

# Bugs & Diseases

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## Looking into the Forest Health crystal ball.....

With ongoing drought, relatively low snow cover and milder than usual winter, drought-caused tree kill could be a problem to reckon with in 2010. Barring substantial snowfall in March some tree kill due to drought is inevitable. More aspen kill across central Alberta could be expected in 2010.

Drought conditions will also lead to more stressed out trees that become prone to pests. Forest defoliator problems become exasperated under drought conditions.

Grasshopper populations could also become a problem, especially in southern Alberta. Although grasshoppers are usually not considered to be forest pests some newly planted seedlings have been severely defoliated by these critters in the past.

Bruce spanworm and large aspen tortrix are bound to herald a gradual recovery of aspen defoliator populations in Alberta in 2010. However, extensive outbreaks of these insects may still be a couple of years away.

Spruce budworm defoliation in northeast Alberta is expected to be more intensive in 2010 compared to that in 2009. The results of egg mass surveys in the northeast forecast severe budworm defoliation again (Tom Hutchison, personal commu-

nication); the moderate defoliation experienced there in 2009 appears to be an anomaly.

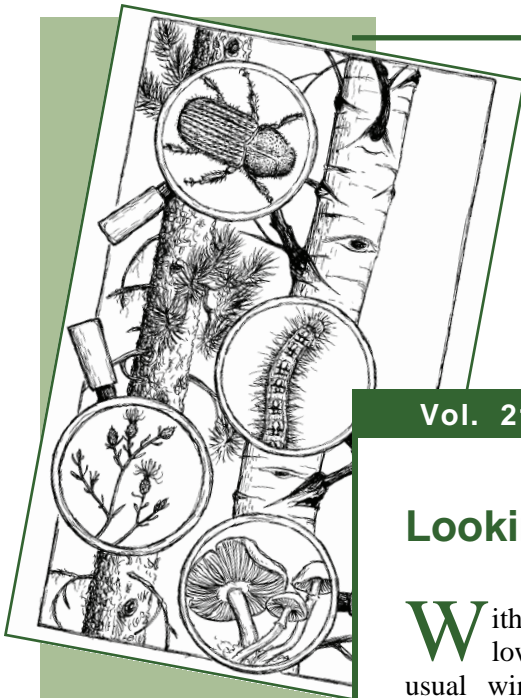
In the northwest, based on the male moth catches in pheromone-baited traps, budworm populations are expected to decline in 2010 in most of the areas currently affected by them. The two-year cycle budworm populations will be higher in 2010, as it normally happens in even years. At some high elevation locations there may be aerially visible defoliation caused by these budworms.

The western spruce budworm populations in southwest Alberta will continue unabated. More tree kill due to this budworm is expected in 2010.

Following unprecedented long distance dispersal of mountain pine beetles that occurred in 2009 summer, infestations are expected to occur in the Lac La Biche Area in 2010. Early fading of MPB-killed trees would be recurrent in 2010 as we have seen in 2009 in central Alberta.

On the bright side, less forest disease problems, especially those due to fungal pathogens like rusts, can be expected if low moisture regimes prevail in 2010. This may be the “silver lining in this dark cloud” as the old adage goes!

*Sunil Ranasinghe - Edmonton*



## Alberta's eye on forest health

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## The Bronze Birch Borer

Over the course of the spring and summer, we often get phone calls from the local public to look at their dying birch trees. More often than not, the agent causing the damage is the bronze birch borer (*Agrilus anxius*). The first sign one typically sees is the reduced crown and leaf size and dying upper branches (A). Upon closer inspection, one will find the “bumps” on the infested stems (B) or looking closely, one might find the “D-shaped” emergence holes from a previous generation (C).

The bronze birch borer is a common insect in Alberta and it is often associated with shelterbelts or single trees in urban landscapes. The insect may take one or two years to complete its lifecycle and the adult has a metallic, olive green color. Light infestations are often found and they typically kill the upper branches in their host tree but in some years, the infestations become quite severe and sometimes the entire tree is killed.



A. Dying upper branches

B. Typical “bumps or swellings found on infested stems

C. “D-shaped” emergence holes

*Mike Maximchuk - Peace River*

## An Early Spring?

On February 28, 2010 I happened to come across something that only a Forest Health person could appreciate -- a February caterpillar!

