

Forest Health in Alberta



2005 Annual Report

Alberta

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Forest Health Vision

A healthy forest environment that provides sustainable fibre resources and a diverse forest ecosystem that supports biodiversity and critical wildlife habitats.



Mountain Pine Beetle Management Program

A comprehensive program to manage the mountain pine beetle infestations in the province was undertaken in 2005. This program included education and awareness, prevention, monitoring, surveying, assessment and control operations aimed at controlling MPB populations.

Prevention

A ministerial order under the authority of Alberta Forests Act, RSA 2000 c. F-22 was issued on March 24, 2005 prohibiting transportation of pine logs or pine products with bark attached, within Alberta. This moratorium was in effect from May 1 to September 30.

With the assistance of Alberta Transportation - Inspection Services, SRD implemented a program geared to prevent transportation of pine logs or pine products with bark attached within the province. During this moratorium period five trucks loaded with pine material were refused entry into the province. In two of these cases, blue stain and pitch tubes were visible on logs.

Programs to Control MPB Populations

Municipal and Private Lands

Between January and April 2005, the Town of Canmore cut and burned 58 infested trees and the Municipal District of Bighorn removed 22 infested trees. In addition, 100 infested trees were removed from the Silvertip Golf Course and 72 infested trees were removed from the Three-Sisters Mountain Village.

Federal Lands

Banff National Park⁹

Approximately 1 200 MPB-infested trees were removed from the park by hand fall and burn in late fall of 2004 and in early winter of 2005. In addition, park personnel set up about 500 aggregation pheromone baits to contain beetle populations within the infested area.

Provincial Crown Land

Southwest Corporate Region (SW)

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

2004/05 Ground Surveys - Walkthrough Surveys

A group of 25 volunteers representing national parks, Department of Community Development, Spray Lake Sawmill and the general public carried out walkthrough surveys over the MPB-suspected areas identified during the aerial surveys. Each volunteer team was given instructions on the survey procedure, a safety briefing, a map showing the designated survey area and a GPS Unit to track their survey paths. These survey crews identified general areas that needed to be followed up with detailed transect surveys.



⁹ Jane Park, Banff National Park, Parks Canada, personal communication



2004/05 Ground Surveys - Transect Surveys

Contract crews and eight employees of SRD carried out transect surveys on areas delineated by the walkthrough survey crews. These areas were divided into four beetle survey zones. The transect survey crews identified 346 green attack trees in the Bow Valley (Figure 13) and six green attack trees near Blairmore in 2.5 months of surveying.

Cut and Burn Infested Trees

Following the ground surveys from 2004 fall through the winter of 2005, the control crews cut 346 MPB-infested trees in the Bow Valley and burned those on the stumps. In addition, six infested trees were cut and burned in Blairmore area.

Foothills (SW3) and
Woodlands (SW4)
Corporate Areas

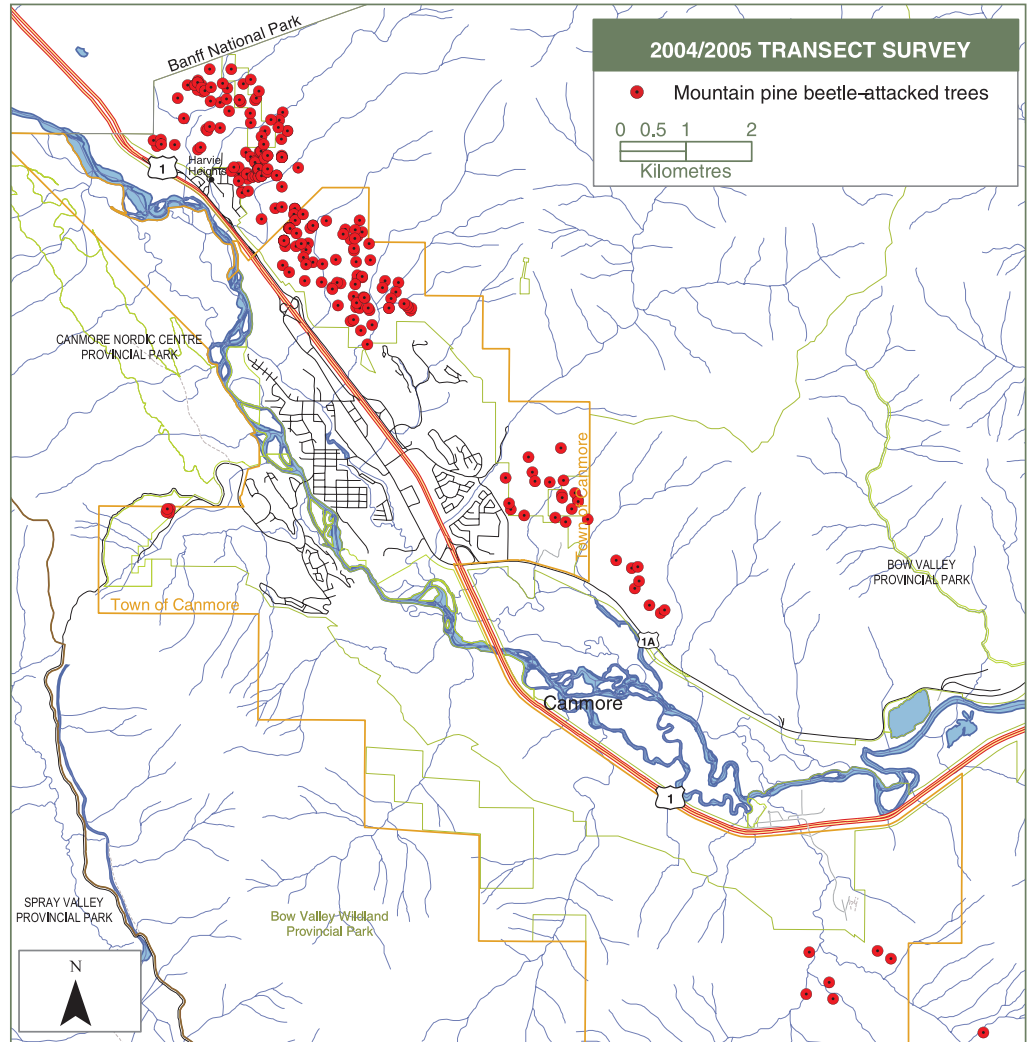


Figure 13

Mountain pine beetle-attacked trees detected during transect surveys of Bow Valley in Alberta, Winter 2004/2005.

