

Williamson's Sapsucker Occupancy Monitoring: Boundary and East Kootenay 2018

Les Gyug, R.P.Bio.

Okanagan Wildlife Consulting
3130 Ensign Way,
West Kelowna, BC V4T 1T9

Prepared for:
Ministry of Forests, Land, Natural Resource Operations
and Rural Development
#401-333 Victoria St.
Nelson, BC V1L 4K3

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ABSTRACT

TABLE OF CONTENTS

INTRODUCTION	2
METHODS.....	3
Study Sites	3
Occupancy Field Methods.....	3
RESULTS	4
Boundary	4
East Kootenay	5
DISCUSSION.....	6
LITERATURE CITED	6

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INTRODUCTION

Williamson's Sapsucker (WISA) has been designated as Endangered in Canada (COSEWIC 2005, and re-confirmed in 2017), and is listed under Schedule 1 of the Species at Risk Act. In 2016, effectiveness monitoring protocols were prepared (Gyug 2016) to estimate the conservation effectiveness of Wildlife Habitat Areas (WHAs) and the Best Management Practices for timber harvesting in the Williamson's Sapsucker Area of Occupancy (AO). After choice of study sites, part of this monitoring requires determining if Williamson's Sapsucker are present at sites (Level 1 monitoring), and if they are successfully breeding at sites (Level 2 monitoring). This project was initiated by the Ministry of Forests, Land, Natural Resource Operations and Rural Development (FLNRORD) in 2017, but funding came too late to determine occupancy of sites, so only habitat measurements were made. Occupancy determination was put over until spring 2018. The purpose of this project in 2018 was to determine Williamson's Sapsucker occupancy of selected study sites at Level 1, the territory establishment phase, and Level 2, the nestling phase, as specified in the effectiveness monitoring protocol (Gyug 2016).

METHODS

Study Sites

Study sites were chosen in 2017 by FLNRORD in the Boundary and East Kootenay regions within the AO of Williamson's Sapsucker (Table 1, Figures 1 and 2). In the Boundary region, additional study sites were added in early 2018 to provide unharvested controls for harvested sites. These controls forests were nearby the harvested sites and were of similar habitat suitability for WISA. Lehman Springs conservation area owned by the Nature Conservancy of Canada was included by FLNRORD in the comparison even though it was not a WHA.

Occupancy Field Methods

Methods have been described in Gyug (2016) and are paraphrased here with minor updates.

Level 1: WISA Presence during territory establishment phase.

1. Sites to be visited early in year (approximately April 1 to May 7) when breeding territories are being set up to confirm WISA presence.
2. This requires one extended site visit, i.e., with >1 CPB done on site.
3. If visiting a site where previous occupancy is known, begin with 15 minutes silent listening, revisiting the old nest site(s) in ideal weather conditions (wind < Beaufort 3, and not raining).
4. Then, if no WISA have been detected, use at least 5 CPB over 30 minutes moving around entire site and listening for responses.
5. If a WISA is detected, attempt to determine if there is only one adult present, or if a breeding pair may be present.
6. If visiting a site where previous breeding occupancy is unknown, then CPB can start immediately upon arrival, and continue for at least 30 minutes or until one or more WISA are detected.

Level 2: Breeding Confirmation during nestling phase.

1. If no WISA were present on a prior Level 1 visit, then WISA will almost certainly not be present and Level 2 need not be performed.
2. Visit site during egg incubation or nestling period (approximately May 15 to June 20).
 - a. Timing will depend on breeding conditions in any given year, and
 - b. Must allow for general furtive behaviour and unresponsiveness of WISA in (at a minimum) the first week after eggs hatch while they are brooding young.
 - c. After about June 20 (depending on the year), some nests may have already fledged young making confirmation of breeding difficult if the fledglings and adults have left the nest area.
3. Confirmation will require
 - a. Visits of any old nests, and
 - b. Up to 45 minutes on site in ideal weather conditions (winds < Beaufort 3 and not raining) including a series of CPB in the site, not just at any old nests, or until a response is detected.

