

Forecast on Major Forest Pests for 2005

Spruce Budworm

The male spruce budworm populations were monitored provincewide by using Multi-Pher I® traps (Le Groupe Biocontrol, Quebec) baited with female budworm sex pheromone lures (Plastic lure, Phero Tech Inc., B.C.). The procedure for deploying these traps is described in the "Spruce Budworm Management Guide" (Ranasinghe and Kominek, 1998). The trap catches are used to predict the risk of new outbreaks occurring in the near future at or near the trap sites. The predictions based on the moth catches in pheromone-baited traps are shown in Figure 9.

Altogether 178 plots were set up across provincially managed forested land to monitor the spruce budworm male moth populations. Four plots with disturbed traps were dropped from the analysis. Overall, the risk of new spruce budworm outbreaks occurring in 2005 in the province dropped considerably compared to the risk in 2004. Only eight plots (4.6%) had average moth catches indicating a high risk of outbreaks occurring. The risk of outbreaks occurring was moderate in 39 plots (22.4%) and low in 127 plots (73%).

Northeast Corporate Region (NE)

Fifty plots were set up in this region. Twenty-eight plots were located in the Lac La Biche (NE1) Area and 22 were located in the Waterways (NE2) Area.

The risk of new outbreaks occurring was low in 24 plots (86%) and moderate in four plots (14%) in the NE1 Area. No plot had a high risk of an outbreak occurring in 2005. This is a further decline in the risk of outbreaks compared to 2004 when three plots in this area had high risk of outbreaks.

In the NE2 Area, the risk of outbreaks occurring was high in 6 plots (28.6%), moderate in 13 plots (61.9%) and low in 2 plots (9.5%); traps in one plot were disturbed and excluded from analysis. A similar trend was observed in this area in 2003. This is the only area in the province with a high risk of spruce budworm outbreaks occurring in the near future. Most of the high risk plots were located near Fort

McMurray, which is bracing for a serious budworm outbreak in 2005 (Figure 9).



Northwest Corporate Region (NW)

Ninety-seven plots were set up in this region; traps at three sites were disturbed and excluded from consideration. These plots were distributed as follows in the corporate areas of Smoky (NW1) - 9; Lesser Slave (NW2) -16; Peace (NW3) - 24 and Upper Hay (NW4) - 48.

In the NW1 Area, risk was low in eight plots (89%) and moderate in one plot (11%). Similarly, in the NW2 Area, risk was low in 14 plots (87.5%) and moderate in two plots (12.5%). The risk was very low in the NW3 Area where all 23 plots (100%) had low risk and one plot was disturbed. The risk of new outbreaks occurring in these areas was either as low or lower than what was reported in 2003. In the NW4 Area, risk was low in 35 plots (76%), moderate in 10 plots (22%) and high in one plot (2%); two plot sites in this area were disturbed. The plot with a high risk was located near Zama City. The risk of new outbreaks occurring has continued to decrease in this area. In comparison, eight plots (36%) had high risk of outbreaks in the NW4 Area in 2004.

Overall, spruce budworm outbreak is expected to collapse in this region in 2005. The tree-kill observed in 2004 in some repeatedly defoliated stands is expected to continue for another year or two even if the budworm populations collapse in 2005.