2004/05 Ground Surveys

In the fall of 2004, three patches of MPB infested trees were found on Willmore Wilderness Park during an aerial survey. A four-person crew carried out ground surveys in late fall through winter of 2004/05 in the areas identified during aerial surveys. They



detected 895 green attacks during this period (Figure 14 and Table 5).

During a subsequent flight in early summer of 2005 approximately 500 additional red and fading trees were detected along the Fetherstonhaugh Creek, Muddywater River and Sheep Creek drainages in Willmore Wilderness Park. This detection prompted a combined detection and control of several thousand infested trees (see next section for details).

Cut and Burn Infested Trees

The four-person survey crew hired in the fall of 2004 cut and burned all 895 MPB-infested trees detected in this park (Table 5).

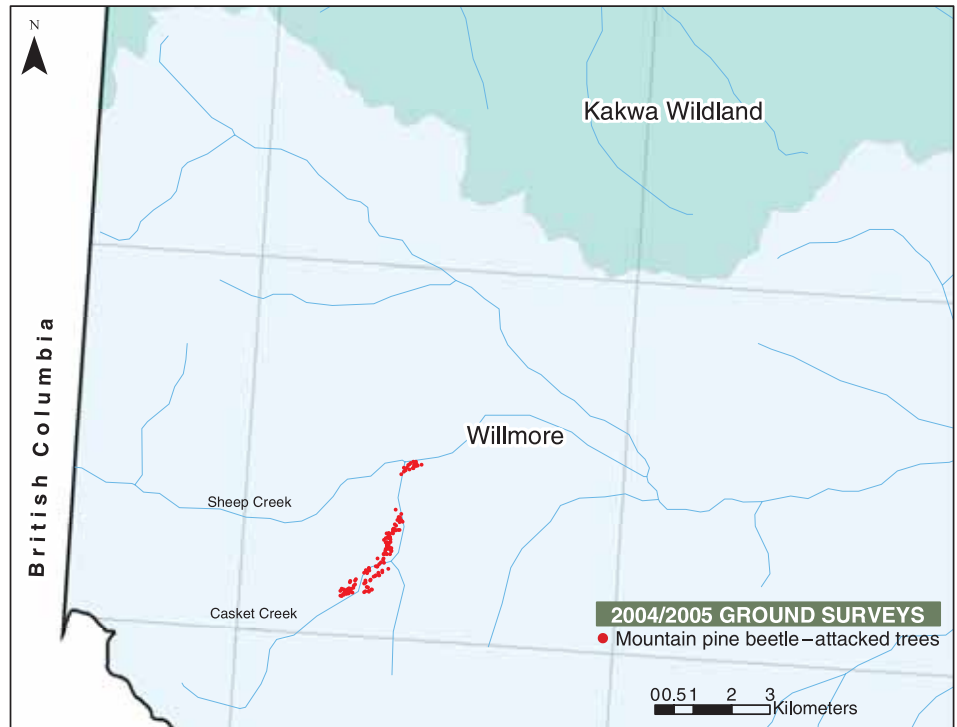


Figure 14

Results of the ground surveys carried out in fall 2004 to detect mountain pine beetle-attacked trees on Willmore Wilderness Park.

Table 5

Incidence and control of mountain pine beetle infestations in Willmore Wilderness Park, Alberta in fall 2004

Site	Area (ha)	No. of Trees Controlled	Manpower Days Used
Beaverdam Creek	160	398	175
Meadowland Creek	130	128	76
Casket Creek	130	369	241
Total	420	895	492



In addition to the above, in early summer of 2005 a control program was carried out simultaneously with the detection program in view of the extremely limited window that was available for control before emergence of MPB. This program was organized under an incident command system (ICS). At its peak, this operation had an incident command team with 20 overhead team members, nine contractors, 55 support personnel, 191 Type I, 8 Type II and 9 Type III firefighters. An average of 10 medium and intermediate helicopters were available for this operation. Two camps were set up to accommodate the project personnel.

Surveyors also found infested trees on Kakwa Wildland Provincial Park that were included in this control program (Table 6 and Figure 15).

Altogether, 5 257 trees were treated during this combined operation (Figure 15). The breakdown of this control treatment is shown on Table 6.



Table 6

Details of MPB detection and control on Willmore Wilderness Park and Kakwa Wildland Provincial Park in Alberta in 2005 summer

Region/ Corp.Area	Type	Name	MPB Green/ Fader Trees Surveyed	Lodgepole Pine Cut & Burned	Whitebark Pine Cut & Burned	Total Treated
Foothills (SW3)	Provincial Crown Land	FMU E8	67	67	0	67
		FMU E10	184	184	0	184
	Provincial Parks and Wilderness Areas	Willmore Wilderness Park	4 592	4 302	81	4 383
Smoky (NW1)	Provincial Crown Land	FMU G3	2	2	0	2
		FMU G6	1	1	0	1
	Provincial Parks and Wilderness Areas	Kakwa Wildland Provincial Park	658	597	0	597
	FMA- Weyerhaeuser Canada Ltd.	FMU G3	21	21	0	21
		FMU G6	2	2	0	2
TOTALS			5 527 ^a	5 176	81	5 257
*FMA-Forest Management Agreement; FMU-Forest Management Unit						

^a Includes 270 infested trees that were pheromone baited for 2005 winter control operations.



Use of Pheromone Baits

Pheromone baits were used to limit spread of emerging beetles in areas where time was running out to cut and burn green attack trees before beetle emergence. In each case, the largest healthy host tree closest to the infested tree was baited with a two-component MPB aggregation pheromone (Phero Tech Inc., B.C.). The intention was to attract and trap any beetles emerging from green attack trees in near by baited-trees. The baits were affixed onto the north side of the stem and the baited trees were marked with flagging tapes. These baited-trees were to be followed up by crews during the following round of control operations to check the baited-tree and surrounding host trees within a 100-metre circle for MPB infestations, remove the bait and treat those trees that have been attacked by the MPB.

Under this program, 1 017 pheromone baits were deployed along the Sheep Creek, Fetherstonhaugh Creek, Muddywater River, Pauline Creek, Meadowland Creek and Jackpine River (Figure 15) in WWP. These included spot baiting near 209 individual infested trees that could not be treated before MPB emergence. As well, line baiting by establishing several lines of trees with pheromone-baits across the valleys was used to trap MPB flying into Willmore Wilderness Park.

