Habitat Retention and Mountain Pine Beetle Salvage in the Fly Hills

Complaint Investigation 050634

FPB/IRC/122

December 2006

Table of Contents

Executive Summary

A trapper in the Fly Hills area, southwest of Salmon Arm, complained that salvage logging due to the mountain pine beetle epidemic was impacting marten habitat. The complainant had previously transplanted marten in the area and the Okanagan-Shuswap LRMP had set habitat retention targets.

The complainant was concerned that areas that would make good habitat corridors might be logged before retention plans were done. In addition, the complainant observed the harvest of non-pine trees and green pine. The complainant was concerned that stands with little pine were being harvested as part of the salvage operations.

The investigation determined that the licensees Tolko and Federated Cooperative Ltd. (FCL), had largely met and exceeded LRMP guidelines for landscape-level habitat retention. Non-pine trees and green pine were being harvested along with beetle-killed trees within salvage cutblocks, however the stands were predominantly pine.

The board found that retention within older salvage blocks has been low but licensees have taken steps to improve retention, as observed in some recently harvested cutblocks. The board remains concerned with the impact that the accelerated harvesting may be having on marten habitat particularly in those areas that are developing into large aggregate cutblocks.

Board Commentary

The investigation determined that the habitat targets in the LRMP are largely being met. The corridors are identified in retention plans and at least 33 percent of the area is being retained in stands 19 metres or greater in height. In considering the assertion that non-pine trees and green pine were being harvested, the board also looked more broadly at how habitat retention was happening within the cutblocks. Retention within older cutblocks has been low and this is a real concern for the complainant. The licensees have recently developed higher standards for retaining trees within their salvage cutblocks. Tolko had completed harvesting on some cutblocks using these new guidelines and demonstrated on-the-ground a significant improvement in retaining non-pine trees. Newly harvested cutblocks may not provide significant marten habitat in the short-term, but retaining trees will allow the cutblocks to develop multi-storied and multi-species characteristics with snags and downed trees. This should greatly shorten the time that until cutblocks function again as marten habitat.

However, it is not clear whether the combined landscape-level and stand-level retention practices are enough to sustain a harvestable marten population. Recently a review of the impact of the mountain pine beetle on achieving the Okanagan-Shuswap LRMP objectives was completed for ILMB.[1] The review used modelling information to predict the increase in beetle killed pine trees in the region. It specifically considered the Fly Hills resource management zone (RMZ), and determined that it is unlikely that the mountain pine beetle will detract from meeting objectives and strategies for the marten in the RMZ. However, this review considered the amount of pine in the RMZ, but did not consider the existing conditions on the ground or

[1] M. Fenger and Associates. An Assessment of Mountain Pine Beetle Implications to the Okanagan-Shuswap Land and Resource Management Plan. March 2006.

future salvage harvesting. The review was not intended to assess whether achieving the LRMP retention targets will still provide sufficient habitat for marten.

ILMB is currently attempting to convert Okanagan-Shuswap LRMP objectives into legally-binding government objectives. The proposed wording is *to maintain forage, cover and connectivity for marten* rather than to maintain a sustainable marten population. Under FRPA, forest stewardship plans will be required to address government objectives. However, the draft wording of the new objective is not measurable itself and therefore it is important to tie it to measurable outcomes such as the 200-metre corridors and the 19+ metre stands. The board is advised that the strategy to maintain the 200-metre corridors and the 19+ metre stands are intended to be retained as criteria that the MOFR district manager will consider in relation to the new government objective when deciding whether to approve a forest stewardship plan.

In considering habitat management and retention, this investigation compared the licensees' practices to the LRMP targets. These targets were negotiated amongst government agencies and stakeholders. Although corridors and retention are being planned by the licensees, the landscape will still be heavily impacted by the mountain pine beetle epidemic and salvage harvesting. That will result in a higher proportion of younger forest than anticipated when the LRMP objectives were developed. Achievement of the LRMP goal to manage for a sustainable population of marten may be compromised, in some areas, by the accelerated salvage harvesting in response to the beetle epidemic.

