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in the East
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of
British Columbia:**

**Results of 2007
Inventory**

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P. Ohanianian
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The Forest Investment Account
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Isabel (Penny) Ohanianian¹, P. Davidson² S. Hansen³ and C. Conroy⁴

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¹ P. Ohanianian, 4481 LD Ranch Road Kimberley, BC

² P. Davidson, 3247 37th St. S, Cranbrook, BC

³ S. Hansen, 4829 LD Ranch Road, Kimberley, BC

⁴ C. Conroy, 255 Lindsay Ave, Kimberley BC

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Cover photo of female Williamson's Sapsucker in flight by Peter Davidson

EXECUTIVE SUMMARY

This report presents the results of Year 2 of a study of the Williamson's Sapsucker in the East Kootenay. In 2007, the objectives were: to improve our knowledge of the range and distribution of this species, locate nests and characterize nesting habitat attributes, and obtain preliminary information on productivity.

Survey areas were chosen based on a predictive model developed by Gyug (2006a) and the results of the 2006 inventory (Ohanjanian et al. 2006). The model targeted areas with mature and old growth western larch. These were Findlay Creek, Whiteswan Lake, Lost Dog/Houle Cr, Kimberley/Perry Creek/Kiahko, Moyie, Baker/Rocky Creek/Plumbob, Gilnockie/Ward Cr, Strauss/Linklater FSR/Sink Creek and the Flathead. Call playback methodology followed the FIA guidelines for Williamson's Sapsucker (FIA 2006a), and began on April 16, 2007. 953 call playback (cpb) stations were set up. A CD recording of Williamson's Sapsucker drums and calls was broadcast in three directions. If a Williamson's Sapsucker was detected, its location, sex and activity were recorded on datasheets. Detection sites and incidental observations were re-visited from June 12 to June 26 to search for nests. Nesting habitat attributes included tree species, dbh, nest aspect, height, tree height, stand characteristics and BEC classification. To obtain data on brood size, nest trees were climbed and nestlings recorded on video.

In 2007, 33 adult Williamson's Sapsuckers were found. The majority (16) were in the Strauss Road / Linklater /Englishman Creek area, 7 were in Lower Sink Creek, 6 in East Kiahko, 2 at the junction of Plumbob and Caven Creek roads, and 2 in Kimberley. No birds were detected at New Lake, Rocky Creek or Perry Creek, although they had been present in those areas in 2006. Surveys at Whiteswan Lake, Findlay Creek, in the Flathead Valley, in Houle Creek, and in the Gilnockie were also unsuccessful.

Ten active Williamson's Sapsucker nests were located in 2007. Two pairs used the same trees as in 2006. One nest was located in Kimberley on private land (Forest Crowne developments) less than 50 m away from the Kimberley Nature Park. Two nests were in Kiahko, one along Plumbob FSR, four west of the Koocanusa Reservoir in the Strauss/Linklater/Englishman Creek area, and two in Lower Sink Creek. New active nests were easy to locate: the longest time spent to locate a nest was 1 hour 39 minutes (three people searching simultaneously). Six previously occupied (in 2005 or 2006) territories were not occupied in 2007. These were in the Kimberley Nature Park (3), East Kiahko (1), New Lake (1) and Rocky Creek (1). In addition, the nests of four birds seen incidentally, and two that were detected during cpbs were not found. A total of 71:09 person hours were spent searching unsuccessfully for nests.

Seven of ten nest trees were larch and three were Douglas fir. All but one were alive with signs of decay (WTC 2); one Douglas fir was recently killed (WTC 3). Mean dbh was 57.8 cm (range 37-89.8) and nests were between 6.9 m and 21 m up the trees. Nests were in dry to zonal sites of the IDFdm2 (8 nests) and MSdk (2), and ranged from 899 m to 1302 m in elevation. They were located in leave tree blocks (6), old partial cutblocks (1), seed tree blocks (1), unlogged forest (1), and a clearcut with a few leave trees (1). The latter broke off in a windstorm on June 29, the day after the young had fledged. Percent canopy closures within 50 m of the nest tree ranged from 2% – 60%.

Chicks hatched between approximately May 26 and June 10. Nesting success (defined by FIA standards (2006a) as the number of nestlings to reach 80% of fledging time, or 23 days) could only be determined for one nest of 4 young. A second nest reared 4 young to approximately 22 days and two other nests fledged at least one young. Seven of ten nests (including these four) are known to have reared chicks to at least 2 weeks of age. Nestlings flew prematurely from the nest hole at two nests due to disturbance at the base of the tree.

More Williamson's Sapsuckers were found in the southern portion of their known range than in the north, with the highest concentration of activity in the Strauss Road / Linklater FSR area, west of the Koocanusa Reservoir (3 nests, 560 to 1200 m apart). This was outside the predictive model, and indicates that the search criteria should be expanded beyond the model or the model should be refined. Although 9 of the 10 nests found in 2007 were in logged areas, there were large diameter western larch with old sapsucker-sized holes in forests adjacent to at least 5 of these nest sites. Several major questions remain including: why were these trees not used by Williamson's Sapsuckers in 2007? The answer may lie in the structure of the understory of these stands. Fire suppression has resulted in high stem densities in the East Kootenays and the species' use of logged areas with tree retention suggests that they may be keying in on a more open structure – one that reflects the historic structure of a fire-maintained ecosystem. Other possibilities may include competition for nest trees or predator avoidance.

The following recommendations are made:

1. Continue to determine the Williamson's Sapsucker's range and distribution in the East Kootenay. Re-survey areas which had detections in 2006 but not 2007 (for example Perry Creek, Rocky Creek and New Lake). Expand effort in the Plumbob/Caven Creek area and Lost Dog.
2. Concentrate surveys in areas in which the species has been confirmed to obtain more information on habitat selection.
3. Evaluate predictive model by comparing it with known locations using GIS and field testing.
4. Compare stand densities and structure with other "benchmark" habitat elsewhere.
5. Review and assess FIA guidelines (Standards for Measuring Vegetation) regarding its sampling procedures for ants.
6. Study whether predator avoidance and/or competition for nest trees may be affecting Williamson's Sapsucker habitat selection and productivity.
7. Inform public of danger of premature fledging caused by disturbance in high use areas.

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1 INTRODUCTION

The Williamson's sapsucker, *Sphyrapicus thyroideus*, was assessed as a federally endangered species in 2005 (COSEWIC 2005) and is red-listed in British Columbia (BC Ministry of Environment 2007). The subspecies *S. t. nataliae* occurs in the East Kootenay region of southeastern British Columbia, but, prior to 2005 reported sightings were rare and sporadic (Cooper 1995; Fraser et al. 1999). In 2006, a Williamson's Sapsucker inventory was carried out (Ohanjanian et al. 2006) and 44 detections of the species were made in Perry Creek, the Kimberley Nature Park, East Kiahko, New Lake, Rocky Creek, Strauss Road, and Lower Sink Creek. Eight nests were found, including one nest that was just over the US border. The 2006 inventory provided preliminary information on minimum numbers of Williamson's Sapsuckers, their distribution, and nesting habitat attributes. Birds were not detected in some areas at which they were suspected to occur, however, possibly because the timing of the surveys was not optimal. In addition, only a small portion of the East Kootenay was included in the 2006 inventory, and other areas with potential habitat remained. In 2007, therefore, an inventory was again undertaken with the following objectives:

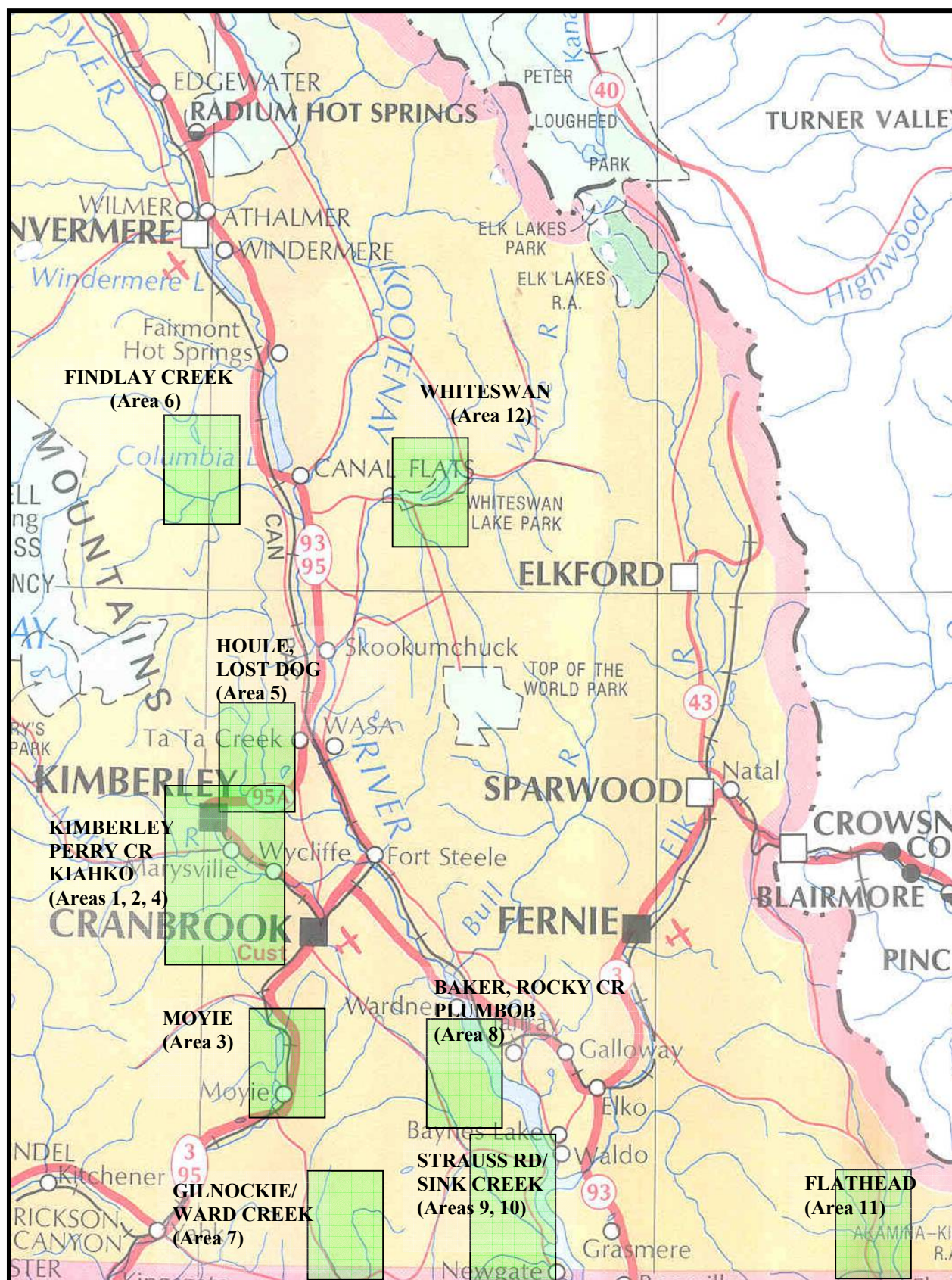
- i. Improve our knowledge of the Extent of Occurrence (EO) and Area of Occupation (AO) of the species in the East Kootenay.
- ii. Locate nest sites and collect data on the habitat characteristics surrounding these nests
- iii. Obtain preliminary information on brood size and productivity
- iv. Collect basic information about Williamson's Sapsucker ecology, breeding phenology and site-fidelity in the East Kootenay

2 METHODS

2.1 Survey areas

Twelve survey areas within the East Kootenay were chosen, based mainly on a predictive model developed by Gyug (2006a), and also on previously reported sightings (Cooper 1995; Manley 2005) (Figure 1). The model predicted the location of potential habitat based on the presence of old-growth larch in Vegetation Resources Inventory (VRI) mapping. The habitat was ranked by Gyug as Priority 1 or 2, based on stand composition and age. In addition, habitat not described by the model was included based on detections from the 2006 inventory and sightings of sapwell trees (Ohanjanian et al. 2006).