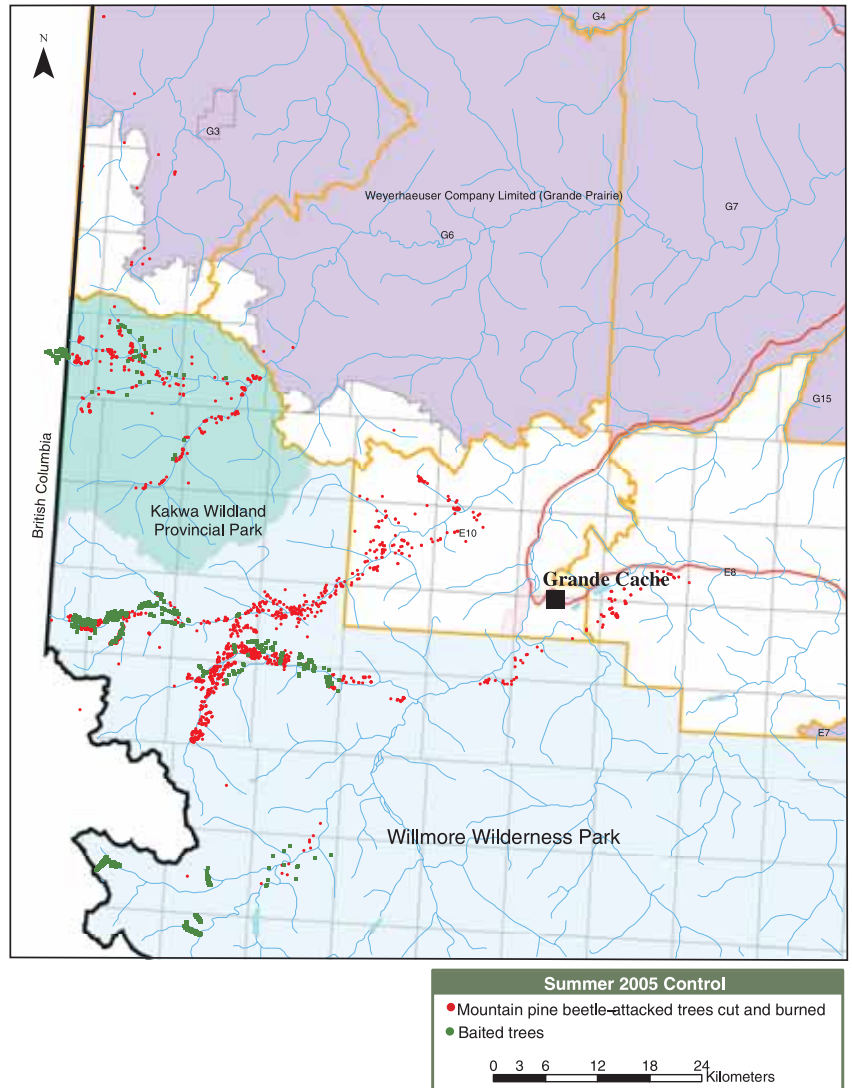


Figure 15

Mountain pine beetle-attacked trees cut and burned and locations of pheromone baited trees on Willmore Wilderness Park in Alberta, summer 2005



Northwest Corporate Region (NW)

2004/05 Ground Surveys

Ground surveys to detect current attacks (green attacks) of MPB were carried out concurrently with the 2005 control program on Kakwa Wildland Provincial Park. Crews were dispatched to those sites where faders were detected during aerial surveys carried out in 2005 summer. These crews surveyed mature pines within a 100-metre circle around each fader to detect green attacks. Altogether, these crews detected 658 attacked trees on Kakwa Wildland Provincial Park.



Cut and Burn Infested Trees

The surveyed trees in Kakwa Wildland Provincial Park were cut and burned in conjunction with the WWP control operation carried out in the summer of 2005 (Figure 15 and Table 6). For further details, see the Southwest Corporate Region- Foothills (SW3) and Woodland (SW4) Corporate Areas section.

In addition, pheromone spot baiting was used to trap beetles emerging from 61 infested trees that could not be harvested before MPB emergence. Altogether 85 pheromone baits were deployed in Kakwa Wildland Provincial Park.



Forest Invasive Alien Plants

Provincial

In 2005, SRD followed the direction outlined in its *Invasive Plant Strategy* to more effectively address the impacts of invasive plants in partnership with others.

Invasive Alien Species Working Group

SRD facilitated the establishment of the Interdepartmental Invasive Alien Species Working Group (Working Group). Under the direction of the Alberta Biodiversity Steering Committee, the Working Group will undertake to:

- Coordinate, align, and where possible consolidate Government of Alberta legislation, policies, programs, communications, and partnerships towards addressing impacts of invasive alien species.
- Develop a risk management framework and an assessment tool to minimize impacts of Alberta's current and potential invasive alien species.
- Provide advice and support towards the Government of Alberta's implementation of the National Invasive Alien Species Strategy, action plans and other related federal legislation, policies and programs.

The Working Group commenced to develop an Invasive Alien Species (IAS) Risk Management Framework. The framework is viewed as a systematic process and decision-making tool that allows a proactive, cost-effective, and consistent approach to address the impacts of IAS either threatening to enter or currently established in Alberta.

The framework will enable the provincial government and potentially other stakeholders to quantitatively identify and prioritize alien species by their likelihood to establish, spread and adversely impact Alberta's economic base, social values, natural resource productivity and biodiversity. Once the IAS are identified and prioritized based on the level of threat, decisions can be made on what

actions, if any, need to be taken to prevent their introduction and/or spread.

The framework consists of four incremental stages.

1. Screening and identification of alien species of potential or existing threat;
2. Systematic and quantitative assessment of the likelihood of alien species to establish, spread and create adverse impacts to Alberta's economic base, social values, natural resource productivity and biodiversity;
3. Utilize the risk assessment results to make strategic management decisions; and,
4. Enhance various communications.

The Working Group has taken early action on the second stage of the framework, i.e., the development of an IAS risk assessment tool. One initial focus of the tool will be the assessment of invasive plant risks. The first version of the tool will be completed in the spring of 2006, and will then be reviewed, tested and possibly refined.

