HERON INVENTORY AND STEWARDSHIP IN THE COLUMBIA BASIN: FINAL REPORT 2020

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1.0 BACKGROUND AND INTRODUCTION

The interior provincially blue-listed subspecies of the Great Blue Heron (*Ardea herodias herodias*) has shown significant declines in numbers of both active and successful nests, and in size of heronries since monitoring was first initiated in the Columbia Basin in 2002 (see review in Machmer 2017 and earlier reports: Machmer and Steeger 2003, 2004; Machmer 2005, 2006, 2007, 2008, 2009, 2010, 2013, 2015). These persistent declines have been attributed to a combination of (a) habitat loss, encroachment and associated human disturbance and degradation in key riparian and wetland breeding and overwintering habitats, (b) Bald Eagle and corvid species harassment and predation, as well as (c) competition with other stick-nesting and fish-eating species occupying the same breeding and overwintering areas.

This report summarizes inventory and stewardship activities completed from April 1, 2020 to March 10, 2021 on a heron conservation project funded by Kootenay Connect (a project facilitated by the Kootenay Conservation Program) in four focal areas of the Columbia Basin: 1 - Columbia Wetlands Wildlife Management Area; 2 - Wycliffe Conservation Corridor; 3 - Creston Valley Wildlife management Area; and 4 - the Bonanza Creek Biodiversity Corridor. Appendix 1 provides approximate boundaries for each of the four focal areas.

1.1 Goals and Objectives

The following project goals and objectives were identified for 2020/2021:

Goal 1: Update listed Great Blue Heron breeding site occupancy locations in the Columbia Wetlands, Wycliffe, Creston Valley and Bonanza Creek areas.

Objective 1: Using appropriate methods previously established in Machmer (2018), implement a heron breeding site inventory at all four locations.

Goal 2: Implement conservation and stewardship follow-up actions at confirmed breeding sites.

Objective 2*:* Work collaboratively with the Ministry of Forests, Lands and Natural Resource Operations and Rural Development (FLNRORD) to conduct all steps required (i.e., info gathering, surveying, mapping, stakeholder and adjacent landowner engagement, etc.) to establish one Provincial Wildlife Habitat Area (WHA) at an active Great Blue Heron breeding site located on crown land within the Columbia Wetlands.

Objective 3: For active heronries on private land, conduct stewardship follow-up to increase awareness and reduce disturbance, in order to promote successful breeding and prevent further habitat degradation.

