

1998 Forest Development Plan Red- and Blue-listed Species Inventory for Owls and Woodpeckers

by

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Prepared for

B.C. Ministry of Environment,
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Penticton, B.C.

August 20, 1998

EXECUTIVE SUMMARY

1998 draft Forest Development Plans (FDPs) and woodlot boundaries were reviewed for overlap with the nesting habitat of red- and blue-listed owls and woodpeckers in the Boundary, Merritt, Vernon and Penticton Forest Districts. Overlap was found to occur, and inventory conducted, for Flammulated Owls and Williamson's Sapsuckers.

Williamson's Sapsuckers were detected in only one new location in 1998. In total 20 Williamson's Sapsucker nests have been found in the 3 years of inventory. Large (>70 cm dbh), live western larches with obvious defects and dead standing birch trees are most important for nesting. Williamson's Sapsuckers commonly nest in Canada in only a very small geographical area of less than 54,000 ha, of which only 24% might be considered suitable habitat. I estimate there are only 114 nesting pairs of Williamson's Sapsuckers in this area based on a simple habitat model and a nesting density of one pair per 125 ha in some of the best habitat available (Woodlot 411-1 at Johnstone Creek, Boundary F.D.).

Flammulated Owls were found in 16 of the 58 areas that were inventoried specifically for their presence. Sixty-four Flammulated Owls were heard at 72 of the 507 playback /listening points between May 13 and June 17, 1998. Sixty-three of the 64 Flammulated Owls were found in the IDF (dm1, xh2, xh1 and dk1) with 84% of the records from elevations between 700 and 1100 m.

Recommendations-Williamson's Sapsucker

Minimum-sized Wildlife Tree Patches should be placed around the known Williamson's Sapsucker nest sites within proposed cutblocks that will be selectively cut, or a 4-ha patch in cutblocks that will be clearcut or seedtree cut. In Penticton Forest District this will apply to CP121 in TFL 15. In Boundary Forest District this will apply to Woodlot 411-1, to Small Business TSL A48486, and to Pope and Talbot's CP281-1 and 277-1.

In 1999, the 15 Williamson's Sapsucker nest sites should be checked for re-nesting to determine if the same trees or nearby ones are used for nesting. All the most likely woodlots and planned Cutting Permits in Forest Licence areas were inventoried in 1998 so that only new CP areas will need to be inventoried in 1999. Rechecking nests and new CP's should require 10 field days by a crew of two in 1999. There is a definite need to begin inventory in TFL 15 and TFL 8 because 50% of the Williamson's Sapsucker range is within these TFL's.

Recommendations-Flammulated Owl

Flammulated Owls are considerably more common and more widespread than any of the other species considered in this inventory. There is still a large backlog of areas that have not been inventoried yet, and of areas where Flammulated Owls are known to occur based on these inventories but where nests have not yet been found. We also do not know the extent of their occurrence within the Vernon Forest District since no surveys have yet been conducted in the central or eastern section of the district.

Wildlife Tree Patches should be set up around sites where Flammulated Owls were found are in Weyco's CP 120 and Woodlot 359 in Merritt Forest District, in Woodlot 700 in Vernon Forest District, and in Pope and Talbot's CP 269 in Boundary Forest District.

No nests were located during the 1998 inventories or during the 1997 Cannings and Booth inventories (C&B 1997). Further nest searches should be undertaken where Flammulated Owls were found in proposed blocks but no nests located as listed below.

Merritt F.D.	Vernon F.D.	Penticton F.D.	Boundary F.D.
<i>Weyco</i>	none	<i>Gorman's</i>	<i>Pope and Talbot</i>
48		315 (C&B 1997)	269
119		317	
120-1		331	
133			
<i>Small Business</i>		<i>Weyco</i>	<i>Woodlots</i>
Manning Cr. (C&B1997)		5	418
Otter Mt. (C&B 1997)			471
Rabbitt Mt.			1771
			1468 (C&B 1997)
<i>Woodlots</i>			
359, 1634			

Because Flammulated Owls are widespread over the southern interior, we could not cover all the areas where the habitat is apparently suitable. Areas that still need to be surveyed include:

Merritt F.D.	Vernon F.D.	Penticton F.D.	Boundary F.D.
<i>Weyco</i>	wider ranging surveys	<i>Gorman's</i>	<i>Woodlots</i>
41	to determine range	319	413-2
119 (portion)	of Flammulated Owl		1775
120 (portion)	within district		
<i>Aspen</i>	(TFL 49)	(TFL 15)	
240		(TFL 49)	
<i>Tolko</i>			
112			
<i>Woodlots</i>			
390, 392, 1446, 1636, 1737			

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INTRODUCTION

This project was designed to collect inventory and habitat information for White-headed Woodpecker, Williamson's Sapsucker, Lewis' Woodpecker, Flammulated Owl, Spotted Owl and Western Screech-Owl within selected Forest Development Plans in the Merritt, Vernon, Penticton and Boundary Forest Districts of the Southern Interior Region of B.C. Environment. These species have been designated on the Red and Blue Lists by B.C. Environment (1995) and are generally very uncommon and /or their distribution not well known. Breeding habitat requirements for the woodpecker species have been previously reviewed (Gyug 1996, Gyug 1997). Breeding habitat requirements for the owl species were previously reviewed by Cannings and Booth (1997).

The specific objectives of this report were to:

- conduct inventory for the species listed above within the identified Forest Development Plan areas,
- produce detailed maps showing positive locations and all sampling sites or transect locations, and
- record information on other Red or Blue-listed species observed in the search areas.

Acknowledgements

This project and report was completed under contract to the Southern Interior Region of British Columbia Ministry of Environment, Lands and Parks through the Habitat Protection Section, of the Okanagan Sub-Region of B.C. Environment, Penticton, B.C. Funding was supplied through Forest Renewal B.C. Alan Peatt, B.C. Envt., Penticton, served as contract monitor. Ross Munro and Chris Charlesworth provided technical assistance.

STUDY AREA

Figure 1. Location of 1998 inventory areas for Williamson's Sapsuckers and Flammulated Owls in the Merritt, Vernon and Penticton Forest Districts of the southern interior of British Columbia at 1:1,000,000 scale.