Education and Awareness

With regard to invasive plant education initiatives in 2005, SRD in conjunction with Alberta Community Development worked to develop educational signs to be placed at a number of recreational staging areas. The signs will provide information about the impacts of invasive plants, methods to control their introduction/spread, and will feature a few invasive plants common to a particular area. The signs will be posted in the spring/summer of 2006. SRD also continues to contribute to the initiatives of the



Alberta Invasive Plants Council. In 2005 the Council held a well-attended workshop in Red Deer focusing on the theme of cooperative invasive plant management.

Regional

Northeast Corporate Region (NE)

In the Northeast Region, education and awareness remained the top priority of the invasive plant program. The second priority was to establish some control projects, and the third was to continue with the development of a comprehensive inventory of invasive plants in the Northeast Region.

Education and Awareness

Three Regional Invasive Plant Management Working Group sessions were conducted in Athabasca and Ft. McMurray. During the formal presentation in the two fall meetings, information was presented dealing with both invasive plants currently present and those that may be of concern in the near future. Also presented at the meetings was an overview of the 2005 Northeast Region invasive plant program.

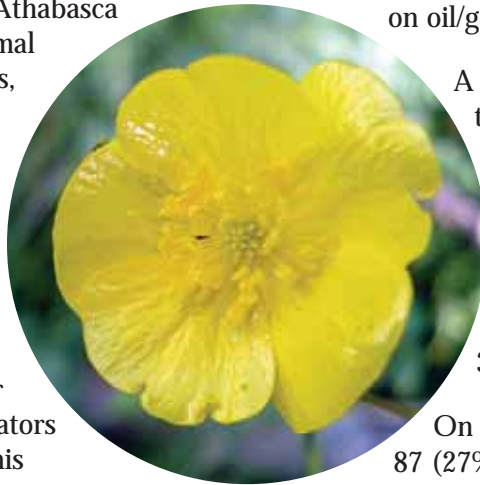
A formal presentation was made for landfill and waste transfer site operators within the County of Athabasca. This session concentrated on invasive plant identification, proper handling/disposal of picked plants, and the impact invasive plants can have on the environment.

Interactive presentations and short field tours were given to campers at the Long Lake Junior Forest Wardens (JFW) Camp and at the JFW National Campout. Also, an information booth was set up in conjunction with other PLFD programs at the Lac La Biche Centennial Day Celebration. Brochures, booklets and other pertinent information regarding invasive plants were available to the public in addition to the opportunity to discuss concerns with Forest Health staff.

Whenever possible, when SRD crew was out conducting invasive plant inventories, other workers out in the field were approached to provide a “teachable moment” on invasive plants management. This spur of the moment approach seemed to be generally positive and allowed for a rapport to be developed at a common level between government and industry. This same approach was also used with recreational users (such as campers, off-highway vehicle operators, fishermen etc.) resulting in increased knowledge of invasive plant issues both at a local and provincial scale.

Surveys and Control

Inventory priority was placed upon the forested Crown land not currently under disposition. As well, there were follow-up surveys on previously known infestations. Surveying occurred to a lesser extent on oil/gas and timber dispositions.



A relatively higher percentage (87%) of the 373 sites inventoried in 2005, had invasive plant infestations (in comparison to 62% in 2004). The severity of infestation at these sites varied from trace (48%), low (28%), moderate (15%) to high (9%); the comparative numbers in 2004 were 37%, 28%, 19% and 16% respectively.

On the 325 sites that had invasive plants, 87 (27%) had multiple species.

The frequency of species varying regionally was consistent with 2004 and 2003 results - *Canada thistle*¹⁰, *oxeye daisy* and *tall buttercup* were primarily found in the southern part (Lac La Biche area) of the Northeast Region. *Scentless chamomile*, *common tansy* and *perennial sow thistle* were scattered throughout the entire region. *Perennial sow thistle* is still extremely prevalent along most roads, to such an extent that many individual infestations were not recorded.

¹⁰ See Appendix II for scientific names of invasive plant species.



Invasive plant species in descending frequency were:

- Common Tansy - 38.4%
- Scentless Chamomile - 21.8%
- Perennial Sow Thistle - 17.6%
- Tall Buttercup - 8.6%
- Canada Thistle - 6.9%
- Oxeye Daisy - 5.6%
- White Cockle - 1.2%

Note: In 2005 there was a deliberate emphasis on recording **common tansy** infestations along the Athabasca River north of Ft. McMurray.

Invasive plant inventories were conducted along various locations of the Pembina, Calling, Rock Island and Athabasca Rivers. Along the Athabasca River, surveying occurred from the southern edge of the forested Crown land (Twp 69, Rge 18, W4) downstream to the old Pelican Settlement Cabin (Twp 78, Rge 18, W4). As well, the Athabasca River was surveyed north of Ft. McMurray. In a majority of locations along all of the watercourses, **common tansy** was found in quantity. As well, **Canada thistle** and **perennial sow thistle** were also found at these remote locations.

Hand picking, digging or mowing of different invasive plant species occurred at 80 locations. The primary target species was **scentless chamomile**, and others controlled included **common tansy**, **Canada thistle**, **oxeye daisy**, **tall buttercup**, **perennial sow thistle** and **white cockle**. The control actions taken on these infestations were done regardless of land use type or who the disposition holder was, if any.

Northwest Corporate Region (NW)

In 2005, the Smoky (NW1), Peace (NW3) and Upper Hay (NW4) areas continued their invasive plant management programs. The main priority in these areas was to detect noxious and restricted invasive plant species within targeted survey areas, and to notify those stakeholders whose dispositions contained the invasive plants. A second priority was to ensure that disposition holders were complying with control

notifications from the previous year.

Education and Awareness

An invasive plant awareness workshop was held in Grande Prairie on April 26 through the cooperative efforts of local municipalities and the Public Lands and Forests Division. The attendance was at a record level and plans are being made for another workshop this spring.



Surveys and Control

Within the Smoky (NW1) Area, invasive plant surveys were conducted at 92 sites between mid-June and September by SRD staff. The most prevalent species found was **Canada thistle**, which was recorded on 39.1% of the sites. Other species found were **perennial sow thistle**, **scentless chamomile**, **oxeye daisy**, **common tansy**, **bull thistle** and **nodding thistle**. Multiple species were found on 7 (7.7%) of the 92 sites. Twenty (21.7%) of the 92 sites were clean of any invasive plants.

A number of small control programs for **Canada thistle** continued within three areas of the Smoky Area in 2005. A contractor was hired to treat a number of significant infestations on the Dobbin Grazing Lease and two smaller infestations on vacant crown land (Canyon Creek and an abandoned gravel pit). Tordon 101® and Arsenal® were used at an application rate of 7.0 litres per hectare.