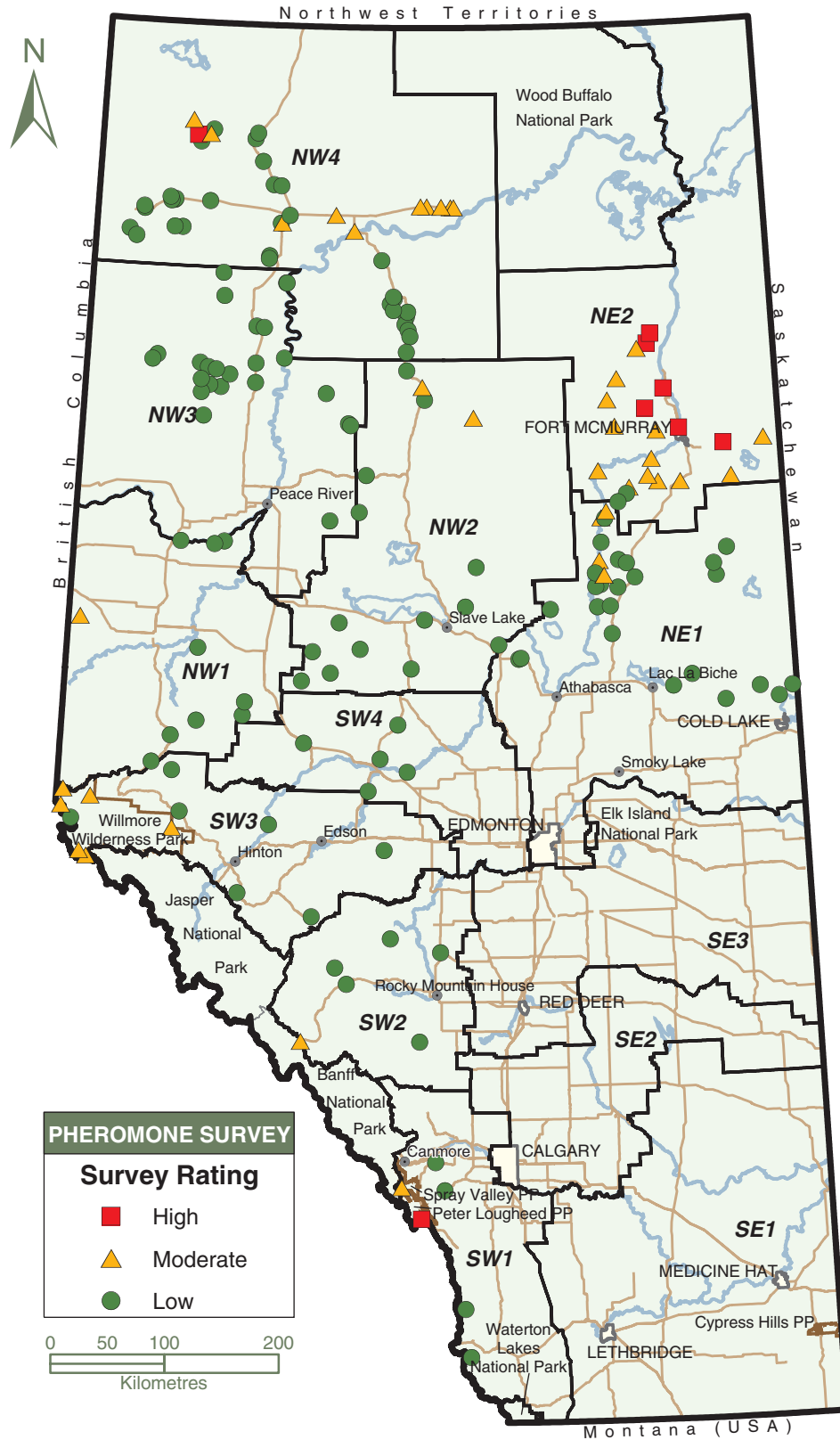


Figure 9

Forecast on risk of new spruce budworm outbreaks occurring in 2005, based on the number of male moths captured in pheromone-baited traps deployed in 2004 in Alberta.



Southwest Corporate Region (SW)

Thirty-one plots were established in this region in 2004. These plots were distributed as follows among the corporate areas of Southern Rockies (SW1) - 6; Clearwater (SW2) - 6; Foothills (SW3) - 14 and Woodlands (SW4) - 5. Some of these plots, especially those located at high altitudes, are inhabited by the two-year cycle budworm, *C. biennis* Free. Thus the moth catches alternate between high numbers found in even years with the low numbers found in odd years. Consequently, the moth catch in a given year is used to predict the risk of outbreaks occurring two years later.