- c. Only after 45 minutes of searching can it reasonably be concluded that WISA are absent if no responses are detected.
4. The entire site must be searched, approaching all areas to within at least 100 m as previously unknown nest trees may be used.
5. Sites larger than 16 ha may take considerably longer to survey properly for nesting activity. Surveying the Lehman Springs conservation area of 28 ha took 2-3 hours, and was repeated twice to ensure accurate results.

Call playback equipment used included FoxPro electronic game caller units through large external FoxPro speakers with front bell dimensions of 25-cm x 17-cm or 21-cm diameter. When walking through the site with the intention of covering every area of the site to within 100 m, sometimes only a pocket call playback unit (FoxPro NX4 or equivalent) with a 3-4" speaker was used.

Each formal CPB point sample consisted of three broadcasts of a 10-15 second Williamson's Sapsucker drum and call combination repeated three times in three directions, and then a silent listening period of 3 minutes, for a total listening time of 4 minutes and 20 seconds. If a formal CPB point was done, the location was recorded. For each WISA detection we recorded the time (seconds) of the initial response from the beginning of the CPB. We recorded the sex (male, female, unknown or pair), the number and the type of responses (visual, drum and/or call), the estimated distance (m) and direction (degrees from a compass reading) to each WISA. Both male and female WISA drum, so the type of response cannot be used to identify sex. Recorded for WISA detected while walking within a site where the full formal CPB protocol was not necessarily followed were location, type of detection, sex (if known), and type of behaviour.

Field data was entered into a single WISA Excel file template designed for submission to the Wildlife Species Inventory (WSI) Species Inventory (SPI) system of the BC Ministry of Environment. This file has been quality checked for formatting and for data entry errors.

RESULTS

Boundary

The study sites in the Boundary were sampled for Level 1 occupancy from April 9-13, 2018. The sites where WISA were found in April were resampled from June 11-18, 2018, to check for nesting.

WISA occupancy in April at unharvested WHAs was high at 84% (Tables 1 and 2). WISA occupancy in June was also high at the unharvested WHAs at 57%. There were no nests actually in WHA8-221 where the old nest tree had fallen. A male was on territory and probably nesting in forest 100-200 m west of the WHA, and another WISA was found about 100 m southwest of the WHA in a lightly partially harvested area. One new nest tree was found in the Lehman Springs conservation area. There was a second male in the area, but he did not appear to be nesting, and was continually moving around the south end of the conservation area, vocalizing and drumming throughout the search times. This one active nest was considerably lower than the maximum of five active nests found in June 2007.

For sites where prior nesting was known, all sites were occupied in April, whether harvested or not (Table 1). WISA bred successfully in two of the tree harvested sites, and one of the three unharvested sites. WISA were found in both of the WHAs that had been harvested, one that was harvested prior to WHA designation, and one that was partially harvested for ecosystem restoration. There was successful breeding at only one of the two harvested WHAs. In the harvested WHA 8-389, the male was found dead on the ground a few m from the known nest tree where he had been very active in April. It appeared to have been killed by an avian predator as both wings had been removed and left near each other on the ground as well as some of the belly feathers had been plucked and left. One new nest tree was found in WHA 8-312 where there had been ecosystem restoration treatment. The two previously known aspen nest trees in this area, and the one ponderosa pine, had all naturally fallen over. The new nest was in a dead aspen in a portion of the area where no ecosystem restoration had been done. In general, the only suitable nesting trees in the WHA were aspen as all suitable western larch had been logged out of this area long ago. With relatively little new aspen regeneration, the long-term prognosis for WISA nesting habitat in this WHA is not very good as most aspen are overmature or dead, and will not provide nest habitat for more than probably 20-30 years.