The study area was in the southern interior of British Columbia (Figs. 1 and 2). The nominal study area included the Merritt, Penticton, Vernon Forest Districts of the Kamloops Forest Region of the B.C. Ministry of Forests, and the Boundary Forest District of the Nelson Forest Region of the B.C. Ministry of Forests.

Figure 2. Location of 1998 inventory areas for Williamson's Sapsuckers and Flammulated Owls in the Boundary Forest District of the southern interior of British Columbia at 1:500,000 scale.

The study area is in the Southern Interior Ecoprovince and includes parts of the Northern Cascade Ranges, Interior Transition Ranges, and Thompson-Okanagan Plateau Ecoregions. Actual inventory was undertaken in parts of the Southern Thompson Upland, Northern Thompson Upland, Southern Okanogan Basin, Okanogan Range, Southern Okanogan Highland and Northern Okanogan Highland Ecoregion.

SUMMARY OF EXISTING INFORMATION

Existing information for the woodpecker species was summarized in Gyug (1996) for the three target inventory species. This section of Gyug (1996) is repeated verbatim here as a service for those who may not have copies of that report on hand.

Excerpted from Gyug (1996):

Lewis' Woodpecker (*Melanerpes lewis*)

Lewis' woodpecker was the subject of a fairly recent status report in British Columbia (Siddle and Davidson 1991) as well as being described in a species account in the Managing Identified Wildlife Handbook of the Forest Practices Code of B.C. (B.C. Min. of Forests and B.C. Env't. 1996). To briefly summarize these here, "Lewis' woodpecker breeds locally throughout lowland areas of B.C.'s southern interior from the U.S. border north to Williams Lake, Revelstoke and Invermere. . . from sea level to 1150 m elevation. Its centre of breeding abundance is in the Okanagan Valley." (B.C. Min. of Forests and B.C. Env't. 1996). Optimal breeding habitats contain large snags (>30 cm dbh) and an open tree canopy (<25%). Other desirable breeding habitats are partially logged or burned forest and deciduous and riparian woodlands-particularly black cottonwood forests.

White-headed Woodpecker (*Picoides albolarvatus*)

The white-headed woodpecker was the subject of a recent status report in British Columbia (Cannings 1995) as well as being described in a species account in the Managing Identified Wildlife Handbook of the Forest Practices Code of B.C. (B.C. Min. of Forests and B.C. Env't. 1996). To briefly summarize these here, "white-headed woodpeckers nest locally in the southern Okanagan valley from Osoyoos north to Naramata. . . This species requires dry, open (<70% canopy cover) of mature forest (age class 7-9) with large diameter (>60 cm dbh) ponderosa pine." (B.C. Min. of Forests and B.C. Env't. 1996). Home range sizes of 100-400 ha will limit this species to large areas of this type of habitat.

Williamson's Sapsucker ssp. *thyroideus* (*Sphyrapicus thyroideus thyroideus*)

Williamson's Sapsucker was the subject of a recent status report in British Columbia (Cooper 1995) as well as being described in a species account in the Managing Identified Wildlife Handbook of the Forest Practices Code of B.C. (B.C. Min. of Forests and B.C. Env't. 1996). To briefly summarize these here, the *thyroideus* subspecies of Williamson's Sapsucker breeds in the Thompson-Okanagan Plateau, west to Manning Park and Lytton. They require dry, open to semi-open stands of mature or old douglas-fir, ponderosa pine, and western larch between 780 and 1300 m elevation although stands of large diameter hardwoods are occasionally used for nesting (FPC 1996). Home range sizes as small as 4 ha (data from outside B.C.) indicate this species may be able to use relatively small patches of suitable habitat.

End of Excerpt from Gyug (1996)

Existing information for the owl species was summarized in Cannings and Booth (1997) for the three target inventory species. Information is very briefly recapitulated here. The Spotted Owl is not included here because the only mapped cedar-hemlock site where it might occur in the Merritt Forest District has already been surveyed by Cannings and Booth (1997). Low elevation cedar-hemlock forests that are typical Spotted Owl habitat are not found in the Merritt Forest District. Western red-cedar and hemlock do occur in the district but generally only in higher elevation valleys near to the spine of the Cascade Mts. and in mixed spruce and true fir stands.

Western Screech-Owl ssp. *macfarlanei* (*Otus kennicotti macfarlanei*)

Western Screech-Owl ssp. *macfarlanei* is found in the Okanagan Valley and a few other sites in the southern interior (Cannings 1997a). Cannings (1997b) conducted surveys in 1996 and found only 13 occupied territories, one in the Grand Forks area and 12 in the Okanagan Valley. This subspecies is strongly associated with riparian habitats and along creeks, especially water birch, trembling aspen or black cottonwood stands in open ponderosa pine forest below 600 m elevation. They nest in cavities made by Northern Flickers and Pileated Woodpeckers or in similar natural cavities in a wide variety of tree species (Campbell et al. 1990). Nesting trees are at least 30 cm dbh.

Flammulated Owl (*Otus flammeolus*)

Flammulated Owls are summer residents (May-September) in the drier Douglas-fir forests of the southern interior as far north as Williams Lake. They prefer forest of mixed ages with some large veteran trees, usually ponderosa pines or Douglas-firs, mixed with small grassy openings and thickets of smaller, regenerating trees, usually Douglas-fir (Howie 1994). In B.C. they have been found nesting in cavities excavated by woodpeckers, usually by Northern Flickers, in large (>46 cm dbh) Douglas-fir or ponderosa pine snags (van Woudenberg 1987). However, they will also sometimes use cavities as small as those excavated by sapsuckers (McCallum 1994). Principal foods are arthropods hunted at night including mainly orthopterans (grasshoppers and crickets), lepidopterans (moth adults and larvae), and coleopterans (beetles) (McCallum 1994). Breeding territories are about 15 ha in size (McCallum 1994). Elevation range in B.C. is from 375 to 1250 m (Campbell et al. 1990).

