

**100 Mile House Forest District
Forest Health Strategy
June 1, 2007 – March 31, 2008**

**Prepared by:
100 Mile House
Ministry of Forests and Range**

**100 Mile House Forest District
Forest Health Strategy
2007-08**

Table of Contents

- Introduction..... 3
- Major Forest Health Agents..... 4
- Ranking of Forest Health Agents..... 5
- Status of Priority Forest Health Agents..... 6
- Status of Locally Important Pests..... 10
- Management Objectives..... 11
- Specific Strategies and Tactics..... 12
- Reporting to the Chief Forester 19
- Beetle Management Status and Maps..... 20

100 Mile House Forest District Forest Health Strategy 2007-08

Introduction

The 100 Mile House Forest District Forest Health Strategy is prepared by the 100 Mile House, Ministry of Forests and Range. The strategy is compiled under the guidance of the Provincial Forest Health Strategy, and Provincial Bark Beetle Strategy. The purpose of this strategy is to outline bark beetle management objectives, specific strategies and procedures, and the current status and extent of priority forest health agents. The main focus of this strategy will be the priority forest health agents of the district, with some comments on locally important pests. Also mentioned are comments related to issues that are hindering control efforts such as biodiversity. (i.e. old growth management areas)

The 100 Mile House Forest District (1.2 million hectares) encompasses a land base rich in resource values which provides substantial benefits to local communities. Resource users such as forestry, ranching, and tourism offer direct and indirect economic benefits to the local community. Other valuable resources including wildlife, water, and recreation provide significant social and economic benefits.

Bark beetle pests are posing a significant threat to management objectives for many of these resources. The mountain pine beetle, Douglas-fir beetle, and spruce beetle are classed as the priority forest health agents. Catastrophic infestations result in millions of dollars in reduced revenue due to timber losses, degraded lumber values, reduced stumpage values, degradation of non-timber resources, disruptions in forest planning, and long-term impacts on resource sustainability. Large scale tree mortality within the 100 Mile House Forest District could also have negative impacts on recreation, fire hazard, visual quality objectives, wildlife habitats, and other resource values.

Major Forest Health Agents

100 Mile House Forest District

Bark Beetles

- Douglas-fir Beetle
- Spruce Beetle
- Balsam Bark Beetle
- Mountain pine beetle

Defoliators

- Western spruce budworm
- 2 year cycle budworm
- Douglas-fir tussock moth
- Satin moth
- Western hemlock looper
- Forest tent caterpillar
- Black army cutworm
- Serpentine leaf miner

Root Disease

- Armillaria root disease
- Tomentosus root disease
- Laminated root disease

Stem and Branch Diseases

- Dwarf mistletoe
- Western gall rust
- Stalactiform blister rust
- Atropellis canker
- Commandra blister rust

Weevils

- Spruce weevil
- Lodgepole pine terminal weevil
- Warren's root collar weevil

Foliage Diseases

- Lophodermella needle cast
- Elytroderma needle cast

Abiotic Injuries

- Blowdown
- Ice damage
- Animal damage

100 Mile House TSA Ranking of Forest Health Factors by Importance

Pest species are ranked according to:

- The collective knowledge of the Regional/District forest health specialists.
- Known or suspected impacts to forest resource values.
- Availability of operational detection and treatment methods.
- Costs and benefits of applying detailed detection and treatment activities.
- Distribution of pests and current incidence levels.
- Resources and funding required to implement the necessary management for the pests.

Note: abiotic injuries (i.e. blowdown, ice damage) are not ranked, as the severity can change with each event.

Also note that not all forest health factors are ranked, only the more significant pests within the 100 Mile House Forest District.

Table 1- Ranking of Pest Species by priority for Forest Management Activities

Very High	High	Medium	Low	Very Low
Douglas-fir beetle	Western spruce budworm	Balsam Bark beetle	Mountain Pine beetle	Atropellis canker
Spruce Beetle	Armillaria root disease	Laminated root disease	2 year cycle budworm	Elythroderma needle cast
		Dwarf mistletoe	Western hemlock looper	Satin moth
		Western gall rust	Douglas-fir tussock moth	Animal damage
		Spruce weevil	Forest tent caterpillar	Black army cutworm
		Lodgepole pine terminal weevil	Commandra blister rust	Serpentine leaf miner
		Tomentosus root disease	Stalactiform blister rust	
			Lophodermella needle cast	
			Warren's root collar weevil	

Forest health treatment planning should target highest priority stands first. Douglas-fir bark beetle suppression is the highest priority followed by Spruce beetle suppression.

**Status of Priority Forest Health Agents
100 Mile House Forest District
2007**

Priority Ranking for Bark Beetles

- Douglas Fir Bark Beetle (IBD) – highest
- Spruce Bark Beetle (IBS) – highest
- Balsam Bark Beetle (IBB) – medium
- Mountain Pine Beetle (IBM) – low

Douglas-fir Beetle (highest priority)

Douglas-fir beetle throughout the district has been identified as *aggressive* for the purpose of the provincial established Emergency Bark Beetle Management Areas. (refer to pages 13-14 for definitions of BMU strategies)

From the 2006 aerial survey, 974 sites were detected. The majority of the sites are small 5-40 current attack trees, however a few sites in the following locations were larger 200-500 current attack trees: Deka Lake, Cougar Lake, Bedingfield Lake, Canim South, and Horse Lake..

