



**Forest
Practices
Board**

Logging in Spotted Owl Habitat in the Blackwater Creek Valley

FPB/IRC/148

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The Complaint

In June 2007, the Board received a complaint about a timber sale in the Blackwater Creek Valley near D'Arcy, in the Squamish Forest District.

The complainant, the Blackwater stewardship group, is a group of local residents concerned that logging will harm pine mushroom habitat, spotted owl habitat, and water values. The Board reported previously about the complainant's concerns with pine mushroom and water.¹ This report deals with the concern about spotted owl habitat.

Background

In 1986, the spotted owl was designated as endangered in Canada. In 1999, the provincial government developed resource management plans (RMPs) to guide operational forestry and spotted owl habitat conservation in several resource management zones (RMZs) in the Squamish Forest District.

The RMPs included a number of spotted owl activity centres within each zone, each intended to provide habitat for one or more breeding pairs of spotted owl, whether currently occupied by the owl or not. The Blackwater spotted owl activity centre, 18E, is one of five such centres that fall within the Birkenhead RMZ. The Ministry of Environment (MOE) has monitored owl activity in the Blackwater activity centre each year since 1993. Owl detections up to and including 2006 indicated that a pair of spotted owls was residing in the area, but it remains unknown whether those owls nested there.

Activity centre 18E is 3,181 hectares in size and is divided into two zones. About two-thirds of the area has been designated a long-term owl habitat area (LTOHA), while the remainder has been designated a forest management area (FMA). In the absence of specific spotted owl habitat mapping, government used forest cover map attributes to delineate suitable spotted owl habitat within the activity centre. Government defines suitable habitat as forest stands over 100 years old and taller than 19.4 metres.

One of the objectives of the Birkenhead RMP was to ensure that, over time, the entire 2,142-hectare LTOHA in activity centre 18E would become suitable as spotted owl habitat. Currently, not all the LTOHA is suitable because of past disturbances, such as logging and fires. It will take several decades for it to grow to the point where it can be designated as suitable habitat, so, in the interim, 751 hectares of suitable habitat was temporarily retained as replacement area within

¹ See Board report IRC 134, *Logging in the Blackwater Pine Mushroom Management Area*, January 2008.
<http://www.fpb.gov.bc.ca/complaints/IRC134/IRC134.pdf>

the adjacent FMA. Any forest in the FMA not required for meeting the suitable habitat goal was designated for “heavy volume removal” logging.²

In 1999, all available, suitable habitat in the LTOHA (1,322 hectares), plus that in the FMA (751 hectares), totalled 2,073 hectares, somewhat short of the desired 2,142 hectares.

In 2004, BCTS decided to reassess the amount of available, suitable spotted owl habitat to determine whether forest growth since 1999 had allowed some previously non-suitable habitat in the LTOHA to become suitable. If this was the case, it meant that an equivalent amount of replacement area timber in the FMA would now be available for harvest. The reassessment indicated that there was indeed additional suitable habitat available, so, in January 2006, the Ministry of Forests and Range (MFR) approved an amendment to BC Timber Sales’ (BCTS) 2000-2004 forest development plan (FDP).³ The amendment added three new partial-cut cutblocks⁴ in activity centre 18E to reflect forest growth since 1999. BCTS had calculated that the suitable habitat goal would not only be met, but exceeded, when the harvesting was completed.

A secondary goal of the spotted owl RMP was to retain 50 percent of each activity centre in a superior habitat condition. The RMP describes superior habitat (again using forest cover map attributes) as forest stands greater than 140 years old and over 19.4 metres tall. Among other considerations, the RMP also includes operational constraints to be applied to heavy volume removal cutblocks; in this case, the chief constraint was retention of 40 of the largest 80 tree stems per hectare.

Discussion

The Board investigated these questions:

1. Why did BCTS harvest in spotted owl activity centre 18E?
2. What measures did BCTS take to ensure spotted owl habitat was managed appropriately?
3. How did BCTS assess what constituted spotted owl habitat?
4. Did BCTS manage for superior habitat?
5. Did BCTS retain large trees as recommended in the RMP?

1. Why did BCTS harvest in spotted owl activity centre 18E?

Government’s resource management plan (RMP) provides for timber harvesting throughout each activity centre, including the LTOHA. Timber supply for BCTS in the Blackwater area is

² The 1999 *Spotted Owl Resource Management Plan* defined heavy volume removal as a silviculture system of clearcut with reserves and single or group leave tree retention.

³ Amendment 66 to the BCTS 2000-2004 FDP (government extended the original expiry date of the BCTS FDP several times to March 2007).