The Ministry of Environment (MOE) has had limited involvement in the Fly Hills marten habitat issue since draft OGMAs were delineated and they generally do not review harvesting plans. Recently the ministry has initiated a new program under the Mountain Pine Beetle Action Plan to assess the impacts of the mountain pine beetle on the environment. As MOE has responsibility for habitat protection and expertise for wildlife and biodiversity management, providing this oversight function is important in light of the large scale harvesting currently underway.

Much of this complaint has been about the harvest of other tree species such as spruce and fir during beetle salvage. This issue is not unique to this complaint and has come up in previous and current board investigations. The harvest of some non-pine species during salvage operations will be unavoidable. However, it raises the question of how much of this harvest is appropriate. The board will be examining this question in a new special report: "Species Profile of Harvest Associated with the Response to the Current Mountain Pine Beetle Outbreak".

Recommendations

In accordance with section 131 of the *Forest and Range Practices Act*, the Board recommends that:

1. The regional ILMB and regional Ministry of Environment offices review the habitat targets in the LRMP marten strategy to determine if they are adequate to meet the LRMP goal given the accelerated harvesting that has occurred and is proposed to address the mountain pine beetle epidemic.

2. Because of the extent of the current mountain pine beetle epidemic, stand-level retention should not be evaluated by pre-epidemic ideas of adequate retention, e.g., the 7 percent wildlife tree requirement in FPPR. In cutblocks that have little or no

adjacent landscape-level retention, licensees should plan for higher levels of retention.

3. In areas that are becoming one large clearcut, licensees should proactively increase retention within cutblocks in these areas, including leaving standing green or dead pine for structure where there is an insignificant non-pine component.

Under section 132 of the *Forest and Range Practices Act*, the Board requests that ILMB and MOE report back on recommendation 1 by March 31, 2007.

The Investigation

Background

The Fly Hills area is located southwest of Salmon Arm mainly within the Chase Creek watershed. This watershed has a history of land clearing for agriculture in the lower drainage and harvesting in the upper watershed because of a spruce beetle infestation in the 1990s. Early in the 1990's, the owners of a trapline (the complainant) expressed concerns to government and forest companies about impacts of forest practices on marten habitat in the Fly Hills. The marten is a small furbearer that has long been a staple in the trapping industry. It is not considered to be at risk in BC.

The complainant had previously transplanted marten to the area. Marten are trapped throughout BC, with the majority of the trapping occurring in the northern half of the province. In the interior of BC, the best marten habitat is found in higher elevation spruce and balsam forests. The Fly Hills area is not considered special in terms of habitat for marten, but the complainant has a strong stewardship interest in maintaining the marten population.

In 1994 the Ministry of Environment (MOE) released guidelines for maintaining marten habitat in the Fly Hills area[2]. The guidelines described preferred marten habitat as "dense canopied, multi-storied, multi-species climax coniferous forests containing high numbers of large snags and downed logs. This habitat usually contains riparian corridors used as travel ways and is often interspersed with small openings important for foraging." The guidelines also identified a requirement for marten travel corridors at least 200-metres wide with 30-70 percent coniferous canopy closure. Such corridors were to be at least at a young forest seral stage (10-15m in height) to be useful.

A Land and Resource Management Plan (LRMP) process began in 1995 and concluded in 2000. Cabinet approved the plan in 2001 as government policy and direction but did not declare it a higher level plan under the Forest Practices Code Act. In 2001, the LRMP guidelines for the Fly Hills Resource Management Zone (RMZ) replaced the 1994 marten guidelines. These guidelines were similar to the 1994 guidelines but included less retention. The new guidelines also called for corridors approximately 200-metres wide, made up from the proportionate share of old growth management areas (OGMAs), enhanced riparian reserves (ERR), and wildlife tree patches (WTP) for the RMZ. While the original corridors were considered during retention placement, they provide less connectivity due to a budget of 2300 hectares of total retention area negotiated by the members of the LRMP table.

Although the original marten guidelines were replaced in 2001, the LRMP required that the original corridors remain until the OGMAs were in place. Draft spatial OGMAs were completed in 2003, cancelling the original marten corridors for the RMZ.