Within the Upper Hay (NW4) Area, SRD staff conducted 540 invasive plant surveys, an impressive number, in July and August. The most prevalent species found was **perennial sow thistle**, which was recorded on 382 (70.7%) of the sites. Other species recorded were **scentless chamomile**, **toadflax**, **oxeye daisy** and **Canada thistle**. Multiple species were found on 93 (17.2%) of the 540 sites, and 106 (19.6%) of the 540 sites were clean of any invasive plants.

Within the Peace (NW3) Area, surveys were completed between mid-June and September by SRD staff, as well as staff from the municipalities of Northern Sunrise County and Northern Lights. There were 499 sites inspected in total. The most prevalent species found was **perennial sow thistle**, which was recorded on 228 (45.7%) of the sites.

Other species recorded were **scentless chamomile**, **Canada thistle**, **oxeye daisy**, **tall buttercup**, **toadflax** and **common tansy**. Out of the 499 sites, multiple species were found on 77 (15.4%) and no invasive plants were found on 156 (31.3%) sites (Table 7).



Table 7

Occurrence of invasive plant species on inspected sites in the Northwest Corporate Region, 2005

Species Found	Smoky (NW1)	Corporate Areas Peace (NW3)	Upper Hay (NW4)
Clean	20 (21.7%)	156 (31.3%)	106 (19.6%)
Bull thistle	3 (3.3%)	0	0
Canada thistle	36 (39.1%)	97 (19.4%)	4 (0.7%)
Nodding thistle	1 (1.1%)	0	0
Oxeye daisy	2 (2.2%)	1 (0.2%)	2 (0.4%)
Perennial sow thistle	2 (2.2%)	228 (45.7%)	382 (70.7%)
Scentless chamomile	25 (27.2%)	105 (21.0%)	136 (25.2%)
Tall buttercup	0	3 (0.6%)	0
Common tansy	3 (3.3%)	1 (0.2%)	0
Toadflax	0	2 (0.4%)	3 (0.4%)



Southwest Corporate Region (SW)

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

In southern Alberta, a very wet summer limited the control activities of the invasive plant program in 2005. Control work was delayed until rain and flooding was over in June. Control access was disrupted for most of the season. Wet weather persisted off and on through August. The season overall was somewhat cool, but not so cold as to restrict plant growth. The moisture provided excellent germinating conditions for invasive plants.

In 2005, the invasive plant program objectives for the SW1 and SW2 Forest Areas were as follows:

- Eradicate restricted weed infestations
- Contain and control (reduce abundance & density) noxious weed infestations
- Control and eradicate isolated noxious weed infestations where feasible
- Reduce herbicide costs and impacts on the environment
- Maximize stakeholder participation in cooperation, prevention, treatment, and inventory
- Increase invasive plant awareness and stewardship of public lands through increased awareness
- Protect economic and ecological values of public lands from the damage caused by invasive plants

The following are priority areas that were selected for invasive plant surveying and control in 2005:

1. Co-operative management areas.
2. Identified recreation areas on SRD lands.
3. All other vacant crown land not under disposition.

Approximately 43% of the budget was allotted to the SW1 Area, 29% to SW2 Area, and 5% was allotted for education. For the second year in a row, the Forest Protection Division (FPD) provided funds for invasive plant survey and control in the 2003 Lost Creek Fire area.

Education, Awareness and Co-operative Initiatives

In the SW2 Area, the Owl River Road co-operative spray project in 2004 achieved excellent control of the **tall buttercup** that previously dominated the area. Due to the good residual control, the project area required only touch-up control by SRD and the leaseholder participants in 2005.



A new co-operative initiative went forth in the Rig St. area west of Sundre (SW2). The area comprised about two townships and involved 10 leaseholders and Clearwater County (on behalf of Alberta Infrastructure and Transportation).

The primary target plants were **tall buttercup** and **wild caraway**. It is hoped that in 2006 this co-operative control area can be extended eastward beyond the forest reserve boundary.

In the SW1 Area, the Municipal District of Ranchland as the PLFD contract sprayer, conducted co-operative spraying with Devon Energy Corp.

Surveys and Control

Herbicide applications in the Rig St. area (SW2) began once the land dried out after wet weather. The boundaries of this co-operative control area were: the Clearwater River, south to the James River, and east from the Forestry Trunk road to the Forest Reserve boundary.

Following the Rig St. control operation, the focus shifted to touch-up herbicide applications on the Owl River co-operative and recreation staging areas west



of the Trunk road (Cut Off Creek, Peppers Lake, Hummingbird, Onion Lake, Eagle Lake). Many invasive plants are introduced into these and other backcountry areas via contaminated hay and manure, in addition to other traffic. Recreational actions of all kinds then unknowingly spread these invaders further along trails. Another attempt was made this season to thoroughly treat backcountry infestations in the Blackstone/Wapiabi areas with herbicide. The **tall buttercup** infestation of Nelson Flats was missed again because of high water.

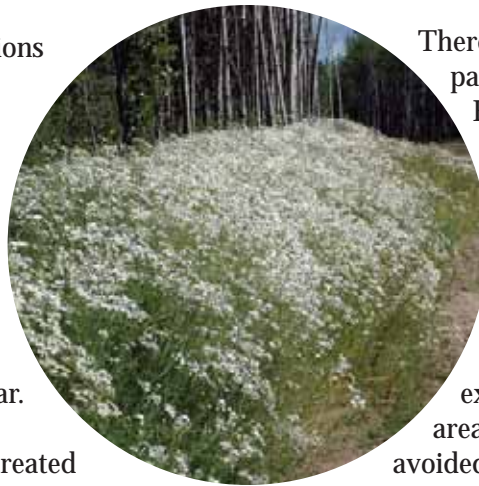
In Kananaskis Country, ample moisture was likely the cause for resurgence in **field Scabious**. The area was thoroughly treated with an herbicide and hopefully will look better in 2006. Sites in the MacLean Creek area where infestations persisted in the past have been drastically reduced.

The presence of **tall buttercup** has increased significantly just south of the Highwood Junction and also in the north Livingstone area. Some of the Livingstone infestations were treated with an herbicide and the remaining will be dealt with next year. Farther south, the Trunk Road and adjacent pipelines were thoroughly treated for invasive plants as part of co-operative management with Devon Energy Corp. To the west, the Atlas Haul Road area remains badly infested with **oxeye daisy** among other species. The **oxeye daisy** infestation is beyond control, and containment is the only option in the area for the time being. The Racehorse Watershed into the Oldman River remains infested with **oxeye daisy**.