Douglas-fir beetle infestations have increased slightly, from 3,050 ha in 2005 to 4,112 ha in 2006. Most of the infested area was classified as trace, and represents very scattered, low levels of mortality. The number of smaller spot infestations has remained low, at just 26 (380 trees). Most of the mortality was seen in Lac La Hache, Horse Lake, Pigeon Creek, canoe Creek, Loon Lake, Bonaparte Lake, Deka Lake and Canim Lake areas.
(Provincial Overview Report)

Winter Mortality Table

Year	Winter Mortality	R-Value
2007	61.28%	2.34
2006	57.92%	3.34
2005	86.8%	1.83

Note: R-value of over 1.3 means the population is increasing.

(Douglas-fir beetle con't)

Timber Area (Ha) affected by Douglas-fir Beetle

	2000	2001	2002	2003	2004	2005	2006
100 Mile House F.D.	198	54	3,911	7,183	4,974	3,050	4,112

Infestation data from Provincial overview surveys: These area hectares are all estimates of new annual infestations based on the aerial overview survey.

Spruce Beetle (highest priority)

In 2006 the status of the Spruce beetle, for the purpose of the provincial Emergency Bark Beetle Management Area, was updated to the following: Mckinley and Spanish BMUs are *salvage*, Deception and Hendrix BMUs are *containment*, and the other spruce type BMUs are *aggressive*. These BMU strategies were updated because of the infestation levels in these areas and the very limited to non-existent control efforts to date. (refer to pages 13-14 for definitions of BMU strategies)

All infestations continue to be in the northeast of the District, and have increased slightly to 15,279 ha. Mortality has increased in the Deception Creek and McNeil Lake areas, while declines were seen in the Pendleton Lakes and Windy Creek areas.. (Provincial Overview Report)

Timber Area (Ha) affected by Spruce Beetle

	2000	2001	2002	2003	2004	2005	2006
100 Mile House F.D.	609	587	4355	20,935	17,250	13,724	15,279

Infestation data from Provincial overview surveys: These area hectares are all estimates of new annual infestations based on the aerial overview survey.

Balsam Bark Beetle (medium priority)

Scattered mortality was observed throughout the northeast of the District. Infestations were mapped on a total of 12,488 ha, down slightly from 15,446 ha.. (Provincial Overview Report)

The only effective control method for the extent of the balsam bark beetle infestation is large harvesting cutting permits. The majority of the balsam bark beetle infestations are located in spruce/balsam mixed stands. For this reason balsam bark beetle will not be treated unless in conjunction with spruce bark beetle treatment. These stands are very susceptible to blowdown if single tree extraction is conducted. Trap trees can be utilized to contain/concentrate balsam bark beetle.

Timber Area (Ha) affected by Balsam Bark Beetle

	2000	2001	2002	2003	2004	2005	2006
100 Mile House F.D.	2312	3577	23,469	20,935	26,722	15,466	12,488

Infestation data from Provincial overview surveys: These area hectares are all estimates of new annual infestations based on the aerial overview survey.

Mountain pine beetle (low priority)

Mountain pine beetle mortality continues to increase throughout the District. Although infested area increased by only 15%, the amount of red attack increased sharply in most areas, especially in the eastern half of the District. The 100 Mile house District is experiencing the most widespread extreme mortality rates in the Sothern Interior Region – just under 30% (190,000 ha) of the infested area was classified as very severe, and 60% (438,343 ha) were classified as moderate or greater. The number of spot infestations has dropped to almost nil (6 spots only). Much of the increased area has come from infestations expanding into high and low elevation areas with minor pine components. .
(Provincial Overview Report)

Because the epidemic has reached its peak, the infestation area has expanded into the districts younger stands (<40 years old). From the Young Lodgepole Pine stands surveys, the infestations levels in these stands varies from 10%-80% attack. Mortality of the larva in these small diameter trees is very high, and adult success is very low.

In 2005 the majority of the TSA had been identified as *salvage* for the purpose of the provincial established Emergency Bark Beetle Management Area. Although the prevalence of mountain pine beetle is in the epidemic stage, its status as a priority for management has been reduced to medium. Since there are no longer opportunities to effectively control the spread of the mountain pine beetle, emphasis (priority) for the management has been shifted to spruce beetle and Douglas-fir beetle where suppression activities may still be effective in controlling the spread, and impact of the beetle. *(refer to pages 13-14 for definitions of BMU strategies)*

Timber Area (Ha) affected by Mountain Pine Beetle (current attack)

	2000	2001	2002	2003	2004	2005	2006
100 Mile House F.D.	558	672	14,603	106,400	660,000	623,560	628,343

(Provincial Overview Report) : These area hectares are all estimates of new annual infestations based on the aerial overview survey.