For sites where prior nesting was not known, either because the area had never been sampled, or had been sampled but no WISA nest had been found, WISA were found in April at about half the harvested and half of the control sites (Tables 1 and 2). However, no WISA breeding was found at any of the harvested sites, while one WISA nest was found at an unharvested control site.

East Kootenay

The study sites in the East Kootenay were sampled for Level 1 occupancy from April 24-25, 2018. The sites where WISA were found in April were resampled from June 17-18, 2018, to check for nesting. Only six sites were sampled in the East Kootenay.

Only one of the two WHAs was occupied (Table 3). In the WHA that was unoccupied (WHA 4-136), the nest tree was in an Ecosystem Restoration partially harvested site, and the nest tree had decayed to the point where it was no longer suitable for nesting use. In the site that was occupied (WHA 4-110), the WHA had been established as foraging territory for a nest that was just across the border in the U.S.A. In 2018, there was still no nest in the B.C. side, although WISA were present in the WHA. Any nesting appeared to be on the U.S. side where territorial activity was concentrated, and there appeared to be many more suitable nesting trees than on the B.C. side. We did not cross the border to determine if there may be an active nest there, but the behaviour of the pair indicated they were probably nesting.

In the three harvested sites, we only found WISA in April in one site (Kiahko Cut 2; Table 3). Returning in June, the active nest was found within the harvested area approximately 100 m from the forest edge. This was a previously unknown nest site and has been assigned the GPS mark WNE054.

The last site was at the edge of the 2017 Linklater Creek Burn. The area chosen to sample had been partially burned, while the majority of the burn had killed 100% of trees

within the burn perimeter. No WISA were found in this area, even though it was adjacent to (400 m away from) WHA 4-110 where WISA were active.

DISCUSSION

Occupancy rates with only three to seven sites in any group will not provide for meaningful analyses until more sites of each type can be added to the sample in future years, and/or the same sites resampled in future years. Sites from all regions can also be combined as the analysis need not be broken down by region. Gyug (2016) estimated sample sizes on the order of 25-35 per group for sites with previously confirmed breeding, and 50-70 per group with no prior information would be required for a comparison with reasonable power of 80%.

Some of the harvested areas selected for sampling had not been harvested, or the 2017 habitat plots had targeted unharvested areas of cutting permits. I suggest that no harvested area be included in the sampling until the cutting permit is examined, the actual harvested area determined, and that harvesting be confirmed with either the licensee or from up-to-date satellite imagery. Sampling both for WISA and for habitat plots can then be stratified by whether the area within the overall harvesting perimeter of any cutblock was actually harvested, or had been reserved. The polygon outlines within the Results database or the Vegetation Resource Inventory database often do not indicate where the reserved areas are within a cutblock perimeter. This may also allow harvesting type to be stratified by the density and type of leave trees, with seed tree cuts or cuts with less than 50 trees/ha in the harvested areas to be a separate comparison group from harvested sites where more than 50 tree/ha are left in the harvested area.

LITERATURE CITED

- COSEWIC. 2005. COSEWIC assessment and status report on the Williamson's Sapsucker, *Sphyrapicus thyroideus*, in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, Ontario, Canada. 45 p.
- Gyug, L.W. 2016. Draft Williamson's Sapsucker WHA and BMP effectiveness protocols. Report prepared for Thompson-Okanagan Region, Ministry of Forest, Lands and Natural Resource Operations, Kamloops, B.C.

Table 1. Boundary sites used for WISA occupancy monitoring, 2018.