Public Lands and Forests Division and Forest Protection Division co-funded invasive plant species management in the Castle Area where containment is the control strategy. Survey and treatment of the fireguards serve as containment lines on the south side of the fire. Nearly all salvage-logged areas that were clean previously have rebounded with native growth.

Recreation trails in the west Castle Area extending to the British Columbia border were surveyed and treated. The south Castle still has small isolated infestations. One exception is an explosion of **oxeye daisy** around the Drywood Creek Bridge near the Shell compound. A co-operative project with Shell at this site will be pursued in 2006.

The Beaver Creek area remains the most heavily infested of the Porcupine Hills; however the area looks better every year. This is likely due to high recreational activity. Removing the bolting stalks of **hound's-tongue** continues to be an effective control component. A proposed biocontrol release in the area had to be postponed until 2006.



There are two invasive plants that are of particular concern in the region.

Foremost is **wild caraway**, which has been spreading throughout the forested Crown land. This invasive plant poses significant threat to wildlands, as it seems to be very tolerant of a wide range of growing conditions. Treatment of poorly accessible, isolated infestations is expensive. In ecologically sensitive areas, where use of residual herbicides is avoided, **wild caraway** can take several seasons to control. The second invasive plant of concern is **orange hawkweed**, which is increasing in numbers where it is currently present. This plant can rapidly colonize a site by vegetative reproduction.

Foothills (SW3) & Woodlands (SW4) Corporate Areas

Education, Awareness and Co-operative Initiatives

In the SW3 area, cooperation with industry stakeholders was mainly voluntary. The companies that participated were expected to submit and follow an invasive plant control strategy. Companies were asked to monitor their leases for invasive plants, record survey information and follow up with control



activities. The records were then submitted to SRD for input into the database. The overall compliance and record completion by the companies have been satisfactory.

Surveys and Control

In the SW4 area invasive plant surveyors inventoried over 500 sites during the 2005 season. The main species recorded were *oxeye daisy*, *scentless chamomile*, *Canada thistle*, *toadflax*, *common tansy*, *perennial sow thistle* and *tall buttercup*. One other species that was found in many different areas was the *bull thistle*. Although this species is currently not categorized as a nuisance, noxious or restricted weed, it is thought to have the potential to become a large issue if not addressed.

In the SW3 area, survey and control operations focused on primarily on the area north of Edson

(Table 8). The invasive plants in the area include *Canada thistle*, *oxeye daisy*, *scentless chamomile*, *toadflax*,

common tansy and *tall buttercup*. The most common invasive plants found in the north Edson area were *scentless chamomile* and *oxeye daisy*. See Figure 16 for frequency of occurrence of invasive plants on inspected sites in this area.



Table 8

Invasive plant control sites in the SW3 Area in 2005

Site #	Site	Dates of Control	Type of Control	Type of Weeds Controlled
1	Old mill (NE 8 51 10 5)	Jul-05	Sprayed	Scentless chamomile
2	Reclaimed well (SE 3 50 10 5)	Jul-05	Sprayed	Oxeye daisy
3	Triumvante Road Cutblock (SE 4 51 10 5)	Jul-05	Sprayed	Common tansy, tall buttercup, oxeye daisy, Canada thistle
4	Pedley Gravel Pit (NW 10 52 24 5)	Jul-05	Sprayed	Perennial sow thistle, oxeye daisy
5	Gravel Pit by Entwistle (SW 8 53 7 5)	Jul-05	Sprayed	Tall buttercup, oxeye daisy, Canada thistle
6	Edson Warehouse	Aug-05	Sprayed	Oxeye daisy
7	Gregg Cabin (SE 23 49 24 5)	Jul-05	Sprayed	Tall buttercup
8	McLeod Group Camp	Jul-05	Picked	Oxeye daisy



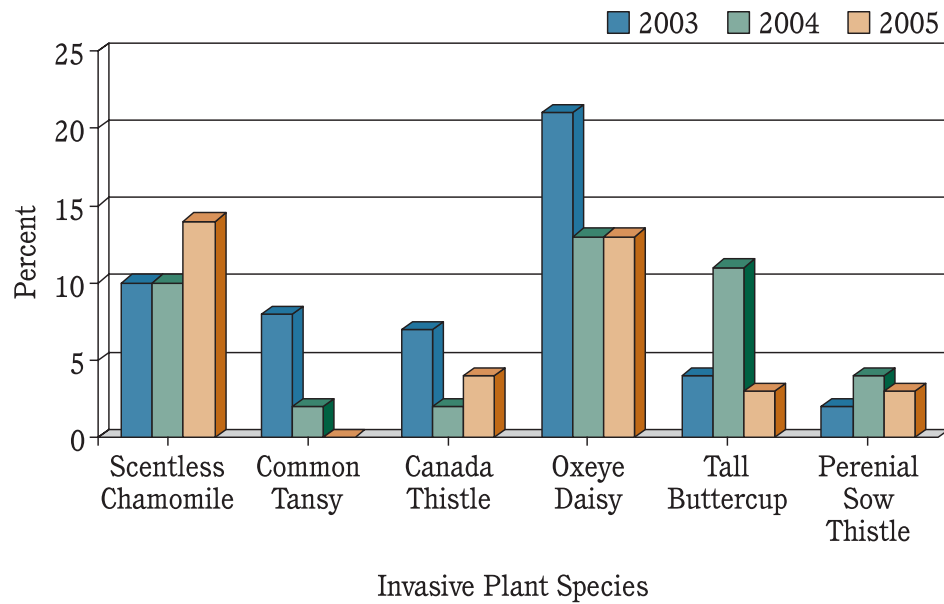


Figure 16

Frequency of invasive plant species occurrence on inspected sites in the north Edson area in Alberta between 2003 - 2005.



Forecast on Major Forest Pest Conditions for 2006 in Alberta

Spruce Budworm

Multi-Pher I® traps (Le Group Biocontrôle, Quebec) baited with female budworm sex pheromone lures (Phero Tech Inc., B.C.) were used to monitor male spruce budworm moth populations in high budworm-risk forest stands. The average count of male moths is used to predict the potential risk of new SBW outbreaks occurring in these stands. These procedures are described in the "Spruce Budworm Management Guide" (Ranasinghe and Kominek, 1998).

