

Clowhom Project Water Use Plan

**Monitor of Aquatic Wildlife in Wetlands Affected by
Dam Operations**

Implementation Year 8

Reference: COMMON-1

Clowhom Lake Wildlife Census

Study Period: April 2013 to March 2014

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

September 15, 2014

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 during this study period is presented in this report and will be submitted to BC Hydro for inclusion in a master database and future analysis of reservoir operations on established wetland habitat and subsequent use by area wildlife. .

Table of Contents

	Page
Executive Summary	2
Table of Contents	3
List of Figures	3
List of Tables	3
List of Appendices	3
1.0 Introduction	4
2.0 Study Area	4
3.0 Methods	4
3.1 Wildlife Census.....	4
3.2 Data Entry.....	5
4.0 Results	7
4.1 Wildlife Census.....	7
5.0 Discussion	7
5.1 Wildlife Census.....	7
6.0 Conclusion	7
7.0 Recommendations	7
8.0 References	7
List of Figures	
Figure 1: Location of Clowhom Lake wetland complex census area. The study area was established in 2006 and remains unchanged.....	6
List of Tables	
Table I: Schedule of the second rotation for the wildlife census to be completed for the Clowhom Lake wetland complex.....	5
List of Appendices	
Appendix 1: Data collected from wildlife census in 2013 and 2014.....	9

1.0 Introduction

In 2013/2014, the shíshálh First Nation and BC Hydro completed the 8th 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 4th year of the second “Rotation” in the survey cycle. Each “Rotation” consists of a 4-year period.

As in previous years, the wetland complex continues to be affected by changes in reservoir levels due to hydroelectric operations and reservoir management at the 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. 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 2013/2014 sampling season.

2.0 Study Area

The study area for the census remains the same as delineated in 2006 and is comprised of a wetland complex. 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 in low elevation Coastal Western Hemlock Dry Maritime biogeoclimatic subzone, which has a climate consisting of cool summers and mild winters. Average annual temperature is 8°C. As is past years, the study area is back-flooded cyclically by Clowhom Lake as storage and lake stage height changes. The wetland is also inundated during spring and fall freshet events that occur in the 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 ages, 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 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 – 4 hour period post-sunrise.

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:

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

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

Two or three 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.

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

Table 1. The schedule of the second rotation for the wildlife census to be completed for the Clowhom Lake wetland complex.

Census Number	Year (Rotation 2)			
	1 (2010/2011)	2 (2011/2012)	3 (2012/2013)	4 (2013/2014)
1	June	July	August	April
2	October	November	December	September
3	January	March		March

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 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).