INVENTORY SITE CHOICE

Selection of Forest Development Plan (FDP) areas to be inventoried were selected firstly for occurrence within the mapped range of each species, and secondly for nesting habitat characteristics based on BEC Zone occurrence, forest cover typing and elevation. No FDPs from Tree Farm Licences were reviewed and no searches conducted within Tree Farm Licences, except for follow-up searches at Williamson's Sapsucker nest sites found in 1996 (Gyug 1996).

The following Forest Development Plans or Woodlots were reviewed for potential inventory areas (Forest Districts listed from west to east):

Merritt Forest District:

Weyerhaeuser Canada Ltd.,
Tolko Industries Ltd.,
Aspen Planers Ltd.,
Ardev Wood Products Ltd.,
Small Business Forest Enterprise Program,
All Woodlots;

Vernon Forest District: No 1998 FDPs were examined. Two woodlots were inventoried based on the 1997 reviews.

Penticton Forest District:

Weyerhaeuser Canada Ltd. (Forest Licences only),
Gorman Bros. Lumber Ltd.,
Riverside Forest Products Ltd. (Forest Licence only),
Small Business Forest Enterprise Program,
All Woodlots;

Boundary Forest District:

Pope and Talbot Ltd. (Forest Licence only),
Weyerhaeuser Canada Ltd.,
Small Business Forest Enterprise Program,
All Woodlots;

Based on the species nesting habitat requirements as summarized in the previous section and the FDP and Woodlot reviews, surveys were only conducted for Williamson's Sapsuckers and Flammulated Owls. Draft Flammulated Owl habitat suitability mapping was available for the Merritt Forest District from the B.C. Env't. Regional Office in Kamloops. This mapping was used to select and then prioritize areas for Flammulated Owl inventory in the Merritt Forest District. Areas with the highest Flammulated Owl suitability were highest priority for inventory in 1998. Not all potential Flammulated Owl habitat could be inventoried in 1998. Areas that still need to be inventoried are detailed later.

No FDPs were found to target low-elevation riparian forests that Western Screech-Owls or Lewis' Woodpeckers prefer or the very open low-elevation stands that Lewis' woodpeckers prefer. No FDPs were found to target mature or old-growth hemlock stands in the Cascade Mountains that Spotted Owls prefer, and these stands are generally lacking in the study area. Some FDPs targeted ponderosa pine stands that White-headed Woodpeckers prefer, but these had already been inventoried in 1996 and

1997, or were visited during Flammulated Owl nest searches to check on the presence of White-headed Woodpeckers.

INVENTORY METHODS

Woodpeckers

Tapes of the calls and drums of Williamson's Sapsuckers were played to listen for responses using the protocol suggested by the RIC manual (1996, p.59) from early May through early June in areas selected for inventory. Where Williamson's Sapsuckers were detected, we returned to search for nests in late June. The method relies on hearing the begging calls of young woodpeckers in the nest, or keying in on drumming or calling adults to find the nest. To detect nests, fairly intensive surveys covering a high proportion of the area to be sampled were required where we tried to cover every portion of an area likely to hold a nest by approaching all points within that area to within 100 m. All occurrences of woodpeckers or sapsuckers heard or seen were recorded. All young heard from a nest were investigated to determine the species of nesting woodpecker or sapsucker. Exact Universal Transverse Mercator (UTM) locations for all woodpecker and sapsucker nests were determined using a Garmin GPS12XL handheld GPS receiver with an accuracy of ± 100 m. These GPS readings were immediately plotted on Forest Cover Maps to determine if the nest could be assigned a more precise UTM location by its position relative to roads, water features or forest cover types. Data collected at each nest were tree species, DBH, tree height, nest height, Decay Class, BEC Zone, elevation, slope, aspect, topographic situation and Site Series.

In addition, all Williamson's Sapsucker nests found during inventories in 1996 and 1997 were rechecked in June 1998 to determine if the same nest tree was being re-used for nesting. If the nest tree was found not to be used, the immediate area (up to 1 km distant) was searched to determine if another tree in the vicinity was being used for nesting. Data collected at each new nest tree was as described above. At each re-used tree, the nest height and direction of the opening were noted to determine if the same nest hole was being used.

Owls

Flammulated Owl search areas were usually scouted out during the evening or day beforehand to check on access and habitat. Owl surveys were undertaken from May 13 to June 17. Most surveys were conducted during darkness (between 2130 or 2200 hrs until 0300 hrs). However, some surveys began earlier in the evening because Flammulated Owls will sometimes respond to playbacks in the evening. Listening points were first set out at 800-m intervals along roads. Later in the season, listening points were set out at 400-m intervals because experience showed us that Flammulated Owls could frequently not be heard from more than 200 m, and at 58 of 59 points where we heard Flammulated Owls, the owls were heard before any playback attempt.

At each stop, we listened for one minute. If no Flammulated Owls were heard, we played the taped calls for 20-30 seconds and then listened for another minute. If still no Flammulated Owls were heard, we played the tape for another 20-30 seconds and listened for another minute. If a Flammulated Owl was heard, we recorded the bearing to the call, and estimated a distance. For owls that we thought were calling from a fairly stationary position, we would move 100-200 m along a road and attempt to get another bearing to try and triangulate to find the position of the owl. If the owl was felt to be close, and the topography not too extreme, we attempted to locate the owl exactly by walking to the point from where we thought it was calling. Time, date, sky and wind conditions and location (using a Garmin GPS12XL receiver) were recorded for every listening/playback point. All species of owls heard or seen were recorded. For locations where owls were heard, the exact location of the owl was estimated to allow for a daytime return for nest searching.

Several areas were surveyed on foot because no roads existed into these areas. This was not a preferred survey method because very little area (no more than 20-30 ha) could be covered in one night owing to the often rugged topography and high density of young trees in most Douglas-fir forests that made nighttime navigation difficult, and sometimes treacherous. For foot surveys, GPS locations and time and weather data were taken at least every 400 m, and these were used as listening points. If owls were heard between listening points, the exact location and full data was recorded.

