



Bugs & Diseases

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Workshop on aerial overview survey of other forest health damaging agents

Usually, the Forest Health Section of Alberta Environment and Sustainable Resource Development (ESRD) carries out aerial overview surveys of damage caused by major conifer and aspen defoliators, and the mountain pine beetle. In view of anticipated changes in forests and forest pests due to climate change, we decided to expand these traditional forest health surveys to include other forest health damaging agents. Such damaging agents would include other bark beetles, major forest diseases, animals and abiotic damaging agents like drought, hail, and windstorms. The objectives of this workshop were to standardize aerial overview surveys in Alberta, and to maintain a long-term record of these damaging agents in relation to changes associated with climate change that may occur in forests and forest pests in Alberta.

The three-day workshop was held in June 2012 in Grande Prairie. It was composed of a classroom session and an aerial survey session. The classroom session covered details on how to recognize, monitor and assess forest damaging agents from the air. The aerial survey session provided an opportunity to learn about how to put knowledge gained in the classroom lessons into practice.

This training program was attended by 18 ESRD trainees with varying levels of experience ranging from veteran surveyors to rookies who have never carried out aerial surveys. This workshop was well received by the trainees who raised many questions that generated fruitful discussions. The rookie trainees benefitted most by the limited aerial overview survey practice session.



Alberta's eye on forest health

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Sunil Ranasinghe—Edmonton

New status for Whitebark Pine

Whitebark and limber pine were both designated as Endangered in Alberta under the *Wildlife Act* on September 9, 2009. The listing was based on the on-going and projected decline of both species due to the introduced white pine blister rust and native mountain pine beetle epidemic. A provincial recovery plan for both species is in progress and there are various conservation activities occurring among agencies, managers, researchers and citizens across the species' range in Alberta.

On June 20, 2012, whitebark pine was added as Endangered to Schedule 1 of the federal *Species at Risk Act*. The development of a federal recovery strategy, led by the Canadian Wildlife Service in Vancouver and in collaboration with Parks Canada, will be initiated. Federal planning will be in coordination with Alberta and British Columbia.

It is anticipated that limber pine will be nominated to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for Endangered listing in the foreseeable future.



Whitebark decline in a mixed stand—
Southern Rockies area.

Limber decline on a ridge—
Southern Rockies area.



Brad Jones—Southern Rockies

Collaborative forest health monitoring

It has long been the philosophy of the forest health team that creating mutually beneficial partnerships and relationships with people outside of our department is better than working in isolation. We try to model ourselves after the many mutualistic relationships found in the world (e.g. the honey bee and the flower, the ant and the aphid, Hall and Oates) that are all more successful when working together.

Two recent examples of collaborative forest health monitoring projects are CIPHA (Climate Impacts on the Productivity and Health of Aspen) with the Canadian Forest Service, and with the Wood Buffalo Environmental Association's (WBEA) Terrestrial Environmental Effects Monitoring (TEEM) Project.

The CIPHA project was initiated in 2000 when Dr. Ted Hogg of the Canadian Forest Service set out to determine, in part, the most important factors affecting aspen growth, dieback, and mortality in the west-central Canadian interior. Over the past 12 years of monitoring the 30 study sites (nine located in Alberta), it has been concluded that mortality and dieback are best correlated with drought severity. Considering that CIPHA and other studies have shown aspen forests to be moisture-limited, climate change predictions are very relevant in estimating the future range of this species.



WBEA is a multi-stakeholder, not for profit organization conducting air quality and terrestrial ecosystem



monitoring to help assess the effects of emissions related to oil sands industrial activity on surrounding landscapes. One of the most likely impacts of industrial pollutants could be the predisposition of trees to harm from various damaging agents such as drought, insects, and diseases. The TEEM program collects samples, measurements, and other data from a network of Jack Pine sites primarily located in northeastern Alberta. For the past two seasons ESRD Forest Health staff have assisted these efforts by conducting annual Forest

Condition Assessments at these sites. These surveys track forest pest incidence/severity which may indicate if these stands are (or are not) being stressed by industrial pollutants.

With both of these projects, our forest health staff has contributed professional field expertise in tree health assessments, identifying forest insects and diseases, and forest mensuration. In return, we will have access to data and expert analysis that will help guide ESRD's Forest Health program in the future. Such collaborative efforts are genuinely beneficial and, as mentioned earlier, will make our programs more successful.