Status of Locally Important Pests 2007

Defoliators

Western spruce budworm

Defoliation expanded slightly, from 108,119ha in 2005, to 128,373 ha in 2006, and the proportion of area sustaining moderate to severe defoliation increased to over 35%. Defoliation expanded along Highway 97, from 100 Mile House north to 130 Mile House. In the Clinton-Bonaparte Lake area, overall area declined, while defoliation intensity increased significantly. Widespread light defoliation continued to occur throughout the Canoe Creek – Big Bar Creek area. Eggmass sampling carried out in the fall of 2006 predicts moderate and severe defoliation in the Clinton, Kelly Lake, 70 Mile, Loon Lake and Big Bar Lake areas, in 2007. Light defoliation is expected throughout the Jesmond, China Gulch, Canoe Creek, Eight-three Creek, 100 Mile House and Lac La Hache.

5000-10,000 ha are planned to be sprayed in June 2007 in the Clinton area of the district.

Two Year Cycle Budworm

Light defoliation was observed on 3,667 ha in the Boss Creek and McKinley Creek areas.

Serpentine Leaf Miner

Infestations have occurred consecutively in the past 3-4 years. Infestations are moderate to severe and some mortality is being seen. Infestation areas noted are in the 100 Mile House, and Bridge Lake. There has been some mortality of the young aspen noted and also some top kill of the old trees.

Management Objectives

For priority forest health factors the 100 Mile House Forest Health Strategy will follow the specific management objectives as per the Provincial Bark Beetle Strategy. The following are specific objectives:

- Minimize the loss of timber value
- Minimize the loss of Crown revenue
- Minimize the spread of bark beetles

Bark beetles are a natural component of forest ecosystems in British Columbia, and at most times are present at low or endemic levels. Presently the populations have expanded into large epidemic infestations in some portions of the district. In the epidemic areas only prolonged cold winter conditions, or depletion of appropriate host species will collapse their expansion. With adequate resources the endemic portions of the district are still manageable. This strategic plan provides direction to apply the limited resources we have available to where it is most appropriate to help mitigate the rate of spread. One impediment in achieving bark beetle management objectives includes biodiversity issues (i.e. OGMA and MDWR). This strategy proposes to address all species of priority bark beetles active in this district, which includes Douglas-fir beetle, and spruce beetle.

Specific Strategies

For priority forest health agents the 100 Mile House Forest Health Strategy will follow the specific strategies and tactics outlined in the Forest Practices Code Guidebooks, Provincial Bark Beetle Strategy, Regional Bark Beetle Plans, and focus on areas identified by the 100 Mile House Forest District Detailed Aerial Survey Maps.

Priority Forest Health Agents:

- Douglas-fir Beetle
- Spruce Beetle

Beetle Management Units

A Beetle Management Unit (BMU) is a planning and reporting unit for operational beetle management. Its purpose is to facilitate the implementation of beetle management activities. Resource management objectives will be consistent throughout the unit. Strategies will be evaluated for compatibility with adjacent BMUs. BMUs have been created within the district for prioritising each bark beetle species.

The BMU boundaries for the district will follow the boundaries of Landscape Units. The strategy and the recommended treatment options will be selected after consideration of the status of the outbreak in the BMU, funding allocations, and Provincial direction for bark beetle control strategies.

Beetle Management Unit Strategies

The following four strategies for each or portion of the 100 Mile House BMU's will be implemented. These strategies are selected based on the level of outbreak in an area and the estimated effectiveness of selected treatments in achieving stated objectives. The BMU's will be re-evaluated, usually yearly, as new aerial survey information is received. Revised strategies for each of the BMU's will be adjusted at that time.

1. **Suppression** (Aggressive): This is the most aggressive strategy. It is selected when the infestation status is such that aggressive direct control actions are expected to keep an area at low level of infestation. Areas are lightly infested, and resources for direct control or harvesting and milling capacities equal or exceed the amount of infestation. The intent of the strategy is to reduce or keep the outbreak to a size and distribution that can be managed within "normal resource capability".
2. **Holding** (Containment): The intent of this strategy is to maintain an existing outbreak at a static level. It is a delaying strategy until adequate resources are available, or access created that allow for a more aggressive approach, or to reduce overall loss while waiting for a killing climatic event. This is appropriate in areas with chronic beetle infestations that are too large to deal with using single tree treatments or where access is poorly developed for directed harvesting.
3. **Salvage**: Applied to areas where management efforts would be ineffective in substantially reducing the beetle populations and subsequent levels of damage. Such areas have extensive outbreaks covering a large proportion of susceptible stands. The objective in this case is to salvage affected stands and minimize value loss.
4. **Monitor**: This strategy is applied to areas where management efforts would be ineffective in substantially reducing the beetle population and subsequent levels of damage, or where there is no short term (less than 5 years) possibility of salvaging dead timber. This may be due to management constraints such as wilderness area, Park or ecological reserve, or because access cannot be put in place before substantial merchantable degradation of the dead material occurs.