Figure 1. Survey areas (in green) in the East Kootenay - 2007



2.2 Call playback surveys

A total of 953 call playback (cpb) stations were set up in the twelve survey areas (Figure 1). The proportion of effort allocated to each is shown in Table 1.

Table 1. Distribution of call playback effort among survey areas in 2007

Survey Area #	Survey Area	Licensee / Owner	No. of cpb stations	% of total effort
1	Kimberley Nature Park / Forest Crowne	Tembec/Teck Cominco	43	5%
2	New Lake / Kiahko	Tembec / BCTS*	124	13%
3	Moyie / Etna / Peavine	Tembec / BCTS	89	9%
4	Perry / St. Mary's FSR	Tembec / BCTS	120	13%
5	Houle / Lost Dog / Ha Has Lake	Galloway / BCTS	42	4%
6	Emily / Findlay Cr	Tembec / BCTS	74	8%
7	Gilnockie / Ward Cr	Tembec / BC Parks	76	8%
8	Baker / Rocky / Plumbob	Tembec / Galloway	50	5%
9	Strauss / Linklater / Englishman Cr	Tembec / BCTS	97	10%
10	Sink Cr /Rock Pasture	Tembec / BCTS	110	12%
11	Flathead / Kishinena	Tembec / BCTS / BCParks	76	8%
12	Whiteswan	Tembec / BC Parks	52	5%
Total cpb stations:			953	

* British Columbia Timber Sales

Within these survey areas, cpb stations were established at previous nesting and detection sites, and at unsuccessful sites which may have been surveyed too late in the breeding season in 2006 (Ohanjanian et al. 2006). Examples of the latter include the Gilnockie / Ward Creek area and the Flathead Valley. In addition, new stations were set up in a buffer area within a radius of 1.5 km of last year's successful stations to detect birds which may have moved. New stations were also established in priority habitats, (as ranked by the predictive algorithm developed by Gyug), in areas that were not surveyed in 2006. Examples of this include Houle Creek / Lost Dog, and Findlay Creek. Efforts were made to include a broad range of slopes, aspects and slope positions so as not to bias results towards flat and/or roaded terrain.

Call playbacks were initiated on April 16. Methodology was the same as in 2006, and followed the FIA guidelines for Williamson's Sapsucker (FIA 2006a). Call playback stations were 400 m apart. Upon arrival at a station, the location and time was recorded on Garmin GPSMap 60CSX or 70CSX units for later download to Mapsource and/or Ozi Explorer. Environmental conditions (wind speed, cloud cover and precipitation) and the time were also recorded on datasheets at each stop. The observer listened passively for 30 seconds to detect spontaneous drumming or calling. Then, a CD recording consisting of 2 drums followed by several cheeur calls and scold/alarm calls, was broadcast using a TOA ER-604W megaphone in 3 directions, with 20 seconds of silence between each 10 seconds of playback. After each broadcast, we listened for 2

minutes before moving on to the next cpb station. All woodpecker and raptor species were recorded, along with their bearing and estimated distance, their sex and activity, and the way they were discovered (visual or aural – drum or call). When a WISA was detected, the bird was followed for a short while in an attempt to locate its nest. This was done because nest building activity was observed as early as April 4, and using the opportunity to confirm the nest location was helpful. Surveys started generally between 6:30 and 7:30 Mountain Daylight Time, and were usually finished between 13:00 and 14:30 pm. Ninety percent were completed by May 18. The remaining surveys were completed by May 31, with the exception of one survey (12 stations) carried out on June 20 to follow up on a possible detection that was reported a few days prior. To offset the danger that time of year and time of day could influence the cpb results, the order of stations and the dates were reversed from that of 2006. Every effort was made to access the Flathead and the Gilnockie as early in the season as the snow would allow. The Flathead was surveyed on May 15 and 16, within a few days of the road being ploughed. The Gilnockie was accessed on May 23.

2.3 *Nest searches*

Nest searches were carried out from June 12 to June 26 at stations with cpb detections. In addition, several sites were searched to follow up on incidental observations, and/or to check on possible re-use of nest trees from 2006. Two techniques were employed, following the guidelines set out in the FIA (2006a) standards for Williamson's Sapsuckers. The first was to observe where adults flew while feeding young or nest building. The second involved a systematic search of an area to listen for begging calls and determine the species heard. Three or four researchers walked 50 m apart in parallel lines following a compass bearing. The call playback recording was used to elicit responses. Total effort spent during unsuccessful nest searches was recorded.

2.4 *Nest tree attributes*

Data was collected on nest trees and included tree species, diameter at breast height (dbh), nest aspect, nest height, tree height, and decay condition. Stand characteristics that were recorded included stand structure, macroslope position and aspect, microslope position, BEC classification (Braumandl and Curran 1992), site series, and number of vet trees within 50 m of the nest tree. To obtain a consistent and unbiased record of stand structure at nest sites, a photo of the stand was taken from the base of each nest tree, oriented in the same direction as the nest hole. (A more detailed habitat description will be available when habitat plot data collected on 19 plots within 225 m of each nest tree is pooled with other provincial data, and analyzed.)

2.5 Nesting success and productivity

All nests were visited a minimum of two times. To obtain data on brood size, nest trees were climbed on June 18 and 19 and a small camera was inserted into the nest cavity. A cable led to a video recorder which allowed us to count numbers of nestlings and to determine their sex. Ages were estimated later, upon review of the video recording. Although all nests were visited at least two times, data on Williamson's Sapsucker productivity is limited to the single visit when the tree was climbed and pictures of the young were taken (June 18 or June 19). Determination of nesting "success" included only those nests in which the chicks had reached at least 23 days (i.e. raised to at least 80% of fledging time (FIA 2006a). Nests WNE007 and WNE009 were not climbed for safety reasons, so only the minimum number of young was determined.

2.6 Data management

Data was entered in a new database, provided to Tembec by Les Gyug, and compatible with the BC Provincial Species Inventory (SPI) data management system. Numbering of WISA occurrences and nest trees followed the conventions established by Gyug, in which each project in the province has a similar numbering convention. At a later date call playback data, nesting success data and habitat data will be pooled with other Williamson's Sapsucker projects that were carried out in 2007 in the Boundary, Okanagan and Merritt regions of BC.

3 RESULTS

3.1 *Williamson's Sapsucker detections*

In 2007, 33¹ adult Williamson's Sapsuckers were found in five of the twelve study areas (Table 2). These were: the Kimberley Nature Park / Forest Crowne, East Kiahko, Plumbob, Strauss/ Linklater/Englishman Cr, and Lower Sink Creek. Twenty four of these birds were detected during cpb surveys at 21 of 953 (2.2%) cpb stations ((Figures 2, 8, and 9). The mates of three of these birds were not seen during cpbs, but were encountered during nest visits. One of these had been discovered in early April. (K. Goodwin, pers. comm.). An adult male in Lower Sink Creek responded vigorously to the call playback and appeared to be unmated. Four more unmated birds (three males and one female near the Kikomun-Newgate and Strauss Roads) were observed during nest searches, and a pair was discovered incidentally at the junction of Plumbob and Caven Creek Forest Service Roads (K. Stuart-Smith, pers. comm.).

Table 2. Distribution of Williamson's Sapsuckers among the East Kootenay study areas in 2007

Survey Area	No. of adults
Kimberley Nature Park / Forest Crowne	2
New Lake / Kiahko	6
Moyie / Etna / Peavine	0
Perry / St. Mary's FSR	0
Emily / Findlay Cr	0
Houle / Lost Dog / Ha Has Lake	0
Gilnockie / Ward Cr	0
Baker / Rocky / Plumbob	2
Strauss / Linklater / Englishman Cr	16
Sink Cr /Rock Pasture	7 ¹
Flathead / Kishinena	0
Whiteswan	0
Total birds detected :	33

WISA were not detected at New Lake, Rocky Creek or Perry Creek, although they had been present in those areas in 2006 (Ohanjanian et al. 2006). Surveys at Whiteswan Lake, Findlay Creek, in the Flathead Valley, Houle Creek, and at Gilnockie/Ward Creek were also unsuccessful.

¹ This includes a US pair heard during cpb in Lower Sink Cr (likely the pair that occupied WNE006 in 2006)

Figure 2. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Kimberley, Perry Creek, New Lake, Kiahko - 2007