Mike Undershultz—HQ and Tom Hutchison—Athabasca

Invasive plant management: working towards a bigger & better program

Invasive Plant Management is quite possibly the most challenging yet underappreciated aspects of land and resource management programs. Both from management and regulatory perspectives the problems related to invasive plants can be thoroughly vexing. ESRD's Forest Health Section has struggled to find a way to make its invasive plant management program more effective, efficient, relevant, cohesive, and inclusive of all provincially managed public lands throughout the province. Over the years, various areas have run their own programs and undertaken a lot of invasive plant management initiatives. Some of these have worked well, and some have not. Toward this end, the Forest Health team has assigned a policy intern to this task – Naomi Jehlicka. Here are her thoughts:

As a participant in the Alberta Policy Internship program, I joined Dan Lux's Forest Health crew to examine ESRD's invasive species program. By the end of the project I will develop program scenarios that can be implemented to increase effectiveness and efficiency while decrease redundancy.

A thorough examination into the current situation is needed before proposing changes, so for the past few months I have been undertaking the following research projects:

The first step is determining the current situation, (i.e. how invasive species management is happening within the different ESRD branches, what is working, what is not working, past reform efforts and the degree of their success).

The second step is completing a legislative scan of Provincial and federal legislation, regulations and policy directives to determine any legislative or regulatory gaps.

The third step is completing a jurisdictional summary of how other Canadian provinces and territories are managing their invasive species programs to identify best practices to import. Ontario, British Columbia, and to a lesser extent, Manitoba, have recently released new strategic visions with respect to IAS management and have been generous in sharing their successes and failures with us.

Finally, after the evidence is gathered, form strategies in consultation with ESRD staff and proceed with making a formal change request.

The work is challenging and exciting. People have been great in helping me wander through the labyrinth that is invasive species management and I am looking forward to how the project will roll out.

Invasive species and the future will bring increasing and more diverse issues to deal with. Forest Health aims to build a broader program to effectively manage them.



Browse study resurrection

Once upon a time (2001) a deer lived in the forest...shocking I know! He was a hungry little deer. One day while wandering through the forest, he came across a freshly planted cutblock (belonging to Rocky Wood Preservers managed by none other than Paul King). Interesting, he thought, as he tasted the first of many succulent pine and aspen shoots. So was created the “Study to Determine the Impact of Browsing on Height, DBH and Form of Pine and Aspen in the Parkland, Bow and Prairie Forest Regions”.



Initiated in 2001 by then the Forest Health Officer Dan Lux, the study was aimed at determining impacts of single-year and multiple-year browsing on pine and aspen height, diameter and form as the tree ages and the impact of browsed trees on regeneration surveys. Objectives included; initial measurements, followed by re-measurements at set intervals with a focus on developing guidelines around the acceptability of browsed trees in regeneration standards and gathering of information to aid industry in determining impacts of browsing on future wood supply and what the thresholds might be.

The study area, a Rocky Wood Preservers cutblock located west of Rocky Mountain House, included the construction of a fenced off area 180m x 180m with an eight foot high fence to keep ungulates from accessing the study area. Inside the larger fenced off area, a paired plot design was used, designed to capture 25 trees per plot. Simulated browsing was conducted on the terminal bud (or dominant lateral after year one) after one year, two consecutive years and three consecutive years.

To get started, the Junior Forest Ranger (JFR) crews were put hard to work collecting the field data and carrying out the simulated browsing. It was about this time when mountain pine beetle which had already infiltrated the province really started to become a priority and the poor deer and its related browse study were put on the backburner.



A phone call between Dan Lux and myself is all it took to get things rolling and the next thing we knew, we were walking in the very block Dan had walked 11 years ago, where it all began. Paul King, Dan Lux and I revisited the cutblock this past July and the trees seem to be doing very well.



The next steps will include repeating the measurement protocol for a final set of measurements possibly followed by an analysis of the data to determine the results of the study. Stay tuned!

Kris Heemeryck—Clearwater

Mountain pine beetle workshop In Whitehorse, Yukon

The range of mountain pine beetle has expanded significantly over the past five years. Due to warmer than normal winters, populations have been able to spread and survive farther north than ever before. Currently there is a population within 80 kilometers of the British Columbia/Yukon Territory border.

Yukon Territory has begun a Pest Risk Analysis that will identify the risk of spread into the forests of Yukon, values at risk, and potential responses. A two-day workshop held on June 19 and 20 was held to provide information to stakeholders and a forum to identify their views on mountain pine beetle management and potential values at risk. The Senior Forest Health Officer for ESRD spoke at the workshop. Information on the history of beetle populations in Alberta, current status and management strategies was given. Alberta's values at risk, objectives of the program, and partnerships were highlighted.