Objectives for beetle population removal for BMU strategies:

Strategy	% of Current Infestation to Treat.	Comments
Suppression (Aggressive)	>80%	Address all current attack within two years. The intent is to “control” the outbreak in that area and stop spread
Holding (Containment)	50-79%	Address the largest proportion of the new infested material, at least close to the rate of expansion. The intent is to maintain beetle populations at a level that can be dealt with annually without huge expansion
Salvage	<50%	The priority is to salvage timber previously attacked to minimise value loss. Relevant in areas where suppression or holding actions are no longer appropriate or feasible.
Monitor	0	No action is required beyond monitoring and recording. This is most appropriate in Parks and Ecological Reserves and in inoperable areas where the outbreak has peaked, salvage is not possible, and there is no chance for any mitigation of further loss.

CONTROLS AND TACTICS

A number of tactics are available to achieve the forest health management strategies; these are described as follows:

Douglas-fir Bark Beetle Control Tactics

1. Use UTM coordinates from detailed aerial survey, locate red attack and perform detailed ground surveys collecting data on amount of current attack.
2. Prioritize control techniques by amount of current attack and location to access.

General Guidelines:

- a. 1-10 current attack trees:
 - deploy MCH,
 - or consider heli/conventional trap trees,
 - if access is good harvesting may be considered.
- b. >10 current attack trees:
 - harvest,
 - or MCH deployment in remote locations and consider additional treatment with the use of heli trap trees outside the infestation area.

The above mentioned control techniques will be deployed by the ministry's district forest health program and possibility in conjunction with the major licensee, BCTS or SSS.

3. Harvested bark beetle areas, should have a follow-up treatment such as MCH or trap trees before the next beetle flight to control residual beetles in stumps and slash.
4. Control efforts, in OGMA, must be done in accordance to the Integrated Land Management Bureau (ILMB), Regional Biodiversity Conservation Strategy.
5. Control efforts, in MDWR, must be done in accordance to the Ministry of environment, General Wildlife Measures (GAR).
6. Cutting authorities being planned by major licensees and BCTS in Douglas-fir beetle infested areas should incorporate pre-felling of roads and landings prior to beetle flight to concentrate beetle populations into harvest area.
7. Additional post harvest treatments are described in the Post Harvest Mop-Up, and Trap Trees sections.

Spruce Bark Beetle Control Tactics

1. Use information from detailed aerial survey to locate infestation centres and outer boundaries of infestations.
2. Where the BMU strategies are aggressive and containment the following control techniques can be utilized:

General Guidelines:

- a. Small infestation site, less than 1 hectare in size and isolated:

- The infested trees are to be removed by harvesting.
- If infested trees can not be removed before the beetle flight the following year because of harvesting conditions, a trap tree program is to be utilized.

The above mentioned control techniques will be deployed by the ministry's district forest health program and possibility in conjunction with the major licensee BCTS or SSS.

- b. Larger infestation areas, greater than 1 hectare in size:

- Harvested under a Forest Development plan or Stewardship plan.
- Cutting authorities being planned by major licensees and BCTS in spruce bark beetle infestation areas should incorporate the use trap trees, by pre-felling roads and landings.
- Or bait with attractant semiochemicals in a grid pattern to concentrate beetle populations. Areas grid baited must be assured of harvest within one year. Under the Forest Practice Code of B.C. Act (Regs) Part 5 , Section 44 – Forest Health and the Forest Planning and Practices Regs, Part 4, Div 2, Section 41 – Timber and Forest Health; the use of pheromone baits and lures must be followed up by appropriate treatments to ensure that pheromone treatments do not lead to population increases.

Armillaria root disease control Tactics

1. Inoculum removal through the use of stumping and push over logging.

Where there are sensitive soils the following alternative control tactics should be considered to minimize excessive soil disturbances:

1. Using *Hypholoma fasciculare* inoculation to enhance populations of desirable fungal species that strongly compete with Armillaria root disease. Consider spot application as infection centres become apparent.
2. Minimizing soil disturbance that can provide a substrate for increased colonization by new Armillaria genets.
3. Maintaining coarse woody debris of all size classes from fine to course within group selection openings to provide nutrient sources for desirable fungi that compete with Armillaria. Debris should be spread evenly or left in small clumps.
4. Using alternative species to break up root-to-root contact of Douglas-fir, where inclusion of some species other than Douglas-fir is acceptable. For example, plant cutover rings, described in Point 5, with deciduous species.
5. Carefully identifying infections centres and considering leaving them unlogged as wildlife tree patches (WTP). Also, consider ringing Armillaria WTP with logging areas to create root gaps so that Armillaria spread into the stand by root contact is reduced. Treat logged rings using a combination of as many as possible or other mitigating treatments outlined here, to reduce the risk of Armillaria flashing in the logged rings.
6. Maintaining mature trees in infection centres that have survived Armillaria as seed sources for regeneration.
7. Using natural regeneration to take advantage of the evolved resistance of local trees to the local strains of Armillaria and to avoid the increased susceptibility of container stock to Armillaria root disease.
8. Grooving stump tops to collect moisture to speed up decomposition of stumps. Apply nitrogen fertilizer to stump tops to speed up decomposition of stumps.
9. Looking at potassium nutrient status and, where applicable, considering potassium fertilization.

