

CHIEF FORESTER EXPECTATIONS

Harvest Prioritization in Response to Spruce Beetle Outbreaks



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Approved by:



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ABOUT THIS DOCUMENT

The following document from the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (the “Ministry”) provides the Chief Forester’s expectations to forest professionals who plan and implement harvesting in response to spruce beetle outbreaks in British Columbia. This document does not replace or preclude legal requirements or other sources of guidance that have been previously issued by the Ministry.

INTRODUCTION

The province is experiencing higher than normal populations of spruce beetle (*Dendroctonus rufipennis*) with the potential for significant impacts to timber and non-timber resources, and for lasting social, cultural and economic impacts to communities. The current spruce beetle outbreak, in combination with existing land base impacts resulting from forest management actions in response to mountain pine beetle (*Dendroctonus ponderosae*), has created elevated risk to the stewardship of environmental and economic values. Forest management in relation to the outbreak must reflect these increased risks. Forest management must also consider the combined impacts of spruce beetle, mountain pine beetle and other disturbance agents when planning and prioritizing areas for spruce beetle mitigation activities.

In this document I outline my expectations as Chief Forester, regarding harvesting priorities in forests that are impacted by spruce beetle, or by spruce beetle in combination with other disturbance agents such as mountain pine beetle, Douglas-fir bark beetle or fire. As Chief Forester, in expressing these expectations I have considered the environmental, socio-cultural and economic effects to short, mid and long-term sustainability of our forest resources. I have carefully weighed the loss of short-term salvage opportunities with the need to maintain future harvest opportunities and non-timber values provided by our forests.

I expect that forest professionals will work collaboratively with First Nations on management responses to spruce beetle, and will consider potential impacts to Indigenous rights, title and interests during spruce beetle mitigation activities.

I expect that the Ministry will continue to monitor licensee management activities in response to the spruce beetle outbreak. If, in my professional judgement, there is a risk to the long-term sustainability of timber and non-timber resources in a management unit (timber supply area or tree farm licence), I will exercise my statutory authority under Section 8 of the *Forest Act*. This may involve changes to the allowable annual cut (AAC) and/or AAC partitions, in order to ensure the stewardship and sustainability of the Province’s forest resources.

I expect that licensees will work together with Ministry staff to develop a collaborative management response to mitigate the impacts of spruce beetle to timber and non-timber resources.

The following document includes two matrices to guide prioritization of harvesting for either **PEST REDUCTION HARVESTING** for stands containing live spruce beetle at the time of harvest or

SALVAGE HARVESTING for primarily dead stands. Within this document I first provide definitions of terms, some comments on the unique nature of spruce ecosystems, and then outline four steps that I expect forest professionals will follow in order to plan appropriate harvesting activities in these stands. Step 3 contains the two prioritization matrices to determine harvest priority.

DEFINITIONS

For the purpose of this document, the following terms are defined as:

Ground Surveys – may include timely spruce beetle probing, professional walkthroughs, hybrid probing/walkthroughs, star probes and/or timber cruise. I note that a timely timber cruise may provide information regarding tree mortality. However a timber cruise does not provide information regarding the current infestation, or spruce beetle life stages, at the time of harvest. In most circumstances, I expect forest professionals to provide spruce beetle focused ground surveys.

Percent – percent in relation to species composition and/or proportion of dead should be measured based on proportion of live and dead stem gross basal area and can be derived from: the Vegetation Resources Inventory (VRI), from a beetle reconnaissance walkthrough and/or beetle probe, or from a timely timber cruise or re-sweep. I note that the assessment of species composition or percent mortality using the VRI should consider basal area in the live layer (Layer 1) and the dead layer (Layer D). Desktop assessments using the VRI should be used as guidance and should be verified by ground surveys.

Pest Reduction Harvest – harvesting tactics to remove (suppression strategy) or reduce spruce beetle populations in an effort to slow the infestation’s expansion (holding strategy). Suppression and Holding Beetle Management Units (BMUs, see Step 1 below) are where pest reduction harvesting should be predominantly implemented.

Salvage Harvest – harvest of dead timber to minimize timber value loss.

Susceptible Spruce – spruce-leading stands with live spruce that are greater than 80 years of age. Younger spruce stands may be susceptible when spruce beetle population levels are high.

