Clowhom Project Water Use Plan

Monitor of Wildlife Use in Wetlands Affected by Dam Operations

Implementation Year 12

Reference: COMMON-1
Clowhom Lake Reservoir Wildlife Census

Study Period: April 2017 to March 2018

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Executive Summary

Wildlife census of a small wetland complex at the north end of Clowhom Lake Reservoir was developed by BC Hydro and implemented by the shíshálh Nation, in 2006. This project is part of the BC Hydro Watershed Use Planning process. The wetland complex, selected for its proximity to the upper reservoir changes with managed water levels from reservoir operation. The intent of the project is track and record area use, by wildlife, over a 20-year period.

Data collected in 2017 are provided in this summary report and submitted to BC Hydro for inclusion in a master database. The data from the census surveys will be used in future analysis of reservoir operations, using changes in wildlife use of the area as the metric.

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1.0 Introduction

In 2017/2018 the shíshálh First Nation and BC Hydro completed the 12th Year of a 20-year monitoring program intended to document wildlife utilization adjacent and and within the edge of a wetland complex. This wetland complex is located at the head of the Clowhom Lake Reservoir. This data report presents survey data collected during the fourth year of the third "rotation" in the survey cycle. Each "rotation" consists of a 4-year period.

As in previous years, the wetland complex continues to be influenced by changes in reservoir levels due to hydroelectric operations and reservoir management at Clowhom Falls Dam. This monitoring program, as originally implemented through recommendations made in BC Hydro's Water Use Planning (WUP) process, documents wildlife use at various times in the year following a travelling count on predetermined transect(s). The purpose of the survey data collection is to review the area use against known operational change in the reservoir.

This report presents the results of the 2017/2018 field-sampling season.

2.0 Study Area

The study area for the census was first delineated in 2006 and is comprised of a wetland complex. The wetland is located at the northeastern end of Clowhom Lake Reservoir, approximately 500 meters upstream from the lake and adjacent to the Clowhom River mainstem (**Figure 1**). The area is located in low elevation Coastal Western Hemlock Dry Maritime (CWHdm) biogeoclimatic subzone, which has a climate consisting of cool summers and mild winters. The study area is back-flooded cyclically throughout the year by Clowhom Lake Reservoir. The back-flooding is a result of storage needs and changes in lake stage height resulting in inundation into the treed shoreline. Natural inundation also occurs in the spring and fall following freshet events that occur in the upper Clowhom River drainage.

The study area is approximately 40 hectares in size and is characterized by a mix of deciduous and conifer forest of various seral stages, a diverse shrub and herbaceous understory, and a large area of wetland grasses and sedges along the reservoir's shoreline. Vegetation cover has been undisturbed since the census began in 2006 and details of the polygons are reported in *Bates* (2008).

3.0 Methods

3.1 Wildlife Census

A biologist and technician with the shíshálh Nation conduct the wildlife census following a predetermined schedule (**Table I**). The census area has remained unchanged and is referenced in *Bates* (2007).

Census surveys were conducted mid to late month and completed within a 3 to 4 hour period post-sunrise. The date, time and reservoirs stage height at the start of each survey is provided in **Table II**.

As previously reported, the crew follows geo-referenced transects (*Bates,* 2007) starting at Transect-T1. The crew walks a predetermined route, noting the following information:

- Wildlife species present;
- Habitat type detected in; and
- Type of detection.

Data collection relies on wildlife sounds and observed presence and/or use.

Three to four censuses are conducted each year during different months. Sample months were pre-determined using a seasonal rotating schedule (**Table I**). Staggered monthly survey times ensure data collected is seasonally representative of the wetland over the project's life and that each calendar year is completed. The 20-year study duration ensures that a total of five censuses are completed for each calendar month. In the event weather prevents access to the area the schedule is adjusted in an attempt to ensure that over a rotation period, all months are sampled.

Data is recorded in the field then translated into an Excel® spreadsheet and attached to the annual data report.

Table I. Schedule for the third rotation (2014-2018) of the Clowhom Lake Reservoir wildlife census surveys. The schedule will be updated for the next rotation and dates missed because of unforeseen problems will be added in 2018 onwards.

Field Census	**Sample Rotation (3rd) (Year)**			
	1 (2014/2015)	2 (2015/2016)	3 (2016/2017)	**4 (2017/2018)**
1	June	May	April	August
2	September	October	May	February
3	November	January	July	March
4	-	-	-	-

The objective within each rotation block, is to have samples that represent each season at least 3 times ensuring each month is represented. All census/surveys use the same transects approximated and shown in *Bates* (2007). These transects were reconciled with new more accurate data in 2018 and the re-aligned transects are shown in (**Figure 2**).

