

Clowhom Lake Water Use Plan

Monitor of Aquatic Wildlife in Wetlands Affected by Dam Operations

Implementation Year 9

Reference: COMMON-1

Clowhom Lake Wildlife Census

Study Period: April 1, 2014 to March 31, 2015

D.J. Bates, and G. Ferguson
Resource Management Department
Shíshálh Nation
PO Box 740, Sechelt, BC
V0N 3A0

March 31, 2015

Executive Summary

A wildlife and habitat census of a small wetland complex at the north end of Clowhom Lake reservoir was developed and initiated in 2006 by the shíshálh Nation under the direction of BC Hydro and its Watershed Use Planning process. The wetland complex was selected for its proximity to the reservoir and to examine how changing water levels from reservoir operation influence the wetland's flora and fauna over a 20-year period.

Data collected in 2014/2015 are provided in this summary report. The data will be analyzed following the tenth year of sampling.

Table of Contents

	Page
Executive Summary	2
Table of Contents	3
List of Figures	3
List of Tables	3
List of Appendices	4
1.0 Introduction.....	5
2.0 Study Area	5
3.0 Methods	5
3.1 Wildlife Census	5
3.2 Data Entry	6
4.0 Results	9
4.1 Wildlife Census	9
5.0 Discussion	9
5.1 Wildlife Census	9
6.0 Conclusion	10
7.0 Recommendations	10
8.0 References.....	10

List of Figures

- Figure 1: Location of Clowhom Lake Reservoir wetland complex census area.
The study area was established in 2006 and remains unchanged.....7
- Figure 2: Approximate location of the Clowhom Lake Reservoir wildlife census
transects. There are 5 transects in total and the start and finish is marked
with a 1.25-metre metal posts (*Bates, 2007*).....8

List of Tables

- Table I. The scheduled survey months for Rotation 3 (2014-2018) of the
Clowhom Lake Reservoir wildlife census*.....6
- Table II. The date, time and reservoir stage height for each census survey
conducted in the 2014/2015-field season.....9

List of Appendices

Appendix 1. Data collected from the Clowhom Lake Reservoir wildlife census in 2014 and 2015.....	11
---	----

1.0 Introduction

In 2014/2015, the shíshálh First Nation and BC Hydro completed the 9th Year of a 20 year monitoring program documenting wildlife utilization of a wetland complex at the head of the Clowhom Lake reservoir. This data report presents the survey data collected during the first year of the third “Rotation” in the survey cycle. Each “Rotation” consists of a 4-year period.

As in previous years, reservoir stage levels influence the wetland complex. 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. The intent is to relate use, and any subsequent change in use to the operations of the reservoir.

This report presents the results of the 2014/2015 sampling season.

2.0 Study Area

The study area for the census remains the same as delineated in 2006 and is comprised of wetland complex and immediate riparian vegetation. The “wetland” is located at the northeastern end of Clowhom Lake, approximately 500 meters upstream from the lake, adjacent to the Clowhom River mainstem (**Figure 1**). The area is located within low elevation Coastal Western Hemlock Dry Maritime biogeoclimatic subzone, with a climate consisting of cool summers and mild winters. Average annual temperature is 8°C.

The study area is approximately 40 hectares in size and characterized by a mix of deciduous and conifer forest within the riparian zone, a diverse shrub and herbaceous understory, and a large area of wetland grasses and sedges along the reservoir’s shoreline. The vegetation cover has been unaltered since the census began in 2006. Details of vegetation typing and 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 – 4 hour period post-sunrise. The survey date, time and reservoir stage at the start of each survey is provided in **Table II**.

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

- 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 and mid-month dates are targeted. The 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.

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

Table I. The scheduled survey months for Rotation 3 (2014-2018) of the Clowhom Lake Reservoir wildlife census*.