SPRUCE AND SPRUCE BEETLE ECOLOGY

In [Omineca Region Guidance - Stand and Landscape-Level Retention for Harvesting in Response to Spruce Beetle Outbreaks](#) government provided information regarding spruce and spruce beetle ecology which indicate that forest management activities in response to spruce beetle must diverge significantly from management actions in response to mountain pine beetle.

Most spruce dominant ecosystems are characterized by gap replacement rather than stand replacement disturbance. As a result these ecosystems are typically uneven-aged stands. In these ecosystems clear cut silviculture systems are often less ecologically suitable than patch cut, retention or selection systems. Therefore, where practicable, I expect forest professionals will use silviculture system alternatives rather than clear cut or clear cut with reserves systems. Refer to [Silvicultural Systems Handbook for British Columbia](#) for more information regarding silviculture systems.

STEPS FOR SPRUCE BEETLE MITIGATION

STEP 1. DETERMINE THE BEETLE MANAGEMENT UNIT STRATEGY

Beetle Management Units (BMU) may be classified as Salvage, Suppression, Holding, Monitoring, Monitoring-Plus or No Action. Refer to the Ministry's [Regional and District/TSA Forest Health Strategies](#) for definitions regarding BMU classification. The Ministry reviews and updates BMU classification annually, or may update classification in an expedited manner in response to a forest health emergency.

I expect that harvesting in all BMUs will be focussed on salvage of dead mountain pine beetle impacted pine volume, on salvage harvest of spruce beetle impacted stands, or on spruce beetle population reduction in stands. The classification of BMUs provides guidance regarding mitigation priorities within a unit.

STEP 2. GATHER STAND INFORMATION

The Aerial Overview Survey (AOS) annual and cumulative mortality data sets should be used to identify landscape-level spruce beetle infestations and to guide mitigation. In order to track the status and spread of the spruce beetle population, I expect that ground surveys will be completed for stands targeted for salvage or pest reduction harvest in response to spruce beetle. Ground surveys should provide information regarding tree mortality and beetle life stage. The Ministry has provided guidance regarding ground surveys in [Spruce Beetle Ground Survey Guidelines – Omineca and Northeast Region](#). This guidance was developed for the Omineca and Northeast regions and is applicable to any spruce ecosystems with spruce beetle across the province.

For all BMUs classified as salvage, suppression, or holding, ground surveys are needed to provide detailed data on potential for expansion of the infestation, i.e., information regarding life stages, population density and distribution. I expect that licensees will provide the Ministry with ground survey information. I expect that ground survey information will be included in a professional rationale when implementing spruce beetle mitigation activities that are not consistent with the chief forester's expectations in the most recent AAC determination.

STEP 3. USE MATRICES TO PRIORITIZE STANDS FOR HARVESTING

It is my expectation that the following stand harvest priority matrix will guide licensee forest management. I expect that harvest within spruce beetle infested areas will be focused to the extent practicable in dead, dying, and damaged stands. I expect that stands with little or no damage from biotic (e.g. spruce beetle, mountain pine beetle) or abiotic (e.g. fire, windthrow) will be reserved for mid-term timber supply.

I expect that harvest planning and operations will be focused on:

- **PEST REDUCTION HARVEST (section 3.1)** for the purpose of spruce beetle population growth mitigation;

- **SALVAGE HARVEST (section 3.2)** of spruce beetle killed stands; and/or harvest of mountain pine beetle killed stands.

In some areas, stands have been impacted by both mountain pine beetle and spruce beetle. I expect that management responses will consider the objectives for salvage of mountain pine beetle timber with the objectives for **pest reduction harvest** or **salvage harvest** for spruce beetle management. In these stands management strategies should be modified accordingly.

3.1 PEST REDUCTION HARVEST

The objectives for **pest reduction harvest** in spruce beetle *infested* stands are to control or reduce the spruce beetle population, to reduce the risk of the infestation spreading to adjacent susceptible spruce stands, to protect mid-term timber supply, and/or to conserve non-timber resources.

Stands with < 10%* gross basal area containing live spruce beetle at the time of harvest should be low to very low priority for PEST REDUCTION HARVEST.