I was puttering around on my acreage south of Athabasca. I had an aluminum step ladder lying on the ground all winter, buried in the snow. When I dug it out, lots of last year's (now wet) aspen leaves were stuck to the steps. As I was brushing them off, imagine my surprise when this little critter appeared before me.



I thought that its winter survival as a larva was truly amazing. Upon researching this, I found that insects typically employ two strategies (or a combination thereof) to overwinter: freeze avoidance and freeze tolerance.

Many creatures (insects included) use the freeze avoidance strategy to make it through the cold. One way this is accomplished is by finding a hidden dry place to overwinter (i.e., closely piled fallen aspen leaves at ground level in a nook covered with layers of insulating snow).

Janet M. Storey of the Institute of Biochemistry at Carleton University in Ottawa describes this phenomenon wonderfully in simple terms. She states, in her article *Frozen Alive* (<http://www.naturenorth.com/winter/frozen/frozen.html>), that part of the freeze avoidance strategy is "to prevent contact with molecules that can act as "ice nucleators," molecules that "seed" the formation of ice in body fluids.

Ice itself is the most potent ice nucleator and so animals take steps to avoid contact with environmental ice. Some insects do this by wintering in very dry places, but most rely on water-proofing. This can be

done either by increasing the thickness of the waxy cuticle on an insect's body or by spinning a waterproof cocoon. Potential nucleators inside the insect's body are also eliminated by emptying the gut to get rid of foreign particles and bacteria and by seasonal changes to the proteins present in their blood to remove any whose structure could stimulate ice crystallization.

This strategy, of course, is not limited to insects. Many small animals such as turtles and toads use aquatic or muddy environments (below the frost line) during the winter, and others (think of snakes) will travel to utilize an underground hibernaculum. Animal holes, natural cracks in the ground and the like are also likely overwintering spots.

The other strategy used by some insects (and other critters) to overwinter is "freeze tolerance." The main basis of this is production of a cryoprotectant -- i.e., a substance that is used to protect itself from freezing and prevent associated cell damage that may be caused by freezing. Insects most often use polyols (a type of sugar alcohol) as a cryoprotectant. Good, familiar examples of this would be the woolly bear caterpillar (*Pyrrharctia isabella*) or the mountain pine beetle (*Dendroctonus ponderosae*).

An amazing example of freeze tolerance with reference to where actual freezing takes place is the typical wood frog (*Rana sylvatica*). It overwinters either under damp leaves or in the uppermost duff layer on the forest floor (instead of really burying itself), and up to 65 per cent of the frog's body water can be frozen without actually killing the frog. It is suggested that this adaptation allows the frogs to start breeding as soon as the snow melts.

I'm guessing that my little new-found caterpillar buddy was using Mother Nature's freeze avoidance strategy. I think it must have found that perfect microsite that kept it from freezing its poor little prolegs off. I'm glad my ladder was put to good use over the winter.

I'm not sure of the exact species, but it is now living in a sample container in the fridge. Once we get a little closer to typical spring weather, I'll put it outside in a bigger container, give it some grub (pun intended), and hopefully see what it grows up to be.

To me, this little critter gave me the first sign of spring this season. I'll take it.

*Marty Robillard - Athabasca*

## Directive Update

The forest health program always strives to turn government red tape into flowing green ribbons. It is our intent to create and maintain only practical and necessary policy directives related to management of forest pests. To maintain this high standard, two directives have recently been reviewed and updated: the *Mountain Pine Beetle Log Management Directive*, and the *Debris Management Standards for Harvest Operations*.

The Log Management Directive is in place to protect Alberta's forest resource by reducing the risk of spreading mountain pine beetles (MPB) while hauling and milling infested pine. Due to a significant increase in the proportion of infested pine that is now being included in the annual allowable cut of many operators, various risk mitigating strategies are being explored. For this reason the information letter titled *Best Management Practices for Hauling and Milling MPB-Infested Pine* has been produced as a resource to supplement the Directive. The info letter provides operators with a suite of strategies to consider when developing management plans to safely extend the hauling/milling of MPB-infested wood into the standard no-haul period. Additional revisions to the Directive include a more detailed description of the process for the development and approval of these management plans, and updated terminology to reflect MPB management zone names.