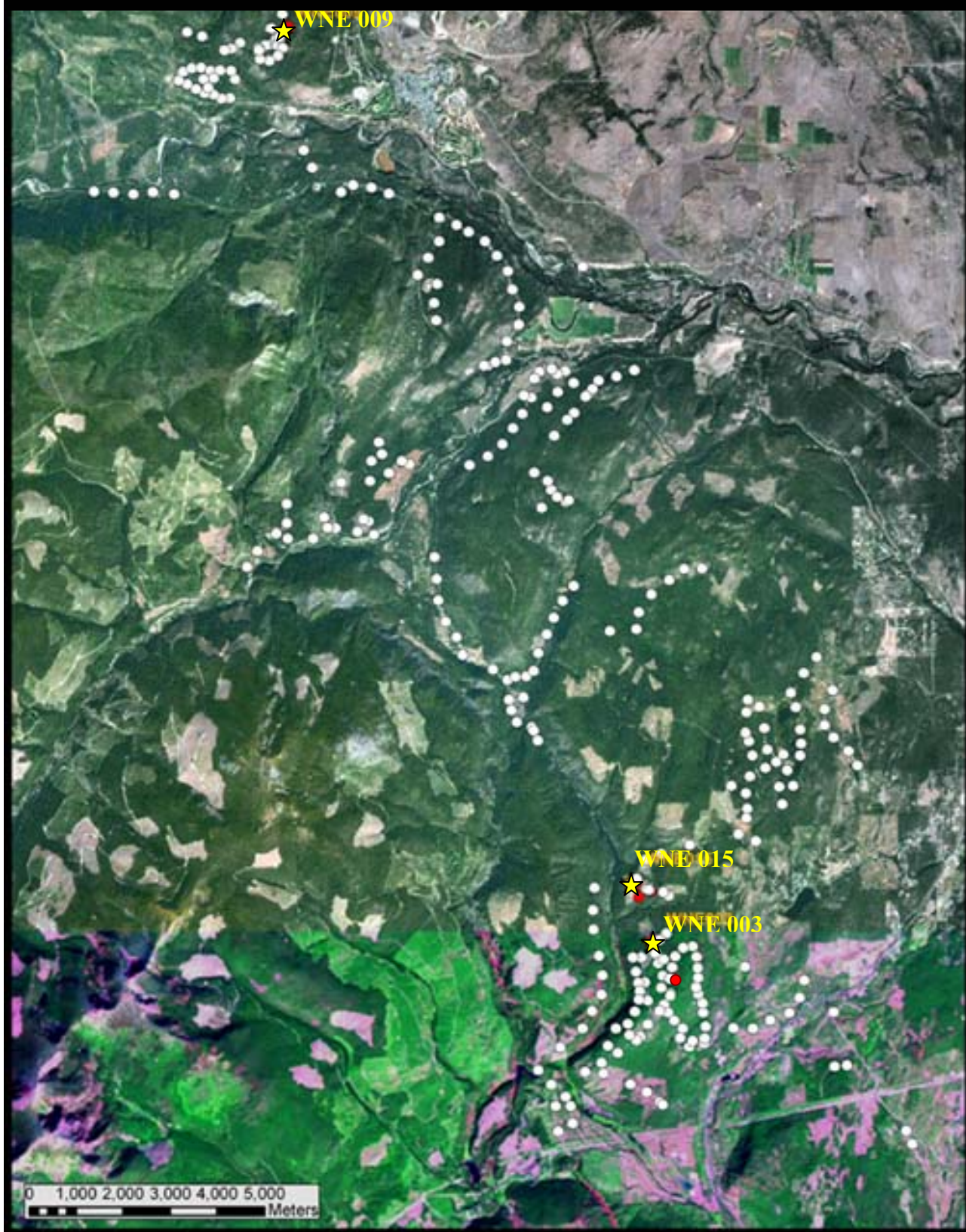


Figure 3. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Houle, Ha Has Lake, Lost Dog - 2007

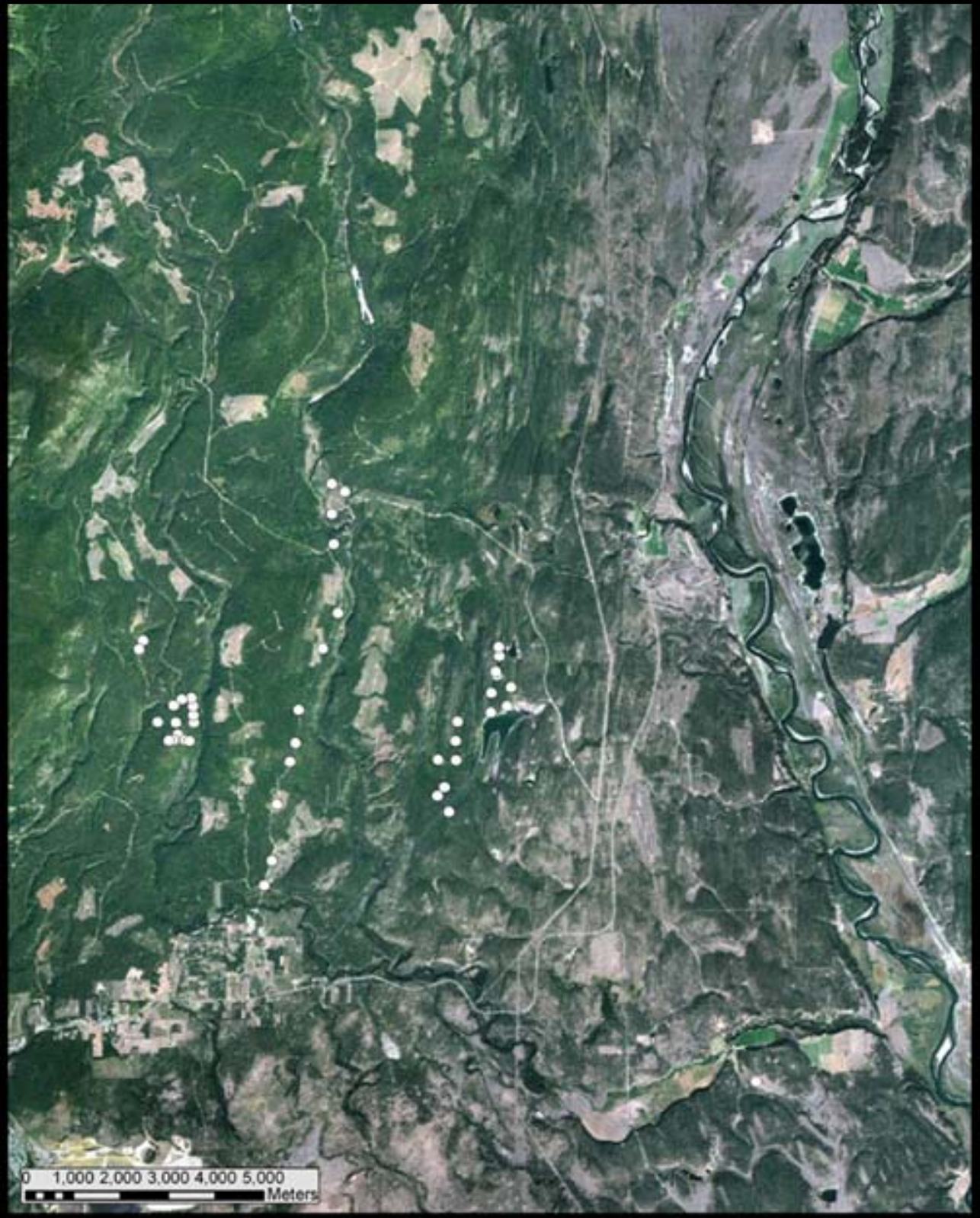


Figure 4. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Moyie, Etna, Peavine - 2007

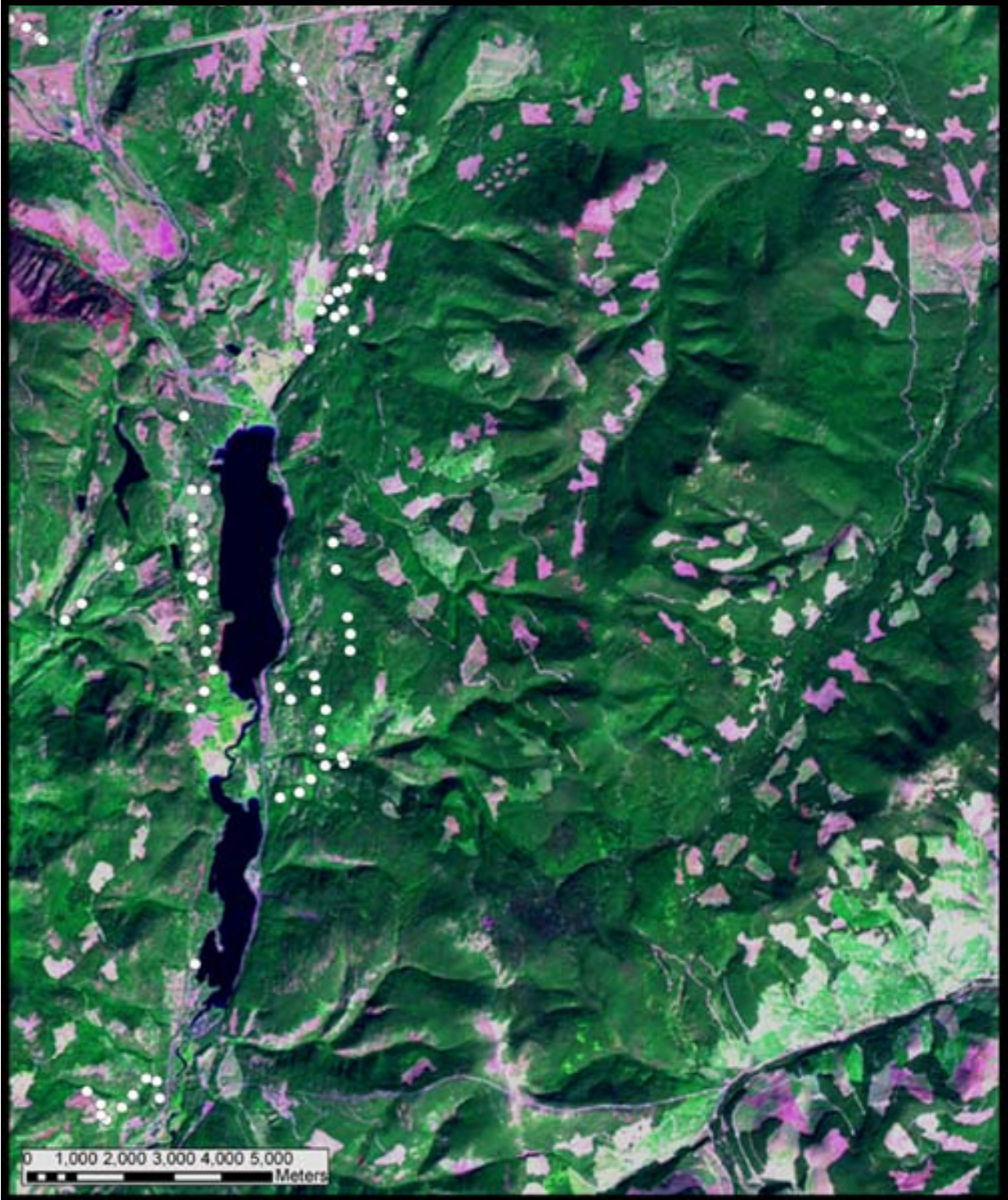


Figure 5. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Emily Creek, Findlay Creek - 2007