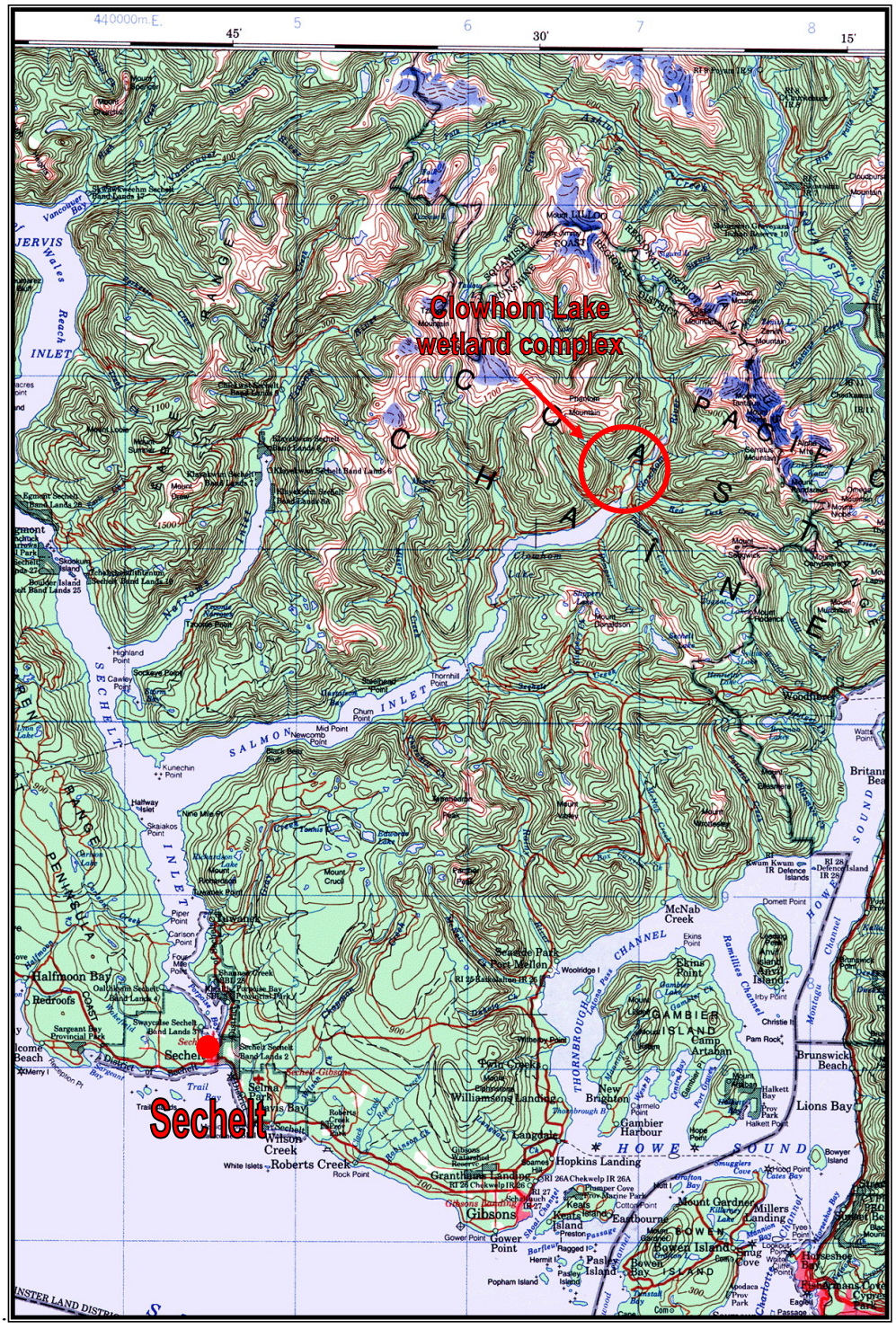

Figure 1: The approximate location of Clowhom Lake Reservoir wetland complex census area.

Table II. The date, time and reservoir stage height for each census survey conducted in the 2017/2018-field season.

Census	Date	Start time (am)	Finish Time (am)	Reservoir Stage (m)
1	August 20, 2017	6:20	8:50	50.18
2	February 9, 2018	Cancelled	-	-
3	March 24, 2018	8:00	10:30	47.93

3.2 Data Entry

Data is entered into a spreadsheet for future analysis. The spreadsheet format remains the same as previous years and is based on a format reported by *Bates* (2007, 2008). Data will eventually be collated as a time series in order to analyze for any temporal trends in species diversity.