Areas were noted for Flammulated Owl nest searches if they were within the actual sites proposed for timber harvest, and we had a fairly exact estimate of where the Flammulated Owl was located. Nest searches were conducted in 5 areas between June 12 and June 23. We attempted to find nests in these areas by locating snags or trees with suitable nest holes made by Northern Flickers or Pileated Woodpeckers, and then knocking on the bole of the snag or tree to see if the owl would emerge. General notes on the forest habitat, topography, and number and type of available nesting sites were taken to assist in developing Wildlife Tree Patch strategies for these areas.

INVENTORY RESULTS

Inventories were conducted in 61 areas as outlined in Figs. 1 and 2. Searches covered: 3 woodlots, 2 Small Business sales and 10 Cutting Permit (CP) areas in the Merritt Forest District; 2 woodlots in the Vernon Forest District; 1 woodlot, 1 Small Business sale and 4 CP areas in the Penticton Forest District, and 14 woodlots, 14 Small Business sales and 10 CP areas in the Boundary Forest District. In total, 49 areas were inventoried for Flammulated Owls, 3 areas for Williamson's Sapsuckers, and 9 areas for both species.

Williamson's Sapsucker

Only 46 playback points were conducted for Williamson's Sapsuckers in 1998. 30 of these points were in the IDFdm1 BEC Zone, and 16 were in the IDFxh1. Only one pair at a nest were located during the playbacks near A58927 (Small Business, Boundary F.D.) along Rock Creek in the IDFdm1. A nest search in late-June was only conducted at CP186 (Weyco, Penticton F.D., Mica Creek) where there was a possible (very faint) response to the playbacks. No Williamson's Sapsuckers were detected during the nest search. Other nest searches were only in areas where we returned to 1996 and 1997 nests.

Despite wide-ranging surveys conducted from 1996 to 1998, Williamson's Sapsuckers were only found in a limited geographical area east of the Okanagan Valley, west of Midway and within 40 km of the U.S. border (Figs. 3 and 4). In total 27 breeding season records of Williamson's Sapsucker were found from 1996 to 1998 (counting pairs at a nest in a single season as one record, or individuals located where no nests were found as one record). 16 of these were from the IDFdm1, 10 from the IDFxh1 and one from the MSdm1. Elevation range of the records was from 1000 m to 1463 m with the majority of the records (74%) between 1000 m and 1200 m.

Figure 34. Detailed map showing location of playback points (small circles), Williamson's Sapsucker breeding areas from 1996-98 (angles) of Williamson's Sapsucker from 1996-98 inventories.

Williamson's Sapsucker nest sites were either in western larch / Douglas-fir forests or in wet western larch / Douglas-fir / spruce / birch seepage areas and gullies. Exceptions included: a young lodgepole pine / Douglas-fir forest with a few western larch veteran trees; within 15 m of the edge of the 100% tree-killed zone in the 12-year old Westbridge burn; and on a narrow ridge crest between an open south-facing dry grassy area and a north-facing Douglas-fir / western larch forest. Site series included a wide range from sub-xeric to sub-hydric sites. Slopes varied from flat to 58% with only 30% of 20 nests on sites steeper than 15%.

In all, 20 Williamson's Sapsucker nests have been discovered during this inventory from 1996-1998 (3 from 1996, 8 from 1997, and 4 re-used trees and 5 newly discovered in 1998) in 16 individual nest trees. Overall, Williamson's Sapsucker nests were most commonly (65%) found in very large (70-118 cm dbh), live western larch typically with broken or dead tops. Next most common (15%) were small and dead paper birch (26-33 cm dbh). One live black cottonwood (96 cm dbh) was used in successive years (10% of nests). There was one occurrence each of dead western larch (70 cm dbh) and dead ponderosa pine (70 cm dbh). Height of nests in live western larches was typically very high with an average tree height of 29.5 m (range 23-45 m) and average nest height of 19.5 m (range of 9.5-40 m). Height of nests in dead birch was typically much lower with snag heights of 11-20 m and nest heights of 5-7 m.

We now have 3 successive years data on 2 Williamson's Sapsucker nest trees, and 2 years data on 8 nest trees. If a nest is found in one year, there is a 40% probability (4/10) that it will be used for nesting the next year as well. Three of the four nest trees used in successive years were large, live western larch while one was in a large live black cottonwood. Based on the high numbers of sapsucker holes in some of these trees (some had >20 sapsucker nest holes), good nest trees may be at a premium in this area so that there is a very good chance they will be used in successive years.

Overall density of occupied Williamson's Sapsucker nests appears to be low, even in "ideal" habitat. There are many potentially suitable nesting trees (large dead-top western larch) in Woodlot 411-1 at Johnstone Creek, and this appears to be some of the most suitable Williamson's Sapsucker habitat in the entire area (outside of the Tree Farm Licences which were not searched). In 1997, 3 nests were found in Woodlot 411-1, another adult was drumming in the eastern part of the woodlot near Johnstone Creek, and one adult was heard drumming northeast of the woodlot in the vicinity of the nest found in 1996. This would make for five possible nesting pairs in an area of about 600 ha. In 1998, 4 nests were found in a 500-ha area including most of Woodlot 411-1 surveyed on June 23. Nesting density was estimated at 1 per 120 ha in 1997, and found to be 1 per 125 ha in 1998.

I do not know the actual density of potential nesting trees in Woodlot 411-1 but believe it to be higher in this area than in most other areas that we examined. Johnstone Creek is at the center of the where this subspecies is common in Canada, and these

densities are probably not repeated anywhere else in Canada except perhaps in portions of Tree Farm Licence 8 at Ingram and Wallace Creeks, and perhaps Tree Farm Licence 15 north of lower Vaseux Creek. Densities of Williamson's Sapsuckers at all other locations seem to be much lower than 1 pair/125 ha.

Woodpecker Nests

Eight other species of woodpeckers were found in the areas searched from 1996 to 1998 with some nests found for each species except Downy Woodpeckers. Eighteen woodpecker nests were found in 1998 bringing the total to 85 nests for which we have collected data from 1996 to 1998. Red-naped Sapsucker has been the most common nesting species found with 50 nests, followed by northern flicker (5 nests), Three-toed Woodpecker (4 nests), Hairy Woodpecker and Pileated Woodpecker (2 nests each), and Black-backed Woodpecker and Lewis' Woodpecker (1 nest each). The Lewis' Woodpecker nest was found in 1997 and was described in Gyug (1997).