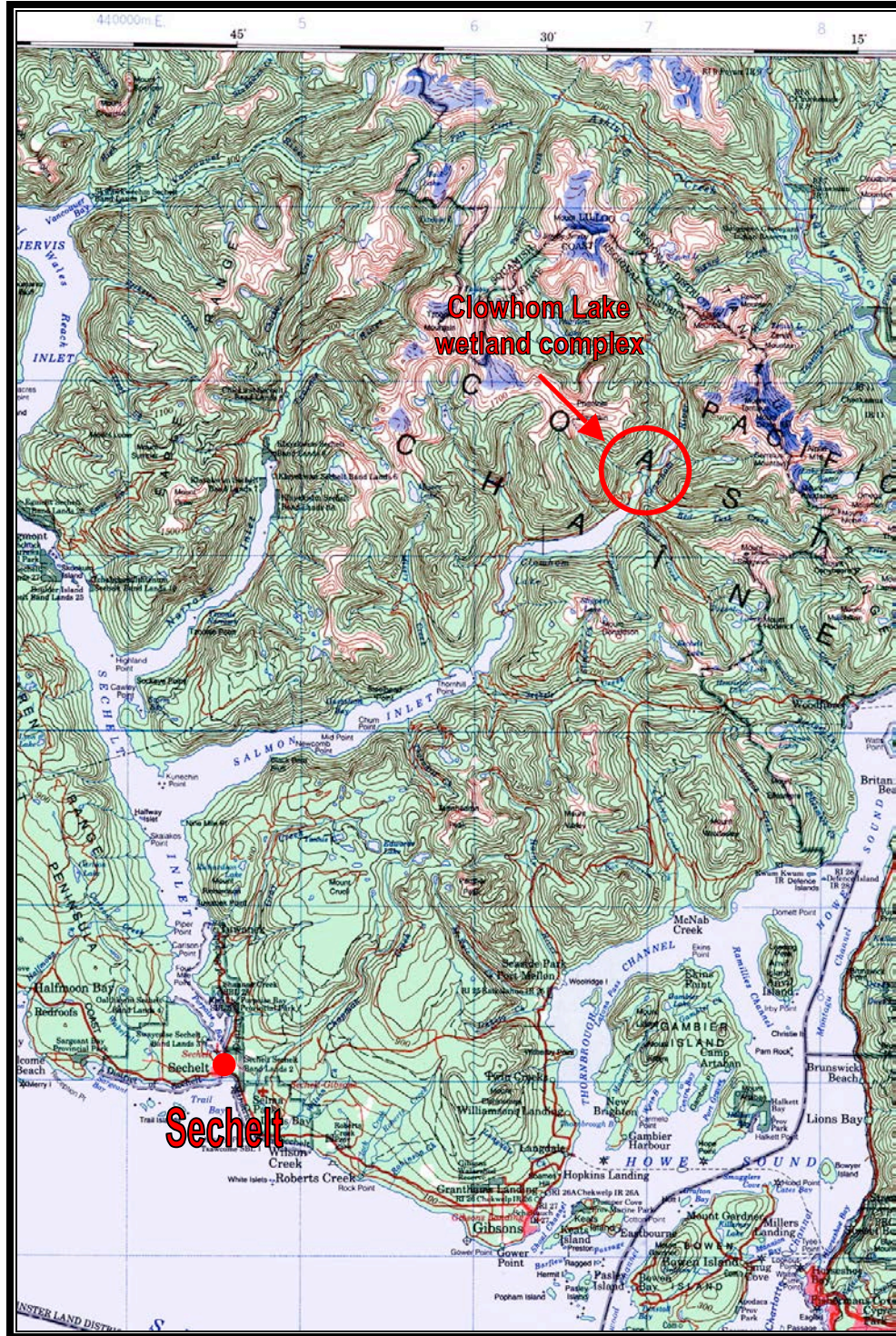


Figure 1: Location of Clowhom Lake wetland complex census area. The study area was established in 2006 and remains unchanged.

4.0 Results

4.1 Wildlife Census

Three census surveys were conducted in 2013/2014: April 20 and September 26, 2013 and February 23, 2013. Data spreadsheets are included in the attached Appendix (**Appendix 1**).

5.0 Discussion

5.1 Wildlife Census

The 2013/2014 wildlife censuses proved successful and the protocols followed will remain the same for the 2014/2015 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 2013/2014-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-4 census in the second "Rotation" of the wildlife use monitoring has been successfully completed. Continued use of study transects and vegetation typing has remained unchanged in 2013/2014.

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 wildlife census in 2013 and 2014.

Clowhom Wildlife Survey

Date 20/04/2013 (i.e., 20 April 2013)
 Cloud Cover: 90; Precipitation: None; Wind: 0 (absent).
 Lake/reservoir level low (very little water in channel east of survey area). Streams running through forest and wetland were moderate to high. Flat wetland/forest area was moist with frequent pools of standing water.
 Surveyors Greg Ferguson, Peter Jackson, Jerry Johnson
 Time Started 7:00 AM
 Time Finished 9:21 AM
 Sunrise 6:10 AM
 Temperature 11 °C

Transect 1 (T1A to T1B) Runs East/West

Species and Number/Habitat ()	Habitat	Time Start: 7:00	Time Finish: 7:30	Observation of behaviour
Pacific Wren (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)			Calling
Varied Thrush (1, 1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar) & Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Calling
Banana Slug (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)			Visual
Roosevelt Elk (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)			Tracks (1 set, fresh)
American Robin (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Calling, visual
Red-breasted Sapsucker (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Drumming, calling, pair
Violet-green Swallow (3)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry) & Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Visual, flying, visiting nesting cavity in snag (photo)
Yellow-rumped Warbler (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Visual, calling

Transect 2 (T2A to T2B) Runs North/South

Species and Number/Habitat ()	Habitat	Time Start: 7:30	Time Finish: 8:07	Observation of behaviour
Common Yellow-throat (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Visual (male)
American Robin (3)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Calling, visual, flying
Rufous Hummingbird (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Visual, calling (male)
Golden-crowned Kinglet (2)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Calling
Red-winged Blackbird (1)	Lake			Calling
Song Sparrow (1,1)	Lake & Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Calling
Harry Woodpecker (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Drumming, visual, feeding (male and female)
Pacific Chorus Frog (4)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Calling (near middle of transect)
Chestnut-backed Chickadee (3)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Visual, calling
Canada Goose (2)	Lake			Visual, calling, flying
Mallard (2)	Lake			Visual, calling, flying
Ruby-crowned Kinglet (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Calling, visual
Columbian Black-tailed Deer (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Tracks (1 set)
Banana Slug (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)			Visual
Ruffed Grouse (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Calling (wing drumming)