Throughout BC, the mountain pine beetle population grew rapidly in the early 2000's, due to a lack of cold winter temperatures that normally keep the population in check, combined with an area of mature lodgepole pine much larger than was present in the past century. The beetle kills attacked trees, greatly reducing the value of the wood for the forest industry. From a timber management perspective, there is an urgency to harvest trees within a short period after attack

[2] Maintaining Marten Habitat in Managed Forests. Fish and Wildlife Branch. June 1994.

to capture as much value as possible and to return areas back to productive forest for crop trees. Government has increased the allowable annual cut in most of the affected areas of the province to facilitate the removal of dead pine. This accelerated harvest also has implications for other forest values. In the Okanagan timber supply area, which includes the Fly Hills, an uplift of 720,000 m3 to the allowable annual cut was approved in January 2006.

The mountain pine beetle epidemic began to expand significantly in the Fly Hills area around 2003. Licensees initially tried to control the outbreak by small-scale salvage operations that removed beetle-attacked trees. However, the retained pines continued to be attacked, requiring re-entry into the cutblocks. It was clear that the outbreak would not be controlled by the harvesting. Therefore, licensees, with direction from MOFR, changed their strategy to taking out both susceptible and attacked pines from their cutblocks, assuming that the susceptible pine would eventually be killed. These blocks focused on pine-leading stands with significant mountain pine beetle incidence.

In 2005, licensees advised the complainant that they were developing retention plans to address the still-rapidly expanding mountain pine beetle epidemic. The licensees wanted to identify areas that would be left to meet the Fly Hills RMZ guidelines. Because of the rapid beetle spread, licensees submitted FDP amendments frequently to adjust previous proposed block boundaries and include new areas. In August 2005, one licensee, Tolko, proposed almost 1700 hectares of clearcut with reserve harvesting. At about the same time, another licensee, Federated Cooperative Ltd. (FCL), proposed about 250 hectares of clearcut harvesting.

These proposals were referred to the complainant, a local trapper. The amendment maps did not show the draft retention corridors as the retention plans were not yet complete. The complainant became concerned that areas that would make good corridors might be logged before retention plans were done. In addition, the complainant observed the harvest of non-pine trees, mainly spruce, but also cedar, balsam and Douglas fir. The complainant was concerned that stands with little pine were being harvested as part of the salvage operations and filed a complaint with the Board in late August 2005.

The Fly Hills RMZ is approximately 32,500 hectares of crown land. The majority of the area of concern is within Tolko's operating area. FCL's only operations in the Fly Hills RMZ are an area of 1918 hectares in Upper Gelling Creek. The licensees referred their draft retention plans to the complainant in the fall of 2005 and completed them while the investigation was underway.

Both Tolko and FCL were in a period of transition at the time of the investigation. Changing philosophies of both the licensees and MOFR regarding the mountain pine beetle led to a range of retention practices being pointed out to the Board during a field trip in September 2005, but there was little in-block retention visible. On a second field trip in late January 2006, the Board observed higher levels of retention in recently harvested Tolko cutblocks. Also, FCL incorporated higher in-block retention strategies in 2006 amendments to its FDP for additional harvesting in Upper Gelling Creek.

Discussion

The Board investigated whether:

- at the landscape level, Tolko and FCL were providing retention corridors and retaining mature forest as prescribed in the LRMP guidelines for the Fly Hills resource management zone (RMZ).; and
- at the stand level, non-pine stands and unattacked pine were being harvested as part of the licensees' beetle salvage operations.

Are the LRMP guidelines for landscape-level retention in the Fly Hills RMZ being met?

Forest development plans must be consistent with higher level plans. The Okanagan-Shuswap LRMP is not a higher level plan, so the licensee's plans do not legally have to be consistent with the LRMP. Nevertheless, the LRMP was approved by cabinet, so it provides strong policy direction and sets public expectations.

The LRMP states that the goal of the plan for the Fly Hills RMZ is to: *Manage for a sustainable marten population for the area, including the production of a harvestable surplus of marten for the trappers of that area.*[3]

Specifically for cover and forage habitat, the landscape-level objectives and strategies are to:

- use OGMAs, WTPs and the "enhanced riparian reserve" (ERR) budgets to develop a network of connected mature/old seral upland and riparian marten corridors to provide cover/habitat requirements and facilitate the movement of marten across the landscape. The corridors must be within the OGMA, WTP and ERR budget for the area (2300 hectares).
- spatially locate corridors that are approximately 200-metres wide.
- maintain 33 percent of the forested area in stands 19 metres or higher and distributed across the RMZ. This is to be met in at least 4 of 5 subunits in the RMZ.