Census Number	Year (Rotation 3)			
	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	-	-	December	-

* Within the Rotation block, the 4 seasons are surveyed 3 times to ensure each month is covered. All census/surveys use the same transects established in 2006 (*Bates, 2007*) (**Figure 2**)

3.2 Data Entry

Data is entered into a spreadsheet for future analysis and the format remains the same as previously reported by *Bates (2007, 2008)*. Upon the completion of Year 10, data will be collated in order to analyze for temporal trends in species diversity.



Figure 1: Location of Clowhom Lake Reservoir wetland complex census area. The study area was established in 2006 and remains unchanged.

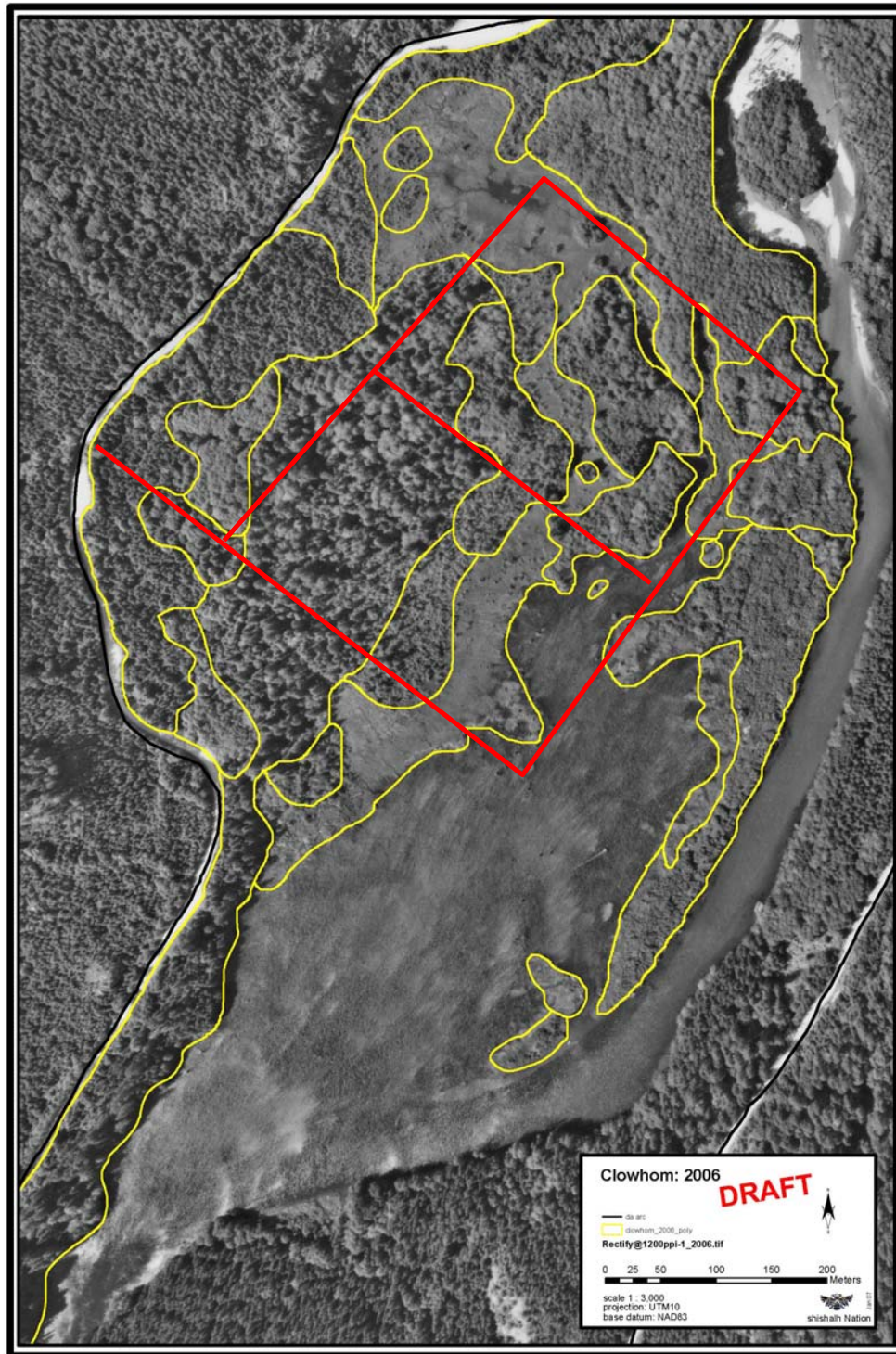


Figure 2: Approximate location of the Clowhom Lake Reservoir wildlife census transects. There are 5 transects in total and the start and finish is marked with a 1.25-metre metal posts (*Bates, 2007*).

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).

Table II. The date, time and reservoir stage height for each census survey conducted in the 2014/2015-field season.

Census	Date	Start time	Finish Time	Reservoir Stage (m)
1	June 13, 2014	5:59	9:19	50.39
2	September 23, 2014	7:50	11:50	52.81
3	November 14, 2014	8:24	10:30	50.21

4.0 Results

4.1 Wildlife Census

Three census surveys were conducted in 2014/2015: June 13, September 23 and November 14, 2014. Data spreadsheets are included in the attached Appendix (**Appendix 1**).

5.0 Discussion

5.1 Wildlife Census

The 2014/2015 wildlife censuses proved successful and the protocols followed will remain the same for the 2015/2016 census.

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. The change in timing resulted from difficulty in accessing the site during winter months. It is not anticipated that the shift to dates later in each month will have any effect on the final outcome. Efforts are made, wherever possible to maintain the approximate sample date.

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 has not changed and remains the same individual that started the project in 2006) and technician continues to allow capacity building among the technical staff. It is anticipated that the crew will remain the same for the completion of the second "rotation" and that techniques and methodology will remain unchanged.

6.0 Conclusion

In conclusion, the 2014/2015-sample season was considered a success. Components of the wildlife use-monitoring program have yielded data within the wetland complex and identified polygons.

7.0 Recommendations

The Year-1 census in the third “Rotation” of the wildlife use monitoring has been successfully completed. Continued use of study transects and vegetation typing has remained unchanged in 2014/2015.