Site No.	Name	Habitat	Comments	WISA nest Prior	N WISA Level 1	WISA Level 2 Results
WHA						
2	8-221	Forest		1 nest	2	Old nest tree in WHA has fallen; Male found on new territory 100-200 m West of WHA; another WISA found in lightly partially harvested area about 100 m SE of WHA
3	8-379	Forest		1 nest	1	No WISA found
4	8-213	Forest		2 nests	1	No WISA found
5	8-202	Forest		1 nest	2	Old nest re-occupied (WNB058)
6	8-204	Forest		1 nest	0	-
7	8-210	Forest		2 nests	1	Old nest re-occupied (WN317)
9	Lehman Springs	Forest	NCC Conservation Area	5 nests	3	New nest found (WNB071) and non-nesting Male
Harvested Sites						
8	8-389	ST Cut	Cut before WHA designation; nests in WTP and edge	2 nests	3	WNB059 F present, M found dead, WN047 not occupied
11		Partial Cut 2010		2 nests	4	Old nests re-occupied (WNB041 and WNB042)
15	8-312	Partial ER Cut	Cut after WHA designation	2 nests	2	New nest found (WNB070) in old WTY (old nest trees WNB010 WNB023 WNB048 all have fallen)
10		Partial Cut 2001	Moderate after cut	Not known	2	WISA present but no WTY centre or nest
12		ST Cut 2016	VL after cut	Not known	0	-
13		ST Cut 2000	Low after cut	Not known	0	-
14		ST Cut 2014	Low after cut	Not known	1	No WISA found
16		ST Cut 2017	Low before, VL after cut	Not known	0	-
*28		Partial Cut	Partial Cut to replace No. 17	Not known	1	No WISA found
17		Forest	Not cut, so not part of comparison	Not known	0	N/A
Control Sites						
26	Control for 8	Forest/Edge		1 nest	2	Old nest re-occupied (WNB061)
20	Control for 11	Very Light Partial Cut		1 nest	2	WISA present but no WTY centre, nest not found
25	Control for 15	Forest	Unharvested portion of 8-312, Control to 15	1 nest	2	No WISA found
19	Control for 10	Forest		Not known	3	New nest found (WNB069)
21	Control for 12	Forest		Not known	0	-
22	Control for 13	Forest		Not known	1	No WISA found
23	Control for 14	Forest		Not known	0	-
27	Control for 16	Forest		Not known	0	-
18	Near 8-316	Forest	found not to be Class 1 – old high-grading removed all potential nest Lw vets	Not known	0	-

* there was no control site for harvested site 28.

Table 2. Occupancy of Boundary sites used for WISA occupancy monitoring, 2018.

Type of Site	Occupancy Level 1			Occupancy Level 2		
	N Sites	N Sites Occupied	Occupancy Rate	N Sites Occupied with nesting or probable nesting	Occupancy Rate	N Sites Occupied but probably not nesting
Unharvested WHA	7	6	0.84	4	0.57	0
Prior Nests Known						
Harvested Sites	3	3	1.00	2	0.67	1
Unharvested Controls	3	3	1.00	1	0.33	1
Prior Occupancy Unknown						
Harvested Sites	6	3	0.50	0	0.00	1
Unharvested Controls	5	2	0.40	1	0.20	0

Table 3. East Kootenay study sites and occupancy, 2018.

Site	Level 1 (April) Results	Level 2 (June) Results
WHA 4-110	2 WISA present	WISA pair present, but nest not in B.C., probably in U.S.A.
WHA 4-136 (part harvested, part intact forest)	No WISA found	-
Prior Nests Not Known		
Harvested Sites		
Kiahko Cut 1 (KC1)	No WISA found	-
Kiahko Cut 2 (KC2)	1 Male WISA	Active nest found in harvested area
Strauss Cut 1 (SC1)	No WISA found	-
Partially Burned site west of WHA4-110 (BC1)	No WISA found	