Red-naped Sapsuckers preferred aspen and birch as nesting trees (41 of 50 nests). The majority of the aspen used were in live trees (21 of 26 nests) with a mean dbh of 37 cm (range 18.5-60 cm). The majority of birch used were in dead trees (11 of 15 nests) with a mean dbh of 33 cm (range 22-49 cm). Other trees used were live western larch (3), dead Douglas-fir (3), dead western larch (1), dead ponderosa pine (1), and live spruce (1).

Fifteen nests of woodpeckers other than sapsuckers were found: 5 were found in live aspen, 4 in live western larch, 2 in dead western larch, 2 in dead Douglas-fir, 1 in a dead aspen, and 1 in a dead ponderosa pine. No woodpecker or sapsucker nests were found in lodgepole pine trees, even though these were among the common trees in many of the areas sampled.

Flammulated Owl

Flammulated Owls were found in 16 of the 58 areas that were inventoried specifically for their presence (Figs 5 and 6). Sixty-four Flammulated Owls were heard at 72 of the 507 playback/listening points between May 13 and June 17, 1998. Some owls were heard at two or more points where points were placed close together to attempt to triangulate the position of the owls. Four other owl species were detected. Twenty-eight Great Horned Owls were detected at 20 listening points, 16 Barred Owls were detected at 16 different listening points, 9 adult Northern Saw-whet Owls were detected along with 8 young at 9 of the listening points, and one Northern Pygmy-owl was detected at one point. One other Northern Pygmy-Owl was detected during woodpecker surveys in Woodlot 411-1 (Johnstone Creek, Boundary F.D.).

Figure 5. Owl hatching/pitching points (circles) and locations of Flammulated Owls (triangles) detected during 1998 inventories in the Mount Vernon Forest District map forest. Map scaled at 1:1,000,000 scale.

Twelve BEC Zones were surveyed in total (Table 1). The bulk of the surveying was in the IDF with 63 of the 64 Flammulated Owls found in the IDF. They were found primarily in the IDF dm1, followed by the IDFxh2, IDFxh1, IDFdk1, IDFdk2, and with one found in the PPxh1. Male Flammulated Owls were located at elevations from 520 to 1200 m (Table 1). The bulk of the records (84%) come from elevations between 700 and 1100 m.

Flammulated Owl nest searches were conducted in only 5 areas. No nests were found. The only animals seen exiting cavities in snags or trees that we knocked on were single northern flying squirrels in two separate areas. A male Flammulated Owl responded to a vocal imitation in CP 269 (Ingram Creek, Pope and Talbot, Boundary F.D.) at 1930 hrs on June 23 from the same location that one was heard on May 29. The roosting location of this male was found in the upper limbs of a Douglas-fir tree. However, despite locating and knocking on every snag within 200 m of where the male was located in a semi-isolated patch of forest, we could not find a nest.

Table 3. Biogeoclimatic Ecosystem Classification (BEC) Zones searched for Flammulated Owls, and the BEC Zones and elevations where Flammulated Owls found.

BEC Zone	Number of Playback/ Listening Points	Number of Points where Flammulated Owls Heard	Percentage of Points where Flammulated Owls Heard within BEC Zone	Elevation (m)	Number of Flammulated Owls Heard	Percentage of Flammulated Owls Heard
IDFxh2	51	14	27.5	520-599	2	3.1
PPxh1	5	1	20.0	600-699	4	6.3
IDFdk1	49	7	14.3	700-799	7	10.9
IDFxh1	76	9	11.8	800-899	15	23.4
IDFdm1	230	24	10.4	900-999	26	40.6
IDFdk2	49	4	8.2	1000-1099	6	9.4
IDFxh2a	1	0	0.0	1100-1200	3	4.7
MSxk	8	0	0.0	>1200	0	0.0
IDFmw2	1	0	0.0	Total	64	
ICHmk1	6	0	0.0			
MSdm2	3	0	0.0			
PPxh2	27	0	0.0			
Total	506	59				

SPECIFIC RECOMMENDATIONS FOR FDP INVENTORIED AREAS

Merritt Forest District

Aspen Planers

CP 16 Key Map No. 2

No Flammulated Owls detected.

CP 49 Key Map No. 1

The areas of Cutblocks 1,6, and 7 were searched. No Flammulated Owls detected even though habitat in Cutblock 7 looked suitable. The area of Cutblock 7 is one of the few in the area with a fairly high density of remaining snags that would provide good nesting habitat. Most of the surrounding areas have been extensively high-graded and there are few suitable nesting snags.

CP 240

Lack of road access prevented surveying of actual block areas in 1998. Valley to the immediate north along Skuhun Creek was surveyed but no Flammulated Owls were found there. Based on abundance of Flammulated Owls in Woodlot 359 immediately to the south of CP 240, Flammulated Owls are probably breeding in CP 240. The actual cutblocks should be surveyed in 1999.

Tolko Industries

No Flammulated Owls were found in the 3 CP areas surveyed: CP 78, CP 128 and CP 191-1.

Weyerhaeuser

CP 96

No Flammulated Owls were found in CP 96.

CP 119 Key Map No. 8

Flammulated Owls were detected near, but not in, the proposed cutblocks of CP 119. The most likely block to contain Flammulated Owls was Cutblock 1 which was a FdPy forest type. However, there is no road access to this particular block, so a night of searching would have to be devoted to this block in 1999.

CP 120 Key Map No. 7

Only the southern part of Cutblock 1 was surveyed at night on foot. Four male Flammulated Owls were found within Cutblock 1 with one other nearby. No Flammulated Owl nests were found during a follow-up daytime search but 11 Py and 5 Fd possible nesting trees (snags or trees with flicker or Pileated Woodpecker holes) were found. Density of possible nesting sites was fairly high (3.6/ha) based on a 0.55-ha wildlife tree transect (275mx20m). Overall large (>30 cm dbh) snag density (14.5/ha) was also fairly high. On the daytime search, both Northern Flickers and Pileated Woodpeckers were found. A Wildlife Tree Patch should be set up within Block 1 in the densest patch of forest in a gully where three males Flammulated Owls were found (see Appendix 1, Map 7).

