



PRINCE GEORGE NATURAL RESOURCE DISTRICT

SPRUCE BEETLE MANAGEMENT DIRECTION

DISTRICT DIRECTION

Bark beetles are a part of the natural ecosystem. However, when conditions are right, populations quickly proliferate from endemic to epidemic levels. Epidemic populations are detrimental as they attack and kill large diameter, mature and over mature trees. Pockets of epidemic populations of Spruce Beetle *Dendroctonus rufipennis* (IBS) were recorded in Prince George Natural Resource District (PGNRD) in 2015 and further growth of these populations will become a threat to the midterm timber supply. As such, actively managing this forest health concern in a consistent manner utilizing recognized beneficial management practices will produce long lasting results. The district Spruce Beetle Working Group is tasked with identifying issues relating to harvesting, planning, and policy in dealing with spruce beetle management.

The PGNRD is providing information and guidance in consideration of getting prompt and effective actions to help manage (and reduce) a growing spruce beetle population.

IBS DETECTION

Initial spruce beetle infestations are identified through high level fixed wing aerial surveys. Low level aerial surveys are recorded through sketch mapping and are verified by ground sampling. The first ground survey, the walkthrough, is a “coarse filter” that quickly determines the extent of the infestation and the treatment options available based on the sanitation harvest index thresholds. Probes are used to gather more precise information to clarify management alternatives. A treatment decision is then developed for the stand based on the intensity of infestation, the beetle life cycle, and other management considerations. This can occur after the walkthrough or the probe.

SUSCEPTIBILITY MAPS

These maps state susceptibility to IBS attack and not current beetle populations. The maps are a tool to help focus surveys and subsequent treatment in areas with higher likelihood of IBS epidemics. High susceptibility does not validate immediate harvest in these areas, rather, the need to institute proactive measures to mitigate impact of potential IBS populations.

PGNRD susceptibility maps are available at:

https://www.for.gov.bc.ca/ftp/HFP/external/!publish/barkbeetles/New%20Susceptibility%20Ratings/rni/Beetle_Hazard_Rating_Data_TSA_24_Prince_George/Beetle_Hazard_Rating_TSA_24.gdb/

ADDITIONAL REPORTS OF IBS AREAS

To supplement data collected through regional fixed wing aerial survey flights, all Ministry of Forests, Lands and Natural Resource Operations (FLNR) staff and licensees should provide the PGNRD representative with information collected through field work or aerial surveys regarding IBS attacked trees and the associated attack codes noted in the manuals. This information will be reviewed and help determine the flight paths and high priority locations of the PGNRD led low level helicopter aerial surveys.

Information is to be provided to the PGNRD representative as soon as possible. All documented spruce beetle infestation areas including AOS polygons, helicopter and ground survey polygons are available in the spatial file format at the following location:

<ftp://ftp.for.gov.bc.ca/DPG/external/!publish/Spruce%20Beetle/Data/>

This information is crucial for how the Spruce Beetle Working Group manages these sites.

Expectation: That all FLNR staff and licensees report any suspect beetle areas to PGNRD appointed staff with the following information: 1. GPS location, 2. Beetle life cycle stage, 3. Beetle attack code and 4. Extent of the infestation (e.g. # trees, size of area).

AERIAL FLIGHTS AND SUBSEQUENT SKETCH MAPPING

FLNR regional staff will conduct the initial fixed wing aerial survey flights of the district and forward results to PGNRD representative. PGNRD staff will review and identify areas of high spruce bark beetle susceptibility and conduct subsequent low level helicopter flights while recording findings through sketch mapping (identification of specific beetle/forest health management areas). “[Omineca Region Forest Health Strategy](#)”

Expectation: FLNR/PGNRD staff will, via annual maps, identify IBS polygons with a hazard rating, and propose treatments/management options based on these aerial flights and sketch mapping.

WALKTHROUGHS AND OR PROBES

Walkthroughs are non-systematic preliminary ground reconnaissance survey that is done after flight /anecdotal information are received but before beetle probes. This is done to determine the extent and concentration of the IBS attack and prior to recommendations for probing or other treatment decisions. Surveyors are to conduct their walkthrough and then attempt to select a representative portion of the area to collect 50-200m of probe data.

Probes are systematic and detailed secondary ground reconnaissance surveys. Probing will determine detailed, more precise estimates of the same information gathered from walkthroughs, and will provide sufficient information to stratify the area for various treatment actions.