The workshop was an excellent opportunity to showcase Alberta's integrated approach to beetle management and provide valuable information to other jurisdictions on what is needed in a comprehensive program. The information was well received and prompted questions on various monitoring techniques, control options, and program development and much discussion. Participants at the workshop came away with a much better understanding of the potential impacts of mountain pine beetle and what can be done to mitigate these impacts. As the Yukon continues with the Pest Risk Assessment, ESRD has committed to providing assistance in this important project.



Image Source Page: <http://www.yukon-news.com/news/13318/>

Erica Samis—Edmonton

How many spruce budworm larvae can you find?

This summer the Forest Health Section collaborated with the University of Alberta on a project that aims to provide understanding of the genetic basis for the distribution of spruce budworm species and their associations with host tree species. Three graduate students from Dr. Sperling's lab and I travelled through the forested area of Alberta training local forest health staff to collect larvae from spruce, fir and Douglas fir trees. Approximately 50 sites were sampled across Alberta. By the end of the summer all forest health staff were proficient at beating the branches of small spruce trees or using pole pruners to clip branches from the mid crown where larvae are more abundant. The shoots of the branches were carefully inspected for larvae, some of which are so tiny in the earlier instars that they are easily missed, unless you know what you're looking for. Fresh foliage was collected from the host trees to rear the larvae to adulthood at which point their DNA will be extracted. Adults caught in pheromone traps will also be used for the study. Extra foliage may be used in future analysis of the genetic structure of the host population.

This research will help determine the extent and risk of expansion of spruce budworm hybrid populations in Alberta. In Alberta five budworm species have been recorded: *Choristoneura fumiferana* and *C. biennis* feeding on spruce and fir, *C. occidentalis* on spruce and Douglas fir and *C. pinus* and *C. lambertiana* feeding on pine. Where their ranges overlap in transitional regions between major forest types, budworms could hybridize and produce offspring with a combination of characteristics that enables them to expand in habitat that was previously not accessible to their parent species. This study aims at determining the genetic structure of the budworm populations and the degree of gene flow between species. It will also evaluate the roles of landscape characteristics and genomic variation in determining the susceptibility of spruce and fir trees to damage by SBW larvae.

Many thanks to all who made this summer project possible! All forest areas provided outstanding support from logistical planning, pleading for using a man-up helicopter from wildfire operations, to making staff available and at times drawing upon staff from other sections, despite the rain flowing down the pole pruners into their sleeves and down their backs. Staff did a great job packaging the larvae in coolers with ice packs and shipping them to the lab at the University or delivering them in person. Thank you for your outstanding contribution to our innovative provincial spruce budworm program!



Anina Hundsdorfer—Edmonton

Weeds are everywhere

(sang to the tune of Hank Snow's "I've Been Everywhere")

I got out of a chopper, way out in the wilderness
Takin' in the scenery, thinkin' it's so pristine – I guess
Then what's that there I spy, stickin' up from the ground?
A stinkin' Common tansy and crap, it's all around.

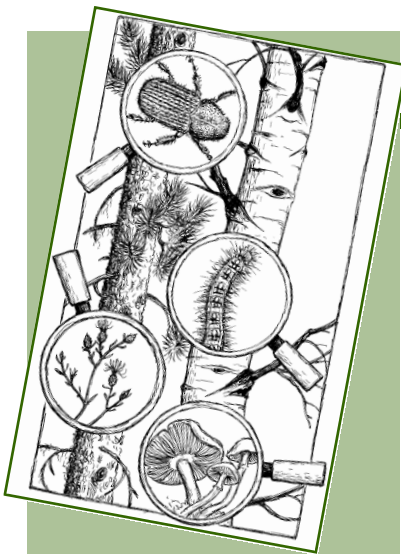
Is there no place I can go to, to get away from weeds,
No place that's protected from their dirty, rotten seeds?

Weeds are everywhere, man
Weeds are everywhere, man
We all have got our share, man
Poppin' up here and there, man
We really need to care, man
Weeds are everywhere

There's chamomile, salt cedar, bellflower, ox-eye daisy, woolly
burdock, loosestrife, garlic mustard, common tansy,
Clematis, knapweed, knotweed, bindweed, blueweed, cinquefoil,
milfoil, tamarisk, buttercup
Nodding thistle, sow thistle, marsh thistle - holy cow, I give up!

Weeds are everywhere, man
Weeds are everywhere, man
But don't fall into despair, man
We just really need to care, man
And do our proper share, man
Weeds are everywhere!

Tom Hutchison—Athabasca



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