As predicted in 2002, moth catches were relatively high in 2004; these ranged from 3 to 2 966 moths per trap. In comparison, moth catches ranged from 0 - 438¹⁰ moths per trap in 2003. In the SW1 Area risk of new outbreaks occurring was low in four plots (66.7%), moderate in one plot (16.7%) and high in one plot (16.7%). The plot with a high risk was located in Kananaskis Country where unconfirmed budworm defoliation was reported in 2004. High trap catches were found in this plot in 2002 as well. The plot with a moderate risk of an outbreak in 2004 also had high moth catches in 2002. Risk of budworm outbreaks was low in the SW4 Area and varied from low to moderate in SW2 and SW3 areas.

New spruce budworm outbreak is likely to occur in Kananaskis Country in 2006 if the present trend continues in this region.

Exotic Pests

The Public Lands and Forests Division of the SRD set up 74 traps as a part of the annual gypsy moth detection program conducted by the Canadian Food Inspection Agency (CFIA). Delta traps baited with Dispalure® were used. No gypsy moths were caught in these traps. However, the Canadian Forest Service, Northern Forestry Centre caught one gypsy moth in a trap set up under this program at Lake Louise in Banff National Park. Gypsy moth is the most likely exotic pest to occur in Alberta in view of occasional trapping of this insect, albeit in very low numbers, in the province. Increased awareness and vigilance

towards timely detection are the keys to manage these pests.

Mountain Pine Beetle

Barring inclement weather conditions such as severe cold weather (-30 °C) occurring either towards the end of 2004/05 winter or in 2005 early spring, new MPB infestations are likely to occur in areas close to the Alberta-B.C. border in the Smoky Area (NW1), Willmore Wilderness Park, Jasper National Park, Banff National Park, Canmore, Kananaskis Country and Crowsnest Pass. Mountain pine beetle infestations already occur on B.C. side of these areas (Figure 10). In Banff National Park, the risk of new MPB infestations in Lake Louise area has increased because of increasing populations in Yoho National Park.

As well, recent U.S. Forest Service survey reports show presence of MPB infestations close to Canada-U.S. border between Alberta and Montana. Potential MPB infestations in Waterton National Park have to be anticipated in view of beetle build-up in Montana.

Aspen Defoliators

In 2005, forest tent caterpillar populations are expected to expand in northern Alberta. The large aspen tortrix populations will continue to decline in 2005.

Historically, large aspen tortrix populations have collapsed after 3-4 years. These population collapses of the large aspen tortrix are usually followed by an expansion of the forest tent caterpillar populations. In 2004 this “switch over” of aspen defoliators appears to have occurred.

Spruce Beetle

Spruce beetle, *Dendroctonus rufipennis* (Kirby) outbreaks are likely in areas affected by the current spruce budworm infestation if an event that promotes spruce beetle population (blow-down, large slash piles) occurs in northern Alberta. This is because the prolonged spruce budworm infestation has stressed large tracts of mature white spruce making them prone to secondary pests such as the spruce beetle.

¹⁰ This figure was incorrectly reported as 0 - 422 per trap in 2003 Annual Report



