



Bugs & Diseases

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Alberta's eye on forest health

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Forest tent caterpillars run amok in the northeast

Many people living in north-eastern Alberta witnessed one of the wonders of the boreal forest last spring — a full fledged forest tent caterpillar (FTC) outbreak. Of course, if one's house, yard, and

“... Populations will remain very high in most areas that were defoliated last season,”

trees were covered with caterpillars, describing it as a “wonder” may have been difficult. However, when considering the scale of the outbreak, it truly was amazing.

In 2007, FTC larvae defoliated over one million gross hectares of deciduous forests in the Waterways and Lac La Biche areas. Much of the defoliation was so severe that it created a “winter-like,” leafless landscape. The number of caterpillars it must have taken to accomplish this is truly mind boggling.

According to University of Alberta professor Dr. Jens Roland, during an outbreak the amount of biomass of FTC larvae can be 821 kg/hectare (the equivalent of about 6.5 caribou/hectare).

If one extends this to encompass the entire area defoliated last spring, the conclusion would have to be, “wow, that’s a lot of caterpillars!”

FTC outbreaks occur periodically in boreal ecosystems, sometimes covering vast areas in a very short period of time. A single egg mass contains around 175 eggs. Given favourable conditions, a large proportion of these eggs (approximately 60%) can hatch out the following spring. Assuming that this exponential growth is unopposed by external factors (climatic conditions, natural enemies, etc.) one female moth can give rise to almost one hundred million moths in just four years. If they all survived to reproduce, it



Forest tent caterpillar larvae blanket the exterior of a Fort McMurray home in the spring of 2007.

would be closer to one billion moths. This explains how the area defoliated in the north-east has gone from around 5,000 gross hectares in 2004 to over one million gross hectares in 2007.

Egg mass surveys completed by SRD staff and the Municipal District of Wood Buffalo predict that in 2008, populations will remain very high in most areas that were defoliated last season. FTC populations around Fort McMurray and surrounding areas will lead to masses of caterpillars and severe defoliation

once again next year. Populations south of the same latitude as Christina Lake/Conklin can take comfort in the fact that egg mass data does not indicate any risk of outbreak populations there for the coming season.

For those in Fort McMurray, remember to take into account the wonder of the event. The good news is that FTC outbreaks often crash more rapidly than they arise, and may not occur again for some time.

Tom Hutchison

Team beetle holds pre-season training camp

In August, Forest Health Staff from across Alberta met in Grande Cache and Grande Prairie for the start-up of our operational year. During two days of field meetings, we were briefed on current science and state-of-the-art control techniques.

After the group was flown by helicopter into the Willmore Wilderness Park, we were briefed on the population forecast for 2007 and mountain pine beetle (MPB) biology. Canadian Forest Service representatives then conducted a question and answer session. I had a chance to ask a couple of questions.

First question: Will current attacked trees fade in the first year or second year in a two-year life cycle? The answer was that strip-attacked trees may not fade until the second year. Yet, mass-attack trees will fade in the first year.

Second question: Could parasitic insects be used as means of bio-control? The answer is no. Insects, such as wasps, only parasitize approximately 10-15 per cent of MPB and therefore are not feasible in an epidemic situation. Additionally, MPB use frass (a mixture of beetle excrement and boring dust) to block their galleries, creating a self-defence mechanism, thus reducing the opportunity for parasites to attack.

As long as long as MPB is an issue in Alberta there will be efforts to advance science and technology to support management.

Warren Oates



MPB crew taking samples with a gas drill and hole saw to forecast the beetle population in the area.

White cockle — the new invader of the north

Slowly ... steadily ... and successfully?

White cockle (*Lychnis alba*) is gradually trying to expand its territory further into north-eastern Alberta.

White cockle is either a biennial or a short-lived perennial of European descent. It is a prolific seed producer and a fairly common noxious weed in agricultural areas. Little is documented on its viability in natural ecosystems within North America. Although, its native range does include Finland, north of 60 degrees.

Until recently infestations found within the Lac La Biche Area have been limited to the white zone north of Bonnyville and on private land in the Chisholm area. Over the past few years, however, a few small infestations of white cockle have been found in various out-

of-the-way locations in the green zone.