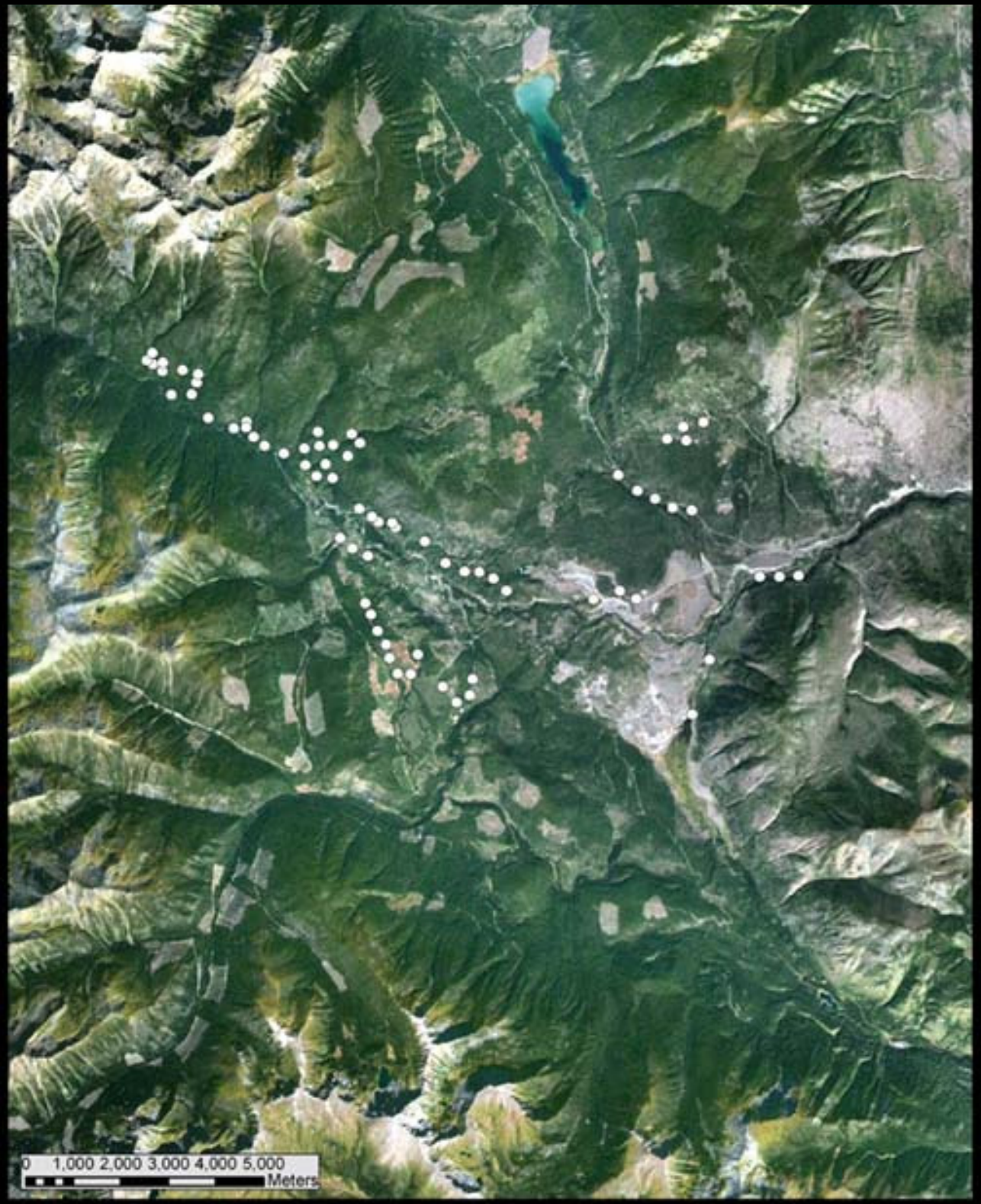


Figure 6. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Gilnockie / Ward Creek



Figure 7. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Baker, Rocky Cr, Plumbob. – 2007

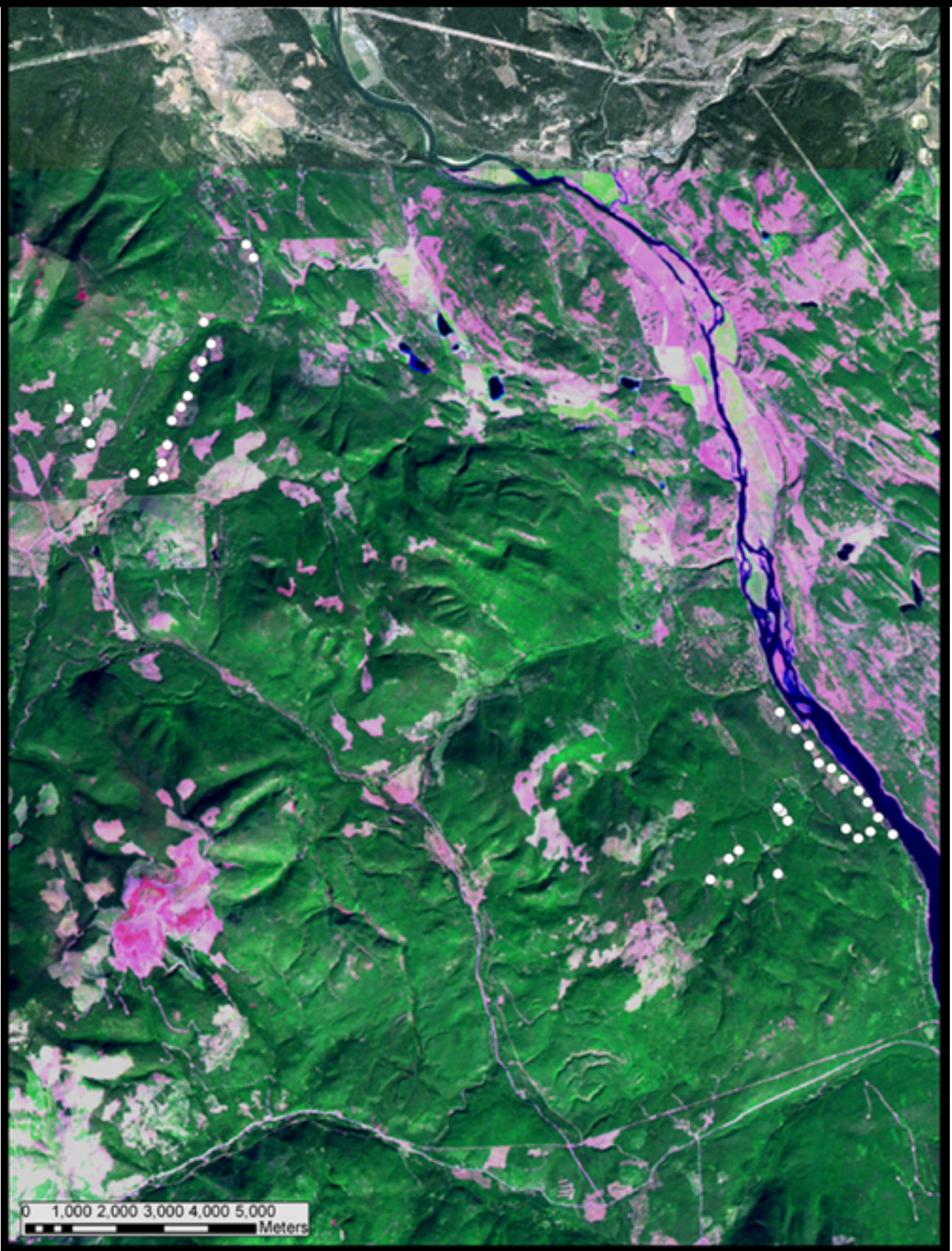


Figure 8. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Linklater, Plumbob, Englishman Creek, Strauss Rd. - 2007

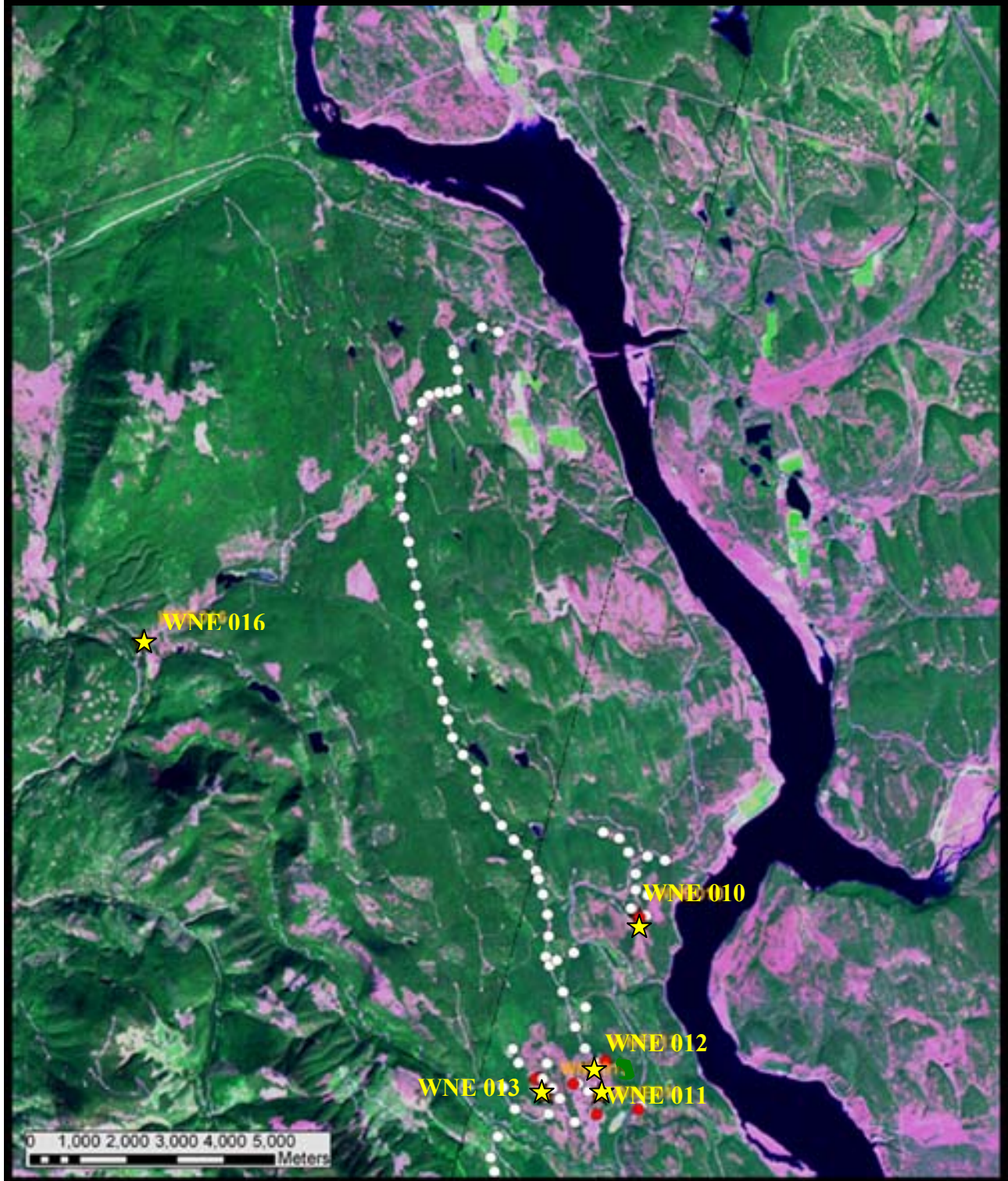


Figure 9. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Lower Sink Creek - 2007