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.

9.0 Appendices

Appendix 1. Data collected from the Clowhom Lake Reservoir wildlife census in 2014 and 2015.

Clowhom Wildlife Survey		
Date	13/06/2014 (i.e., 13 June 2014)	
Weather	Cloud Cover: 90; Precipitation: None; Wind: 0 (absent).	
Site Conditions	Lake/reservoir level very low. Majority of streams running through forest were dry. Flat wetland/forest area was inundated by standing water.	
Surveyors	Greg Ferguson, Jerry Johnson, Clark Joe	
Time Started	5:40 AM	
Time Finished	8:10 AM	
Sunrise	5:10 AM	
Temperature	13 °C	
Transect 1 (T1A to T1B) Runs East/West		Time Start: 5:40 Time Finish: 6:10
Species and Number/Habitat ()	Habitat	Observation of behaviour
Chestnut-backed Chickadee (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Calling
Pacific Wren (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Singing
American Robin (1, female)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Douglas Squirrel (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling, tracks
Columbian Black-tailed Deer (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Tracks
European Black Slug (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Black Bear (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Scat
Common Yellowthroat (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling, singing
Spotted Sandpiper (1)	Lake	Singing
Song Sparrow (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Singing
Transect 2 (T2A to T2B) Runs North/South		Time Start: 6:11 Time Finish: 6:35
Species and Number/Habitat ()	Habitat	Observation of behaviour
American Robin (1, male)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling, visual
Swainson's Thrush (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling
Song Sparrow (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Singing
Pacific-slope Flycatcher (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling
European Black Slug (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Visual
Chestnut-backed Chickadee (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Singing
Varied Thrush (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Singing
Hairy Woodpecker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Pacific-slope Flycatcher (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Transect 4 (T4B to T4A) Runs East/West		Time Start: 6:36 Time Finish: 7:15
Species and Number/Habitat ()	Habitat	Observation of behaviour
Douglas Squirrel (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, tracks
Golden-crowned Kinglet (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Singing