The provincial outlook on risk of new outbreaks occurring in 2006 is shown on Figure 17. A detailed analysis of the data is given on the next page.

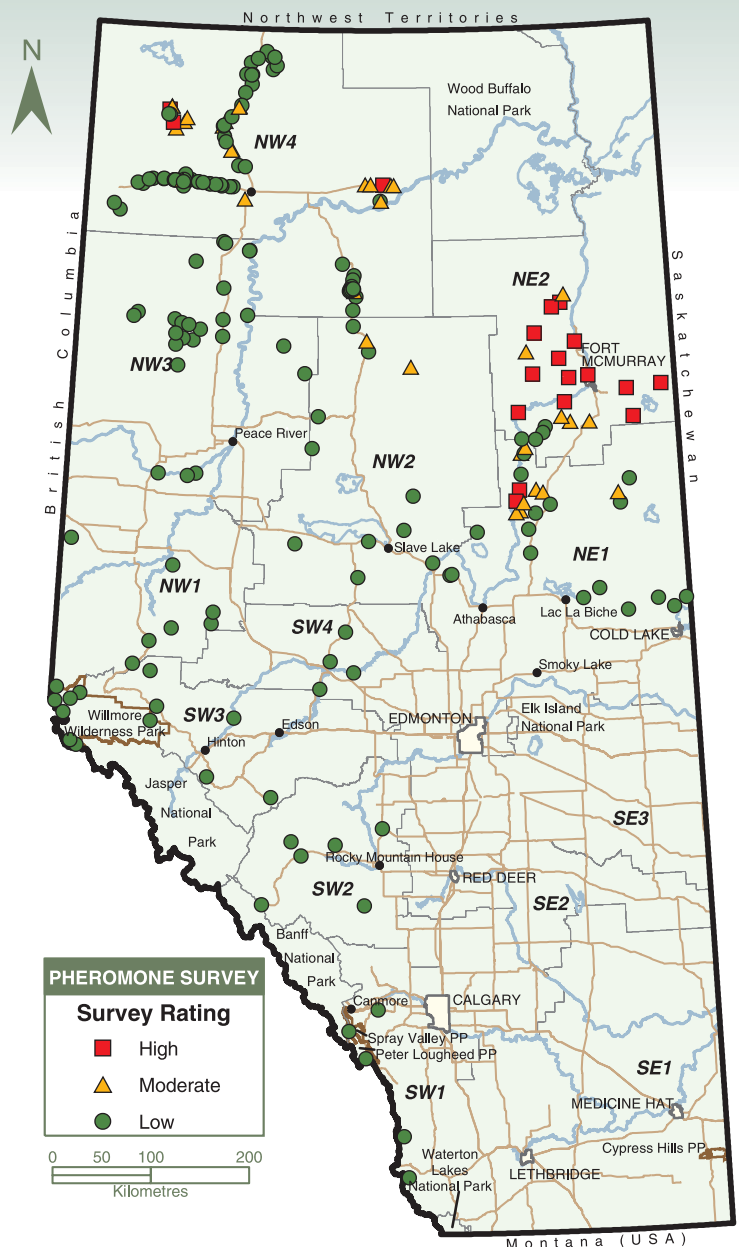


Figure 17

Forecast on risk of new spruce budworm outbreaks occurring in 2006, based on the number of male moths captured in pheromone-baited traps in 2005 in Alberta.



Northeast Corporate Region (NE)

The results of the survey are summarized on Figure 17. These results show that the risk of new spruce budworm outbreaks occurring is still high in this region.

In the Lac La Biche Area (NE1), 28 plots were established; one of these plots was inactive. Compared to the 2005 forecast, there was an increase in the risk of new spruce budworm outbreaks occurring in 2006, i.e., increase in the plots with moderate or high risk.

In the Waterways Area (NE2), compared to the forecast for 2005, there was a slight increase in the percent of plots with low risk, a significant increase in the percent of plots with high risk but a substantial decrease in the percent of plots with moderate risk in 2006 (Figure 18). The number of traps and the average trap catches under each category are shown on Table 9.

The 2005 egg mass counts indicated severe budworm defoliation in 2006 in the City of Fort McMurray located in this corporate area. Thus, the risk of new spruce budworm populations occurring will stay high in 2006 within this corporate area.

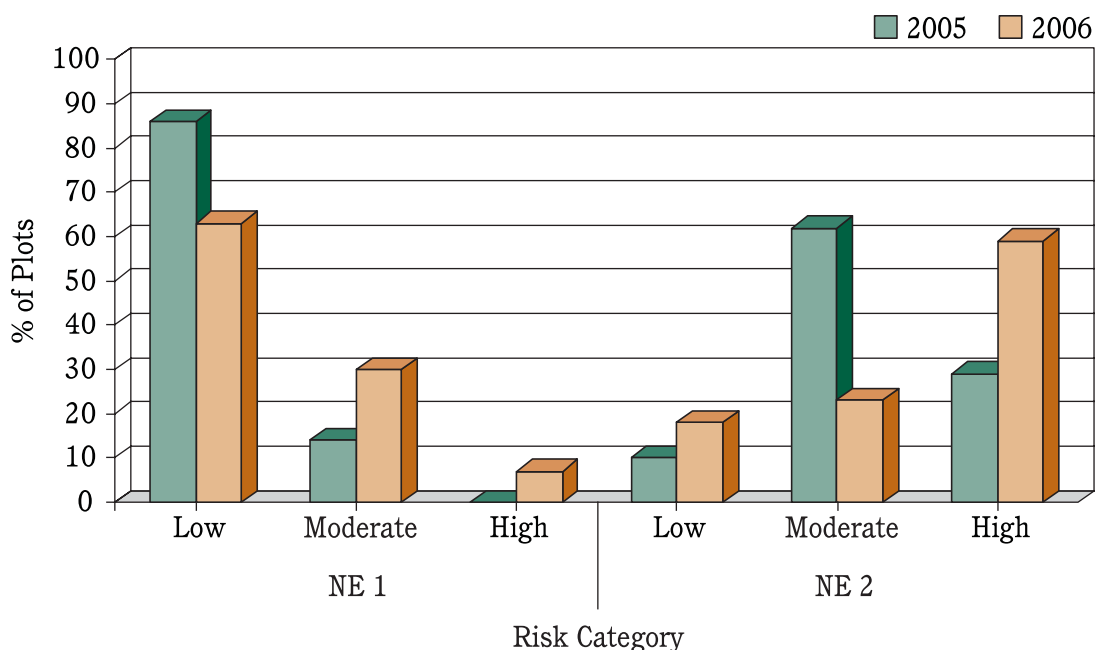


Figure 18

Forecasts based on male moth catches in pheromone-baited traps on risk of spruce budworm outbreaks occurring in 2005 vs. 2006 in the Northeast Corporate Region of Alberta.