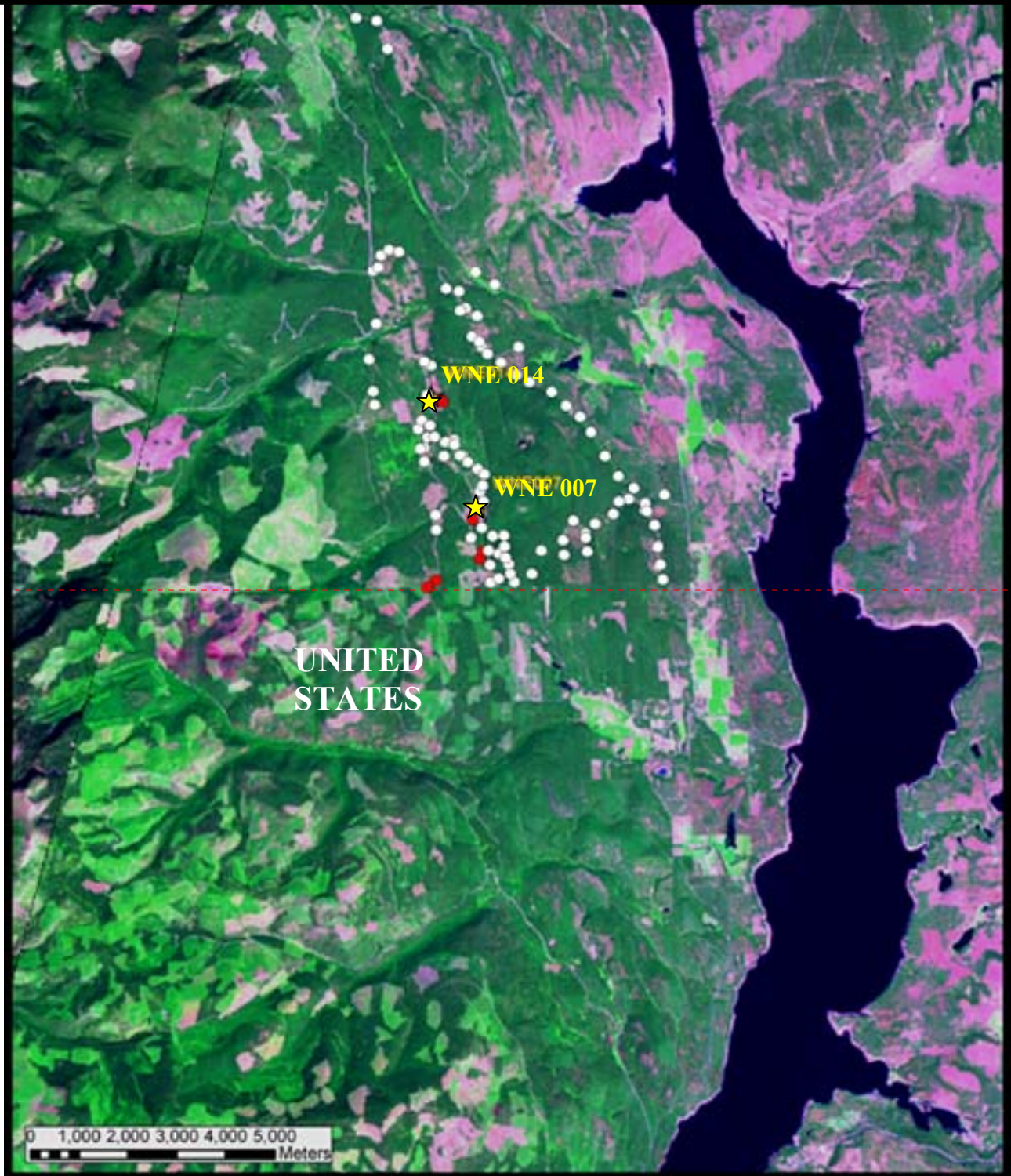


Figure 10. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Flathead Valley - 2007

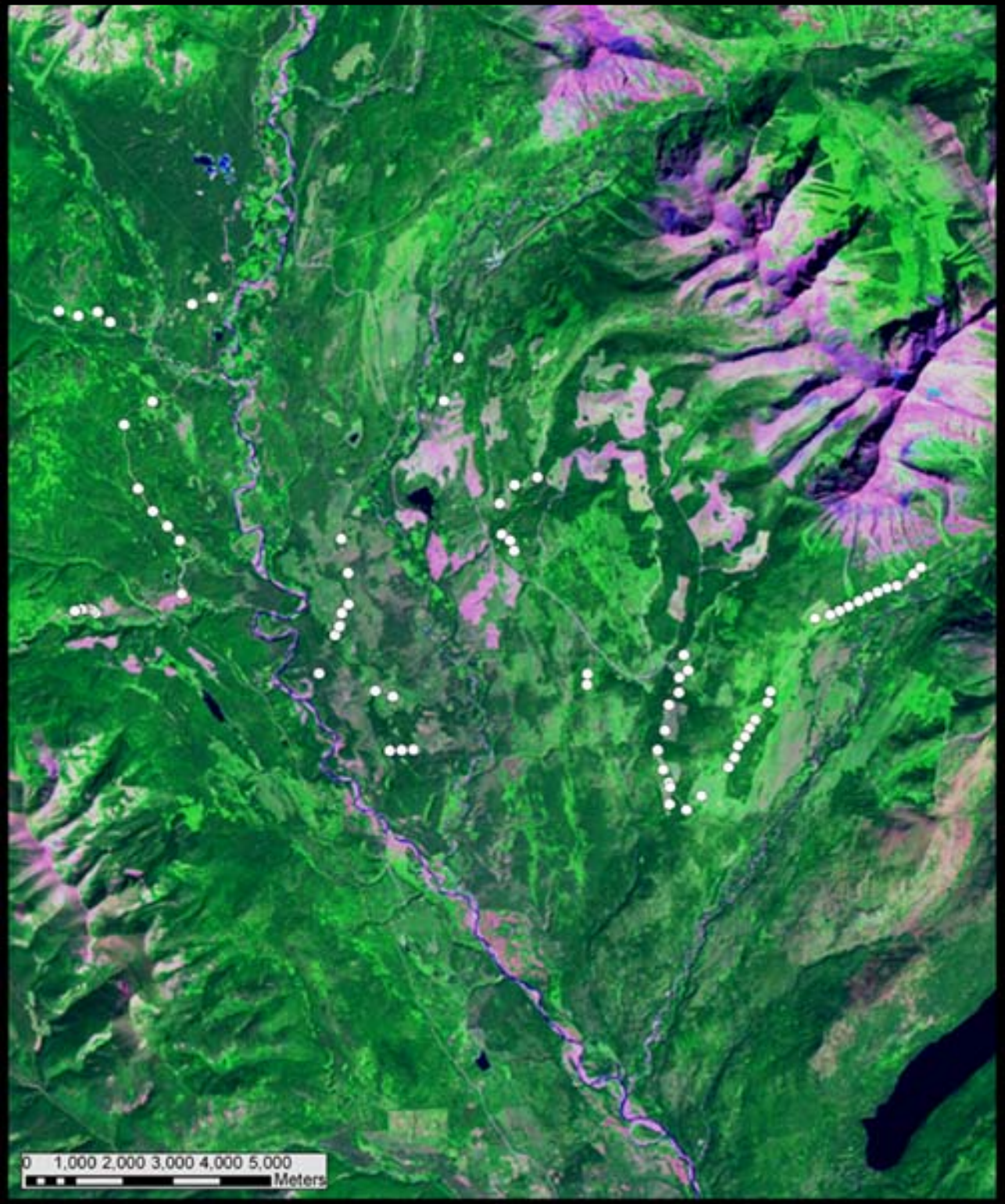


Figure 11. Call playback stations (white), Williamson's Sapsucker detections (red) and nests (yellow stars) Whiteswan - 2007



In mid-June a possible sighting was reported along the Lost Dog FSR, approximately 4 km northwest of Ha Has Lake. Call playbacks carried out in this vicinity on 20 June, failed to locate Williamson's Sapsuckers.

3.2 Nest searches

3.2.1 Active nests

A total of 10 active Williamson's Sapsucker nests were located in 2007. In Kimberley, only one nest, WNE009, was found (Figure 2). It was located on private land owned by Teck Cominco, less than 50 m away from the Kimberley Nature Park boundary. Nest WNE009 was approximately 250 m away from WNE5002, and 418 m away from WNE5001 - nests that were located in the park in 2005 (Manley 2005). A fourth nest, WNE008, was discovered in 2006, 870 m to the east (Ohanjanian et al. 2006). It is not known if the same pair occupied these nests over the three year period.

Table 2. Numbers and locations of Williamson's Sapsucker nests in the East Kootenay in 2007

Survey Area	General location of nest	No. of adults	No. of pairs	No. of nests
Kimberley Nature Park / Forest Crowne	Private land on top bench, adjacent to park	2	1	1
Kiahko	East of Kiahko Lakes	6	3	2
Baker / Rocky / Plumbob	Junction of Plumbob & Caven Cr FSR	2	1	1
Strauss / Linklater / Englishman Cr	W. of Koocanusa Reservoir, n. of Gold Cr	16	6?	4
Sink Cr /Rock Pasture	Lower Sink Creek	5*	2*	2*

* The US pair is not included here as the outcome is unknown.

Three pairs were detected in the East Kiahko area, but only two nests were found (Table 2, Figure 2). One nest tree from 2006 (WNE003) was re-occupied, and a new nest (WNE015) was built 400 m away from nest WNE004, which remained unoccupied in 2007.

One nest (WNE016) was accidentally discovered at the junction of the Plumbob and Caven Creek Forest Service roads when young were overheard begging at the nest hole (K. Stuart-Smith, pers. comm.) (Figure 8). No call playbacks had been carried out in that area.

The largest concentration of confirmed nests ($n = 4$) was west of the Koocanusa Reservoir in the Englishman Creek and Linklater/Strauss Road areas (Table 2, Figure 8). Three of these (WNE011, 012, and 013) were in fairly close proximity to each other - WNE011 and WNE012 were 560 m apart, and each was 1100 -1200 m from nest WNE013. The fourth nest, WNE010, was approximately 3 km to the north of WNE 012. Four Williamson's Sapsuckers were seen on a single tree in a large clear-cut on April 20 in the Strauss Road area. The tree was almost equidistant from WNE011, WNE012 and WNE013 at 559 m, 557 m and 600 m, respectively. Two males and a female flew to the northeast, and a single female flew to the southwest, apparently in

the direction of Nests 012 and 013. It is not known whether these birds failed in their nesting attempts or were the residents of those later-confirmed territories.

In Lower Sink Creek, one nest tree from 2006 (WNE007) was re-occupied in 2007. In addition, another nest (WNE014) was discovered 2.5 km to the north. In 2006, a nest tree was located across the border in the United States (WNE006). This was not visited in 2007, but the pair was heard in the territory on the Canadian side.

New active nests were relatively easy to locate upon return to a call playback detection site. A total of 25.95 hours was spent to find 7 new nests (Table 3). The longest time spent was 1 hour and 39 minutes, with three people systematically walking through the stand searching and listening for begging calls. Nest WNE015 required two visits, but the failure to locate the nest the first time was

Table 3. Search effort required to locate new Williamson's Sapsucker nests in 2007

Nest ID	Means of locating nest	Search effort (no. people x time spent)	Total search effort (person hours)
WNE 009	Reported by K. Goodwin (April)	n/a	n/a
WNE 010	Obs. of flying adults	2 x 10 min	0.33
WNE 011	Obs. of flying adults	3 x 1:39 min	4.95
WNE 012	Obs. of flying adults	3 x 11 min	18:33
WNE 013	Obs. of flying adults	3 x 31 min	1.51
WNE 014	Obs. of flying adults	3 x 10 min	0.50
WNE 015	Obs. of flying adults	3 x 5 min (two visits)	0.25
WNE 016	Begging calls heard incidentally	1 x 5 min	0.08
Total search effort:			25.95 hours

due to a miscommunication, and the wrong area was searched. On the second visit, an adult was observed foraging within 5 minutes of arrival at the cpb detection site. WNE016 was located incidentally, when the young were heard begging, and the location of WNE009 was reported to the authors (K. Goodwin, pers. comm.).