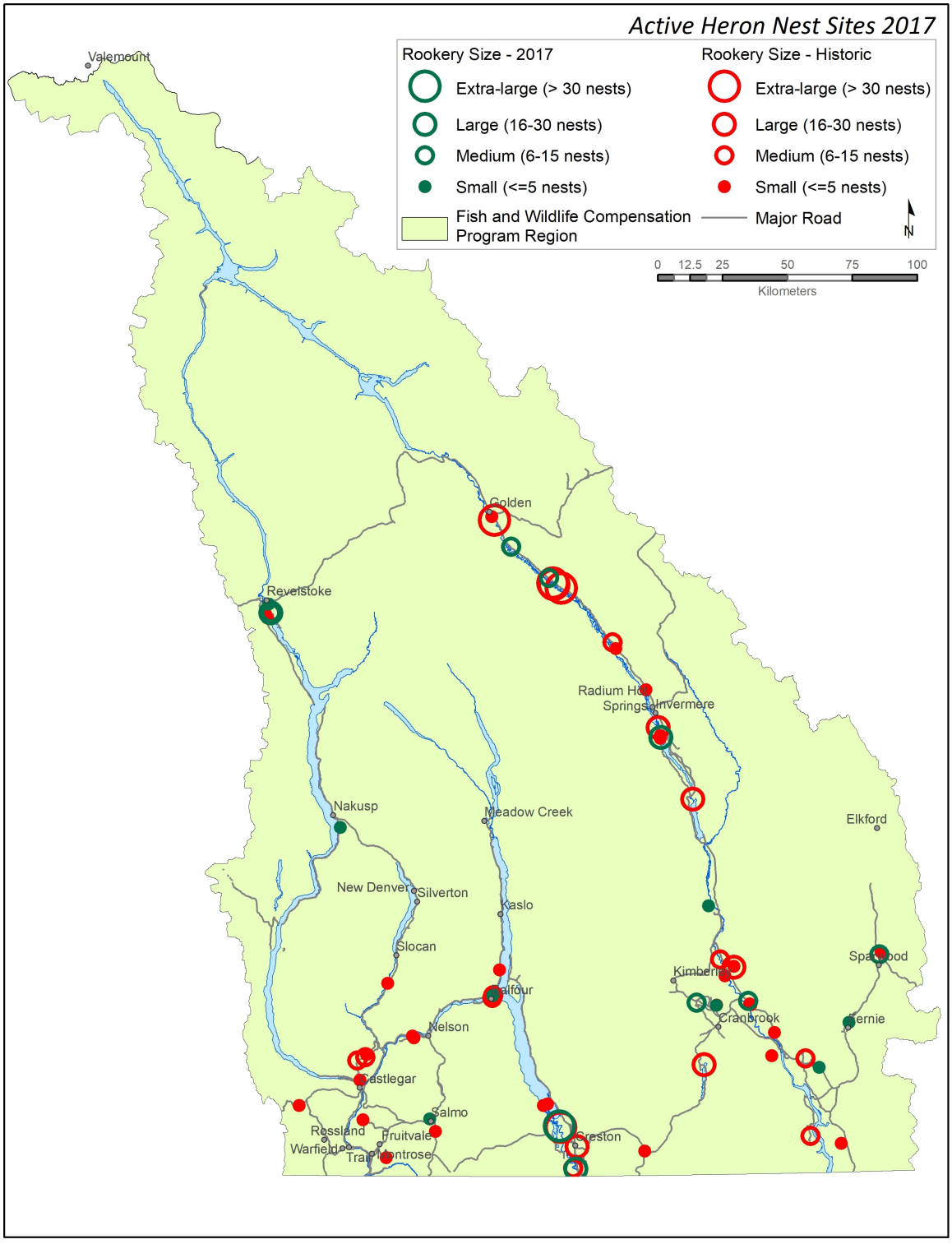


Figure 1. Summary of 2017 active and historical heron breeding sites (and mean heron rookery sizes) in the Columbia Basin since monitoring was initiated in 2002.

2.0 METHODS

Goal 1: Updated Heron Breeding Inventory - In early April of 2020, all contacts relevant to heron breeding activity in the four focal areas were emailed to alert them to the upcoming heron breeding inventory and to solicit any recent heron sightings. Contacts included all landowners and/or land managers at previously occupied heron breeding sites in or near the four areas. The latter individuals also received a "Heron Wanted" poster with solicitation and contact information as well as a follow-up phone call to inquire about recent heron activity and to request notification if breeding sites showed heron activity in 2020. Heron sighting solicitation request emails and posters were circulated to members of Rocky Mountain and West Kootenay Naturalists and to past participants in the Columbia Wetlands Waterbird Survey and the Marsh Bird Monitoring Survey. Local birding contacts in the Creston Valley and the Slocan to Nakusp areas were also contacted to inquire about recent heron observations and to solicit any new 2020 observations. A reasonable response was received from individuals and organizations contacted and all sightings information received was logged in a database for follow-up. Finally confirmed heron sighting records documented on E-Bird over the last three years (since the last heron inventory) were reviewed in and around the four focal areas to refine and further prioritise search areas for follow-up field surveys. "Heron wanted" posters were also put up opportunistically on public information boards while conducting field surveys in each of the four areas.