Use of OGMAs
Both licensees have mapped retention following the LMRP guidance to build on the OGMAs, utilizing WTPs and enhanced riparian reserves. They have also prepared retention plans that identify their strategies for the Fly Hills. Both plans show the mapped location of both short term and long term retention areas.

The two retention plans have been accepted by the forest district. Together, the licensees identified over 3600 hectares of retention made up of OGMAs, WTPs and riparian reserves within the Fly Hills RMZ. This exceeds the 2300 hectares called for in the LRMP. Some of the OGMAs were located close to riparian areas to provide marten habitat and generally placed in non-pine stands to minimize mountain pine beetle impacts. According to the licensees'

[3] Okanagan-Shuswap Land and Resource Management Plan. 2001.
http://ilmbwww.gov.bc.ca/ilmb/lup/lrmp/southern/okan/index.html

retention maps, all of the OGMAs shown on Integrated Land Management Bureau's (ILMB's) final draft OGMA map (2003) are still intact and many have been incorporated into corridors.

Corridors

The Fly Hills RMZ guidelines call for approximately 200-metre wide corridors to be located mainly along stream riparian areas. Both licensees have planned and mapped retention corridors. Because of past harvesting, some of the mapped corridors are less than 200-metres wide, but they exceed the riparian management area widths that are actually required by regulation.

Tolko's retention plan has established corridors with widths that range from 100 to 800 metres. Past harvesting has reduced retention opportunities in some places to less than 200-metres, leaving the narrowest corridors adjacent to portions of Blanc Creek.

FCL's retention map for the Gelling Creek planning unit shows a network of corridors, primarily associated with OGMAs. In some areas the retention corridors are 500 metres wide. However, in the upper end of Gelling Creek the retention corridors are narrow, ranging from less than 50 metres wide in many places up to 250 metres.

Reducing the width in some areas could increase connectivity elsewhere because there was an allocated budget for the total hectares in retention corridors. The licensees have exceeded the budget targets with their mapped corridors, which also extend beyond the Fly Hills RMZ and have been applied to much of the Chase Creek watershed.