Finding these plants always seems to be a surprise. One can search for what seems like an eternity, and then out of nowhere a single plant or a group of plants suddenly appear.

“.. A few small infestations have been found in various out-of-the-way locations in the green zone.”

These minor infestations are easily controlled. All it takes is one minute of careful digging (to ensure you get all the roots) and into the

garbage bag they go.

Historically, white cockle has rarely been noted up north in the Waterways Area. This past summer, though, a fairly large infestation was noticed by SRD staff right within Fort McMurray. How did it get there? Likely from seed transported by a muddy vehicle or in contaminated material or equipment. The Municipal District of Wood Buffalo (the governing body for that area on weed control) was notified promptly.

Has white cockle moved north to stay? Is this another example where increased development and human activity have allowed another invasive species to expand its territory? Only time will tell.

Marty Robillard



White cockle (Lychnis alba) infestation in the Chisholm area of northeastern Alberta.

Living with the impact of a spruce budworm outbreak

At the end of June, the adventure-some, strapping young crew comprised of Mike Undershultz, Tom Hutchison and myself headed up to Steen River country to revisit two permanent sample plots (PSPs) that were in the heart of a previous spruce budworm infestation.

The goal was to assess the health of the white spruce trees that had been defoliated for at least 10 years throughout the 1990s and early 2000s. The PSPs were last visited in 2004, the year following the budworm collapse. It was felt that by 2007, the impacts of the defoliation would have run its course.

Between the two PSPs, 858 white spruce trees were assessed in 2007. Of these 858 trees, remarkably only 100 (11.66 per cent) of them were still living. The majority of these were dominant and co-dominant trees within the stands.

In 2004, there were 862 white spruce trees assessed in the two PSPs, and 180 (20.88 per cent) of them were living but considered declining in their overall health and appearance. Within the three year period, 98



Aerial view of white spruce mortality along the Steen River, approximately 120 km north of High Level.

“... 858 white spruce trees were assessed in 2007. Of these 858 trees, remarkably only 100 (11.66 per cent) of them were still living.”

trees were able to recover and were considered healthy in 2007.

The volume losses within these stands will be equally remarkable. From the 2004 assessment, there were over 150 cubic metres of standing dead volume in each PSP. Standing dead volume calculations have not yet been completed from the 2007 assessment. The Steen River area seems to be the most severely damaged drainage but other areas along the Hay River, Little Rapids Creek, Dizzy Creek, Yates River, Indian Cabins and John D’or areas have significant mortality as well.

These areas were not aerielly sprayed during the budworm management programs of the 1990s.

Mike Maximchuk

Exploring in a world of invaders

It's an absolutely perfect July day in the backcountry – sunny, warm and forecast to stay that way right through the weekend.

I've been coming here every summer to ride the trails since I was a kid. There's a ribbon of white and yellow wildflowers in full bloom all along both sides of the trails. It looks gorgeous ...but there seems to be more and more of them every year. Actually, now that I think about it, I don't remember seeing these particular wildflowers when my folks first started bringing us out here, and I see far fewer of the ones we knew back then. I wonder why?

“... Weedy ornamentals have the distinct advantage of being free of all the insect pests and diseases they had to cope with at home.”

The reason is that these plants are not “wildflowers.” They are non-native plants from another continent. Often introduced for ornamental purposes, they have now escaped cultivation. These weedy ornamentals have the distinct advantage of being free of all the insect pests and diseases they had to cope with at home. As a result they have the best chance of winning the competition for space, sunlight, water and nutrients. Many of these non-natives have also evolved root systems that can monopolize resources, and have reproductive capabilities that make rabbits and guppies look like slow breeders.

So how did these weeds get so far from flowerbeds and crops? Unfortunately it was us – human activities like industry and recreation have unwittingly transported seeds and/or plant parts into our natural areas. Mud caked on vehicles can harbour seed, and plant parts get stuck on undercarriages. As well seed mixes for reclamation efforts and hay for livestock can be contaminated with weed seeds.

Wind, water and wildlife help carry the ball from there.