Transect 4 (T4B to T4A) Runs East/West

Species and Number/Habitat ()	Habitat	Time Start: 8:07	Time Finish: 8:30	Observation of behaviour
Roosevelt Elk (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Feeding (fresh), tracks (1 set), scat (fresh)
Varied Thrush (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Calling
American Robin (2)	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 (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Calling
Golded-crowned Kinglet (1, 1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage & Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)			Calling
Ruffed Grouse (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage			Calling (wing drumming)

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: 8:32 Time Finish: 8:45**

Species and Number/Habitat ()	Habitat	Observation of behaviour
Columbian Black-tailed Deer (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Tracks (fresh along creek bank)
Golden-crowned Kinglet (4)	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 3 (T3A to T3B) Runs West/East **Time Start: 8:48 Time Finish: 9:21**

Species and Number/Habitat ()	Habitat	Observation of behaviour
Pacific Wren (1, 1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar) & Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Golden-crowned Kinglet (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Roosevelt Elk (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar) & Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Tracks (1 set, large, male?)
Banana Slug (1, 1, 1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Varied Thrush (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Rufous Hummingbird (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling, visual, feeding
Stellar's Jay (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage & Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling
Chestnut-backed Chickadee (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
European Slug (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual
Raven (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Visual, flying
American Robin (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling
Yellow-rumped Warbler (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Visual, calling
Green-winged Teal (2)	Lake	Visual
Red-winged Blackbird (2)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Visual (male and female)

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 sightings on other transects.

Pacific Wren
Varied Thrush
Banana Slug
Roosevelt Elk
American Robin
Red-breasted Sapsucker
Violet-green Swallow
Yellow-rumped Warbler
Common Yellow-throat
Rufous Hummingbird
Golden-crowned Kinglet
Red-winged Blackbird
Song Sparrow
Harry Woodpecker
Pacific Chorus Frog
Chestnut-backed Chickadee
Canada Goose
Mallard
Ruby-crowned Kinglet
Columbian Black-tailed Deer
Ruffed Grouse

Stellar's Jay
 European Slug
 Raven
 Green-winged Teal

Total Number of Species by Habitat Type	
Number of Species	Habitat Type
6	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)
14	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage
15	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)

Blue (Sooty population) Grouse (1)	Unknown	Calling to southwest of transect T1A-T2B
Pacific Chorus Frog	Wetland/pond to the northeast of survey area (right side of Clowhorn Mainline at 16km)	Egg masses observed at UTM 10 5514239 469189 (photos)

Clowhom Wildlife Survey

Date 26/09/2013 (i.e., 26 September 2013)
 Cloud Cover: 0; Precipitation: None; Wind: 0 (absent).
 Lake/reservoir level high (water up to edge of vegetation). Streams running through forest and wetland absent to low. Flat wetland/forest area was inundated by standing water. Lots of fungi fruiting. Sun hit survey site ~8:40am or ~1.5 hours after sunrise.
 Surveyors Greg Ferguson, Jerry Johnson
 Time Started 7:30 AM
 Time Finished 10:40 AM
 Sunrise 7:04 AM
 Temperature 6 °C

Transect 1 (T1A to T1B) Runs East/West**Time Start: 7:30 Time Finish: 8:20****Species and Number/Habitat (0) Observation of behaviour**

Stellars Jay (1, 1) **Habitat** Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar) & Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage, Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry) Calling, visual
 Varied Thrush (1) Calling
 Golden-crowned Kinglet (1) Calling
 Chestnut-backed Chickadee (2) Calling
 Pacific Wren (1) Calling
 Banana Slug (4) Visual
 American Robin (1) Calling
 Paper Wasp (1) Visual of old nesting material
 Canada Goose (1) Visual
 Roosevelt Elk (1) Two wallows (likely from earlier in summer)

Transect 2 (T2A to T2B) Runs North/South**Time Start: 8:20 Time Finish: 8:55****Species and Number/Habitat (0) Observation of behaviour**

American Widgeon (2) **Habitat** Lake Visual, calling
 Goldeneye (1 Female) Lake Visual
 Roosevelt Elk (1) Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry) One wallow, one bed, scat (likely from earlier in summer)
 Hare (likely snowshoe) (1) Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry) Scat (fairly fresh)

Transect 4 (T4B to T4A) Runs East/West**Time Start: 8:55 Time Finish: 9:32****Species and Number/Habitat (0) Observation of behaviour**

Pacific Wren (2, 1) **Habitat** Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage & Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar) Calling
 Pine Siskin (2) Flying (overhead)
 Song Sparrow (1) Calling
 Harry Woodpecker (1) Calling, visual
 Varied Thrush (1) Calling
 Golden-crowned Kinglet (2) Calling
 Banana Slug (3, 5) Visual