⁴ Cutblocks BL002, BL003, BL005.

limited, so BCTS wanted to use all available timber, while maintaining the required amount of spotted owl habitat.

Finding: BCTS was guided by government's RMP to harvest available timber in the activity centre after the amount required as spotted owl habitat had been maintained.

2. What measures did BCTS take to ensure spotted owl habitat was managed appropriately?

Under the former *Forest Practices Code of British Columbia Act* (the Code), government could legally establish resource management zones (RMZs) and forest objectives⁵ that licensees are required to comply with.

In this case, however, government did not establish formal, legally required objectives under the Code based on its 1999 spotted owl RMP. Nevertheless, in a 2003 amendment to its 2000-2004 FDP, BCTS considered guidance from the RMP as it planned its harvesting in spotted owl RMZs. Most notably, MFR's approval of a subsequent amendment to BCTS' FDP in 2006 included an expectation (although not a requirement) that BCTS apply the RMP strategies for heavy volume removal, with particular respect to an expectation that large trees, to be retained for owls, be concentrated within cutblock boundaries as opposed to outside the blocks.

Finding: BCTS was expected, but not required, to follow the spotted owl RMP's strategies for heavy volume removal and to ensure large tree retention was concentrated within its cutblock boundaries.

3. How did BCTS assess what constituted spotted owl habitat?

Government's RMP for spotted owl activity centres anticipated that, as the forest aged and grew, unsuitable habitat (as classified in 1999) within the LTOHA would become suitable for owls and that, ultimately, the desired target for suitable habitat in the activity centre could be exceeded. Therefore, the RMP allowed (as unsuitable stands in the recruitment area became suitable) for the timber temporarily retained in the replacement area to be converted to heavy volume removal.

In 2003, MFR advised BCTS that there were forest stands in activity centre 18E that now appeared to be older than 100 years. Therefore, in June 2004, BCTS examined whether it could convert some replacement area to heavy volume removal, and thus make some additional timber available for harvest.

The RMP recommended using Resource Inventory Committee⁶ (RIC) standards and procedures to determine whether forest stands meet the minimum age and height attributes of potentially-

⁵ Section 3 of the former *Forest Practices Code of British Columbia Act*

⁶ The Resources Information Standards Committee (RISC), formerly, the Resources Inventory Committee, is a BC government agency responsible for establishing standards for natural and cultural resources inventories, including collection, storage, analysis, interpretation and reporting of inventory data.

suitable habitat (i.e., 100+ years and 19.4+ metres tall). However, the plan was not clear about those standards; it did not identify or set out the details of the RIC procedure. BCTS sought clarification from the forest district and from a former member of the now-defunct Spotted Owl Interagency Management Team, but was unsuccessful in obtaining it. However, while searching for this information on the Internet, the Board found that, while there is a confusing array of RIC procedures, the procedure for correcting individual forest inventory map labels (called *Localization by Ad-Hoc Observations*) is readily available.⁷ BCTS had searched the internet in spring 2004 but, being focused on owl habitat, it did not find the more general forest inventory procedure. Ultimately, given the ambiguity and lack of detail in the RMP, and the absence of helpful advice, BCTS retained a consulting forest professional to develop a survey procedure to determine forest age and height.

Using its consulting forester's method, BCTS proceeded to collect field data later that summer. The data collection procedure differed from the RIC standards in that it:

- used fewer, and a variable number, of plots per forest stand;
- used a less precise system to establish plot locations and boundaries;
- generally sampled fewer trees per plot; and
- did not systematically or randomly select which trees to measure within each plot.

BCTS explained that it intended simply to determine forest age and height – as those were the habitat classification criteria in the RMP. To do this, it considered a full-blown forest inventory procedure unnecessary. The consultant said its purpose was to:

...non-statistically sample the forest to determine if earlier mapped ages were correct and to identify those forest stands over 100 years of age which qualified as suitable owl habitat.

Finding: Although it tried to identify a recommended method, BCTS did not follow the RMP guidance to use RIC standards and procedures to assess forest age and height.

In December 2004, four months after field work for the forest age and height survey was complete, BCTS asked MFR's Forest Analysis and Inventory Branch (FAIB) whether the survey procedure BCTS had used was appropriate to assess age and height. The FAIB confirmed that the BCTS procedure departed from RIC forest inventory standards in several ways, which made it unsuitable for forest inventory purposes. However, given the limited nature of the data use, the FAIB concluded that the procedure could be used to collect age and height data for a one-time application of the spotted owl guidelines. But, the FAIB also advised BCTS to confirm its standards before collecting such data in the future. The FAIB informed the Board that, although

⁷ Vegetation Resources Inventory Localization Procedures, Version 2.0, March 2005.

http://ilmbwww.gov.bc.ca/risc/pubs/teveg/local/vri_local_v2.pdf (accessed April 4, 2008). This procedure was last updated in March 2005, but field procedures for data collection were unchanged from the earlier October 1999 version.

less rigorous than the RIC standards for forest inventory, the BCTS measurements were done by a forest professional on the ground, so they should be more reliable than the estimated ages shown on the 1999 forest cover maps.