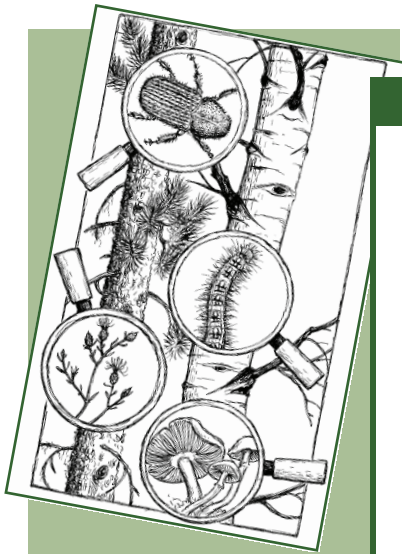
Non-native, invasive plants flourish in disturbance. The bare ground that can result from construction or high traffic will quickly be dominated by invasives if the plants themselves or their seeds are already in the neighbourhood. From there a new infestation creeps into the surrounding plant community, crowding out native plants.

Being part of the problem means that we must be part of the solution. All it takes is to know how to recognize invasive plants, prevent spreading them, and help out with control where we can. Call your local Agricultural Fieldman to find out which invasives are common in your area. The library and Internet are good places to find photos and descriptions.

Marian Jones

Tips to prevent introduction and spread:

- *Avoid creating excess bare ground. Stick to established trails and stay off vegetated areas during wet weather when the ground is soft.*
- *If avoidable, don't travel through a weed patch. If you can't go around, clean vehicles, clothing & pets of any seed and plant material after passing through. Leave the debris in the weed patch.*
- *Pack and riding animals should be fed weed-free feed for 2-3 days before entering the backcountry and throughout their stay. Don't allow animals to graze in weedy areas.*
- *If you belong to a recreation group, organize a weed-pulling project as part of your stewardship activities. Bagged plant material should be disposed of at a waste facility.*
- *Thoroughly wash all soil from vehicles, OHVs and bicycles at a safe location, a car wash, between backcountry trips.*



Bugs & Diseases

What caused this? — the follow up

Do you think you know what caused the damage to the spruce depicted in the August 2007 issue of Bugs & Diseases? Here is your chance to see if you were correct.

The specimen was submitted by a logging company about the first week of June 2007. The forest was still damp with some wet areas from the late snow and spring thaw.

Observations: Black marks on the wood and rub marks that looked

like skidder tire tracks.

No chewing marks or teeth marks from either animals or insects. No other indicators of some sort of biological agent.

Conclusion: My best guess is mechanical damage. The bark would have been soft from being moist. A skidder spinning its wheels or driving over the specimen could have debarked it leaving the harder wood. It was still supple enough that the branches did not shatter.

Rupert Hewison

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'Twas the night before a MPB intervention

'Twas the night before a MPB intervention, and all through the Forest Health section; not a work station was free, not even Erica Lee's.

We held our heads without despair, with hopes that the end soon would be there. The beetles were nestled all snug in their phloem beds, while visions of pine danced in their heads.

When out of the ADMs office there arose such a clatter; Hideji sprang from his chair to see what was the matter. Away to his blackberry he flew like a flash. He tore open the door, fearing a crash.

And what to his wondering eyes should appear, but a pile of beetles, which was his fear. With a little old chain saw, so slow and without might. We all knew then, we were there for the night.

On Seena, on Dale, now Tom, and Brooks! On Christie, on Devin, on Mike, on Wood! Now, work away! Work away! Work away all!

Our eyes were glazed over, fingers nimble and lean, from weekends and nights spent in front of our screens. With a trim of our saw and a twist of our heads, soon gave us to know, we had nothing to dread.

We spoke not a word, but went straight to work, turning specs into plans, and finished without quirk. Dan lay his finger upon the enter key, the plan would turn out hopefully.

The updates updated, corrections corrected. The results appeared just as directed. We examined each whistle, and tested each bell, with not a single edit, all had gone well.

Our job was finished, the audit was concluded. The ADMs last minute changes were even included. "Hey!", the client exclaimed with a snarl and a taunt. "It's just what we asked for, but not what we want!"

Happy new year, Aaron McGill