For each species identified during a wildlife survey, supplementary data was also collected, documenting general vegetation community type and associated structure in and around the detection (*Bates*, 2008).

4.0 Results

4.1 Wildlife Census

Two census surveys were conducted in 2017/2018. These were; August 20, 2017 and March 24, 2018. The scheduled February survey was cancelled after the crew had engine problems with the boat. This date will be re-scheduled in the next rotation. Data spreadsheets detailing the results are included in the attached Appendix (**Appendix 1**).

5.0 Discussion

5.1 Wildlife Census

The 2017/2018 wildlife surveys were hampered by poor weather and logistics problems. The original sample schedule, reported in 2016/2017, had a sample date proposed for February 2018. This sample day was cancelled after the crew boat had engine problems in Salmon Inlet. Poor weather and snow in March resulted in the "pushing" of the date back to ensure the roads were accessible.

The original ToR called for the completion of the census mid month (*BC Hydro*, 2005) but over the course of the sample years the schedule has changed. In 2017 the field crew attempted to realign the timing to meet the ToR. This was not possible in March.

The important component for the study's success is the continued involvement of field staff familiar with the methodology. The pairing of a skilled biologist (biologist is the same individual that started the project in 2006) and technician continues to allow capacity

building among the technical staff and consistency in the data collection. It is anticipated that the crew will remain the same for the completion of the third "rotation" and that techniques and methodology will remain unchanged.

One amphibian species was observed outside the transect area. A Western Toad (*Anaxyrus borealis*) was observed on the road west of the study area during the August 20, 2107 site visit. This species is yellow listed with populations in BC considered secure (BC Ministry of Environment 2017).

Several amphibian species including Western Toad are known to utilize the forest and wetland habitat at the head of Clowhom Reservoir with this wetland having a high diversity of wildlife species (Evelyn and Stiles 2014).

It was also noted that the area surveyed has had nesting boxes placed at various locations. This effort to encourage use of the area by various avian species is part of another non-related project.

5.2 Vegetation Typing

New aerial photography was flown in October 2016. The collection of aerial photography is required to monitor changes in the vegetation of the Clowhom wetland and area. Vegetation community extent and structure in this area will be confirmed by comparing the 2010 and 2017 aerial photography.

Vegetation typing is required once during each census "rotation". In consultation with BC Hydro, vegetation typing and field verification will be completed in 2018. Vegetation surveys to be completed in 2018 will complete the third survey rotation timeframe.

6.0 Conclusion

In conclusion, the 2017/2018-sample season had logistical issues out of the control of the field crew. In order to capture these time periods, the schedule in 2018/2019 will be realigned. Components of the repeated wildlife use-monitoring program continue to yield data adjacent to and within the wetland complex and polygons.

7.0 Recommendations

- The Year-4 census in the "Third Rotation" of the wildlife use monitoring has been completed using a modified schedule. In 2018/2019 the study transects should be ground truthed and realigned using more accurate spatial data.

- Sample months that were missed in this rotation should be included in the next rotation, ensuring the objectives originally identified under the ToR.

- Efforts to document activities funded by the Coastal Bridge Compensation Program and creation of habitats under this program should be included in future data reporting. In particular activities in or on monitoring transects (Screech Owl nest boxes).

- Locations of transects should be re-surveyed. There is concern the spatial data for the transects may vary. The transects and the permanent markers should be re-established.

8.0 References

Bates, D.J. 2007. Clowhom Lake Water Use Plan - Clowhom Lake wildlife census - Year 1. Resource Management Department, shíshálh Nation, Sechelt, BC.

Bates, D.J. 2008. Clowhom Lake Water Use Plan - Clowhom Lake wildlife census - Year 2. Resource Management Department, shíshálh Nation, Sechelt, BC.

BC Hydro, 2005. Clowhom Lake Water Use Plan - Monitoring Program Terms of Reference. BC Hydro, Burnaby, BC.

BC Ministry of Environment. 2017. BC Species and Ecosystems Explorer. BC Conservation Data Centre.