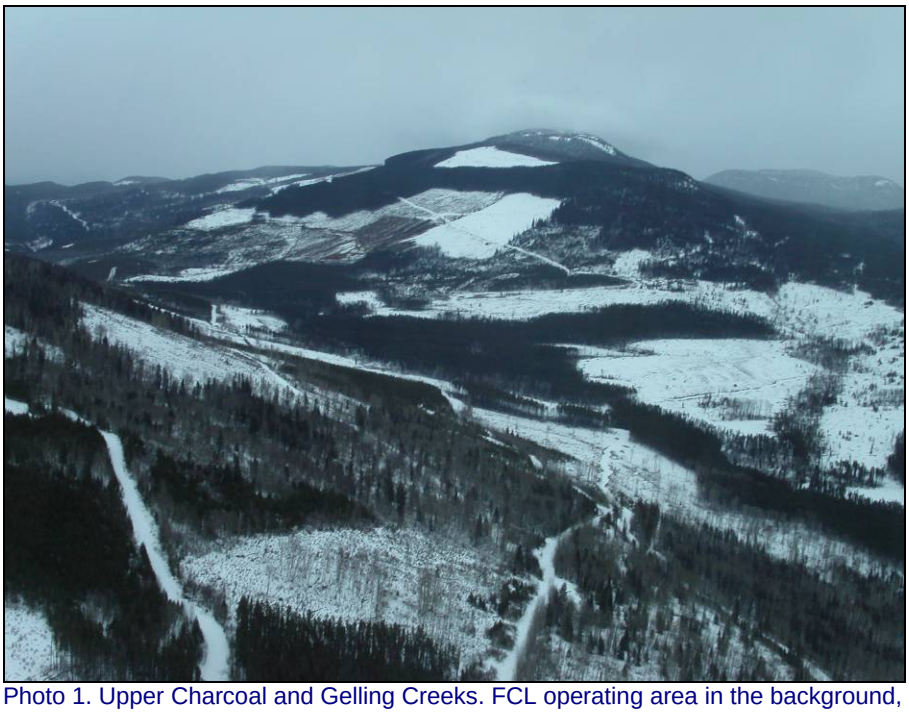

Photo 1. Upper Charcoal and Gelling Creeks. FCL operating area in the background, Tolko operating area in the foreground. Gelling Creek (background) contains the vast majority of FCL's highest risk stands which do not extend much beyond what is seen in the photo. The photo illustrates the large aggregate cutblocks that are being created where new harvesting is adjacent to past harvesting. Harvesting is continuing on the midslope stands in the background. This pattern is also seen elsewhere in the RMZ.

19 metre requirement
The LRMP guidelines recommend maintaining 33 percent of the Fly Hills in stands 19 metres or greater in height in at least four of the five RMZ subzones. The retention corridors are included in the 33 percent target. Both licensees analysed retention in their areas and determined that four of the five subunits have retained between 33 percent and 68 percent; the fifth has less than 33 percent.

Findings:

Both licensees are largely meeting the LRMP guidelines for marten corridors.

- The retention corridors consisting of OGMA, WTP and ERR are mapped and exceed the 2300 hectares requirement.
- The 200-metre guideline is not achieved everywhere, due to past harvesting and LRMP budget constraints, but wider retention is planned in some areas.
- The recommended area of 19+ metre high stands is achieved in four of five subunits.

Are non-pine species and green pine being harvested during salvage?

The complainant asserted that the licensees were harvesting non-pine trees during beetle salvage and that green pines with no sign of attack were taken. To address the complainant's concern, the analyst considered what species the licensees were harvesting and retaining within blocks.

Existing guidance
District manager policy[4] and chief forester recommendations[5] provide guidance for mountain pine beetle salvage harvesting. The Fly Hills guidelines, the district manager policy and chief forester recommendations also guide in-block retention. The Fly Hills RMZ guidelines recommend maintaining marten habitat within harvested areas by retaining at least 10 green trees, 10 stubs or 10 tree pieces per hectare and locating debris brush piles close to the edge of the cutblock and riparian areas. The use of WTP and ERR budgets for corridors along riparian areas, as per LRMP guidelines, means there is less WTP allotment available for retention inside cutblocks that are adjacent to corridors.

District manager policy recommends 20 percent or more of combined landscape level and stand level retention. It describes the type of trees to be retained as primarily live trees, mixed species of conifer and deciduous, and trees in stands that are unlikely to be attacked by beetles. There should be a greater emphasis on maintaining some dead pine in areas of high mortality. The amount of retention should increase as block size increases and distance from areas of landscape-level retention increases. The district manager policy also recommends alternative silvicultural systems to retain non-pine species.

The chief forester guidance supports the district manager policy, stating that watersheds containing significant landscape-level retention may need less stand-level retention. The chief

[4] Okanagan Shuswap Forest District. District Manager Policy – Mountain Pine Beetle Management Strategy and guidance for implementation. August 10, 2005.
[5] MOFR Chief Forester. Guidance on Landscape and Stand Level Structural Retention on Large-scale Operations Associated with Mountain Pine Beetle Killed Timber. December 2005.

forester recommends a range of retention from 10 percent (for openings less than 50 hectares) to greater than 25 percent (for openings over 1000 hectares). Dead pine should be maintained where insufficient live trees exist. 'Functional' opening size should be considered, including contiguous areas that have been harvested within the last 30 years.

Licensees' practices
The licensees agree that non-pine trees are being harvested in the salvage blocks. They explained that the stands are mixed species, with pine spread throughout the cutblocks.

A summary of cruise information[6] indicates that the percentage pine in Tolko's cutblocks ranged from 55 to 99 percent. The FCL cutblocks in Upper Gelling Creek area ranged from 40 to 100 percent pine but most were over 75 percent. While there were likely pockets of mature spruce within the cutblocks, these were generally not left because past experience with blowdown caused concern that a spruce bark beetle epidemic could be triggered in the remaining spruce stands.