BCTS questioned the consultant about several of the forest stands, including one stand of 121 hectares (referred to in this report as the “contentious stand”) in the LTOHA that was labelled on the forest cover map as less than 100 years old, but field-sampled as older than 100 years. Three of the four trees in the stand were hemlock assessed at being younger than 100 years old, and only one of those hemlocks was taller than 19.4 metres. Overall, the stand’s predominant species was hemlock, but the consultant had instead selected a 15-metre tall, 101-year old Douglas fir as representative of the stand’s age. The consultant’s report was therefore somewhat ambiguous, because:

- Douglas fir, not the predominant species, met the age requirement but not the height requirement; and
- hemlock, the predominant species, met the height requirement but not the age requirement.

Given this ambiguity, BCTS asked its consultant to confirm whether the sample plots were actually representative and could be relied upon to indicate that the contentious stand was generally taller than 19.4 metres and older than 100 years. The consultant confirmed that its plots were indeed representative of the age and height of the sampled forest stands. The consultant established stand age based on the oldest tree age calculated in each stand (excluding veterans⁸). In this case, the presence of the sampled Douglas fir tree indicated that the contentious stand had begun to grow at least 101 years before. However, BCTS’ survey procedure required that trees be selected for age assessment based on the trees’ heights in relation to average stand height, but the consultant did not report the average stand height for any of the forest stands it sampled. Nevertheless, the consultant was confident that field observations showing average tree height in the contentious stand to be greater than 19.4 metres were accurate. To confirm the consultant’s conclusion, BCTS reviewed an aerial photo that showed that the contentious stand had two distinct tree layers, leading them to also conclude that the taller layer, and hence the stand overall, was old enough and tall enough to be classified as suitable spotted owl habitat.

The Board attempted to verify stand age and height for the contentious stand from the consultant’s field data using standardized methodology for timber cruising.⁹ However, the Board could not reach a reliable conclusion based on the consultant’s data using standard cruise compilation methods.

⁸ A veteran tree is typically a much older and larger “above the canopy” tree that escaped the disturbance that resulted in the now predominant forest stand.

⁹ See BC’s timber *Cruising Manual*, <http://www.for.gov.bc.ca/hva/manuals/cruising.htm>

The Board also asked the FAIB to review the consultant's field data. The FAIB did so, and reiterated that, for mapping purposes (such as the localization procedure used to correct forest cover map labels) the age and height of a forest stand is typically assigned by taking the average age and height of several systematically-sampled trees of the predominant species. In this case, the BCTS data collection procedure was not systematic, and the three plots its consultant measured in the contentious stand were quite variable. Therefore, like the Board, the FAIB could not verify age and height of the contentious stand by averaging the collected data. BCTS supported the consultant's methodology by noting that the consultant had additional observations made in field that supplemented the plot data. BCTS also pointed out that depending solely on the plot data for assessment would have precluded the additional knowledge gained from reviewing air photos and walking in the contentious stand.

In conclusion, the contentious stand may meet the criteria for suitable owl habitat based on the consultant's field observations and BCTS' subsequent air photo interpretation. The FAIB suggested that professional opinion based on ground visits should be more reliable than the inventory maps. However, stand age and height is not verifiable from the limited field data available. Without additional and systematic fieldwork, the Board could not confirm the accuracy of BCTS' habitat assessment procedure.

Finding: The reliability of BCTS' assessment procedure is uncertain.

4. Did BCTS manage for superior habitat?

Government's spotted owl RMP has a goal that 50 percent of each activity centre be superior habitat: forest stands greater than 140 years old and over 19.4 metres tall. Superior habitat presumably aids owl survival and productivity. In 1999, government calculated that activity centre 18E contained 34 percent superior habitat. It predicted that increasing that to 50 percent would take up to 60 years.

The RMP states the entire superior habitat goal is ultimately to be achieved within the LTOHA. However, neither the RMP nor MFR's approval of BCTS's FDP amendment required that replacement superior habitat be retained in the interim. Consequently, there was no requirement for BCTS to re-assess the activity centre for superior habitat. None of the forest stands its consultant visited were over 140 years old. On the other hand, about 30 hectares of the planned cutblock area are over 140 years old. This means that about 30 hectares of superior habitat, known to be in short supply, may be logged.