No other cutblocks were surveyed because of a lack of road access. Without road access, it will take about 4 nights to survey the proposed cutblocks completely. However, I suggest that this is a high priority site to thoroughly inventory. Flammulated Owls were very abundant to the north of this area (Cannings and Booth 1997) as well as across the valley in Woodlot 359. This area (particularly Cutblock 4) contains some of the finest old-growth FdPy stands in the Forest District that have never been high-graded or roaded, and one of the few FDPy stands that is actually mapped as Age Class 9. If there is any shortage of Old-Growth FdPy stands in the overall Seral Stage inventory, this area (particularly Cutblock 4) should be one of the first candidates for inclusion as an Old-Growth Management Area.

CP 133 Key Map No. 8

Four Flammulated Owls were found within or very close to Cutblock "3,4" of CP 133. No Flammulated Owl nests were found in a follow-up daytime search.

Small Business Forest Enterprise Program

Rabbitt Mountain A57345 A43959 Key Map No. 14, 15

Two Flammulated Owls were found near the boundary of A53745-1 and A43959-1. I have previously completed a Wildlife Tree Patch Strategy for Small Business in this Rabbitt Mt. Operating Area. The area where the Flammulated Owls were found was within (or very near to) proposed WTP area 31 where I suggested that WTPs be placed around specific snags. When WTPs are placed in this area, WTPs should target snags or trees with flicker or Pileated Woodpecker size holes (>4 cm diameter) in them, and particularly in the general vicinity of the places where the Flammulated Owls were found.

Woodlots

Woodlot 359 Key Map No. 5

Twelve Flammulated Owls were found within or near Woodlot 359. Three male Flammulated Owls and one pair were found within Woodlot 359, while an additional seven males were heard very nearby. In total approximately 1000 ha were covered in the survey for an approximate estimated density of one male Flammulated Owl for every 90 ha.

Follow-up daytime nest searches were conducted at three of the areas where Flammulated Owls were heard within the woodlot but no nests were found. Over most of the woodlot suitable nesting snags or trees with large woodpecker holes are very scarce since most of the area has been previously high-graded. Of the areas we searched, only at the southwest corner of the woodlot where the pair was detected were the more suitable nesting trees. However, a search of each of the potential nesting snags or trees (approximately 15 in a ± 3 -ha area) only revealed the daytime resting site of one northern flying squirrel.

A Wildlife Tree Patch should be put in the area where the pair of Flammulated Owls were found in the southwest corner of the woodlot between the road and the creek since this is one of the highest densities of snags in the woodlot. Elsewhere in the woodlot, WTPs should be put around single snags or trees that are potential nesting sites (with woodpecker holes >4 cm diameter) since these are relatively scarce.

Woodlot 1634 Key Map No. 3

One Flammulated Owl was detected along the Danish Lake Road at about 1250 m elevation. The area was not returned to during the daytime. Since only a roadside survey was done, there are probably more Flammulated Owls in the woodlot, particularly to the south of the Danish Lake Road where the single owl was found. Habitat with some Flammulated Owl suitability is identified in this area on the draft Flammulated Owl Suitability Maps.

Woodlot 1635

No Flammulated Owls detected.

Vernon Forest District

Woodlot 700 Monte Lake Key Map No. 16

One pair of Flammulated Owls found. We walked into this area at night to exactly locate the calling male, and a female also called briefly at the same location. A Wildlife Tree Patch should be put around this site as located on the map.

Woodlot 338 Glenemma

No Flammulated Owls found.

Penticton Forest District

Weyerhaeuser Forest Licences

CP 166, McLean Creek (see Gyug 1997, Appendix 1, Map No. 10)

The Williamson's Sapsucker nest found in 1997 was reused in 1998. It is not in any of the proposed blocks. Wildlife Tree Patches for CP 166 should centre on high value nesting trees--particularly large (>70 cm dbh), live western larch with obvious defects and / or woodpecker nesting holes.

CP186, Mica Creek

No Flammulated Owls were found.

No Williamson's Sapsuckers were found. Some were possibly heard during the initial playbacks, but none were found during the return nest search in late June.

CP5 Horn Creek Key Map No. 21

Three Flammulated Owls were found near the proposed cutblocks 5 and 6, although we did not actually search within these proposed cutblocks because of difficulties in road access. The area was not returned to for a nest search.

Weyerhaeuser Tree Farm Licence 15

CP 121

This area was returned to because a Williamson's Sapsucker nest was found in 1996 within the proposed blocks. The nest tree in the blocks was not used in 1998, but another tree well outside the blocks was used in 1998. The area proposed for cut contains several other large live western larch that appear to have been used by Williamson's Sapsuckers for nesting in the past. Wildlife Tree Patches should be centred on the 1996 nesting tree and other sapsucker nest trees in the block.

Gorman Bros.

CP 317/CP 331 Liddell Cr. Key Map No. 18, 19

One Flammulated Owl was found very near to proposed block 317-2, and one found on the edge of 331-5, while one other was found near 331-5. A return to the area of 331-5 during the daytime turned up no Flammulated Owl nests. The area has been high-graded in the past and potential nesting sites were very scarce with none detected in a single 1.2-ha (600mx20m) wildlife tree transect. WTPs should be established around any potentially suitable nesting trees or snags (with woodpecker holes >4 cm diameter).

Small Business Forest Enterprise Program

Steward Creek

No Flammulated Owls were found.

Woodlot 1500

No Flammulated Owls were found.

Boundary Forest District

Pope and Talbot

CP 215, 248, 249, 267, 268, 293, 306, 309-1

No Flammulated Owls were found.

No Williamson's Sapsuckers were found in CP 267, 268 or 293.

CP 281-1 (see Gyug 1997, Appendix 1, Map No. 1)

The Williamson's Sapsuckers nest tree found in 1997 was used again in 1998 with the sapsuckers excavating a new nest hole. The flagging around this tree indicates that it is within the proposed cutblock. A 1.5-tree length Wildlife Tree Patch should be established around this tree.