Aerial and Ground Surveys

The provincial overview survey is carried out each year to determine the spread of the bark beetles within the district. In 2006-07 a detailed aerial survey was completed by the district forest health technician. This flight covered Douglas-fir beetle in the district and the outer edges of the spruce bark beetle attack in the northeast.

Prioritizing BMU's

A priority rating will be given to all beetle management units based on timber types, resource values, adjacent infestations, and past investments. This priority rating then needs to be further evaluated, to consider shelf life, species composition and amount of infestation to prioritizing harvesting.

Beetle Attack Analysis/Susceptibility Maps

This analysis reflects the susceptibility of forest stands to beetle infestation, based on factors such as tree age, elevation, species composition, landscape constraints, current infestation levels, and is calculated from information in the Ministry of Forests' digital inventory ("FIP") files

Small Patch Harvesting

Small patch harvesting is a viable control option for small scattered patch infestations of Douglas-fir and spruce bark beetle. All harvesting should be followed by a mop-up procedure. Small patch harvesting, utilizing Small Scale Salvage is no longer an effective tool in controlling the mountain pine beetle in this district because of the extent of the infestation.

Harvesting: Clearcutting

Harvesting is the main control for bark beetles, and wherever possible should be completed prior the next beetle flight. Forest development plans and Stewardship Plans should incorporate the sanitation of beetle infestations, where possible.

Minimizing Windthrow: where Douglas-fir and spruce are reserved in cutblocks or as wildlife tree patches, cutblocks should be laid out to ensure wind firmness. Reserve areas should have post-harvest inspecting conducted to ensure the wind firmness goals were met, and if there is blowdown these trees should be salvaged to prevent the concentration of bark beetles.

Post-Harvest Mop-Up

For Douglas-fir and Spruce bark beetle control, slash and felled trees which may be present after harvesting should be minimized, piled and burned or cut into lengths less than 1m, to prevent population build-up or survival in that material.

Conventional Trap Trees

This tactic is used against Douglas-fir and Spruce bark beetle, and takes advantage of the fact that this pest prefers downed material over standing trees; trees are removed between September and before beetle emergence. (For spruce bark beetle (IBS) this emergence date is just beyond May 15th and Douglas-fir beetle (IBD) Apr 15th.)

Access

Road deactivation should be delayed if future forest health activities are anticipated in an area.

All timber infested with bark beetles must be delivered to the mill and debarked between the following time periods:

Douglas-fir	Aug 15 th to April 15 th .
Spruce	Aug 15 th to May 15 th
Lodgepole Pine	no restrictions apply.

The mill must be advised of the beetle infested wood. Exemption maybe given to these restrictions if it is determined that these beetle have entered the tree in the present year and will not emerge until the following spring.

Reporting To The Chief Forester:

The effectiveness of the districts forest health strategy will be evaluated in April of each year to fulfil the requirements of the district AAC uplift. The strategy will be evaluated to see if the suppression goals to control >80% of current attack is being accomplished in all BMUs

This requirement is stated in the 100 Mile House, Rationale for Allowable Annual Cut (AAC) determination (page 42) which states: "I urge BCFS district staff to report on how well the 100 Mile House district health strategy is being implemented and opportunities for improvement so that this can be factored into the next determination."