Banana Slug (3)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
European Black Slug (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
America Robin (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Paper Wasp - Native or European? (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (old small nest)
Pacific-slope Flycatcher (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Warbling Vireo (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Singing
Robust Lancetooth Snail (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (empty shell)
Ruffed Grouse (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Flight
Chestnut-backed Chickadee (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Paper Wasp - Native or European? (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual (old small nest)
European Black Slug (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual
Banana Slug (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual
Transect 5 (T5A to T5B) Runs North/South		Time Start: 7:16 Time Finish: 7:30
Species and Number/Habitat ()	Habitat	Observation of behaviour
Paper Wasp - Native or European? (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual (old small nest)
Stellar's Jay (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Singing
Warbling Vireo (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Singing
Swainsons Thrush (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Douglas Squirrel (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual
American Robin (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual, calling
Transect 3 (T3A to T3B) Runs West/East		Time Start: 7:35 Time Finish: 8:10
Species and Number/Habitat ()	Habitat	Observation of behaviour
Swainsons Thrush (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling, singing
Pacific Sideband Snail (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual (empty shell)
Stellar's Jay (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Singing
Chestnut-backed Chickadee (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Singing
America Robin (3)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling, singing
Pacific-slope Flycatcher (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Hairy Woodpecker (1, female)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Pacific Wren (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Singing
Northern Flicker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Singing, calling, visual

Stellar's Jay (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Chestnut-backed Chickadee (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Singing
Pine Siskine (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Singing, visual
Swainsons Thrush (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Common Yellowthroat (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Singing
Tree Swallow (2)	Lake	Visual
Northern-roughwinged Swallow (1)	Lake	Visual
Violet-green Swallow (4)	Lake	Visual
Canada Goose (2)	Lake	Visual
Total Number of Species	28	
Species List	Note: Includes all sign: feeding, scat, tracks, hair, calling, etc.	Additional Note: Some individual species observed on transects were
Chestnut-backed Chickadee		
Pacific Wren		
American Robin		
Douglas Squirrel		
Columbian Black-tailed Deer		
European Black Slug		
Black Bear		
Common Yellowthroat		
Spotted Sandpiper		
Song Sparrow		
Swainson's Thrush		
Pacific-slope Flycatcher		
Varied Thrush		
Hairy Woodpecker		
Golden-crowned Kinglet		
Banana Slug		
Paper Wasp - Native or European?		
Warbling Vireo		
Robust Lancetooth Snail		
Ruffed Grouse		
Stellar's Jay		
Pacific Sideband Snail		
Northern Flicker		
Pine Siskine		
Tree Swallow		
Northern-roughwinged Swallow		
Violet-green Swallow		
Canada Goose		
Total Number of Species by Habitat Type		
Number of Species	Habitat Type	
10	Second growth forest ~20m tall, brushed,	
2	Upland mixed deciduous/coniferous forest	
20	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	
7	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	
5	Lake	
Other Species Observed or Reported in Area (i.e., greater than 100m from plot area or not on transects)		
Sooty Grouse (1)	Heard east of first transect on far side of lake.	Calling