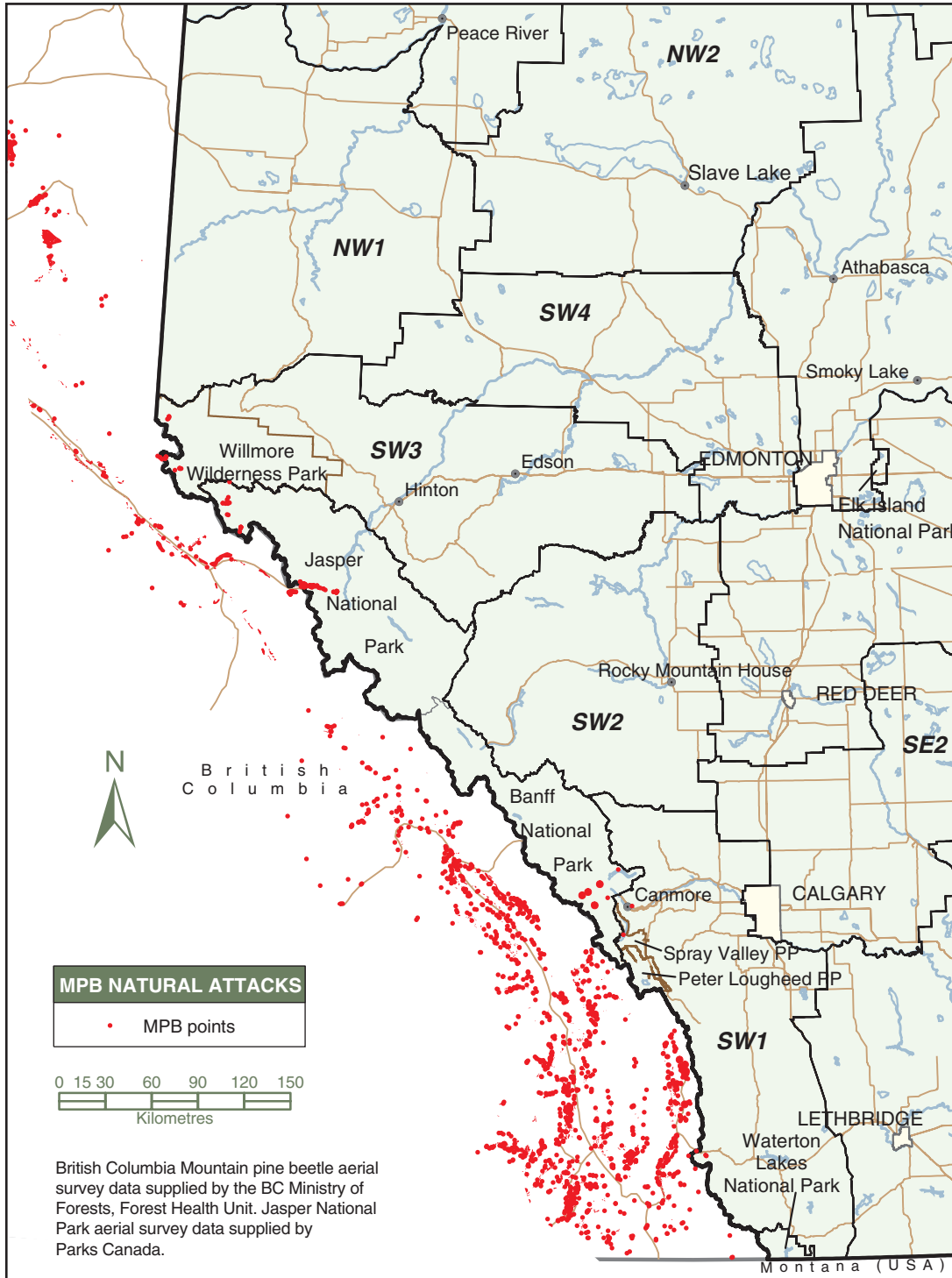


Figure 10
Incidence of mountain pine beetle infestations in Alberta and along the Alberta-B.C. border areas, 2004.



General Education, Awareness and Training

Provincial

Provincial Integrated Pest Management Forum

The 8th annual Provincial Integrated Pest Management Forum was held on November 5, 2004 at the Northern Forestry Centre, Canadian Forest Service in Edmonton. It was well received by 42 attendees from research and educational institutions, government and the forest industry. Topics included current pest conditions, mountain pine beetle operations and research, Armillaria root disease survey methodology, exotic pest updates and the latest forest health research. Presentations from the forum can be viewed on the forest health web site at: http://www3.gov.ab.ca/srd/forests/health/coop_ipm.html