Finding: BCTS was not required to manage the forest to provide for superior habitat, though it was known to be in short supply.

5. Did BCTS retain large trees as recommended in the RMP?

For heavy volume removal cutblocks, the RMP recommends there be an average of 40 windfirm leave trees maintained from the top 80 largest diameter trees per hectare. MFR's approval

comments stipulated that it expected BCTS to concentrate the large tree retention inside the cutblocks, rather than outside.

During this investigation, only two cutblocks were at a stage sufficient to assess retention of large trees. BCTS' consultant designed the two cutblocks to retain 40 of the largest 80 trees per hectare,¹⁰ using a system based on combining tree patches and dispersed trees. The consultant calculated the number of trees to be retained by multiplying the number required per hectare by the total area to be logged, but assumed that much of the retention could be in patches *outside* the logged area. The calculation did not factor in the area of the retention patches themselves, which were to contribute 40 large stems for each hectare of their area as well as account for trees from the area to be harvested. The result was that several hundred fewer large trees than necessary were identified for retention. However, for other reasons, the cutblock design ultimately included almost enough reserve area to meet the 40 stem per hectare requirement in each cutblock.

The consultant's method of calculating the total number of large trees required for retention was unconventional (it has now changed its approach and in future will calculate retention on the basis of the entire area under consideration, not just the harvest area) but the cutblock design did achieve approximately the correct number. However, because half or more of the identified trees were in external reserves, outside the field-marked boundary of each cutblock, BCTS did not implement MFR's advice to concentrate large tree retention internal to the cutblocks.

Finding: BCTS was expected but not required to concentrate large tree retention inside the cutblocks. The number of trees retained on both cutblocks was close to what was required, but neither cutblock was designed to concentrate that retention inside the cutblocks.

Conclusion

BCTS had the discretion to harvest timber within spotted owl activity centre 18E. While it was to consider guidance from the 1999 spotted owl RMP in making such a decision, it was only expected, not required, to ensure that large tree retention was concentrated within its cutblock boundaries.

Government's spotted owl RMP lacked instruction about which RIC inventory procedure to use when assessing whether forest stands had aged and grown tall enough to become newly-suitable habitat. Consequently, BCTS developed its own procedure, rather than using standard forest inventory techniques. The procedure BCTS developed was atypical, but, as it was done on-the-ground by forest professionals, it was thought to be more reliable than the 1999 forest cover map estimates. However, short of doing additional and systematic fieldwork, there is no way to verify the accuracy of the procedure.

¹⁰ For cutblock #2, an earlier timber cruise had indicated that the largest 80 trees per hectare were those over 40 centimetres diameter.

Should the professionals be wrong, and should the contentious stand not meet the RMP definition of suitable owl habitat, the cutblocks could further reduce spotted owl habitat. However, the activity centre, as a whole, still approaches the desired retention target for suitable habitat, even with the proposed harvesting factored in.

The amount of large tree retention associated with the cutblocks was also close to meeting the desired target. It is, nevertheless, uncertain how long the large trees in the external retention patches might be retained. Those large trees were not identified in the cutblock plan, so they could be logged as soon as the adjacent harvested area is regenerated and is free to grow.

Board Commentary

Scientific and public concern for the quality of management of spotted owl habitat is at the root of this complaint. The LTOHA in activity centre 18E is intended to provide effective habitat into the future, regardless of current usage or non-usage by resident owls. Designation of the LTOHA is based largely on generalized features of suitable habitat and the boundaries of the specific area have been selected primarily on the basis of generalized forest cover maps.

In responding to the objectives for maintaining the integrity of the activity centre, BCTS followed the planning guidelines within a level of accuracy consistent with the degree to which the habitat protection requirements are detailed. In making its judgments regarding the balance of habitat protection and timber harvesting, BCTS undertook basic field measurements to develop an on-the-ground understanding of actual forest conditions. That analysis provided an assessment of forest condition and habitat suitability that BCTS used to refine the generalized features on which it was required to base the FDP. While there is concern that the activity centre could be compromised by the planned harvesting activity, the approval of the FDP amendment as it stands puts the proposed harvesting pattern close to the intentions of the spotted owl RMP with one notable exception—the questionable proposal to harvest 30 hectares of superior habitat.

For the balance of habitat conservation and forest harvesting to be improved, government's spotted owl RMPs need to be much more specific about the habitat characteristics actually required by the spotted owl; the habitat inventory requirements needed to qualify such suitable habitat; and the boundaries of areas that need to be conserved. Providing forest licensees with well-defined habitat requirements, rather than general expectations, would make government guidance more effective.

The Board understands that government's resource agencies are currently considering how to make these needed improvements.