3.2.2 Unsuccessful nest searches

A total of 71:09 person hours were spent in unsuccessful nest searches of a) previously occupied territories (34:26 person hours) b) call playback detections (14:54 person hours) and incidental observations (21:49 person hours). Details of these searches are presented below.

a) Previously occupied territories

Kimberley Nature Park

Previously occupied nesting territories in Kimberley Nature Park and on the Forest Crowne property (WNE5001, WNE5002 and WNE008) were searched by two persons using call playbacks and observation for 5:40 person hours on April 25. WNE5001 and WNE5002 were again searched on April 30 and May 1 for 5:46 and 8:00 person hours, respectively. The only Williamson's Sapsuckers detected on all occasions were the occupants of WNE009. Both the male and female were seen gleaning prey off the ends of small branches at the top of young larch trees in the forest, approximately mid-way between WNE5001 and WNE009. On April 30, the male was observed flying within 50 m of WNE5002, and he continued on to WNE009, his nest tree, 260 m away.

New Lake, Kiahko and Rocky Creek

Three searches of the nesting territory associated with WNE002 at New Lake were carried out on May 1, 3 and 10, 2007. A total of 10:47 person hours were spent doing call-playbacks and observing the nest tree. No Williamson's Sapsuckers were detected. At East Kiahko a pair was observed on April 26 at nest tree WNE001. Those birds could not be located again although the nesting territory and surrounding area were thoroughly checked (3:41 person hours) during three subsequent visits on May 25, June 9, and June 14.

WNE005 and the surrounding area was searched once, between 12:39 and 13:11 on April 30. Call playbacks elicited no response.

b) Call playback detections

Strauss Road / Linklater / Englishman Cr

A single female was detected twice at call playback stations near the Gory Road junction. This area was searched extensively by three people on three different occasions (on June 12, 21 and 26). Total search time (person hours) was 6 hours and 24 minutes, and she was not observed again. It is possible that she may have become mated with a neighbouring single male (nest WNE 011).

Lower Sink Creek

A single male detected near the border on Lower Sink Creek could not be re-located during surveys carried out on June 13 (4 person hours) and June 26 (4:30 person hours).

c) Incidental observations

Strauss Road / Linklater / Englishman Cr

A single male (Incidental # 1) was observed flying across the Kikomun-Newgate road on May 30. This sighting was 1.4 km away from nest WNE010. Two systematic nest searches of both sides

of the Kikomun-Newgate road were carried out on June 21 (9:32 person hours) and on June 26 (3:36 person hours). On June 21 an un-mated male was observed foraging in a cut-block and adjacent forest, 750 m away from the detection. This bird was over 600 m from Nest WNE010, and its activities and behaviour indicated that it was not feeding young at that nest. On June 26, no WISA were found during a systematic search west of the road.

Another single male was also observed incidentally on May 30 (Incidental # 3). This male was foraging 578 m from Nest WNE 013. Efforts to find this bird (on June 12, 15, and June 21 (a total of 8:41 person hours) failed, although a single female (Incidental # 4), was observed in approximately the same location, on June 12. Her behaviour, extensive calling, and drumming, indicated that she was not feeding young, and was likely unmated.

3.3 Nest tree characteristics

Seven of ten nest trees were western larch (70%) and three were Douglas fir (Table 4). One Douglas fir (WNE010) was dead (WTC 3), and all other nest trees were live with decay (WTC 2). The mean dbh was 57.8 cm (range = 37 - 90, SD = 19.5). Nests were positioned from 6.9 m to 21 m up the tree and faced a variety of aspects. Photos of nest trees and stand structures are shown in Appendix A.

Table 4. Williamson's Sapsucker nest tree attributes – East Kootenay 2007

Nest ID	Location	Species	WTC	DBH	Nest Hgt (m)	Nest Aspect (°)
WNE003*	East Kiahko	Lw	2	90	14.0	32
WNE007*	Lower Sink	Lw	2	86	21.0	334
WNE009	Kimberley	Lw	2	51	14.3	70
WNE010	Englishman Cr	Fd	3	45	8.5	54
WNE011	W. Strauss/Linklater	Fd	2	37	7.3	146
WNE012	W. Strauss/Linklater	Fd	2	43	6.9	280
WNE013	W. Strauss/Linklater	Lw	2	46	8.1	44
WNE014	Lower Sink	Lw	2	43	7.3	48
WNE015	E. Kiahko	Lw	2	60	16.3	220
WNE016	Plumbob FSR	Lw	2	77	15.3	105

*Same tree used as in 2006

Nests were located primarily in the IDFdm2 (8 of 10), with two in the MSdk (Table 5). Site Series of nests were dry to zonal. Elevations ranged from 899 to 1302 m. One nest tree (WNE007) was in a strip of forest between cut blocks. Nine were in cut blocks: six were in leave tree blocks, one was in a seed tree block, one was in an old partial cut blocks, and one was in a clear-cut with a

few leave trees. The latter (WNE009) broke off below the nest during a windstorm on June 29. Percent canopy closures ranged from 2% - 60% ($X = 16.3\%$, $SD = 17.4$). The highest value (60%) was from the forest around WNE007.

Table 5. Stand attributes of Williamson's Sapsucker nest trees – East Kootenay 2007

Nest ID	Location	Species	Stand type	% Crown Closure**	BEC variant	Site series	Elev (m)
WNE003*	East Kiahko	Lw	Leave tree cut	10	MSdk	03	1302
WNE007*	Lower Sink	Lw	Forest	60	IDFdm2	01	943
WNE009	Kimberley	Lw	Clear-cut with leave trees	3	IDFdm2	01	1173
WNE010	Englishman Cr	Fd	Leave tree cut	10	IDFdm2	03	856
WNE011	W. Strauss/Linklater	Fd	Leave tree cut ²	25	IDFdm2	03	902
WNE012	W. Strauss/Linklater	Fd	Leave tree cut	8	IDFdm2	01	951
WNE013	W. Strauss/Linklater	Lw	Leave tree cut	15	IDFdm2	01	899
WNE014	Lower Sink	Lw	Seed tree cut	5	IDFdm2	01	956
WNE015	E. Kiahko	Lw	Leave tree cut	2	MSdk	02	1257
WNE016	Plumbob FSR	Lw	Old partial cut	25	IDFdm2	01	990

*Same tree used as in 2006 ** Ocular estimate of canopy closure within 50 m of nest tree

3.4 Nesting success and productivity

The majority of nests (70%) hatched in the first week of June. The earliest hatching date was between May 26 and 28 and the latest was June 8 to 10. Nesting success (defined as the number of nestlings that have reached 23 days, or 80% of fledging age) (FIA 2006a) could only be determined for one nest (WNE011). There, adults raised 4 chicks to the threshold 23 days (Table 6). Adults from nest WNE010 raised 4 chicks to at least 22 days. Two other broods are known to have fledged at least one young; one chick fledged from nest WNE009³ on June 28, before a windstorm broke the tree below the nest (Figure 12), and at WNE016, at least one chick appeared ready to leave the nest on June 26. Seven of 10 Williamson's Sapsucker broods (including these four nests) are known to have reached two weeks of age (Table 6).

On June 18, nestlings flew prematurely from the nest hole at two nests. They had been disturbed by our activities at the base of the trees, in preparation for climbing. One male, estimated to be 21-23 days (nest WNE011), flew from the nest hole, leaving three nestlings inside. At nest

² Blocks around WNE011,012 and 013 were harvested under the name 'Ecosystem Restoration' under the KBLUP guidelines for open forest (75-400 stems per ha retained)

³ A newly hatched chick had been found dead at the bottom of this nest tree on June 4

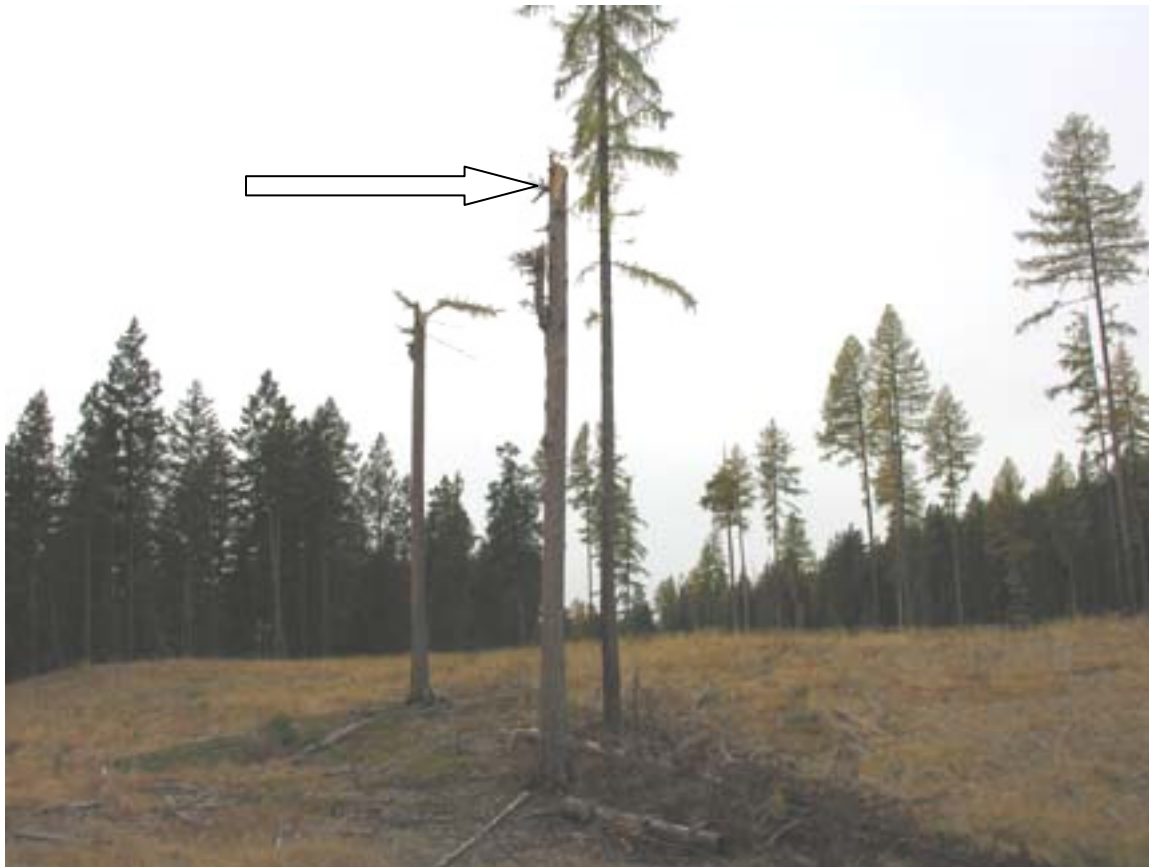
WNE013, two nestlings flew out and two remained in the cavity. They were over 16 days old, and clung to the boles of nearby trees. It is unlikely that those young survived.