Evelyn, M and D. Stiles. 2014. Surveys of Species at Risk and their Associated Habitats in the Clowhom Watershed – Year 1. Prepared to Fish and Wildlife Compensation Program. Halcyon Professional Services and Sunshine Coast Wildlife Project

9.0 Appendices

Appendix 1. Data collected from wildlife census in 2017

Clowhom Wildlife Survey	
Date	20/08/2017 (i.e., 20 August 2017)
Weather	Cloud Cover: 100; Precipitation: None; Wind: 0 (absent).
Site Conditions	Lake/reservoir very low. No continuous connectivity of water between reservoir and wetland. Lots of mosquitoes near marsh. Landslide on southeast side of reservoir above Powder Main. Wetland to lake transition zone had some standing water and moist soils. Four new nest boxes (swallow/chickadee) in marsh on small trees but not accessible to check for usuage.
Surveyors	Greg Ferguson, Jerry Johnson
Time Started	6:20 AM
Time Finished	8:50 AM
Sunrise	6:13 AM
Temperature	14 ˚C

Transect 1 (T1A to T1B) Runs East/West		**Time Start: 6:20 Time Finish: 6:50**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
Golden-crowned Kinglet (1, 1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple), Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Chestnut-backed Chickadee (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Calling
American Robin (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Western Tanager (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Steller's Jay (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Great Blue Heron (1)	Lake	Visual (along north end of reservoir)
Canada Goose (5)	Lake	Visual (along north part of channel across from wetland)

Transect 2 (T2A to T2B) Runs North/South		**Time Start: 6:51 Time Finish: 7:35**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
Roosevelt Elk (13, 1)	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry)	Beds (13, somewhat old but made during summer), Tracks (1 set)
Marsh Wren (1)	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry)	Calling
Steller's Jay (1, 3)	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry), Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling, visual
Cedar Waxwing (2, 13)	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry), Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling, visual
Dark-eyed Junco (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling, visual
European/Black Slug (1)	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry)	Visual
Downy Woodpecker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
American Robin (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Band-tailed Pigeon (4)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (adults flying in small flock north over forest)
Western Tanager (3)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Black-headed Grosbeak (2)	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry)	Visual (juveniles)
Douglas Squirrel (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling

Transect 4 (T4B to T4A) Runs East/West		**Time Start: 7:36 Time Finish: 8:05**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
Varied Thrush (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Black-tailed Deer (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Tracks (1 set)
Steller's Jay (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Golden-crowned Kinglet (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Paper Wasp (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (nest fallen or pulled down)
Pacific Wren (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Douglas Squirrel (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Roosevelt Elk (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Tracks, browse (looked at least 1 month old)
European/Black Slug (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Banana Slug (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual

Transect 5 (T5A to T5B) Runs North/South		**Time Start: 8:06 Time Finish: 8:20**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
Pacific Wren (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling

Transect 3 (T3A to T3B) Runs West/East		**Time Start: 8:21 Time Finish: 8:50**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
Golden-crowned Kinglet (1, 1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple), Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Pacific Sideband Snail (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Visual (1 empty shell)
Banana Slug (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (white)
Western Tanager (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Northern Flicker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Roosevelt Elk (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Tracks, browse (looked at least 1 month old)
Black-headed Grosbeak (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Vaux's Swift (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (adults flying south and north over forest)
Steller's Jay (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Belted Kingfisher (1)	Lake	Calling (along south channel across from wetland)

Total Number of Species	**25**	
Species List	Note: Includes all sign: feeding, scat, tracks, hair, calling, etc.	**Additional Note:** Some individual species observered on transects were likely repeat sightings on other transects.
Golden-crowned Kinglet		
Chestnut-backed Chickadee		
American Robin		
Western Tanager		
Steller's Jay		
Great Blue Heron		
Canada Goose		
Roosevelt Elk		
Marsh Wren		
Cedar Waxwing		
Dark-eyed Junco		
European/Black Slug		
Downy Woodpecker		
Band-tailed Pigeon		
Black-headed Grosbeak		
Douglas Squirrel		
Varied Thrush		
Black-tailed Deer		
Paper Wasp		
Pacific Wren		
Banana Slug		
Pacific Sideband Snail		
Northern Flicker		
Vaux's Swift		
Belted Kingfisher		

Total Number of Species by Habitat Type	
Number of Species	**Habitat Type**
1	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock,
3	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)
19	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage
6	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry)
3	Lake