Transect 5 (T5A to T5B) Runs North/South**Time Start: 9:32 Time Finish: 9:52****Species and Number/Habitat (0) Observation of behaviour**

Golden-crowned Kinglet (4) **Habitat** Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar) Calling
 Chestnut-backed Chickadee (4) Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar) Calling
 Banana Slug (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) Calling

Transect 3 (T3A to T3B) Runs West/East**Time Start: 9:56 Time Finish: 10:40****Species and Number/Habitat (0) Observation of behaviour**

Pacific Wren (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Golden-crowned Kinglet (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Varied Thrush (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Chestnut-backed Chickadee (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Calling
Banana Slug (2)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)	Visual
Red-breasted Nuthatch (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
American Robin (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling, visual
Sharp-shinned Hawk (2 Juveniles)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Flying, visual, calling
Stellar's Jay (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling
Northern Flicker (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Dark-eyed Junco (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling
Belted Kingfisher (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Calling, visual
Douglas Squirrel (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Calling
Yellow-rumped Warbler (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, flying
Vaux Swift (5)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage	Visual, flying (overhead)
Roosevelt Elk (8)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)	Beds (likely from earlier in summer)
Spotted Sandpiper (1)	Lake	Calling

Total Number of Species 25

Species List

Additional Note: Some individual species observed on transects were likely repeat sightings on other transects.

Stellars Jay		
Varied Thrush		
Golden-crowned Kinglet		
Chestnut-backed Chickadee		
Pacific Wren		
Banana Slug		
American Robin		
Paper Wasp		
Canada Goose		
Roosevelt Elk		
American Widgeon		
Goldeneye		
Hare (likely snowshoe)		
Pine Siskin		
Song Sparrow		
Harry Woodpecker		
Red-breasted Nuthatch (1)		
Sharp-shinned Hawk (2 Juveniles)		
Northern Flicker		
Dark-eyed Junco		
Belted Kingfisher		
Douglas Squirrel		
Yellow-rumped Warbler		
Vaux Swift		
Spotted Sandpiper		

Total Number of Species by Habitat Type

Number of Species	Habitat Type
6	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)
16	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage
6	Flat wetland/lake transition 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)

Northern Flicker (1)

East side of lake

Calling

Common Raven (1)

West side of Clowhom Mainline approximately 100m

Calling

Clowhom Wildlife Survey	
Date	23/02/2014 (i.e., 23 February 2014)
Weather	Cloud Cover: 100; Precipitation: Light snow; Wind: 0 (absent).
Site Conditions	Lake/reservoir level very low. Streams running through forest and wetland were low. Flat wetland/forest area was inundated by standing water. Snow on road was approximately 8 cm deep and fell recently (last 5 days). In survey area snow on ground was present in forest openings and on surrounding trees and shrubs.
Surveyors	Greg Ferguson, Peter Jackson (Jerry Johnson onsite but didn't walk survey area)
Time Started	7:55 AM
Time Finished	10:10 AM
Sunrise	7:15 AM
Temperature	2 °C
Transect 1 (T1A to T1B) Runs East/West	
Species and Number/Habitat (0)	Habitat
No species observed on transect	
Transect 2 (T2A to T2B) Runs North/South	
Species and Number/Habitat (0)	Habitat
Hairy Woodpecker (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage
Golden-crowned Kinglet (2)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)
Transect 4 (T4B to T4A) Runs East/West	
Species and Number/Habitat (0)	Habitat
Varied Thrush (2)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage
Spotted Towhee (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage
Dark-eyed Junco (1)	Flat mixed deciduous/coniferous wetland forest with Skunk Cabbage
Pacific Wren (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)
Transect 5 (T5A to T5B) Runs North/South	
Species and Number/Habitat (0)	Habitat
Golden-crowned Kinglet (1)	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)
Transect 3 (T3A to T3B) Runs West/East	
Species and Number/Habitat (0)	Habitat
Golden-crowned Kinglet (2)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)
Chestnut-backed Chickadee (2)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)
Varied Thrush (1)	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)
Common Raven (1)	Flat wetland/lake transition zone (bog orchid, sphagnum, bog cranberry)
Total Number of Species	8
Species List	Note: Includes all sign: feeding, scat, tracks, hair, calling, etc.
Hairy Woodpecker	
Golden-crowned Kinglet	
Varied Thrush	
Spotted Towhee	
Dark-eyed Junco	
Pacific Wren	
Chestnut-backed Chickadee	
Common Raven	
Total Number of Species by Habitat Type	
Number of Species	Habitat Type
2	Second growth forest ~20m tall, brushed, sloped, dry (spruce, hemlock, cedar)
3	Upland mixed deciduous/coniferous forest (hemlock, cedar, maple)

Additional Note: Some individual species observed on transects were likely repeat sightings on other transects.