The area for this inventory encompassed only the four focal areas shown in Appendix 1, but where heronries outside these areas could be readily visited by vehicle while on route between them, they were included. Field surveys were carried out in each focal area in late April and again in June to evaluate breeding occupancy and reproductive success, respectively. In each focal area, any previous known heron breeding sites were visited first, followed by ground-based searches (on foot, by mountain bike, truck or kayak as dictated by access and terrain) of good candidate areas based on the various information sources described above.

Since the four areas are located in different biogeoclimatic zones at varying elevations, attempts were made to time the surveys to accommodate local climatic conditions and likely timing of heron breeding initiation, beginning with the Creston Valley, followed by the Wycliffe and Columbia Wetlands areas, and ending with the Bonanza Creek Corridor. Higher elevations and snowpacks in the Bonanza Creek Corridor were expected to result in later heron nest initiation (and also to constrain spring access to the corridor), hence surveys in the latter area were conducted later (June 7, 9 and 27). Wet inclement weather throughout the spring months coupled with trail closures due to bear activity also supported postponement of surveys. Since no herons were found in June, a further opportunistic search in late August (30, 31) and September (4) was conducted to search for post-fledgling heron activity specifically.

In addition to the data and GPS locations of heron sightings breeding sites, and tentative WHA features and boundaries, photographs and videos were taken during all field surveys for integration into a final video presentation for this project.

Goal 2: Conservation and Stewardship Follow-up - Based on the occupied heron breeding sites identified during the 2020, the best and only candidate for a Wildlife Habitat Area (WHA) within the four focal areas of interest was the Schiesser Road breeding site (see Table 1 and Figures 2-4). This upland site is located on crown land overlooking the Columbia Wetlands Management Area south of Nicholson, BC. It has been re-occupied for many years and has demonstrated high levels of productivity relative to the numbers of occupied nests present (12 successful versus 14 nests occupied in 2020). In summer 2020, all nests were GPS-located and mapped on this crown land parcel, along with crown and adjacent private land ownership boundaries. A recce survey of the entire square crown land parcel was completed. The best stands for inclusion in the WHA were identified and GPS-located (based on stand structure, crown closure, stand type, species composition, and distance from roads), as were other values in the proposed WHA.

Steps required to establish a Wildlife Habitat Area Data are summarised on the Form (http://www.env.gov.bc.ca/wld/documents/wha/Single%20WHA%20Data%20Forms_Mar2009.pdf) and these were discussed with Lisa Tedesco (FLNRORD, Nelson). Steps were systematically implemented (i.e., field confirmation and detailed ground survey, mapping and confirmation of ownership, identification of target and other values present on site, submission of a completed WHA application form with relevant maps. Confirmation of a complete application was received from Lindsay Anderson (Regional Rare and Endangered Species Biologist at FLNRORD) and consultation with First Nations, relevant tenure holders, nearby landowners, and other stakeholders is currently underway (Lindsay Anderson, pers. comm.).

3.0 RESULTS

Goal 1: Updated Heron Breeding Inventory - A summary of inventory findings is presented in Table 1. A total of 18 heron breeding sites were surveyed in 2020, of which 11 heron breeding sites (with 181 nests) were confirmed occupied. Technically, only seven of these breeding sites (with 161 occupied nests) were located within the boundaries of the four focal areas (i.e., two in the Creston Valley, four in the Columbia Wetlands, and one in Wycliffe area). However four additional sites outside these focal areas were either newly discovered (n = 3) or accessed while on route (n = 1).

A total of ten heron breeding sites (with 114 nests) in the basin were confirmed successful (i.e., producing one or more young close to fledging age), however only six of these breeding sites (with 95 successful nests) were located within the boundaries of the four focal areas (i.e., one in the Creston Valley, four in the Columbia Wetlands, and one in the Wycliffe area). The overall rate of breeding site failure (1 of 11 sites or 9%) was low, but the rate of overall nest failure (67 of 181 or 37%) was moderate to high, but comparable to other recent breeding years. When considering only sites within the four focal areas of interest, nests site failure was 14.3% (1 of 7 sites) and nest failure rate was 41% (66 of 161 nests), which is relatively high for herons. Reasons for the

Table 1. Summary of great blue heron breeding site inventory (breeding site occupancy, number of active and successful nests, additional comments) gathered in the 2020 breeding season. For site occupancy, Y = yes, N = no.