Table 9

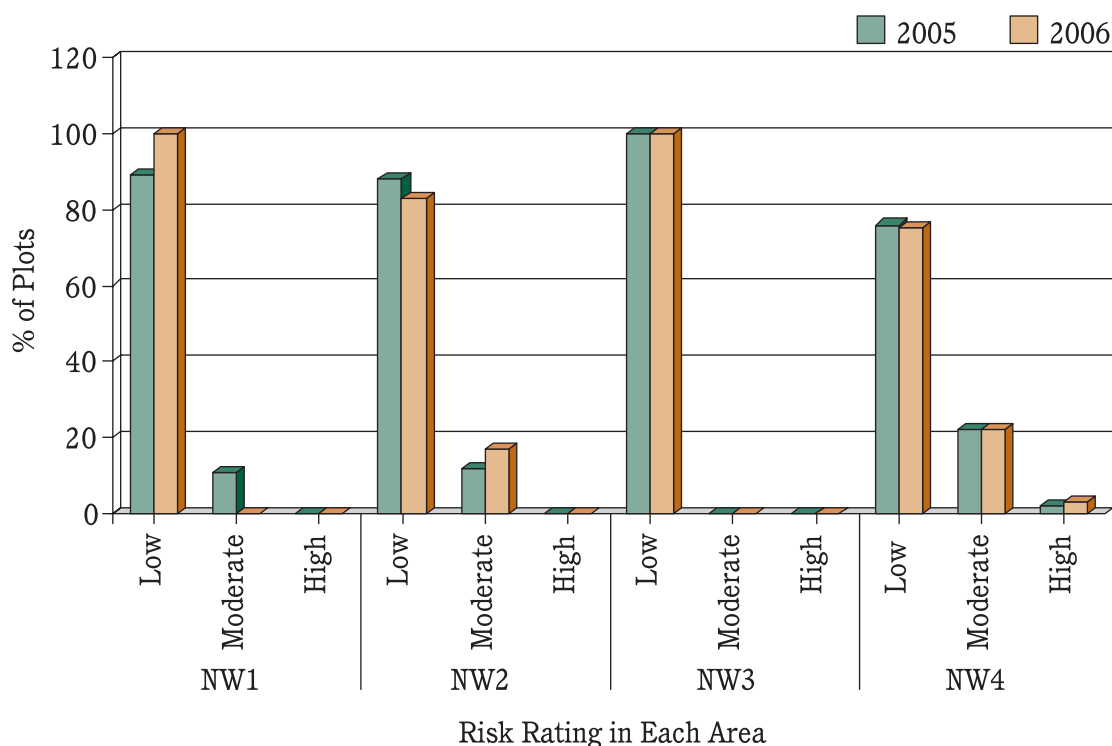
Summary results of spruce budworm male moths surveyed by using pheromone-baited traps in the Northeast Corporate Region of Alberta, 2005

Corporate Area	Risk of New Outbreaks Occurring in 2006					
	Low		Moderate		High	
	# of Plots	Moths/trap	# of Plots	Moths/trap	# of Plots	Moths/trap
Lac La Biche	17 (63%)	17-391	8 (30%)	654-1 324	2 (7%)	3 850-5 000
Waterways	4 (18%)	35-282	5 (23%)	644-1 780	13 (59%)	2 034-6 700

Northwest Corporate Region (NW)

In this region, 138 pheromone-baited plots were established in 2005 in co-operation with Tolko Industries - High Level (70 plots) and Manning Diversified Forest Products (11 plots).

The forecasts, based on male moth catches in pheromone-baited traps, on risk of spruce budworm outbreaks occurring in 2005 vs. 2006 in this region are shown on Figure 19.

**Figure 19**

Forecasts, based on male moth catches in pheromone-baited traps, on risk of spruce budworm outbreaks occurring in 2005 vs. 2006 in the Northwest Corporate Region of Alberta.



Out of the 138 plots, the risk of new outbreaks occurring in 2006 was low in 112 (81.2%) plots, moderate in 23 (16.7%) plots and high in 3 (2.2%) plots. As shown on Figure 19, risk of outbreaks occurring in 2006 remains low, about the same as that in 2005.

The predicted risk of spruce budworm outbreaks occurring in 2006 in the corporate areas of this region is shown on Table 10. This risk is low in the Smoky (NW1) and Peace (NW3) areas; it is low to moderate in the Lesser Slave Area (NW2); and, low to high in the Upper Hay Area (NW4)

Table 10

Summary results of the spruce budworm male moth surveys by using pheromone-baited traps in the Northwest Corporate Region of Alberta, 2005

Corporate Area	Risk of New Outbreaks Occurring in 2006					
	Low		Moderate		High	
	# of Plots	Moths/trap	# of Plots	Moths/trap	# of Plots	Moths/trap
Smoky	9 (100%)	2-38	0	0	0	0
Lesser Slave	10 (83%)	29-330	2 (17%)	795-1 669	0	0
Peace	21 (100%)	5-416	0	0	0	0
Upper Hay	72 (75%)	15-457	21 (22%)	515-1 977	3 (3%)	2 161-3 483

Southwest Corporate Region (SW)

Twenty-nine plots with pheromone-baited traps were set up as follows in this region in 2005: Southern Rockies SW1 (6); Clearwater SW2 (6); Foothills SW3 (13) and Woodlands SW4 (4). One plot in the Southern Rockies was disturbed and excluded from analysis. All the other plots had trap catches indicative of low risk of budworm outbreaks in 2007 in this region. This is expected because most of these plots are inhabited by the **two-year cycle budworm**, *C. biennis* Free.

In 2004, there were relatively high trap catches in some of these plots leading to a prediction of high outbreak risk in some areas of this region in 2006. However, spruce budworm populations have collapsed in most of Alberta and in B.C. If this holds true in the Southwest Region the risk of new outbreaks may be low in 2006.