Forest Health Web Site

In 2004, both the internal and external forest health web sites were regularly updated. Some of the highlights included the Mountain Pine Beetle Management Guide; the large aspen tortrix information page; invasive plants information sheets; "Alberta forest health strategy and shared roles and responsibilities between SRD and the forest industry" document; the Provincial Integrated Pest Management Forum web page; and the Forest Pest Damage Diagnostic System. Other regular updates included forest health conditions and maps; newsletters and publications; annual reports; survey data; and mountain pine beetle updates on the "pest alert" section. The external web site address is: <http://www3.gov.ab.ca/srd/forests/health/index.html>

Forest Pest Damage Diagnostic System

The Forest Pest Damage Diagnostic System was posted this year on the Forest Health external website thus making it available for use by forest industry and other external users. We will continue to upgrade this system with a view of making it accessible through wireless devices. The external web site address is: <http://www3.gov.ab.ca/srd/forests/health/diagnostic.html>

Teacher's Guide

In 2004, the Teacher's Utilization Guide to compliment the "Envirokids Investigate Forest Health Activity Book" was completed. This guide provides tools for teachers to bring the topics of forest ecology and forest health into the grade 6 and 7 classrooms. The teacher's guide and the revised activity book are available on the forest health web site at: http://www3.gov.ab.ca/srd/forests/health/p_posters.html



Regional

Northeast Corporate Region (NE)

The regional FHO carried out the following to provide education, training and increase awareness on forest health in the region:

- Setting up a forest health display for the National Forestry Week;
- Conducting two weed management workshops;
- Making presentations to the divisional staff and Provincial Junior Forest Wardens;
- Conducting a forest health workshop for ALPAC Forest Products staff;
- Interactive presentations and short field tours given to campers at the Long Lake Junior Forest Wardens Camp. These presentations were tied into presentations that dealt with other Forest Health issues.



Northwest Corporate Region (NW)

A forest health workshop which also included invasive plants was held in May 2004, for the staff of Vanderwell Contractors Limited. In late 2004, MPB awareness presentations were made for the benefit of the public advisory groups of Weyerhaeuser (Grande Prairie) and Tolko Industries Ltd. (Slave Lake).

Southwest Corporate Region (SW)

Southern Rockies (SW1) and Clearwater (SW2) Corporate Areas

In the SW1 area, the regional FHO trained staff from Spray Lake Sawmills, Sunpine Forest Products Ltd., contractors and a variety of education groups in the region on forest health-related matters.

Foothills (SW3) and Woodlands (SW4) Corporate Areas

A new pamphlet-holder display area at the Berland River Recreation Area was built. This outdoor information centre provides recreation users with brochures on such topics as invasive plants, mountain pine beetle awareness and fire safety. Similar display areas have been built at staging areas at Sulphur Gates, Whitehorse Creek and Rock Lake.



Research and Development

Armillaria Root Disease

The Forest Health Group was instrumental in assembling a team to address the issues related to increasing concerns over the impact of *Armillaria* root disease on forest stands. This team is composed of representatives from the academic, research, forest industry and forest management areas. Under this initiative, Dr. Peter Blenis (University of Alberta) is finalizing a research proposal to study the potential impact of wildfire intensity on incidence of *Armillaria* in regeneration growing on wildfire-killed forest stands. This proposal will be submitted to Alberta Forest Research Initiative and other donors for funding.

As part of the *Armillaria* Root Disease Initiative, the regional FHO (Woodlands and Foothills Corporate Areas) and a provincial staff member visited one of the impact monitoring study areas located near Cynthia in central Alberta. This area was planted in 1990. The last assessment was carried out in 1999. During the past five years, only four trees (1.8%) were killed by *Armillaria* root disease in this study area. The remaining trees appeared healthy with vigorous growth. This indicates a slowing down of tree mortality rate due to *Armillaria* with increase in the age of the stand.