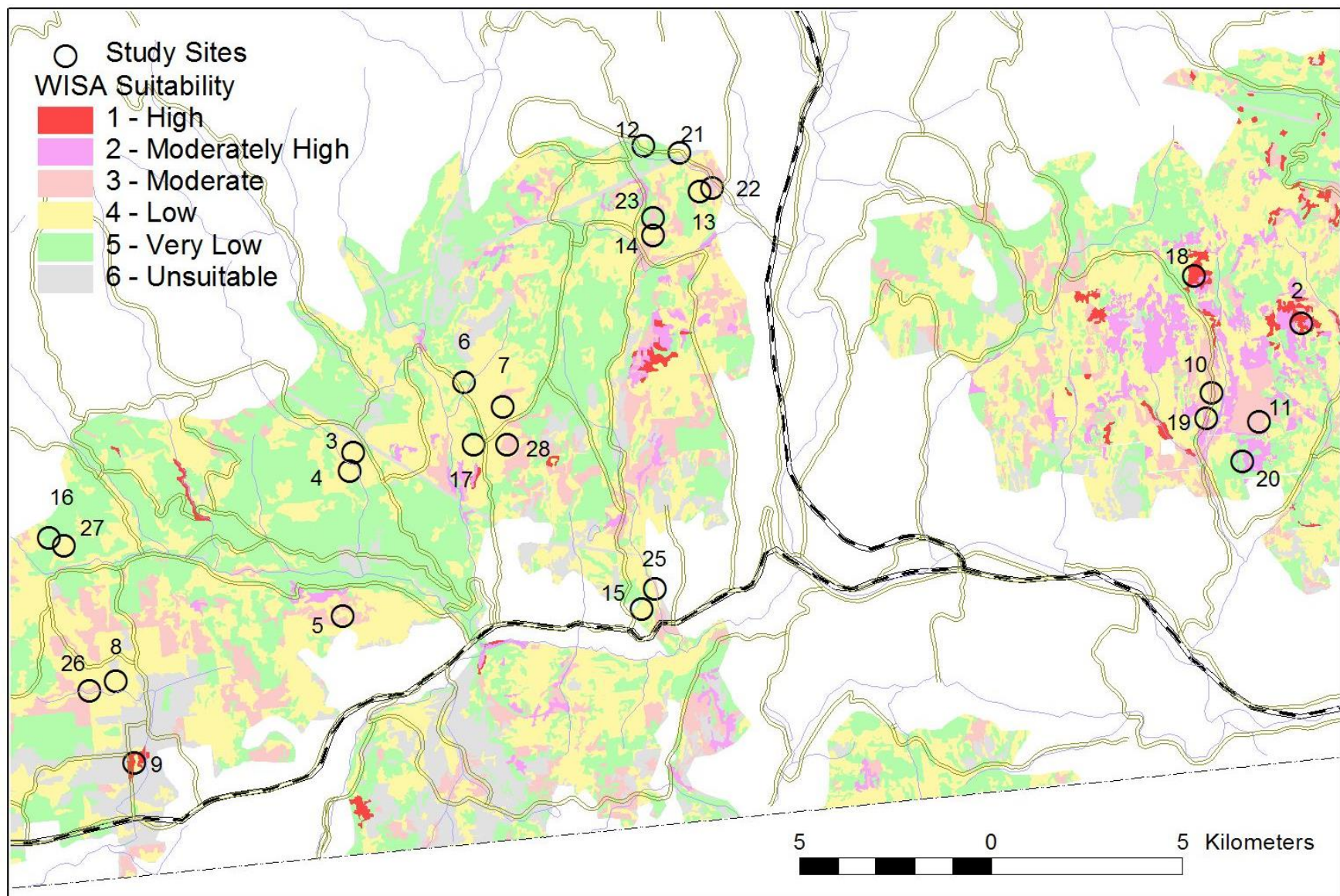


Figure 1. Study sites for occupancy monitoring in the WISA AO in the Boundary region. 2018 WISA nest habitat suitability used for west of Highway 33 and south of Highway 3, and suitability from 2008 east of Highway 33.