Clowhom Wildlife Survey		
Date	23/09/2014 (i.e., 23 September 2014)	
Weather	Cloud Cover: 50, increasing during survey; Precipitation: None at start, very light rain at 8:50 that didn't last long, heavier and steady rain started at 11:15 and continued until end of survey;	
Site Conditions	Lake/reservoir level very high. Majority of streams running through forest were dry. Flat wetland/lake transition area was inundated by standing water. New trees fallen (wind throw)	
Surveyors	Greg Ferguson, Jerry Johnson	
Time Started	7:50 AM	
Time Finished	11:50 AM	
Sunrise	7:02 AM	
Temperature	13 °C	
Transect 1 (T1A to T1B) Runs East/West		Time Start: 7:50 Time Finish: 8:40
Species and Number/Habitat ()	Habitat	Observation of behaviour
Tree Frog (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Douglas Squirrel (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual, calling
Golden-crowned Kinglet (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Stellar's Jay (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Northern Flicker (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Drumming, visual, calling
Pacific Wren (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Calling
Unknown passerine (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Calling, flying
Banana Slug (2)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Visual (white individual)
American Robin (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Calling
Pacific Wren (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Golden-crowned Kinglet (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Douglas Squirrel (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Stellar's Jay (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Black Bear (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Scat
Sharp Shinned Hawk (1, juvenile/immature)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling, visual, flying (hunting along forest/wetland margin)
Belted Kingfisher (1)	Lake	Calling, visual
Roosevelt Elk (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Scat
Northern Pygmy Owl (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Transect 2 (T2A to T2B) Runs North/South		Time Start: 8:45 Time Finish: 9:35
Species and Number/Habitat ()	Habitat	Observation of behaviour
Golden-crowned Kinglet (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
American Robin (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Sharp Shinned Hawk (1, juvenile/immature)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling, flying (hunting along forest/wetland margin)
Tree Frog (1)	Lake	Calling
Roosevelt Elk (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Tracks (fresh), scat

Cougar (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Tracks (middle and at north end of transect, photo)
Woolly Bear Caterpillar (2)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Visual (photo)
Northern Flicker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Stellar's Jay (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Columbian Black-tailed Deer (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Tracks
Hairy Woodpecker (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling
Unknown Large Accipiter (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Flying (heading north in a tucked dive)
Band-tailed Pigeon (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Flying (heading west up high)
Banana Slug (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (white individual)
Unknown passerine (6)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Transect 4 (T4B to T4A) Runs East/West		Time Start: 9:35 Time Finish: 10:35
Species and Number/Habitat ()	Habitat	Observation of behaviour
Stellar's Jay (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Douglas Squirrel (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Hairy Woodpecker (1, male)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Banana Slug (6)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
European Black Slug (4)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (photo)
Chestnut-backed Chickadee (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Possible Cougar (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Scratches on tree (photo)
Roosevelt Elk (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Tracks, rub (fresh)
Pacific Wren (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Ruffed Grouse (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, flying (flew into second growth forest)
Daddy Longlegs (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual (photo)
Golden-crowned Kinglet (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Varied Thrush (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Pacific Wren (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Roosevelt Elk (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Scat (fresh)
Chestnut-backed Chickadee (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Transect 5 (T5A to T5B) Runs North/South		Time Start: 10:40 Time Finish: 11:00
Species and Number/Habitat ()	Habitat	Observation of behaviour
Roosevelt Elk (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Rub (fresh - after last survey, photo)

Ruffed Grouse (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual, flying, scat
Douglas Squirrel (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual, calling
Banana Slug (3)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual
Golden-crowned Kinglet (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Transect 3 (T3A to T3B) Runs West/East		Time Start: 11:05 Time Finish: 11:50
Species and Number/Habitat ()	Habitat	Observation of behaviour
Stellar's Jay (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual, calling
Banana Slug (5)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Visual (three white individuals)
European Black Slug (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	Visual
Douglas Squirrel (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)	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	Feeding (skunk cabbage), scat, tracks (possible bugle to the northeast ~400m)
Columbian Black-tailed Deer (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Scat, tracks, feeding
Douglas Squirrel (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Golden-crowned Kinglet (3)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Stellar's Jay (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Unknown passerine (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Flying, visual, calling
Total Number of Species	25	
Species List	Note: Includes all sign: feeding, scat, tracks, hair, calling, etc.	Additional Note: Some individual species observed on transects were likely repeat
Tree Frog		
Douglas Squirrel		
Golden-crowned Kinglet		
Stellar's Jay		
Northern Flicker		
Pacific Wren		
Black Bear		
Sharp Shinned Hawk		
Belted Kingfisher		
Unknown passerine		
Banana Slug		
American Robin		
Roosevelt Elk		
Cougar		
Woolly Bear Caterpillar		
Columbian Black-tailed Deer		
Hairy Woodpecker		
Unknown Large Accipiter		
Band-tailed Pigeon		
European Black Slug		
Northern Pygmy Owl		
Chestnut-backed Chickadee		
Ruffed Grouse		
Daddy Longlegs		