The licensees also confirmed that green pine trees are also harvested. The harvest of non-attacked pine is part of the current strategy to take both attacked and susceptible pine trees. The actual attack levels within stands initially varied from 20 to 40 percent, so the majority of pine harvested in a block would show no signs of attack. Attack levels increase through time. Susceptible pine trees that are not attacked one year become attacked in subsequent years. Tolko reports that 2006 infestation levels are 40 to 60 percent.

The August 2005 district manager policy also gives guidance on what stands should be harvested in response to pine beetle attack. It says to focus on stands with the highest component of pine and the heaviest levels of beetle attack. Susceptible pines should be harvested before other healthy timber types, but harvest should focus on infested stands first. Within areas heavily impacted by, or at high risk of mountain pine beetle attack, stands with less than 30 percent pine should normally be designated as temporary retention; however, in high-risk watersheds, the pine component threshold for temporary retention should be greater. Tolko now intends to only harvest in stands with more than 50 percent pine. Recently, Tolko removed 5 proposed cutblocks within the Fly Hills from its short-term harvest plan because field work determined that the stands were less than 50 percent pine. One new block was added because it was more than 50 percent pine. FCL is using the minimum 30 percent pine in the district guidance. However, none of the current harvest areas in Upper Gelling Creek have less than 65 percent pine.

In its 2005 FDP amendments, Tolko said that, wherever possible, they will incorporate structural characteristics of natural disturbance in their blocks over 40 hectares. They plan wildlife tree patches based on provincial policy (7-11 percent depending on biogeoclimatic subzone) and also utilize some mature trees for non-wildlife tree patch retention. Retention is to be targeted around mature veterans and deciduous trees. Spruce, pine and balsam will be used for retention where they can be left in windfirm groups to minimize the risk of creating forest health problems. The overall amount or range of retention, other than WTPs, was not specified. Tolko's retention plan explains that individual cutblock retention is influenced by the interaction between stand and landscape level retention.

[6] Field measurements that include species composition and tree volumes.

Tolko produced a stand-level retention guide in December 2005[7]. It refers to the district manager policy, the chief forester guidance and the LRMP as guidance for determining the stand level retention level for a given cutblock. The retention guide varies somewhat from the levels recommended in the chief forester document. For cutblocks greater than 100 hectares in stands with more than 70 percent pine, it recommends target retention levels of 7-10 percent, increasing this to 15-25 percent for cutblocks above 250 hectares. For stands with 50 to 70 percent pine and cutblocks greater than 100 hectares, it recommends retention of 7-10 percent.

FCL's December 2004 FDP amendment for CP 990, in the Gelling Creek, has similar language for incorporating structural characteristics of natural disturbance in its blocks that exceed 40 hectares, including aggregate blocks where harvesting is adjacent to non-greened up areas. Where practicable, non-pine conifers and deciduous are to be used for structural diversity. FCL's retention planning document states that the district manager policy will be considered when planning stand-level retention at the site plan stage. Wildlife tree patches are to be used to complement existing reserves. FCL acknowledged that new blocks in Upper Gelling Creek are part of a large aggregate cutblock and that substantially more retention than occurred in CP 990 is needed. Site plans specify levels of tree retention in large standing trees of deciduous or conifer, smaller standing cedar and balsam trees and patches of poorer quality trees. However, there is considerable flexibility in what the final result may be. Whether predominantly deciduous are left, and whether standing trees or stubs and tree species make up much of the retention, could significantly influence the habitat value of the retention.

On the first field trip of this complaint investigation in September 2005, the retention observed within harvested cutblocks was mainly immature spruce but included deciduous and some Douglas fir vets (photos 2a, 2b).

Photo 2a. Example of low retention in a 2004 Tolko block.

Stub trees were left in some blocks. Debris piles were observed near the edge of cutblocks in some Tolko blocks. In blocks where debris is not piled, the strategy is to leave more coarse woody debris on the ground. Overall, however, observed stand level retention within the cutblocks was low. This was because the WTP retention budget was directed to corridors and not cutblocks (photo 3a).