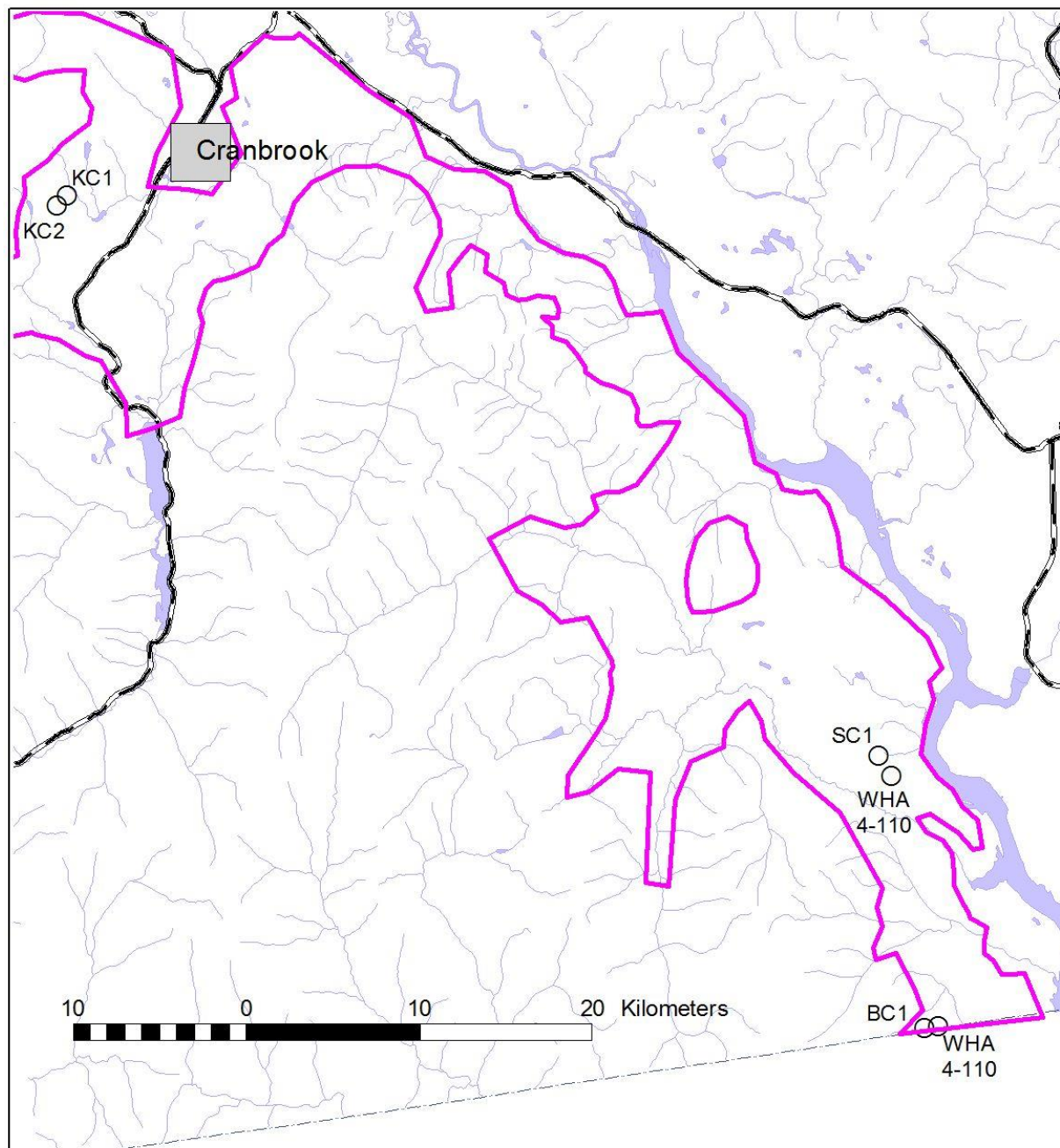


Figure 2. Study sites for occupancy monitoring in the WISA AO in the East Kootenay region, 2018.