Breeding Site Name	Site Occupancy	Active Nests	Successful Nests	Additional Comments
CRESTON VALLEY				
South Reserve, Creston	Y	14	0	April 19: 18 nests but only 14 active. June 19: Abandoned and no herons/eagles nearby.
Leach Lake CVWMA	Y	48	16	April 19: Counted 62 active cormorant nests and more building. June 19: 114 cormorant nests and many heron nests usurped by cormorants; 6-7 heron nests fallen; BAEA harassment.
WYCLIFFE CORRIDOR AND AREA				
St Eugene Wycliffe	N	-	-	April 23: One heron confirmed feeding nearby in St Mary's River, but no occupancy of this site confirmed.
St Mary's River, Wycliffe	N	-	-	April 23: Bald Eagle now nesting in the heron breeding stand and no heron activity noted nearby.
Gas Line Bench, Wycliffe	N	-	-	April 23: No heron activity along the entire gas line and surrounding areas surveyed.
Stump Lake, Fort Steele	Y	15	9	April 26: Disruption due to nearby human activity. June 11: Bald eagles/crows and attacks noted; several dead chicks.
Tamarack Creek, Skookumchuck	N	-	-	April 25: Old nest site blown over; no new site found; landowner confirms no heron activity in 2020.
COLUMBIA WETLANDS AND AREA				
Schiesser Road, Nicholson	Y	14	12	April 24: 2 dead adult herons on the ground in the stand. June 10: All nests with ≥1 chick; 2 dead chicks on ground.
Carbonate Creek, Parson	N	-	-	April 24: 1-2 individual herons observed feeding nearby in spring but no evidence of site occupancy.
Davidson Marsh, Parson	N	-	-	April 24: No evidence of site occupancy; ≥6 herons at a time feeding in the adjacent marsh during the breeding season.
Eastside Yard, Parson	Y	10	10	April 24: Birds may still be building. June 10: All nests with ≥1 chick but visibility very poor in conifers.
Industrial Yard, Invermere	Y	52	38	April 25: Potentially still building; 2 bald eagles adjacent to colony. June 10: Poplars blocking view; minimum estimate; eagles/crows.

Breeding Site Name	Site Occupancy	Active Nests	Successful Nests	Additional Comments
Lake Windemere	N	-	-	April 26: No heron activity observed nearby.
Columere Park Residential	N	-	-	April 26: No heron activity observed nearby.
Columere Park	Y	10	10	June 10: **New site** discovered on second survey; crow harassment.
BONANZA CORRIDOR AND AREA				
Nelson Golf Course**	Y	2	1	June 20: **New site** discovered; 2 dead chicks on ground
Salmo Bench**	Y	3	3	April 23: Re-occupied from previous years.
Bird Road, Nakusp**	Y	1	1	June 27: Re-occupied from previous years
Uplands Road, Revelstoke**	Y	14	14	June 28: **New site** discovered on route
Totals	11 (7) occupied	181 (161)	114 (95)	Numbers in parentheses are total only for those breeding sites and nests located within the boundaries of the four focal areas.

** Breeding sites that are technically outside the focal areas of interest, but which were discovered and/or accessed opportunistically on route while conducting the 2020 survey.

failure rate appeared to be related to Bald Eagle and corvid harassment and predation, coupled with nest site competition from Double-crested Cormorants (at Leach Lake in the Creston Valley only), as well as nearby human disturbance (e.g., at Stump Lake near Fort Steele and in an Eastside yard near Parson).