Varied Thrush		
Total Number of Species by Habitat Type		
Number of Species	Habitat Type	
9	Second growth forest ~20m tall, brushed, sloped,	
7	Upland mixed deciduous/coniferous forest	
20	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	
5	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	
2	Lake	
Other Species Observed or Reported in Area (i.e., greater than 100m from plot area or not on transects)		

Clowhom Wildlife Survey		
Date	14/11/2014 (i.e., 14 November 2014)	
Weather	Cloud Cover: 0; Precipitation: None; Wind: 0 (no leaf movement).	
Site Conditions	Lake/reservoir level was very low. No to very little water coming out of lake at hydro dam. Some of the streams in the forest had running water but others were dry. Some streams and wet areas along transect 5 showed signs of flooding (fine sediment deposition). Wetland/lake transition area was primarily covered by standing water, with some small areas being frozen. The ocean from Sechelt Creek to the most north eastern point before Clowhom Lake was frozen with a layer of ice 1-2 cm thick. Vegetation in wetland frosty. No snow yet in area.	
Surveyors	Greg Ferguson, Jerry Johnson	
Time Started	8:24 AM	
Time Finished	10:30 AM	
Sunrise	7:24 AM	
Temperature	Minus 1 °C	
Transect 1 (T1A to T1B) Runs East/West		Time Start: 8:24 Time Finish: 8:43
Species and Number/Habitat ()	Habitat	Observation of behaviour
American Robin (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Belted Kingfisher (1)	Lake	Calling
Mallard (1)	Lake	Visual, flying
Transect 2 (T2A to T2B) Runs North/South		Time Start: 8:44 Time Finish: 9:06
Species and Number/Habitat ()	Habitat	Observation of behaviour
Mallard (1)	Lake	Calling
Stellar's Jay (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling, visual
Red-breasted Sapsucker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, feeding
Golden-crowned Kinglet (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Transect 4 (T4B to T4A) Runs East/West		Time Start: 9:07 Time Finish: 9:37
Species and Number/Habitat ()	Habitat	Observation of behaviour
Stellar's Jay (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Northern Flicker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, calling
Douglas Squirrel (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Stellar's Jay (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual
Varied Thrush (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual, calling
Golden-crowned Kinglet (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Pacific Wren (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Transect 5 (T5A to T5B) Runs North/South		Time Start: 9:38 Time Finish: 9:56
Species and Number/Habitat ()	Habitat	Observation of behaviour
Golden-crowned Kinglet (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Transect 3 (T3A to T3B) Runs West/East		Time Start: 9:57 Time Finish: 10:30
Species and Number/Habitat ()	Habitat	Observation of behaviour

Golden-crowned Kinglet (4)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling, visual
Douglas Squirrel (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Chestnut-backed Chickadee (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Pacific Wren (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Total Number of Species	11	
Species List	Note: Includes all sign: feeding, scat, tracks, hair, calling, etc.	Additional Note: Some individual species observed on transects were
American Robin		
Belted Kingfisher		
Mallard		
Stellar's Jay		
Red-breasted Sapsucker		
Golden-crowned Kinglet		
Northern Flicker		
Douglas Squirrel		
Varied Thrush		
Pacific Wren		
Chestnut-backed Chickadee		
Total Number of Species by Habitat Type		
Number of Species	Habitat Type	
5	Second growth forest ~20m tall, brushed, sloped, dry	
0	Upland mixed deciduous/coniferous forest (hemlock,	
8	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	
0	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	
2	Lake	
Other Species Observed or Reported in Area (i.e., greater than 100m from plot area or not on transects)		