With the help of the Forest Protection Branch, the Debris Disposal Directive was also updated to reflect the current MPB situation. This Directive provides standards of disposal of in-block harvesting debris while considering both wildfire threat and several other values. In the previous version of this Directive, the timeline for disposing of high-risk debris piles in MPB-infested blocks within the leading edge zone was shortened from the standard 2-year period to June 15 of the year following harvest. This was to ensure that the debris was burned and beetles destroyed prior to emergence. The updated Directive now contains no shortened timeline specific to MPB-infested debris piles. This change is due to MPB population increases in the leading edge zone, and that the risk of few beetles emerging from debris within this area was lower than the risk of escaped wildfire. This risk assessment considers that operators were being pushed to burn piles in late winter or spring, thus increasing the potential of hold-over fires; and that the risk posed by the few beetles emerging from these piles is now considered negligible in the big picture.

To view or download the updated directives, follow this link to the Forest Management Branch Directives website: <http://srd.alberta.ca/ManagingPrograms/ForestManagement/ForestManagementDirectives/Default.aspx#policy>

*Mike Undershultz—Edmonton*

## Interview with the newest member of the Forest Health Team

I recently had the chance to sit down with Brett Spady, the most recent addition to our Forest Health team. I spoke with Brett about himself and his new job as Mountain Pine Beetle Information Officer.

*Q: Please tell me a little bit about yourself such as where you were born, and where you grew up?*

A: I was born at the University of Alberta hospital 28 (almost 29) years ago, in a wing that has since been destroyed. Grew up in Lamont, Alberta, however, at the age of 14 moved to an acreage (80 acres in total) just North of Elk Island National Park.

*Q: Did you have any nicknames growing up?*

A: Bert (like Bert & Ernie) and/or Spady

*Q: Were you always interested in Forest Health? Or was there something else you wanted to do when you grew up?*

A: I have always been interested in the natural environment, especially birds and plants, and have done tons of camping and hiking in the Rockies.

My grade five science project demonstrated the effects of "clear cut logging" on watersheds.

I was lucky to have fallen into such a great position.

It's amazing how the Mountain Pine Beetle, being such a small insect, can have such huge impacts on our forested landscape.

*Q: Although you've only been with Forest Health since mid February, what would you say is your best forest health related experience?*

A. In 2008, as a Junior Forest Ranger Field Logistics supervisor, myself and a group of young rangers picked lots of oxeye daises and Canada Thistle around Jasper Park Lodge where we worked for free but it was worth it since they gave us a free lunch!

*Q: What are some of your hobbies & interests?*

A: I enjoy biking, especially to and from work everyday. It would be great if everyone would do the same so that we could cut down on rush hour traffic. I also enjoy playing the mandolin, as well as local history. Spent 3 summers working at the Ukrainian Village which is a living history museum, where I first learned to play the mandolin. I have played a few different roles including, the school teacher, Constable, and grain elevator agent.

*Q: Do you have a favourite forest health pest and why?*

A: MPB beetle of course!!! since it is such a tough little creature and can protect itself from cold Alberta winters using glycol. Also really curious why the blue stained fungus lives in its mouth and what it actually does for the beetle.

*Q: What are one or two of your favourite Alberta plants or trees?*

A: Canada columbine, because it looks nice and white birch because you can make syrup out of it. I even tried tapping the trees once at my parent's acreage! It tastes like hazelnut. Did not tap nearly enough trees and only ended up with about 1/4 cup of syrup. It was well worth the work though.

*Q: How have you been liking your new role as Mountain Pine Beetle Information Officer?*

A: Really enjoying it so far. Really busy with lots to learn. People are really laid back in the office.

*Q: What has been your impression of the Forest Health team in your first month?*

A: Candid, yet still professional group. It's a refreshing team of great people who seem to deal with problems all together as one single unit and then you move on.

*Andrea Sharpe - Edmonton*



## Forest Health 100 - back by popular demand

**A**re you a Government of Alberta employee or a forest industry professional responsible for managing forest health through the development, review and implementation of forest management and land management plans? Are you interested in learning how forest health management can fit into your daily work? Do you want to round-out your knowledge base, and improve your forest and land management capabilities? If you answered “yes” to any of these questions, then Forest Health 100 is the course for you.

