foothills Landscape Management Forum and the Alberta government worked this summer to take the Berland Smoky Integrated Industrial Access Plan to a whole new level.

It's a year since the plan was proposed to the government as a way of advancing Integrated Land Management and further reducing the industrial footprint in this high-use area. The plan comes out of a partnership between Foothills Research Institute, timber and energy companies, Alberta Sustainable Resource Development and Alberta Energy.

New access plan in the works

Next step is development of a Regional Access Development Plan for the area that will guide primary and secondary road access and anticipate future development needs, mitigation strategies and a stewardship reporting system.

This past summer, the partners began the process of developing terms of reference for a secondary road plan that will include a review of mitigation practices and approval processes – the first of its kind in Alberta. Overall, says forum managing director Wayne Thorp, the objectives of this year's project are to validate the original primary access corridors identified in the 2008 plan, rationalize the need for secondary roads coming off primary corridors in future, identify whether the planned roads are required as permanent or temporary access, align pipeline routing and develop mitigation strategies.

The new plan will not consider seasonal roads, those in use for less than two years, or in-block roads and access to wellheads.



Arch replaces culvert, saves fish and dollars

Foothills Research Institute and a number of industry and government partners worked together to install a geotextile-reinforced-soil arch to re-establish fish passage on Hardisty Creek near Hinton. Previously a culvert had been acting as a barrier to fish passage.

Not only does this type of stream crossing maintain the natural stream bed so that fish passage is not an issue, but its installation is also substantially cheaper than a bridge or traditional open-bottom arch supported by concrete footings.

Rather than the cost of having to transport concrete to the location for footings, the system uses local materials in steel mesh baskets, which are then stacked on

geotextile as the support structure for the open-bottom arch.

"It is a lot more economical to do it this way," says Stream Crossing Program lead Jerry Bauer. "We think this crossing has the potential to replace a lot of culverts where previously we thought we'd have to put in bridges."

Fisheries and Oceans Canada and West Fraser Mills Ltd funded the project. Institute biologist Ngaio Baril coordinated the gathering of materials, work schedules and public tours of this high-profile project 6.6 km south of Hinton along Robb Road.

Other partners included FPInnovations, Trout Unlimited Canada, Hinton Fish Habitat Coalition, Hardisty Creek Restoration Project, Hinton Fish and Game Association and TerraTech Consulting.

News and Events

Natural Disturbance Info Session

The Natural Disturbance Program of the Foothills Research Institute invites you to attend a three-day conference on the latest results, events and future direction of this partner-driven program, December 9- 11, 2009 at the Coast Edmonton Plaza Hotel. There will be demonstrations of the latest decision support tools in natural landscape patterns, talks on the latest research in healthy landscapes, riparian disturbance dynamics, large woody debris and fire regimes, and information about professional development courses. Material will be presented from industry, academic and government perspectives. http://foothillsresearchinstitute.ca/pages/Education_Events/Education_EventsInformation_Sessions.aspx

FRI-Days Speaker Series

The FRI-Day Brown Bag Lunch Speaker series continues with a presentation on our Mountain Pine Beetle Ecology Program on Friday November 20, 2009, at the Hinton Training Centre. Bring a friend and your lunch and learn about new research into the effects of mountain pine beetle infestation in the foothills and mountain areas of Alberta.

For future FRI-Day events in 2010, look for presentations on how our partners are using the information, tools and products being generated out of the many FRI research programs and projects.



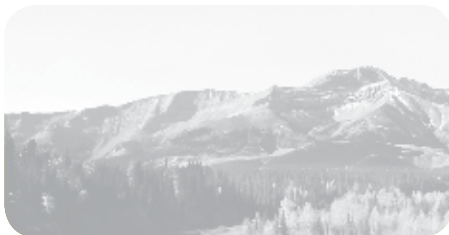
Natural Disturbance Short Course

The recent fourth offering of the Natural Disturbance Approach to Landscape Management Course drew participants from a variety of organizations. We had a unique mixture of people from sectors such as forestry, forest health, land use, oil and gas, parks ecology and landscape architecture, all bringing a broad range of experience to the discussions. Today's evolving policy and economic backdrop also helped make this a unique version of the course, with extensive discussion on collaboration between forestry and energy, and the influence of mountain pine beetle on planning and decision making.

Land and Resource Planning for Grizzly Bears Course

A course set for December 8, 2009, is designed for strategic and operational planners in forestry and energy, and regulatory, GIS and environmental specialists required to interpret habitats during the land use-planning phase with grizzly bear conservation in mind. Learn about grizzly bears' use and selection of habitat, habitat mapping using satellite imagery, and the new GIS-based planning tools now available. Using the Foothills Research Institute grizzly bear habitat modeling software, the class will review two scenarios, analyzing and interpreting the data in order to develop land management plans that minimize impacts on grizzly bear populations. For more information and to register go to [-http://foothillsresearchinstitute.ca/pages/Education_Events/GB_Short_Course.aspx](http://foothillsresearchinstitute.ca/pages/Education_Events/GB_Short_Course.aspx)

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The Foothills Research Institute core landbase is located in west-central Alberta, and is based in the resource community of Hinton, some three hours west of Edmonton. It covers roughly 2.75 million hectares (27,500 square kilometres), and embodies Jasper National Park of Canada, Willmore Wilderness Park, William A. Switzer Provincial Park and the Forest Management Area of Hinton Wood Products, A division of West Fraser Mills Ltd. It also includes some provincial "crown forest management units" and the Hinton Training Centre's Cache Percotte Training Forest. Within its boundaries are three forest areas – boreal, montane, and sub-alpine – and many forest uses including timber, petroleum, and coal extraction, tourism, and recreation.