[7] Tolko-Okanagan Regional Woodlands Variable Retention Field Guide. Stand Level Approaches to Conservation of Biodiversity. December 2005.

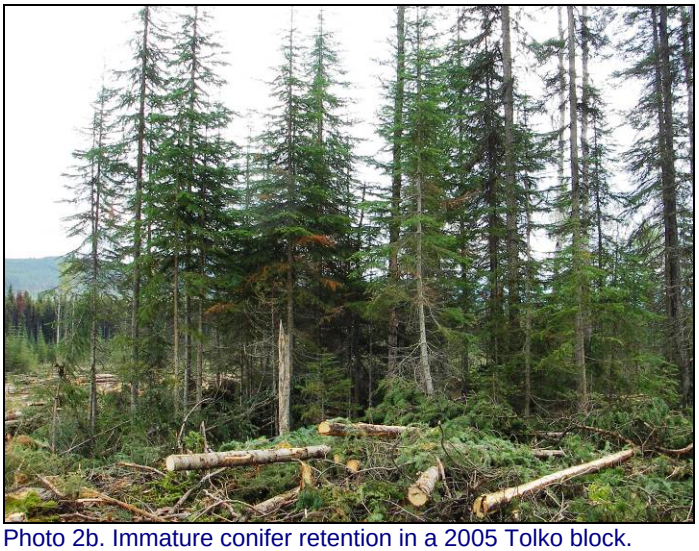

Photo 2b. Immature conifer retention in a 2005 Tolko block.

The analyst and the licensees discussed whether more retention was possible, particularly mature spruce. Spruce is particularly susceptible to windthrow, but green and even dead pine could be left as a buffer around pockets of mature spruce. Such buffering could reduce the likelihood of windthrow along cutblock boundaries, adjacent to spruce timber types and inside cutblocks.

Photo 3a. 2004 Tolko cable harvested cutblock with no internal WTP retention.

Photo 3b. Tolko cable block harvested winter 2005/6 with internal WTP retention.

On the second field trip, in January 2006, the analyst observed three Tolko cutblocks that formed one large aggregate cutblock, while harvesting was underway. Retention practices within the blocks were noticeably different than what had been seen in September. This reflected new direction from Tolko's Retention Plan and recent field guide for stand-level retention, independent of the board investigation. A wide riparian corridor connected a riparian corridor on Chase Creek below the block with an OGMA above the cutblock. Numerous patches of spruce were left across the block. Green and dead pine was being left as a buffer on some of the spruce patches within the cutblocks (photos 4a, 4b).

Photo 4a. Tolko harvesting winter 2005/2006.

Photo 4b. Tolko block. January 2006 harvesting with mature spruce retention patches and increased riparian corridor linked to an OGMA.

A helicopter flight over Tolko's operating area in January 2006 confirmed that proposed cutblocks were largely pine and that the pine was scattered throughout the blocks. As well, the upper boundaries of harvested cutblocks were at the elevation where the stands changed from predominantly pine to spruce.

There are many incentives to harvest non-pine, including mill requirements based on customer needs for a range of forest products, operational constraints in the block, or forest health concerns such as blowdown. However, the district manager policy recommends designating non-pine forest types for temporary retention until the beetle epidemic has passed. Tolko identifies these stands as short-term retention in its retention plan. Most of the stands targeted for salvage harvest in the Fly Hills area are mixed species leading in pine.

Because of hydrological concerns resulting from previous harvesting and disturbances in the Chase Creek watershed, Tolko had a contractor complete a hydrological assessment in 2004 and update it in 2005 for the retention plan. The assessment indicated that stands with more than 70 percent mature pine would, over time, function hydrologically similar to a clearcut. Stands with up to 40 percent pine would not be particularly affected hydrologically. Tolko suggested that it would be better, from a hydrological recovery perspective, to harvest and replant pine-dominated areas. That would re-establish a stand quickly. In contrast, if such stands were not harvested, the pine component would die and, because there would be no post-harvest replanting, they would take some time to reforest naturally. FCL expressed a similar view. (A recent study for Canfor concluded that a stand of dead pine trees would have an equivalent clearcut area factor between .45 and .52, meaning that it would function similarly to a stand with 50% of the trees removed[8]).