Notably, the Bonanza Corridor area had no evidence of heron breeding activity in 2020, despite having a previously documented breeding activity and evidence of fledgling success four years ago (pers. obs.). The absence of heron activity is a concern given that this area certainly still supports suitable heron breeding and foraging habitat. There has however been significant land development (with expanding housing demand and construction in local communities on Slocan Lake) as well as recreational development (including a recently approved motorised recreational corridor and bypass trail between Slocan Lake and Summit Lake which is experiencing use year-round). There has also been a noticeable increase forest development in recent years (by NACFOR, BCTS, and now Kalesnikoff who are apparently proposing two large cutblocks near Bonanza Creek Marsh; W. King, pers. comm.). MM has attempted to promote awareness and opposition to these cumulative developments by liaising with local stewardship groups (i.e., Slocan Watershed

Streamkeepers Society, Slocan Lake Stewardship Society, Bonanza Biodiversity Corridor Committee, Kootenay Connect, etc.), writing letters to BC Rec Sites and Trails and FLNRORD as part of her targeted stewardship follow-up, but to date all proposed developments have proceeded.

The Revelstoke breeding site on private land in a residential neighborhood near the Illecilliwaet River (newly discovered this year) is arguably one of the most in need of immediate stewardship follow-up, given the repeated local cases of heron breeding site habitat loss, encroachment, human disturbance, as well as colony abandonment and reproductive failure that have been documented in this area, due primarily to land developments fueled by the adjacent ski hill and recreational activities (Machmer 2017). MM contacted the local FLNRORD Ecosystem Specialist (Cory Legebokow, pers. comm.) to alert him to this new breeding site and explore possible options, given the site is entirely located on private land in a residential zone. MM distributed heron stewardship brochures and talked with landowners having herons on or adjacent to their properties (at this site and all other occupied sites).

Over the years, several landowners have agreed to be "nest stewards" (i.e., to watch over these sites and report any disturbances or out of the ordinary activities occurring nearby). On May 2nd, MM received a call from a nest steward (V. Davidson, pers. comm.) in Parson who observed unsettled herons flying around near the Parson Eastside breeding site where some forest clearing activity was underway uphill on a community pasture. During the incubation and nesting period, such activity can cause herons to fly up off their nests, providing access to nest predators, like corvids and eagles which can quickly decimate a heronry. MM immediately called the RAPP line and the Golden CO (A. Desjardins, pers. comm.) drove to Parson that same morning to check on tree clearing activity, which was apparently deferred to a later date, after the birds fledged. Such rapid responses and pro-active intervention can save a heronry (in this case 10 active nests) from reproductive loss and/or complete abandonment.

Goal 2: Conservation and Stewardship Follow-up – A WHA boundary was delineated and mapped (Figure 3) incorporating all of the active heron nest trees (in mature Douglas-fir), several alternate nest stands with age class 7-8 Douglas-fir buffered from roads and human disturbance, as well as two small wetlands, and nests of Pileated Woodpecker, Brown Creeper, as well as several nests used by cavity nesting ducks (including wood ducks). The adjacent private landowner to the south is extremely vigilant and has been a heron nest steward for the last four years. Twelve of the fourteen active heron nests were successful again this year producing an estimated 26 fledglings. It is hoped that these values will provide a compelling case for approval of this site as a heron WHA.

4.0 CONCLUSIONS

With emphasis on four focal areas of interest, this project has assisted in "bridging" between heron inventories of the entire Columbia Basin. Targeted investigation and stewardship follow-up at any new occupied sites will continue in future years.