This course is being held at the Hinton Training Centre on July 6-8, 2010. Over approximately three days, the curriculum is divided equally between classroom and field studies. In a creative and interactive classroom setting, students will explore related legislation and policy, the identification and management of damaging agents and the integration of forest health into planning and decision-making. Once in the field, students will have a hands-on experience exploring stands of various ages and types to see first hand the effects of insect, disease and climate damage in the beautiful foothills.

Again, this critically acclaimed course is being held at the Hinton Training Centre on July 6-8, 2010. The nomination deadline is May 25, 2010, and seating is limited (24 spaces available), so sign up now. As previously stated, it is open to Government of Alberta employees and forest industry professionals responsible for managing forest health through the development, review, and implementation of forest management and land management plans.

For more information, and registration details visit the Hinton Training Centre website: <http://www.srd.alberta.ca/ManagingPrograms/Training/HintonTrainingCentre.aspx>

Forest Health 100 course

field trip near Jasper – 24th June 2009



*Mike Undershultz - Edmonton*

## 2009 SRD Corporate Recognition Award

The SRD Corporate Recognition Program recognizes employees through the presentation of the **SALUTING OUR BEST** awards.

### 2010 Winners:

#### Mountain Pine Beetle Decision Support Team

Aaron McGill

Brad Tyssen

Devin Letourneau

Erica Lee

Mike Maximchuk

Seena Handel

This team developed a risk rating system to allow SRD and industry to put beetle control efforts in areas that pose the greatest risk of beetle spread. Scientific-based GIS enabled information allows government and industry to prioritize infested trees and control. This tool forms the foundation of our program and helps to allocate and strategize our large program. This DSS was the product of using the latest science, experience and wisdom of the Canadian Forest Service and our SRD team.

Congratulations!

*Daniel Lux—Edmonton*

## Maxi's top 10 list.....

“Tonight’s category ladies and gentlemen, Top 10 Things You Didn’t Know Forest Health Officers Were Good At”.....”Here we go”.....

# 10.....Cow Tipping.....

# 9.....Laying rubber in front of the 7 – Eleven.....

# 8.....Doing the Moon Walk.....

# 7.....Final Jeopardy.....

#6.....Stage diving at Motorhead concerts.....

#5.....Making kick-ass bologna sandwiches.....

#4.....Sucking back jumbo slurpees without getting a brain freeze.....

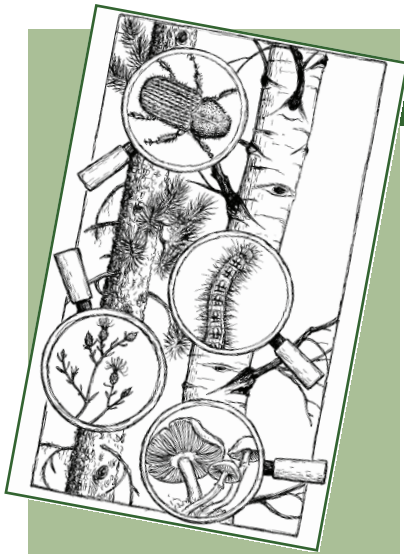
#3.....Reciting the names of all seven dwarfs and the Jackson Five.....

#2.....Playing air guitar to Jimi Hendrix tunes.....

And the #1 thing you didn’t know forest health officers were good at.....

Imitating Elvis....

*Mike Maximchuk - Peace River*



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## Go Away El Nino!

El Niño, El Niño

You haven't been a friend  
Unseasonably warm weather  
You continue to send

El Niño, El Niño

You haven't done us right  
Reduced precipitation  
Is a continued blight

Early spring

Lack of rain

A warm and balmy summer

May sound grand

But from where I stand

It could be quite a bummer

Dendroctonus

Drought stressed trees

Not our favourite combination

As we try our best

To stop this pest

Going right across the nation

El Niño, El Niño

You've never meant us well

Go away, leave, scram, vamoose

Let's have a sudden, colder spell

*Tom Hutchison—Athabasca*