Expectation: Licensees perform walkthroughs and full scale probes (if required) in areas identified as priorities using methodologies outlined in the “[Spruce Beetle Ground Survey](#)”

[Guidelines](#)” established for the Omineca Region. This should be done prior to performing or requesting a treatment option

Expectation: Licensees are to use the ground survey data provided by PGNRD staff to plan and forecast their activities. This should be completed as part of their planning each year.

IBS TREATMENT OPTIONS

Treatments for IBS are limited to four general options:

1) Monitor site

- a) Field checks of a susceptible spruce beetle timber type to determine if beetle attack has occurred or if a known endemic population is growing. Information obtained to assist in decision to move to other treatment options.

2) Trap trees (conventional and lethal)

- a) Conventional trap trees are deployed to:
 - i) contain emerging beetles in cutblocks prior to sanitation logging
 - ii) protect adjacent healthy timber or reserves
 - iii) “mop-up” beetles emerging from stumps and slash following sanitation logging.
 - iv) conventional trap trees **must be subsequently removed or treated** to kill trapped beetles prior to emergence.
 - v) Please refer to [“Use of trap trees for spruce beetle management in bc RH 1991” for more information.](#)
- b) Lethal trap trees are not available at this time (Research trials currently being planned)

3) Harvesting

- a) Sanitation harvesting is the extraction of currently infested spruce stands to help reduce the existing spruce beetle population and help prevent their spread (trap tree programs can be run in conjunction with this). Priority is given to stands with high levels of new attack, high hazard, and a high risk of spread. All harvesting methods can be used.
- b) Salvage harvesting is primarily conducted to recover damaged timber before it loses its value for potential wood products. Such trees no longer have any living broods. This tactic does not reduce spruce beetle populations, but is the first step in returning the site to forest production.

4) Prevention (including hauling restrictions)

- a) Hauling and milling restrictions may be required: i.e. all wood to be milled prior to next beetle flight.
- b) Prudent utilization during and after harvesting may be required i.e. 10cm tops, stumps to be cut as low as possible, long butts to be burned along with other larger tops or material that the bugs can breed in.

Baiting (associated with harvesting) – The use of semiochemical tree baits in grid patterns in spruce beetle infested stands is a temporary holding tactic until the stand can be sanitation logged.

BLOCK HARVEST PLANNING

Harvest planning along with operational planning will have to be adjusted to accommodate trap trees felled in advance of the normal felling schedule (i.e. fall trap trees in March –April; summer harvest may

be delayed until September). Some blocks may have small portions of spruce left and felled at the end of the winter harvest season as trap trees to draw in any residual bugs flying from stumps and then removed the following fall.

Expectation: Harvest plans are made using information gathered from walk through or probe information and in accordance to IBS treatment options appropriate for the hazard rating attributed to the harvest or adjacent polygon(s).

Expectation: Conventional trap trees should be routinely felled every year in spruce harvesting areas to continually reduce the IBS population. Trap trees can be deployed as patches, decks, strips and or pre-felled landings and rights-of way. Once the traps become infested, they must be removed or otherwise treated before the brood matures to attack new hosts.

Expectation: Licensee's will be aggressive in their planning for sanitation harvesting and trap tree use by providing FLNR with necessary walkthrough and beetle probe information to assist in quick and timely decisions /permits.

Expectation: FLNR/PGNRD staff will store and maintain spatial and attribute data in a database made available to FLNR and Licensee practitioners involved with managing the spruce beetle infestation. Standards for data submission and frequency of updates will be identified by FLNR staff and Licensee representatives. This live dataset, which collates all available, known IBS information, will be used to facilitate effective monitoring, coordinate activities and update mapping products.

ADDITIONAL INFORMATION

“Hazard rating identifies those stands where substantial losses can be expected to occur if an outbreak of spruce beetle occurs. This valuable planning tool identifies those stands that are highly susceptible to attack. Hazard rating considers stand age, host basal area, stand density, and elevation.” (Bark Beetle Management Guidebook 1995)

High hazard stands have:

- an average spruce dbh greater than or equal to 41 cm
- a spruce volume exceeding 300 m³ /ha
- more than 65% spruce content in well-drained creek bottoms.

In general, the order of hazard for spruce stands is:

1. stands in creek bottoms
2. better stands of spruce on benches, slopes, and high ridges
3. poorer stands on benches, slopes, and high ridges
4. mixtures of spruce and lodgepole pine
5. stands containing all immature spruce

REFERENCES

[Use of trap trees for spruce beetle management in BC RH 1991](#)

[SBGroundSurveyGuidelineAug62014](#)

[Bark Beetle Management Guidebook 1995](#)

[Spruce beetle life cycle document](#)