Table 6. Brood size of Williamson's Sapsuckers in the East Kootenay - 2007

Nest ID	Location	No. young	Approximate age on June 18	Approx. hatching date
WNE003	East Kiahko	5	11 days	June 5-7
WNE007	Lower Sink	≥3*	9-11 days	June 8-10
WNE009	Kimberley	≥1	18 days	June 1
WNE010	Englishman Cr	4	20-22 days	May 29-30
WNE011	W. Strauss/Linklater	4	21-23 days	May 26-28
WNE012	W. Strauss/Linklater	5	12-14 days	June 4-6
WNE013	W. Strauss/Linklater	4	16+ days	June 1-3
WNE014	Lower Sink	5	12 days	June 6
WNE015	E. Kiahko	3	15 days	June 3
WNE016	Plumbob FSR	≥2*	18 days	June 1-4

* values derived from listening to begging calls (min. estimates only)

Figure 12. Broken nest tree WNE009



4 DISCUSSION

4.1 *Call playback surveys*

We found fewer birds (8 of 33) in the northern area and more (23 of 33) in the southern portion of their known range in the East Kootenays. The highest concentration of Williamson's sapsucker activity was in the Strauss Road / Linklater FSR area, west of the Koocanusa Reservoir. That area was not surveyed as extensively in 2006 (Ohanjanian et al. 2006), because it was outside the predictive model developed by Gyug (2006a). In 2007, we went outside the model, and included that area because sapwells had been seen. It is likely that the Williamson's Sapsuckers were present there in 2006; nest trees WNE011, 012 and 013 had an additional 3, 5 and 15, sapsucker-sized holes, respectively, indicating probable use from previous years. Nest site fidelity of 36% is reported for the Okanagan (Gyug 2006b), and this, as well as the observation that 2 of 10 pairs in the current study returned to the same nest tree in 2007, supports the suggestion that the Strauss / Linklater birds were present before their discovery in 2007.

Nest WNE016, at the Plumbob / Caven Creek FSR junction, was discovered after the call playback survey period, and is in an area that has not been surveyed to date. It is approximately 10 km north west of the Strauss Road / Englishman Creek area, and may represent the western portion of a continuous area of occupation. Call playbacks in the 2008 breeding season are recommended.

The failure to detect any WISA in the Perry Creek area is unexplained. There were three separate detections there in 2006, although no nests were found (Ohanjanian et al. 2006). The timing of surveys in 2007, and the amount of effort (120 cpb stations and 13% of total effort directed at Perry Creek) appears to have been adequate. A possible Williamson's Sapsucker was glimpsed in late June to the north east of Perry Creek, on the Lost Dog Forest Service road. There was a sapwell tree there also, and that area should be investigated further next year.

In addition to the current project, several other Williamson's Sapsucker call-playback surveys were carried out in the East Kootenay (K. Stuart-Smith, pers. comm; T. Antifeau, pers. comm; Ohanjanian and Wigle, in prep.). Areas surveyed included the St. Mary's Indian Reserve, Premier Lake Provincial Park and the Whiteswan Forest Service Road. No Williamson's Sapsuckers were detected.

4.2 *Habitat attributes of nest sites*

A broad selection of stand structures, including both cutblocks and intact forests, was sampled in the Williamson's Sapsucker surveys of 2007. This is shown clearly in Figures 2 to 10, which depict the locations of call playback stations on Landsat images.

Williamson's Sapsucker distribution was previously thought to correlate with that of western larch in BC and northern Montana (Cannings et al. 1987; Campbell et al. 1990; McLelland 1977). Gyug et al. (2006) report on the species' use of aspen, however, in areas where there are no larch. Similarly, in the US, Williamson's Sapsuckers are found in a variety of habitats including montane spruce-fir, Douglas fir, lodgepole pine, and ponderosa pine forests. In southern Colorado, the species was observed in Douglas fir vegetation more frequently than expected, on the basis of Douglas fir abundance (Winternitz 1976; cited in Dobbs et al. 1997). If results from 2005, 2006 and 2007 are combined, 3 of 18 nest trees were Douglas fir, 1 was ponderosa pine and 14 of 18 were western larch. Only 3 of 18 nest trees were dead – all others were live, WTC 2, with some heart rot and signs of decay. Western larch decay patterns make the species particularly conducive to excavation; the sapwood resists rot, thus providing a good support structure, while the heartwood is softer, assisting in excavation (McLelland 1977).

No WISA were detected in the Findlay Creek, Whiteswan Lake, Houle Creek, Ward/Gilnockie and Flathead Valley survey areas, although large-diameter western larch were present. Stand attributes may have been unsuitable. A dense lodgepole pine and/or fir understory was present on many sites, and crown closures were quite high. In 2007, Williamson's Sapsucker nesting sites were almost all (90%) in altered environments – old partial cuts and seed- and leave-tree cut blocks. (See Appendix A. for photos of nest trees and stands). In many of these cases, however, (for example at East Kiakho, Kimberley Nature Park, Lower Sink Creek, and Englishman Creek) old WISA-sized cavities in veteran larch (WTC 2) were present in adjacent forests. A major question is: why were these trees not used by Williamson's Sapsuckers in 2007? Similarly, in 2005, both known nests (one of which was in such a veteran larch) were located in forest in the Kimberley Nature Park. In the following two years, Williamson's Sapsucker nests were found in the cutblocks nearby, and the forest was used as a foraging site, not a nesting area.

Dobbs et al. (1997) remark on the Williamson's Sapsucker's apparent ability to tolerate post-fire and logging effects, citing a variety of sources. Benchmark habitat in the Okanagan and at Lehman Springs in the Boundary, however, consists of un-logged forest with veteran western larch in densities of 30 and 32 per ha, respectively (L. Gyug, pers. comm.). One polygon near nest WNE016 (Plumbob) also had such trees at a density of 32 per ha (L. Gyug, pers. comm.). One answer to the apparent correlation between Williamson's Sapsuckers and partial cutblocks in the East Kootenay may lie in the structure of intact forests here. As a result of fire suppression, stem densities regularly reach 10,000 stems per ha, with densities of over 1,000 stems/ha being common (R. Harris, Ministry of Forests, pers. comm.). Williamson's Sapsucker use of partially logged areas with tree retention suggests that they may be keying in on a more open structure – one that reflects

the historic structure of a fire-maintained ecosystem. The ingrowth that has been attributed to successful fire suppression activities in the twentieth century is estimated to be advancing at a rate of 1% to 3% annually in the Rocky Mountain Trench (Gayton 1998).

The distribution of the 17 Williamson's Sapsucker nest sites⁴ relative to Ungulate Winter Range habitat types (UWR) and natural disturbance types is shown in Table 7. Seven of 17 are in Open Forest (OF), 6 are in Managed Forest (MF) dry, and 4 are in Managed Forest moist. Historically, the MF dry and OF types experienced more frequent, low-intensity fires, while the MF moist sites (the higher elevation Kiahko nests) likely experienced a regime of mixed severity fires, including relatively frequent low and moderate intensity fires, resulting in an intermediate stand structure. Research on mixed severity fire sites in the southern portion of the East Kootenay revealed a median fire return interval of 15-77 years (Cochrane 2007). This type of analysis, coupled with a deeper understanding of fungal species and decay patterns in the East Kootenay Trench, may help inform the picture being developed of Williamson's Sapsucker habitat use in the East Kootenay.

Table 7. Williamson's Sapsucker nests relative to Ungulate Winter Range habitat types in the East Kootenay.

Nest ID	General Location	BEC zone & Site Series	UWR Habitat type
WNE5001	KNP	IDFdm2 01	MF dry
WNE5002	KNP	IDFdm2 01	MF dry
WNE001	E. Kiahko	Msdk 04	MF moist
WNE002	New Lake	IDFdm2 03	OF
WNE003	E. Kiahko	MSdk 03	MF moist
WNE004	E. Kiahko	MSdk 03	MF moist
WNE005	Rocky Cr	IDFdm2 01	MF dry
WNE006	US	n/a	n/a
WNE007	Lower Sink	IDFdm2 01	OF
WNE008	Kimberley	IDFdm2 01	MF dry
WNE009	Kimberley	IDFdm2 01	MF dry
WNE010	Englishman Cr	IDFdm2 03	OF
WNE011	Strauss / Linklater	IDFdm2 03	OF
WNE012	Strauss / Linklater	IDFdm2 01	OF
WNE013	Strauss / Linklater	IDFdm2 01	OF
WNE014	Lower Sink	IDFdm2 01	OF
WNE015	E. Kiahko	MSdk 02	MF moist
WNE016	Plumbob	IDFdm2 01	MF dry

⁴ This does not include the US nest, WNE006

Williamson's sapsuckers are regularly seen entering the forest to forage. In the US, they have been reported foraging on logs in cut blocks (Dobbs et al. 1997), and it is likely that they will use them in the forest as well. It is vital to determine how important it is to have forest nearby, and how much is required. Other questions are: What is the importance of old growth features? Are they required to meet long-term (not just short-term) species' needs? What is the optimum patch size and distribution over the landscape? What are the effects of flying large distances on adult energy budgets and their susceptibility to predation? Does competition for nest trees affect habitat choice? Are trees in cut blocks more vulnerable to breakage? Events in the East Kootenay would suggest the latter to be so. In 2006 and 2007, windstorms caused two nest trees to break below the nest hole. Both were on Teck Cominco land in Kimberley. WNE008 (2006) was a dead WTC 3 ponderosa pine. WNE009 (2007) was a live, WTC 2 western larch. Both were in exposed locations, in cut blocks, with crown closures of 15% and 3%, respectively. The loss of 2 of 16 nests (12.5%) in a two year period is a high percentage and it may illustrate a susceptibility to breakage when Williamson's Sapsuckers nest in open cut-blocks. In both cases, the young had fledged prior to the breakage.

4.3 Nest productivity

Breeding phenology in 2007 was similar to that of 2006, with most young hatching near the beginning of June. It was learned that nests can be initiated early in the season when adults at WNE009 were observed excavating at what would be the final nest tree on April 4, 2007 - a full 8 weeks prior to the hatching date (K. Goodwin, pers. comm.). The nest camera was only available on June 18 and 19, and the sites were not re-visited, so few conclusions about productivity can be made based on the data collected from the 2007 field season. As nesting "success" is determined by the number of young that reach 80% of their fledging age (23 days) (FIA 2006a), only one nest (WNE011) can be considered "successful" based on those criteria. A second nest, WNE011, raised four young to 22 days, and was also likely successful. The final outcomes of these and other nests are unknown, however, and greater follow-up is needed. Only one young fledged at WNE009 - this is poor nesting success. A project examining ant availability and Williamson's Sapsucker productivity will be undertaken using provincially pooled data (L. Gyug, pers. comm.). Data on ant availability in the East Kootenay will be collected in a separate project and added to that provincial database, along with the limited productivity information gathered here in 2007.

The value of inserting nest cameras must be examined in relation to the potential loss of young. The present study showed that premature fledging is a strong possibility when there is disturbance at the base of a nest tree. Chicks are fully feathered after 14 days (Jackson 1977), and

premature fledging occurred at 2 of the 5 nests (40%) that had young 14 days or older. One approach would be to climb nest trees before young are fully feathered, obtain a brood size at that age, and attempt to be present at fledging time.