In order to be considered for **pest reduction harvest**, I expect that a significant component (defined in the matrix below) of susceptible spruce is infested with live spruce beetle at the time of harvest. Information regarding intensity of the infestation and life stages present in the stand at the time of harvest should be confirmed via timely ground surveys and I expect that this information will be reported to government in a manner that allows timely monitoring of the spruce beetle outbreak and management responses.

Pest reduction harvest prioritization objectives at different threshold levels of spruce beetle infestation are provided in Table 1.

Stands that are impacted by both mountain pine beetle and infested with live spruce beetle should be given higher priority for **pest reduction harvest**.

When harvested spruce contains live spruce beetle I expect that activities will be consistent with [Omineca Region – Guidelines for Spruce Beetle Haul and Mill Strategies](#).

** 10% is approximately equivalent to the minimum harvest rating index for walkthrough classification “Moderate” based on the [Spruce Beetle Ground Survey Guidelines](#). For a full description of the ground survey guidelines please refer to the guidance document. Percentages provided in the matrices may be used interchangeably with the sanitation/salvage harvest rating from the guidance document. For example, a sanitation/salvage harvest rating of 600 may be used in place of 10% gross basal area.*

Table 1: Matrix for PEST REDUCTION HARVEST in spruce beetle infested stands.

Criteria	PEST REDUCTION HARVEST PRIORITY				Additional Considerations
	Very Low	Low	Moderate	High	
Stand occurs in special management area	X				See <i>Omineca Region – Guidelines for Spruce Beetle Treatment in Special Management Areas</i> . Treatment for spruce beetle in these areas must balance the needs to control or reduce beetle populations with the need to maintain the other identified values.
Unconstrained THLB with > 30% spruce basal area containing live* spruce beetle at the time of harvest.				X	Stands with >30% dead basal area (any species) are higher priority in this category.
Unconstrained THLB with 10 to 30% spruce basal area containing live* spruce beetle at the time of harvest.			X		Stands with >30% dead basal area (any species) are higher priority in this category.
Unconstrained THLB with <10% spruce basal area containing live* spruce beetle at the time of harvest.		X			Stands with >30% dead basal area (any species) are higher priority in this category. Stands which are adjacent to large areas of susceptible spruce, and where the live* beetle can be removed (pest reduction harvest for suppression) are higher priority in this category.
Susceptible spruce stands with no live* beetle present at the time of harvest.	X				Stands with susceptible spruce containing no live* beetle are not a priority and should be retained for future timber supply.

*a tree containing “live spruce beetle” is defined as an attacked tree (tree code 1, 2, 3 or 4 in the [Spruce Beetle Ground Survey Guidelines](#)).

3.2 **SALVAGE HARVEST**

The objectives for **salvage harvest** of spruce beetle killed stands must be to reduce economic impacts of spruce beetle, to maintain a sustainable future timber supply, to maintain healthy forest ecosystems, and to conserve non-timber values. Beetle population reduction is a secondary objective.

Stands with > 50% dead gross basal area at the time of harvest should be considered for SALVAGE HARVEST.

A candidate **salvage harvest** stand should have greater than 50% dead (by gross basal area) of all merchantable species combined. I expect that stands with less than 50% dead, without a significant component of susceptible spruce infested with live beetle at the time of harvest, will be maintained for future timber supply.

Salvage harvest prioritization objectives at different threshold levels of spruce beetle infestation are provided in Table 2.

Stands that are impacted by both mountain pine beetle and spruce beetle should be given higher priority for **salvage harvest**.

Table 2: Matrix for **SALVAGE HARVEST** in spruce beetle killed stands.

Criteria	SALVAGE HARVEST PRIORITY				Additional Considerations
	Very Low	Low	Moderate	High	
Stand occurs in special management area.	X				See <i>Omineca Region – Guidelines for Spruce Beetle Treatment in Special Management Areas</i> .
Unconstrained THLB with > 50% dead basal area with >30% live* beetle present at the time of harvest.				X	Stands that are adjacent to large areas of susceptible spruce, and where the live* beetles can be removed (pest reduction harvest for suppression) are highest priority in this category.
Unconstrained THLB with > 50% dead basal area with 10 to 30% live* spruce beetle present at the time of harvest.				X	Stands that are adjacent to large areas of susceptible spruce, and where the live* beetle can be removed (pest reduction harvest for suppression) are higher priority in this category.
Unconstrained THLB with > 50% dead basal area with <10% live* spruce beetle present at the time of harvest.			X		Stands that are adjacent to large areas of susceptible spruce, and where the live* beetle can be removed (pest reduction harvest for suppression) are higher priority in this category.
Unconstrained THLB with > 50% dead basal area with no live* spruce beetle present at the time of harvest.		X			Stands with higher proportion of dead pine basal area should be given higher priority for harvest in this category.