Other Species Observed or Reported in Area (i.e., greater than 100m from plot area or not on transects)		
North Pygmy Owl (1)	On southeast side of reservoir (on hillside) at 6:35am	Calling (continuously)
Northern Flicker (1)	South of station T1A at 8:30am	Calling
Osprey (1)	Flying north along road at 8:45am	Visual (flying)
Western Toad (1)	Crossing north across Clowhom Lake mainline at 530am when driving up to survey site (UTM: 10 460951 5506933 +/-100m)	Visual
Western Screech Owl	Two nest boxes are placed in trees along transect 4	Visual
Swallow/chickadee	Four nest boxes placed up on small trees in wetland lake transition zone	Visual

Clowhom Wildlife Survey	
Date	24/03/2018 (i.e., 24 March 2018)
Weather	Cloud Cover: 50; Precipitation: None; Wind: 0.
Site Conditions	Lake/reservoir very low. No continuous connectivity of water from reservoir to wetland. Wetland transition zone to lake had standing water and stream water flowing into reservior. Approximately 1-2 cm of semi-fresh (yesterday) snow on ground, particularly in open areas. Searched (2 people for 20 minutes) small, shallow pools of water south/southeast of station TB1 for amphibians and egg masses but none were observed (track log and photos). Pools look too shallow and we've had very few sightings of adult amphibians in our survey area.
Surveyors	Greg Ferguson, Jerry Johnson
Time Started	8:00 AM
Time Finished	10:30 AM
Sunrise	7:08 AM
Temperature	2 ˚C

Transect 1 (T1A to T1B) Runs East/West		**Time Start: 8:00 Time Finish: 8:30**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
Roosevelt Elk (2, 1, 2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar), Upland mixed deciduous/coniferous forest (hemlock, cedar, maple), Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Scat, browse (skunk cabbage)
America Robin (1, 1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple), Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Pacific Wren (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Calling
Golden-crowned Kinglet (1, 3)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple), Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Red-breasted Sapsucker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Drumming
Hairy Woodpecker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Canada Goose (2)	Lake	Calling

Transect 2 (T2A to T2B) Runs North/South		**Time Start: 8:51 Time Finish: 9:20**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
Red-breasted Sapsucker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Hairy Woodpecker (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (male and female)
America Robin (7)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Song Sparrow (1)	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry)	Calling
Downy Woodpecker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (female)
Golden-crowned Kinglet (3)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Black-capped Chickadee (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
American Marten (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, dead (cougar kill, photos, waypoint)

Transect 4 (T4B to T4A) Runs East/West		**Time Start: 9:21 Time Finish: 9:45**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
Roosevelt Elk (1-2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Scat, browse (skunk cabbage)
Pacific Wren (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
America Robin (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Varied Thrush (3)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Steller's Jay (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling

Dark-eyed Junco (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling

Transect 5 (T5A to T5B) Runs North/South		**Time Start: 9:46 Time Finish: 10:06**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
Roosevelt Elk (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Scat

Transect 3 (T3A to T3B) Runs West/East		**Time Start: 10:07 Time Finish: 10:30**
Species and Number/Habitat ()	**Habitat**	**Observation of behaviour**
America Robin (1, 3)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple), Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Varied Thrush (3)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Golden-crowned Kinglet (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Steller's Jay (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Pacific Wren (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Brown Creeper (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Ruffed Grouse (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Roosevelt Elk (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Scat
Dark-eyed Junco (1)	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry)	Visual, calling
Red-breasted Sapsucker (1)	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry)	Calling
Canada Goose (6)	Lake	Calling, visual

Total Number of Species	**16**	
Species List	Note: Includes all sign: feeding, scat, tracks, hair, calling, etc.	**Additional Note:** Some individual species observered on transects were likely repeat

Roosevelt Elk
America Robin
Pacific Wren
Golden-crowned Kinglet
Red-breasted Sapsucker
Hairy Woodpecker
Canada Goose
Song Sparrow
Downy Woodpecker
Black-capped Chickadee
American Marten
Varied Thrush
Steller's Jay
Dark-eyed Junco
Brown Creeper
Ruffed Grouse

Total Number of Species by Habitat Type		
Number of Species	**Habitat Type**	
1	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	
4	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	
14	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	
3	Flat wetland/lake tranistion zone (bog orchid, sphagnum, bog cranberry)	
1	Lake	
Other Species Observed or Reported in Area (i.e., greater than 100m from plot area or not on transects)		
American Robin (1)	Southwest of transect T1A to T1B at 8:05am	Calling
Varied Thrush (1)	Southwest of transect T1A to T1B at 8:05am	Calling
Common Raven (1)	Southwest of transect T2A to T2B at 9:00am	Calling
Swallow/chickadee	Four nest boxes placed up on small trees in wetland lake transition zone still present	Visual