5 RECOMMENDATIONS

The following recommendations are made:

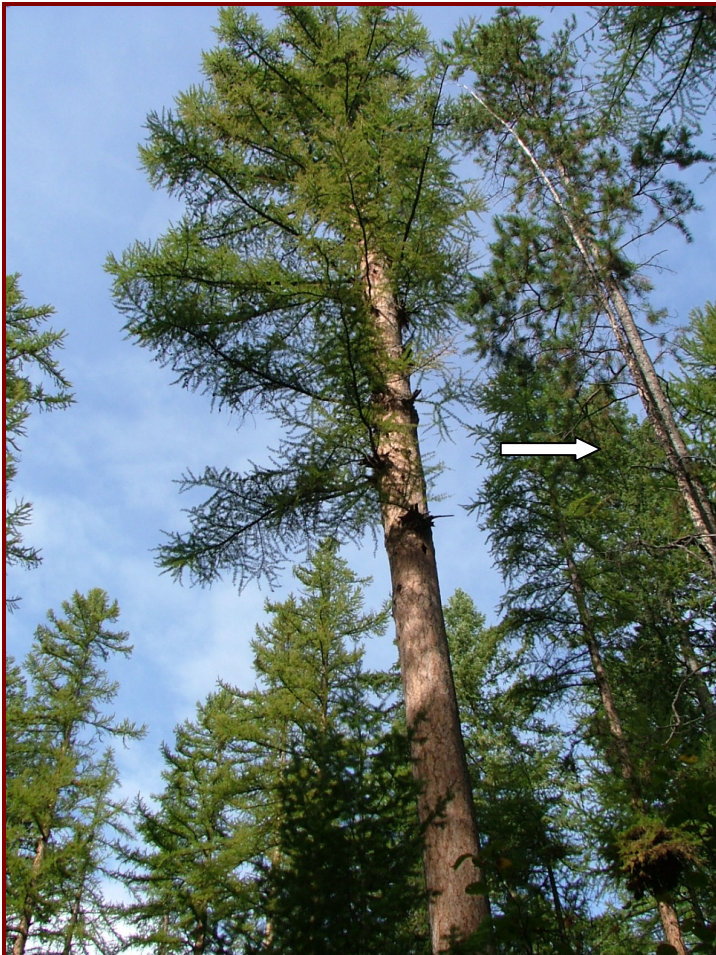
1. Continue to determine the Area of Occupation of the Williamson's Sapsucker in the East Kootenay. Re-survey areas which had detections in 2006, but not 2007. Expand effort in the Plumbob/Caven Creek area and Lost Dog FSR, north west of Ha Has Lake.
2. To obtain more detailed information on densities, numbers of nests, and habitat selection, concentrate surveys on those areas in which WISA have been confirmed.
3. Evaluate the predictive model (Gyug 2006a) by comparing it with the known locations of Williamson's Sapsuckers in the East Kootenay. This may be done as a GIS exercise, and could also be tested in the field by including areas for cpb survey that are outside the model.
4. Compare stand densities and structure with those found at nests in "benchmark habitat" in the Boundary and Okanagan areas. Stand structure may be playing a very large role in Williamson's Sapsucker nest territory selection.
5. Review and assess the "Standards for Measuring Vegetation" set out by FIA (2006b) for its value in establishing links between habitat choice, prey selection and productivity. Although not directly a part of the current project, the productivity data collected here will be channelled into the provincial effort to evaluate habitat selection by Williamson's Sapsuckers. Sampling procedures for ants in that document should be evaluated by an entomologist. Productivity at present cannot be correlated to ant abundance without directly sampling standing trees in the unlogged forest – a procedure that is not done currently, and which may be a deficit when attempting to establish links between prey base and nest tree / stand selection.
6. Study whether predator avoidance (including pine marten, red squirrels, and goshawk) and/or competition with Red-naped Sapsuckers for nest trees may be affecting Williamson's Sapsucker habitat selection and productivity.
7. Inform the public of the danger of premature fledging caused by disturbance in high use areas such as the Kimberley Nature Park.

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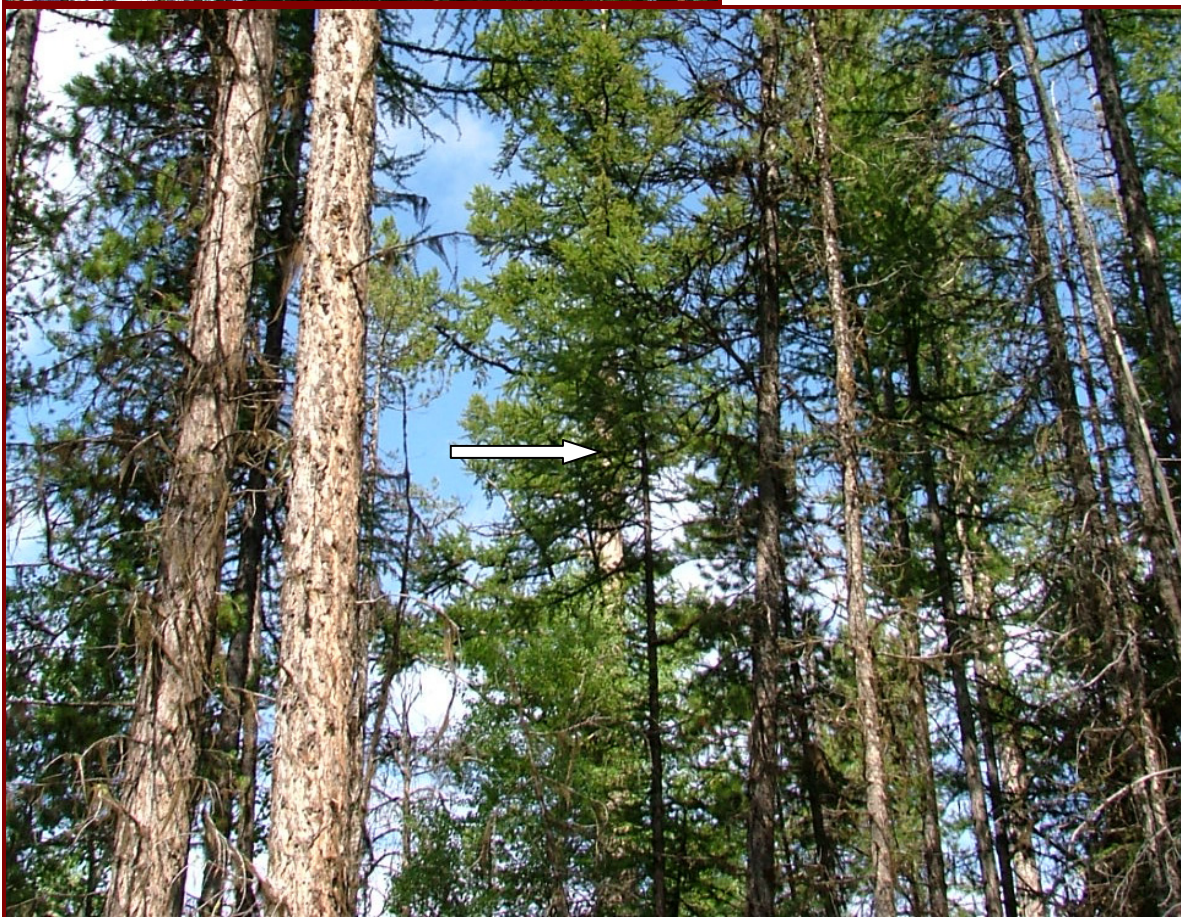
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**APPENDIX A. Nest trees (2006 and 2007) and stand structure.
(Photo of stands taken from the base of the tree in the same direction
as the nest hole for 2007 only)**



WNE 001 (above)

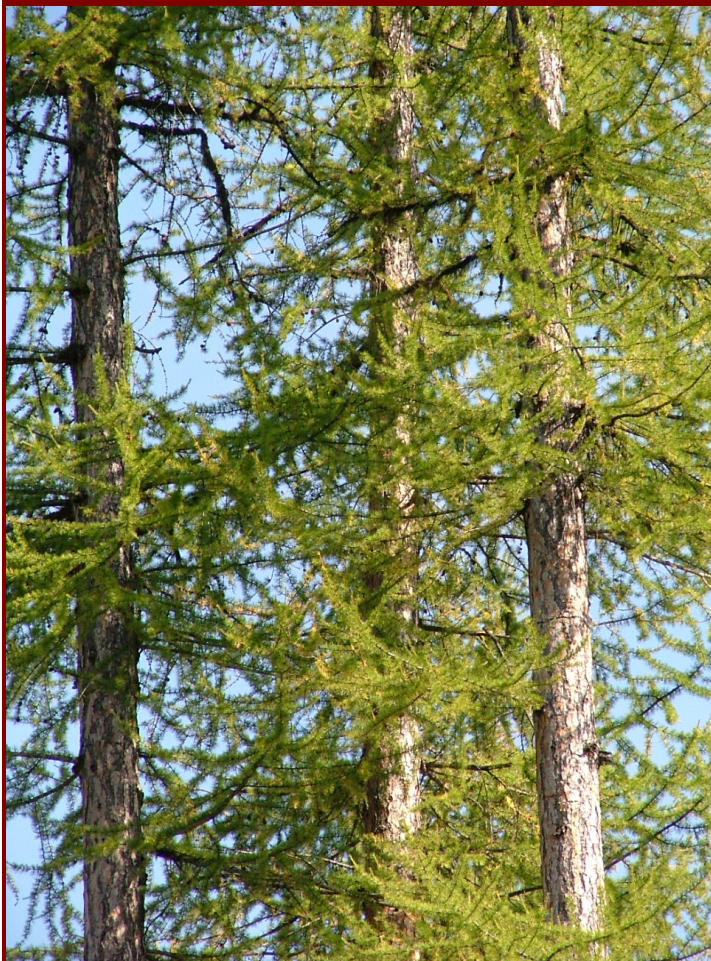
WNE 002 (below)







WNE 004 (above)



WNE 005 (below)

WNE 006 (US nest)
photo unavailable



WNE 007 Nest tree (above)

WNE007 Stand view (below)





WNE 008 Nest tree (above)



**WNE 008 Nest tree after
breakage (below)**

WNE009 – Nest Tree prior to breakage (top) after breakage (below)



WNE 010 Nest Tree (top) Stand view (below)



WNE 011: Nest tree (top) Stand view (below)



WNE 012: Nest Tree (top) Stand view (below)



WNE 013 Nest Tree (top) Stand view (below)



WNE014: Nest tree (top) Stand view (below)



WNE015 Nest tree (top) Stand view (below)



WNE 016 Nest tree (top) Stand view (below)



APPENDIX B. List of electronic data files that accompany this report

1. Excel Spreadsheet (using SPI template for provincial database) that includes:
 - Nest locations (UTMs), descriptions (including dbh, species, etc), all with unique nest numbers following provincial naming convention (L. Gyug, pers. comm.)
 - Call playback stations with unique cpb station numbers and results, including survey data, time, weather, and other woodpecker and raptor species detected
 - Nest search and site visit data
 - Incidental observations
 2. GIS spatial files (ESRI.shp)
 - All call playback stations, differentiated by those that had and those that did not have detections
 - All active nest locations
 3. Adobe pdf and Word formats of report
- (Maps of each of survey areas included in the report)