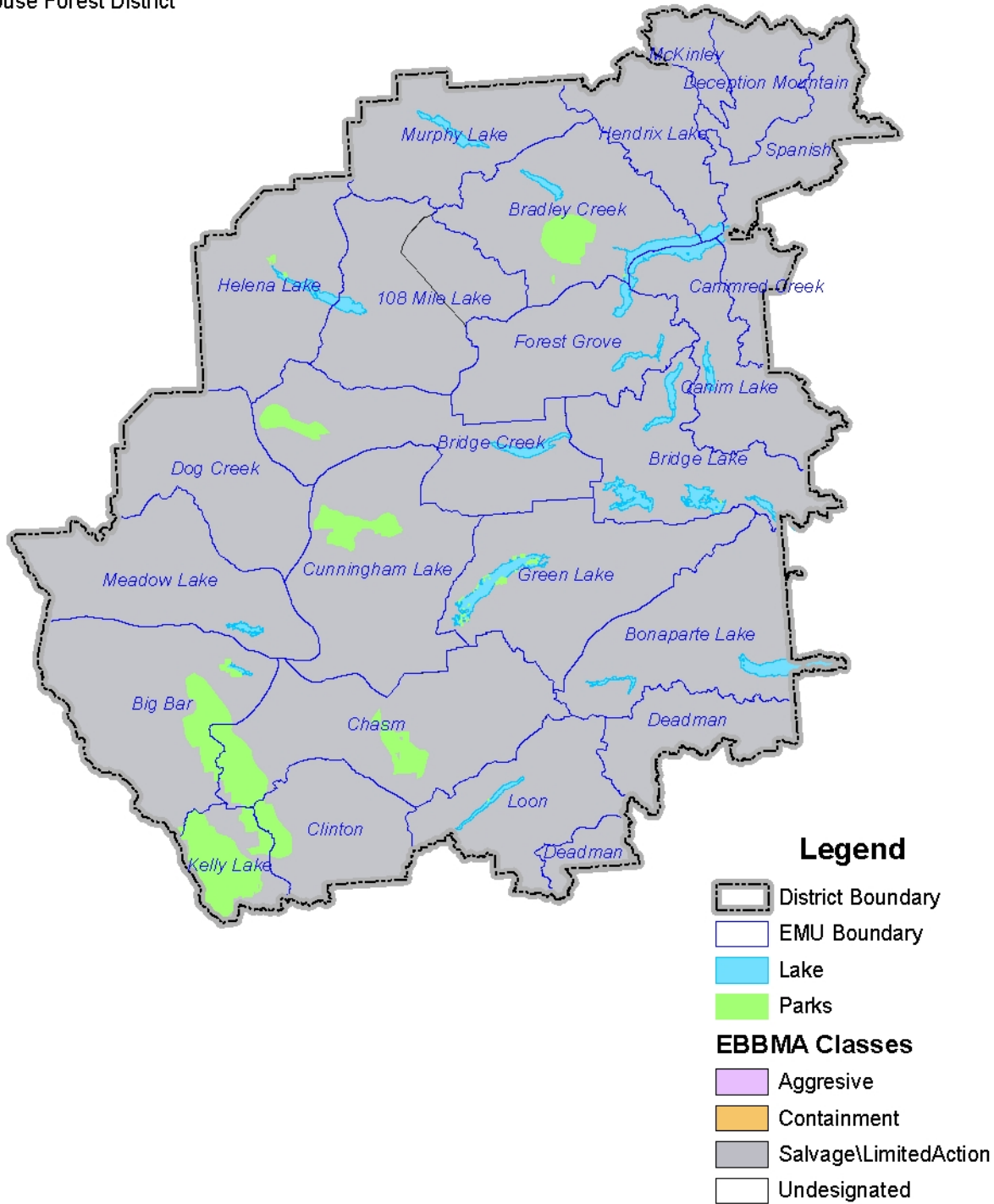
**Beetle Management Units
100 Mile House Forest District
Mountain Pine Beetle**

BMU	STATUS May 2007
108 Mile Lake	salvage
Big Bar	salvage
Bonaparte Lake	salvage
Bradley Creek	salvage
Bridge Creek	salvage
Bridge Lake	salvage
Canim Lake	salvage
Canimred	salvage
Chasm	salvage
Clinton	salvage
Cunningham	salvage
Deadman	salvage
Deception	salvage
Dog Creek	salvage
Forest Grove	salvage
Green Lake	salvage
Helena Lake	salvage
Hendrix Lake	salvage
Kelly Lake	salvage
Loon Lake	salvage
McKinley	salvage
Meadow Lake	salvage
Murphy Lake	salvage
Spanish	salvage

Mountain Pine Beetle EBBMA & EMU Status Map

(Effective June 1, 2007)

100 Mile House Forest District



June 1, 2006

SOURCES:
 PLOT: \\marble\work\FOR\RS\DMH\PlotFiles\ForestHealth\MountainPine_1EBBMA and StrategicPlanningMap_2007_v1.pdf
 mxd: \\marble\work\FOR\RS\DMH\Projects\ForestHealth\MountainPine_1EBBMA and StrategicPlanningMap_2006_v1.mxd
 EBBMA Classes: \\marble\work\FOR\RS\DMH\Local_Data\FHealth\EBBMA_Nov2006\PI_EBBMA_2006_v1.shp