*a tree containing “live spruce beetle” is defined as an attacked tree (tree code 1, 2, 3 or 4 in the [Spruce Beetle Ground Survey Guidelines](#)).

STEP 4. IMPLEMENT MANAGEMENT RESPONSE

It is my expectation that forest professionals will implement management responses that are appropriate to mitigate risks to environmental, socio-cultural and economic values of our forest resources in priority stands.

I expect that management responses to mitigate spruce beetle impacts will incorporate the following objectives:

- Avoid harvesting live un-infested timber;
- Protect secondary stand structure (live, un-infested mature, immature and advanced regeneration trees) wherever practicable;
- Implement patch cut, selection or retention silviculture systems when operating in spruce beetle impacted ecosystems. Refer to *Silvicultural Systems Handbook for British Columbia*;
- Apply beetle control tactics outlined in *Regional and District /TSA Forest Health Strategies*;
- Apply guidance provided in *Omineca Region - Spruce Beetle BMPs* and *Omineca Region Guidance – Stand and Landscape Level Retention for Harvesting in Response to Spruce Beetle Outbreaks*; and
- Avoid or minimize potential impacts to Indigenous rights, title and interests and culturally significant features and resources.

I expect that the Ministry will monitor and report regularly regarding this harvest prioritization guidance. If, in my professional judgement, and supported by the monitoring reports, there is a risk to the long-term sustainability of timber and non-timber resources in these management units, I will exercise my statutory authority under Section 8 of the *Forest Act*.

ADDITIONAL GUIDANCE

I expect that guidance which has been provided by government will be considered in forest management planning and operations in response to the spruce beetle outbreak. This guidance includes:

Regional and District /TSA Forest Health Strategies

https://www.for.gov.bc.ca/hfp/health/TSA_strategies.htm

Spruce Beetle Management in B.C.

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/forest-health/bark-beetles/spruce_beetle_guidebook.pdf

Silvicultural Systems Handbook for British Columbia

<https://www.for.gov.bc.ca/hfp/publications/00085/silvsystemshdbk-web.pdf>

Spruce Beetle Ground Survey Guidelines – Omineca and Northeast Region

<https://www.for.gov.bc.ca/ftp/dpg/external/!publish/Spruce%20Beetle/Guidelines/SBGndSurvGuidelinesAug2017.pdf>

Omineca Region Guidance – Stand and Landscape Level Retention for Harvesting in Response to Spruce Beetle Outbreaks

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/forest-health/bark-beetles/retentionguidance_spruce_beetle_20sept2017.pdf

Omineca Region – Guidelines for Spruce Beetle Treatment in Special Management Areas

<https://www.for.gov.bc.ca/ftp/DPG/external/!publish/Spruce%20Beetle/Guidelines/Spruce%20Beetle%20Management%20Direction/Omineca%20Region%20Guidelines%20for%20Spruce%20Beetle%20Treatment%20in%20SMAs%20May%202017.pdf>

Omineca Region – Guidelines for Spruce Beetle Haul and Mill Strategies

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/forest-health/forest-health-docs/spruce-beetle-docs/spruce_beetle_omineca_haul_and_mill_guidelines.pdf

Omineca Region - Spruce Beetle BMPs

<https://www.for.gov.bc.ca/ftp/DMK/external/!publish/SpruceBeetle/Documents/Omineca%20Region%20Spruce%20Beetle%20Document%20Series/v3%20SB%20Document%20Series%20Omineca%20Region%20June%202017.pdf>

Omineca Region - Guidelines for Watershed Planning

<https://www.for.gov.bc.ca/ftp/dpg/external/!publish/Spruce%20Beetle/Guidelines/Spruce%20Beetle%20Management%20Direction/Omineca%20Region%20Guidelines%20for%20Watershed%20Planning%20May%202017.pdf>

Post-Natural Disturbance Forest Retention Guidance – 2017 Wildfires

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/2017_fire_report_revised.pdf