However, in the Board's opinion sound stewardship supports limited harvesting and maximum practicable retention of non-pines in this area because of the mountain pine beetle epidemic. It has already been heavily impacted by past harvesting. Tolko's hydrological assessment found the area to be at 30 percent equivalent clearcut area early in the beetle infestation. That is predicted to increase to about 60 percent after the proposed salvage harvesting due to the current pine beetle infestation, which will further reduce habitat, not only for marten but for many forest-dwelling species. From a biodiversity perspective, retention of non-pine species is an important issue.

The chief forester guidance document says that keeping non-pine tree species within salvage blocks will help retain about 60 percent of terrestrial vertebrates, bryophytes, lichens and non-pest invertebrates. The chief forester cites research that shows that dead pine can remain standing for 10 years and can help sustain cavity nesting species, provide shade and ultimately become coarse woody debris. Beetle-free but susceptible pines are also worth retaining, because they will provide transpiration and other benefits for some time yet and will remain standing longer than pine that is already dead.

Findings:

No evidence was found that non-pine stands were being harvested as beetle-salvage blocks. Cruise data on recently harvested blocks and observed unharvested cutblocks showed that

[8] Snow Surveys in Supply Block F Prince George TSA January to April 2006. P.Beaudry and Associates Ltd. May 2006.

there was a component of spruce, balsam and fir within the blocks but all were predominantly pine. Retention within older salvage blocks has been low for both licensees, but Tolko's recent harvesting showed a significant improvement in retaining in-block structure. FCL's plans in Upper Gelling Creek also show improvement in in-block retention.

Recommendations

In accordance with section 131 of the *Forest and Range Practices Act*, the Board recommends that:

1. The regional ILMB and regional Ministry of Environment offices review the habitat targets in the LRMP marten strategy to determine if they are adequate to meet the LRMP goal, given the accelerated harvesting that has occurred and is proposed to address the mountain pine beetle epidemic.

2. The two licensees have demonstrated increased stand-level retention in planned and harvested cutblocks; however, there is a fair degree of flexibility inherent in their plans. Because of the extent of the current mountain pine beetle epidemic, stand-level retention should not be evaluated by pre-epidemic ideas of adequate retention, e.g., the 7 percent wildlife tree requirement in FPPR. In cutblocks that have little or no adjacent landscape-level retention, licensees should plan for higher levels of retention. To the extent practicable, that retention should involve non-pine species. For example, if there is 30 percent non-pine in a cutblock and it is practicable to leave most of it, licensees should do that, even in cutblocks in the 40 to 100 hectare range. This may only be practicable where the non-pine is clumped and not uniformly distributed throughout the stand. If pine is needed as a buffer or to minimize ground disturbance, it should be retained. Taking all of the dead and susceptible pines is contrary to sound stewardship of the full range of forest resources.

3. An area on the south side of Upper Charcoal Creek, north-east of the confluence of Blanc and Charcoal Creeks, is becoming one continuous clearcut. The same applies in upper Gelling Creek. These areas should be considered to function as one large clearcut. Licensees should proactively increase retention within cutblocks in these areas as per the chief forester's recommendations, including leaving standing green or dead pine for structure where there is an insignificant non-pine component.

Under section 132 of the *Forest and Range Practices Act*, the Board requests that ILMB and MOE report back on recommendation 1 by March 31, 2007.

Conclusion

The licensees' plans largely meet the LRMP guidelines, and exceed the budget for retention corridors. This has resulted in the planning for a higher standard of retention along riparian areas and a higher level of connectivity than is required by the legislation. This will benefit other forest resources such as wildlife. Both licensees have increased stand-level retention in the planning for new cutblocks, however, there remains considerable flexibility in the plans such that the final result is not evident until harvesting nears completion.

Tolko has extended the retention planning outside of the RMZ and conducted hydrological assessments for the entire Chase Creek watershed. It has also developed guidelines for stand-level retention and this is a proactive initiative.

Non-pine trees and green pine are being harvested during salvage operations but in stands that are predominantly pine. Practices in the recent past have left little retention, but retention of non-pine has improved within the past year.