Forest Tent Caterpillar Pheromone Study

Unitraps[®] baited with pheromone lures (Phero Tech Inc., B.C.) were deployed in 25 plots in the NE Region and in 20 plots in the NW Region. The objective was to study the use of these lures to predict onset of forest tent caterpillar outbreaks and defoliation levels. In the NE Region, the average trap catch in the plots ranged from 4-103 moths per trap; in the NW Region, the range was 2-37 moths per trap. Between 2003 and 2004, the overall average moths per trap decreased in the NE Region but remained about the same in the NW Region. There was no defoliation in any of the plots. In the NW, moths of the large aspen tortrix and aspen two leaf tier also were found in these traps. In the NE Region aspen two leaf tier moths were found in almost all the traps. However, the maximum number of two leaf tier moths per trap declined from 827 in 2003 to 281 moths in 2004.



Woodborer Study

The second-year component of this project was completed in 2004. The remaining sample trees in the study plots were harvested and processed by repeating the procedure outlined in the 2003 Forest Health Annual Report. The woodborer damage was more evident and abundant in the second-year logs, as expected. Early indications are that the larger diameter logs still yielded sound lumber in spite of damage due to fire and woodborers. The data from this field trial are being summarized for analysis.

Biological Control of Scentless Chamomile

In the Southwest Corporate Region, there were no further releases of the two biological control insects, scentless chamomile gall midge (*Rhopalomyia* sp.) and the seedpod weevil (*Omphalapion bookeri*) to control scentless chamomile this year. The seedpod weevils still maintain a viable population after 3 years of being released. Evidence of their existence can be found by the half eaten flower buds.

The gall midges released in the summer of 2002 in the Entwistle Public Gravel Pit have also shown viable populations. Stunted and deformed plants have decreased seed productivity levels, which will further decrease as the midge population increases.

However, to-date the control achieved by these biological control agents is rather limited and confined to a slight decrease in chamomile population at these sites.



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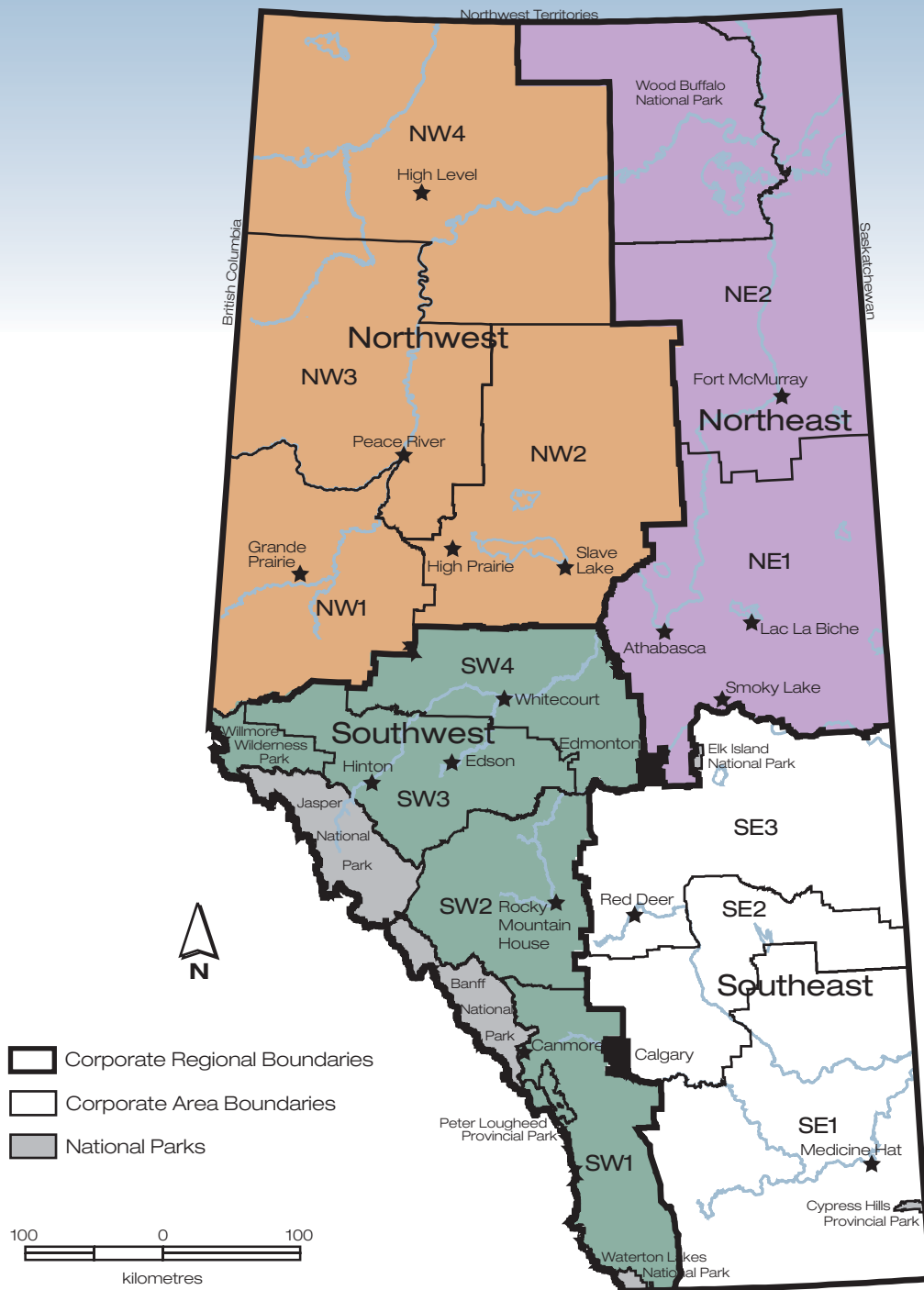
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Appendixes