CP 277-1 (see Gyug 1997, Appendix 1, Map No. 2)

The Williamson's Sapsuckers nest tree found in 1997 was used again in 1998 with the sapsuckers excavating a new nest hole. I am unsure if the cutblock actually extends to the nest tree, but if it does then a Wildlife Tree Patch should be established around this tree. The cottonwood nest tree is leaning into a marsh, so that the no-work zone around the nest tree would not have to be very large, and it is possible that it could just be part incorporated into a riparian reserve zone.

CP 269 Ingram Creek Key Map No. 53

One male Flammulated Owl found just at the edge of, or possibly within, proposed block 269-1. A nest search revealed quite a few possible nesting sites in the area where the male was found, but no nest was found. The majority of the cutblock area was not inventoried for owls because of the lack of roads. Because the majority of this area is on the Grassland / Forest interface, there is a high possibility that other Flammulated Owls are using this area. The entire area of these blocks should be inventoried for Flammulated Owls in 1999.

No Williamson's Sapsuckers were found.

Small Business Forest Enterprise Program

A42677, A45651, A49390, A53469, A56730, A57393-2, A58937, A58995

No Flammulated Owls were found.

A54486 Crouse Creek Key Map No. 35

Four Flammulated Owls were found along the Crouse Creek Road below A54486 with one found less than 100 m from the proposed sale. The area was not returned to for a nest search. The area of A54486 should be inventoried again on foot in 1999 for owls. Most of the area of the sale is off the Crouse Creek Road and there is a good chance that Flammulated Owls occur there but might not have been heard during the roadside survey.

The areas of A54484 and A54485 were not surveyed but are not likely to contain Flammulated Owls because the areas are on a north aspect, the forests are too closed and contain too much lodgepole pine.

A48486, A58927 Key Map No. 47

The Williamson's Sapsucker nest tree used in 1997 was not used in 1998, possibly because a Northern Goshawk had taken up residence in the area in the breeding season of 1998. A Williamson's Sapsucker nest was found about 700 m away in 1998, nearer to A58927. However, the 1998 nest was not in the proposed A58927.

A Wildlife Tree Patch should be established in A48486 around the 1997 nest tree since it had well over 20 woodpecker / sapsucker nest holes in it, has obviously been used for many years, and such trees are at a premium in the area.

Woodlots

Woodlots 410, 411-2, 413-1, 414, 475, 477, 478-2, 479, 1623, 1768

No Flammulated Owls were found.

Woodlot 411-1 Key Map No. 48

No Flammulated Owls were found.

Six Williamson's Sapsuckers nests have been found in this woodlot. Three nests were found in 1997 with one of these nest trees being reused in 1998. Three additional nests were found in 1998 for a total of four nesting Williamson's Sapsucker pairs in 1998. This woodlot probably has one of the highest densities of nesting Williamson's Sapsuckers in the province with one pair per 125 ha (see Williamson's Sapsucker Results).

Density of cavity-nesting birds in general also seems to be quite high in this woodlot. Nests of Pileated Woodpeckers, Red-naped Sapsuckers, and Northern Flickers were also found. Other cavity-nesters that probably nest there based on our observations include Northern Pygmy-Owl, Hairy Woodpecker, Three-toed Woodpecker, Brown Creeper, Mountain Chickadee, and Red-breasted Nuthatch.

Most of the woodlot seems to have been high graded in the past, and some of it has been more recently logged. However, the high-grading in the past seems to have left a lot of the highest value wildlife trees--particularly the large live western larch with obvious defects (broken top, dead top, basal scars, conks and / or multiple woodpecker holes). These large western larches are usually veteran trees of multiple fire events. One long-ago cut larch stump showed four past fires at intervals of ± 70 yrs, 24 yrs and 17 yrs.

A Wildlife Tree Patch strategy should be developed in cooperation with the woodlot operator to preserve the high value for cavity nesters in general, and

specifically to preserve the high value for Williamson's Sapsuckers. Large (>70 cm dbh), live western larch with obvious defects and with woodpecker nest holes should be preserved if at all possible, and be assessed for risk so that they do not need to be "automatically" cut down if within a work zone to meet Worker's Compensation Board safety requirements. The woodlot operator appears to have already started such a program by designating wildlife trees with wildlife tree signs.

Woodlot 418 Key Map No. 42

I estimated that 15 separate male Flammulated Owls were found in or very near to Woodlot 418 just north of Westbridge. Flammulated Owls could be heard from just about any point in the Woodlot with up to 5 males heard from one single point. Since not all parts of the woodlot were surveyed, there may be even more Flammulated Owls there. Our surveys in this area probably covered about 600 ha, for a probable density of one male Flammulated Owl for every 40 ha. This site was probably the most dense population of Flammulated Owls that we encountered in the 1998 inventory.

The site was only returned to for a cursory daytime visit to see the habitats from which most of the Flammulated Owls were calling from. There are numerous patches of open range or semi-forested steep rock outcrops and hillsides scattered through the otherwise PyFd forested woodlot that would seem to make it ideal as Flammulated Owl habitat. The more accessible parts of the woodlot have been high-graded as well as more recently logged and potential nesting sites are very scarce. More thorough nest searches for Flammulated Owls should be made in 1999. In the interim, Wildlife Tree Patches should be established around all suitable potential nest trees or snags (with >40 cm diameter woodpecker holes) within any areas to be harvested since these nest sites appear to be so scarce.

Woodlot 471 Key Map No. 40

Flammulated Owls were found on the semi-open FdPy forested slopes just above the Kettle Valley Road. The area was not returned to for nest searches.

Woodlot 1771 Key Map No. 38

One Flammulated Owl was found just south of Ouellete Creek in an open forest on a rock knob just above the Kettle Valley bottom. The area was not searched for nests.

MANAGEMENT CONCERNS-Williamson's Sapsucker

The only species for which this inventory has produced new data (other than location data) that will be important for management of the species is Williamson's Sapsucker. I attempted a very crude estimate of the numbers of Williamson's Sapsuckers found in the only part of their range in Canada where they can be considered anywhere near to common. While there are small pockets of Williamson's Sapsuckers outside of this mapped range, their occurrence is very sporadic and they can not be considered anywhere abundant outside of this range. As an educated guess, there are probably not more than 10 pairs of Williamson's Sapsuckers nesting outside of this core part of their range in B.C.