Produced by: MoFR, DMH, June 1, 2007

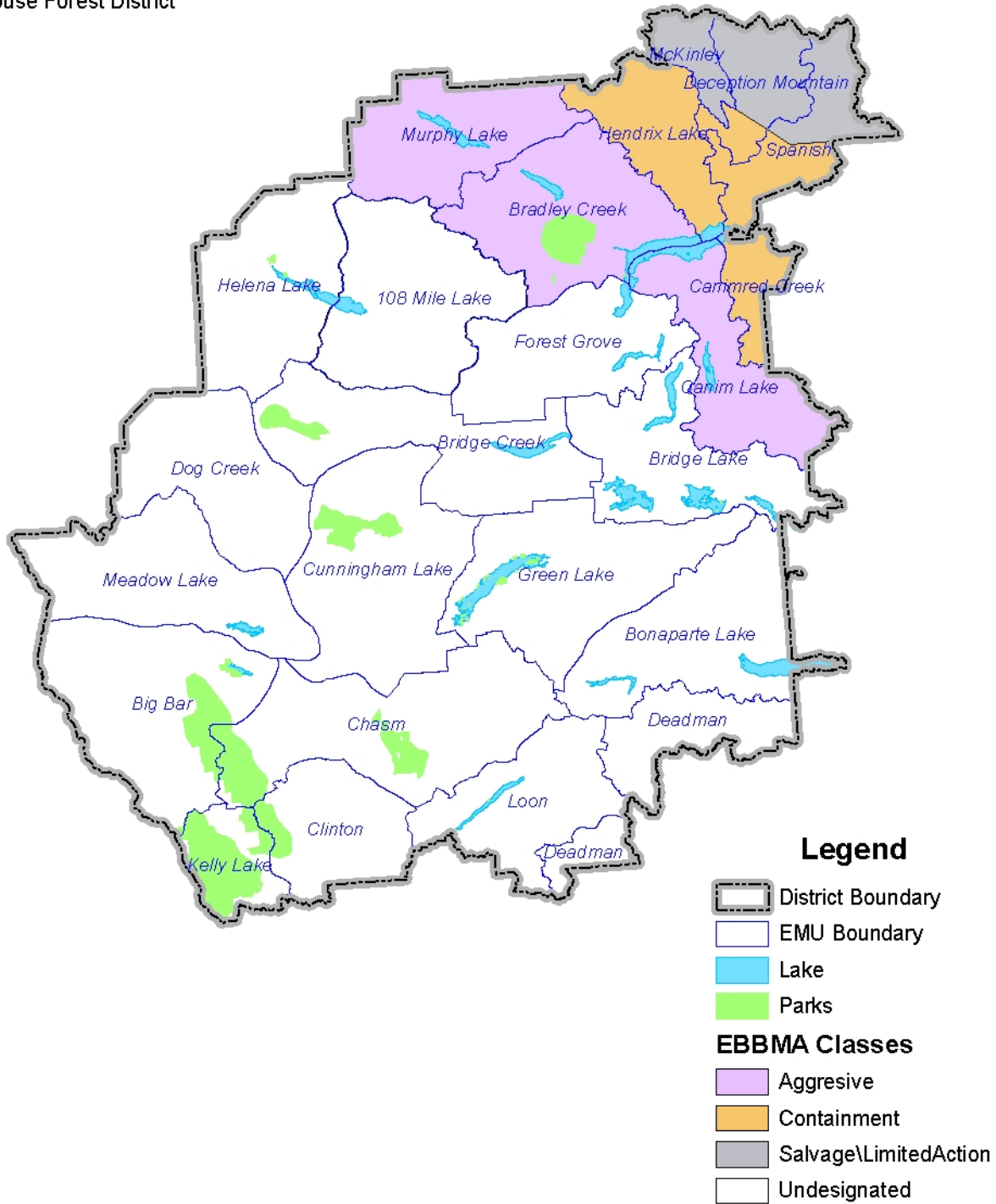
**Beetle Management Units
100 Mile House Forest District
Spruce Beetle**

BMU	STATUS May 2007
108 Mile Lake	aggressive
Big Bar	aggressive
Bonaparte Lake	aggressive
Bradley Creek	aggressive
Bridge Creek	aggressive
Bridge Lake	aggressive
Canim Lake	aggressive
Canimred	aggressive
Chasm	aggressive
Clinton	aggressive
Cunningham	aggressive
Deadman	aggressive
Deception	Containment
Dog Creek	aggressive
Forest Grove	aggressive
Green Lake	aggressive
Helena Lake	aggressive
Hendrix Lake	Containment
Kelly Lake	aggressive
Loon Lake	aggressive
McKinley	Salvage
Meadow Lake	aggressive
Murphy Lake	aggressive
Spanish	Salvage

Spruce Bark Beetle EBBMA & EMU Status Map

(Effective June 1, 2007)

100 Mile House Forest District



June 1, 2007

SOURCES:
 PLOT: \\marble\work\FOR\RS\DMH\PlotFiles\ForestHealth\SpruceBeetle_1EBBMA and StrategicPlanningMap_2007_v1.pdf
 mxd: \\marble\work\FOR\RS\DMH\Projects\ForestHealth\SpruceBeetle_1EBBMA and StrategicPlanningMap_2006_v1.mxd
 EBBMA Classes: \\marble\work\FOR\RS\DMH\Local_Data\FHealth\EBBMA_Nov2006\Sx_EBBMA_2006_v1.shp