Appendix I

Corporate Regions and Areas of Alberta, 2004



Appendix II

Information on Operational Use of Pheromones in Alberta, 2004

Forest Tent Caterpillar

Chemical component(s):	Z5, E7 - dodecadienal
Lure type:	Flexlure®
Trap type:	Uni-trap®
Pheromone source:	Phero Tech Inc., Delta, British Columbia

Gypsy Moth

Chemical component(s):	(+)cis-7, 8-epoxy-2-methyloctadecane
Lure type:	Disparlure®
Trap:	Delta sticky trap
Pheromone source:	Trécé Inc., Salinas, California (purchased and distributed by Canadian Food Inspection Agency)

Mountain Pine Beetle

Chemical component(s):	trans-verbenol, exo-brevicomin
Lure type:	Pre-packed tree-bait
Trap:	not applicable
Pheromone source:	Phero Tech Inc., Delta, British Columbia

Spruce Budworm

Chemical component(s):	95% E-11-tetradecenal, 5% Z-11-tetradecenal
Lure type:	Plastic lure
Trap type:	Multi-Pher I®
Pheromone source:	Phero Tech Inc., Delta, British Columbia



Appendix III

Scientific Names of Invasive Plant Species

- Bladder campion - *Silene cucubalus* Wibel
- Blueweed - *Echium vulgare* L.
- Canada thistle - *Cirsium arvense* (L.) Scop.
- Common tansy - *Tanacetum vulgare* L.
- Toadflax - *Linaria vulgaris* Hill.
- Dalmatian toadflax - *Linaria dalmatica* (L.) Mill.
- Field scabious - *Knautia arvensis* (L.) Duby
- Hound's-tongue - *Cynoglossum officinale* L.
- Leafy spurge - *Euphorbia esula* L.
- Orange hawkweed - *Hieracium aurantiacum* (L.)
- Ox-eye daisy - *Chrysanthemum leucanthemum* L.
- Perennial sow thistle - *Sonchus arvensis* L.
- Scentless chamomile - *Matricaria perforata* Merat.
- Spotted knapweed - *Centaurea maculosa* Lam.
- Tall buttercup - *Ranunculus acris* L.
- Tall larkspur - *Delphinium glaucum* S. Wats.
- White cockle - *Silene alba* (Mill.) E. H. L. Krause
- Wild caraway - *Carum carvi* (L.)