This core range of the Williamson's Sapsucker in Canada is defined first by a small geographic area and then further defined as only including the IDFdm1, the IDFxh1 above 1000 m, the ICHmk1 below 1400 m, and not including open rangelands that are not forested (Figure 7). This range is 57,390 ha in total size, of which 51% occurs in Tree Farm Licences (TFL 15-34.9%; TFL 8-16.4%). Based on 1:250,000 broad scale habitat mapping, only 24.8% of this area is in forest greater than 120 years old, and might be considered Williamson's Sapsucker habitat. Given that their "maximum observed nest density" is only 1 per 125 ha in the best of habitats in the area (see calculation for Woodlot 411-1), then I estimate there to be **114 nesting pairs** in this part of their range in Canada. This rather simplistic model could be made considerably more precise by integrating 1:20,000 forest cover mapping into the model. Adding forest cover mapping to the model would also allow much better prediction of where Williamson's Sapsuckers may be nesting.

Figure 7. Range in Canada where Williamson's Sapsucker is common in suitable habitat based on data from these inventories and other sources. Mapping derived from 1:250,000 digital BEC Zone, contour and broad-scale habitat mapping.

Based on their very limited geographic range in Canada, their low estimated numbers even within that range, and their apparent dependence on very large western larch (this study, Cannings et al. 1987, Gyug 1996, Gyug 1997, Gyug and Bennett 1995) in this area, Williamson's Sapsucker appears deserving of its blue-listed status.

Nesting habitat in many places even within the range where they are relatively common has been negated by previous high-grading of large western larch. Some of the area is unsuitable because they are immature forest types with no remaining veteran trees. Large, live broken-top western larch appear relatively common in those areas where Williamson's Sapsuckers have been found nesting and should be targeted as the centers of any proposed Wildlife Tree Patches in this area. Cutting of large western larches on an opportunistic basis, or for firewood, should be discouraged in this particular area. On sites where large western larch are not found in this area, sites with birch or large cottonwood should be targeted for Wildlife Tree Patches.

Williamson's Sapsucker inventory must begin in Tree Farm Licence 15 and Tree Farm Licence 8, Block 1 since this inventory only covered areas in the provincial forest outside of Tree Farm Licences. These TFL's account for 50% of the Williamson's Sapsucker nesting range, and contain large amounts of suitable habitat.

RECOMMENDATIONS

Williamson's Sapsucker

Wildlife Tree Patches should be placed around the known Williamson's Sapsucker nest sites within proposed cutblocks. Where these cutblocks are to be partially cut at levels below 50%, then the WTP should be of the minimum size to preserve the standing nest tree. Where the area around the nest tree is to be clearcut or seedtree cut, then a 4-ha WTP should be placed around the nest tree. In Penticton Forest District this will apply to CP121 in TFL 15. In Boundary Forest District this will apply to Woodlot 411-1, to Small Business TSL A48486, and to Pope and Talbot's CP281-1 and 277-1.

In 1999, the 15 Williamson's Sapsucker nest sites should be checked for re-nesting. All the most likely woodlots and planned Cutting Permits in Forest Licence areas were inventoried in 1997 so that there is no backlog of areas to be checked. Rechecking nests and inventorying any new Cutting Permit areas within the Williamson's Sapsucker range should require 10 field days by a crew of two. Any inventory to be undertaken within Tree Farm Licences would be additional to this. Based on the number of present proposals within Williamson's Sapsucker range in these TFL's, inventory would require about 10 field days by a crew of two in TFL 15 and another 10 days in TFL 8.

Flammulated Owl

Flammulated Owls are considerably more common and more widespread than any of the other species considered in this inventory (Figure 8). There is still a large backlog of areas that have not been inventoried yet, and of areas where Flammulated Owls are known to occur based on these inventories but where nests have not yet been found. We also do not know the extent of their occurrence within the Vernon Forest District since no surveys have yet been conducted in the central or eastern section of the district.

Figure 8. Known locations of Flammulated Owls in the Merritt, Vernon, Penticton and Boundary Forest Districts from Cannings and Booth, 1997 (), B.C. Env't. files (), Hugh Westheuser (Westbank resident,) and 1998 inventories (this report,).

At this point the only areas where we would definitely recommend Wildlife Tree Patches be set up around sites where Flammulated Owls were found are: within Weyco's CP 120-1 and in Woodlot 359 in Merritt Forest District, in Woodlot 700 in Vernon Forest District, and in Pope and Talbot's CP 269 in Boundary Forest District. The descriptions of these can be found in the area-by-area summary and the exact locations of these can be found in the maps in Appendix 1.

No nests were located during the inventories in 1997 (Cannings and Booth 1997) or in 1998. Further nest searches should be undertaken at all those areas where Flammulated Owls were found but no nests could be located. These areas are listed below. Areas cited as (C&B 1997) are from the 1997 inventories. Others are from our 1998 inventories.

Merritt F.D.	Vernon F.D.	Penticton F.D.	Boundary F.D.
<i>Weyco</i>	none	<i>Gorman's</i>	<i>Pope and Talbot</i>
48		315 (C&B 1997)	269
119		317	
120-1		331	
133			
<i>Small Business</i>		<i>Weyco</i>	<i>Woodlots</i>
Manning Cr. (C&B 1997)		5	418
Otter Mt. (C&B 1997)			471
Rabbitt Mt.			1771
			1468 (C&B 1997)
<i>Woodlots</i>			
359, 1634			

Because Flammulated Owls are widespread over the southern interior, we could not cover all the areas where the habitat is apparently suitable. Areas that still need to be surveyed include:

Merritt F.D.	Vernon F.D.	Penticton F.D.	Boundary F.D.
<i>Weyco</i>	wider ranging surveys	<i>Gorman's</i>	<i>Woodlots</i>
41	to determine range	319	413-2
119 (portion)	of Flammulated Owl		1775
120 (portion)	within district		
<i>Aspen</i>	(TFL 49)	(TFL 15)	
240		(TFL 49)	
<i>Tolko</i>			

34

112

Woodlots

390

392

1446

1636

1737

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