Produced by: MoFR, DMH, June 1, 2007

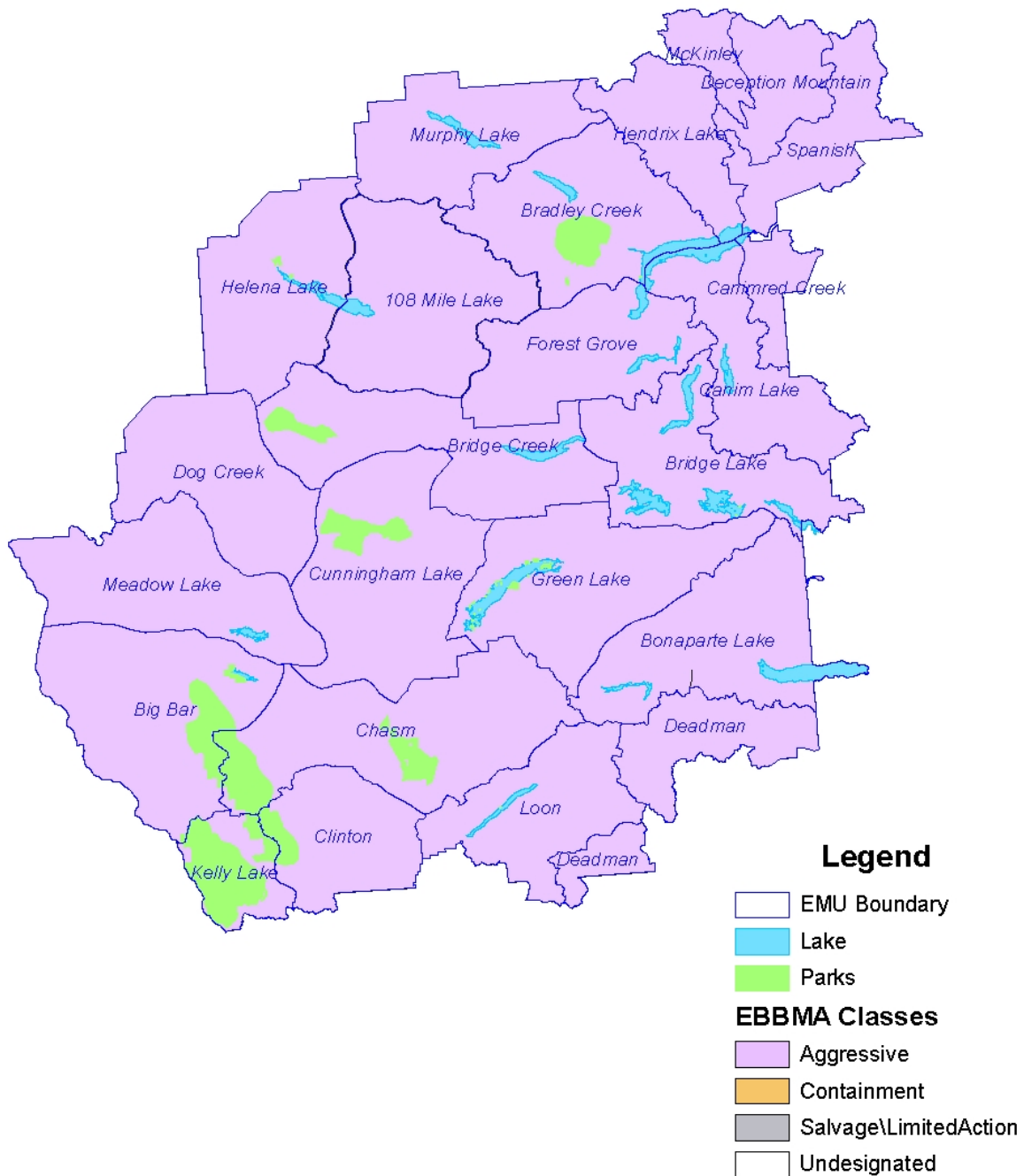
**Beetle Management Units
100 Mile House Forest District
Douglas-fir Beetle**

BMU	STATUS May 2007
108 Mile Lake	aggressive
Big Bar	aggressive
Bonaparte Lake	aggressive
Bradley Creek	aggressive
Bridge Creek	aggressive
Bridge Lake	aggressive
Canim Lake	aggressive
Canimred	aggressive
Chasm	aggressive
Clinton	aggressive
Cunningham	aggressive
Deadman	aggressive
Deception	aggressive
Dog Creek	aggressive
Forest Grove	aggressive
Green Lake	aggressive
Helena Lake	aggressive
Hendrix Lake	aggressive
Kelly Lake	aggressive
Loon Lake	aggressive
McKinley	aggressive
Meadow Lake	aggressive
Murphy Lake	aggressive
Spanish	aggressive

Douglas Fir Beetle EBBMA & EMU Status Map

(Effective June 1, 2007)

100 Mile House Forest District



June 1, 2007

SOURCES:
 PLOT: \\marble\work\FOR\RS\DMH\PlotFiles\ForestHealth\DouglasFir_1EBBMA and StrategicPlanningMap_2007_v1.pdf
 mxd: \\marble\work\FOR\RS\DMH\Projects\ForestHealth\DouglasFir_1EBBMA and StrategicPlanningMap_2006_v1.mxd
 EBBMA Classes: \\marble\work\FOR\RS\DMH\Local_Data\FHealth\EBBMA_Nov2006\Fd_EBBMA_2006_v1.shp

Produced by: MoFR, DMH, June 1, 2006