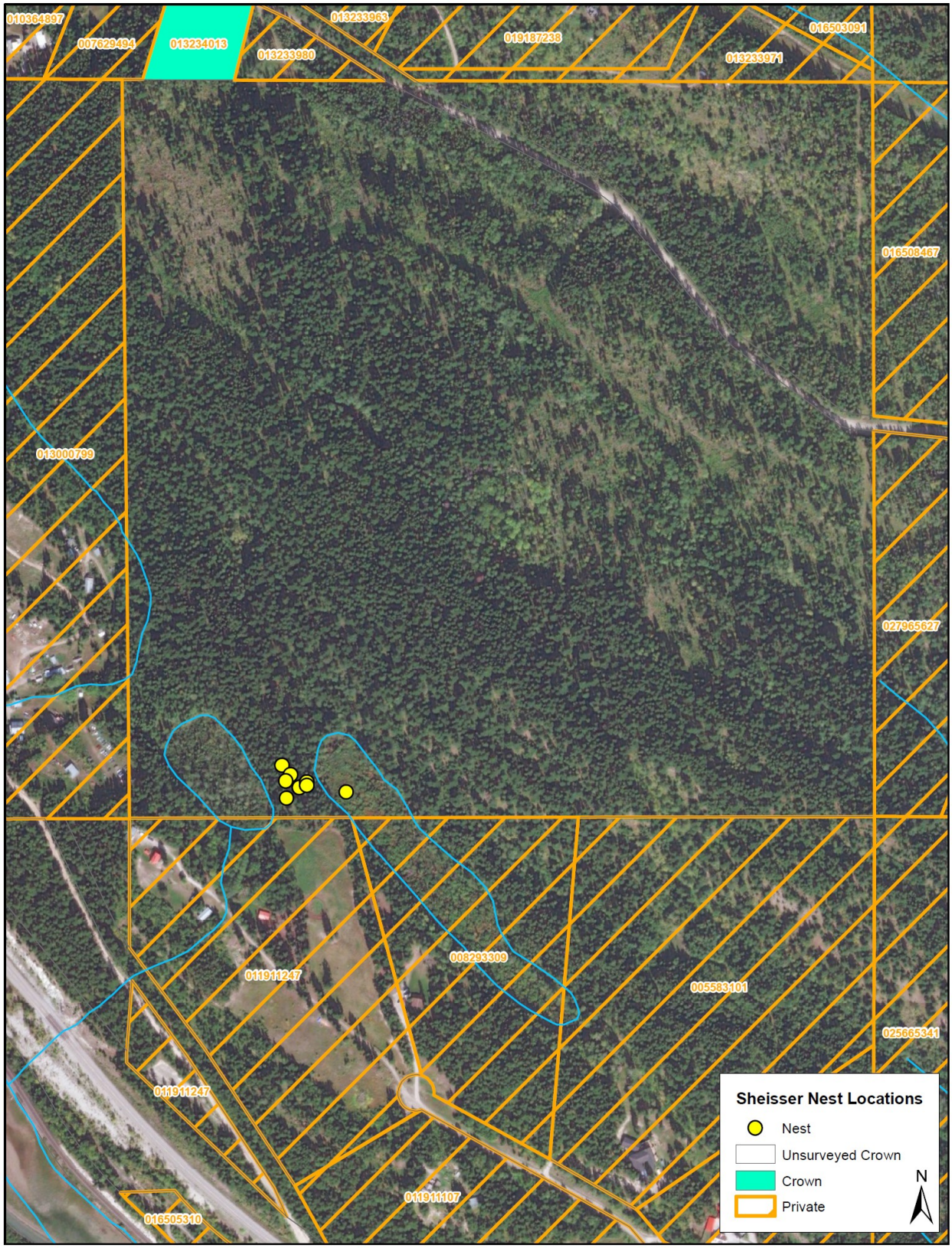
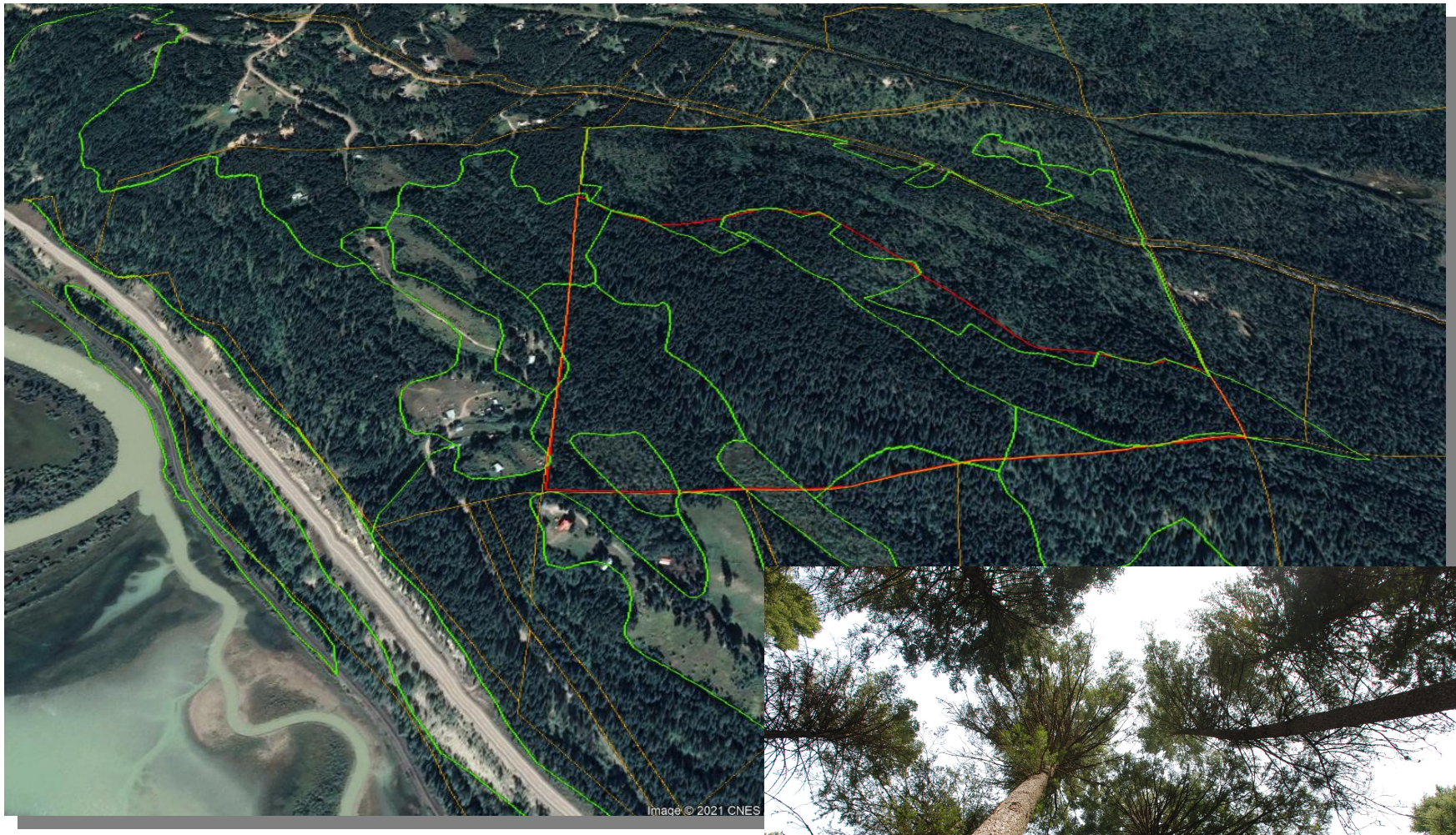


Figure 2. Square crown land parcel at Schiesser Road south of Nicholson (showing active heron nests between the two small wetlands) proposed as a WHA.



Figures 3. Delineated boundary for proposed WHA (red) at Schiesser Road south of Nicholson.

Figure 4 (right): Stand structure in the proposed WHA with mature and veteran Douglas-fir selected as nest trees in these age class 6-8 stands.

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APPENDIX 1: Kootenay Connect Focal Corridors