

Appendix 5-6-C Prosperity Mine 2006 Bird Survey Field Report

C.1 Methods

C.2.1 Raptor Surveys

Call/Playback Survey

Raptor call/playback surveys were conducted as per established protocols (RIC 2001). Surveys for diurnal raptors occurred from May 15 to 22, 2006, and surveys for nocturnal raptors occurred on May 16, 17, 19, 21 and 22, 2006. Survey stations covered a broad range of habitat types within the proposed mine development area (19 stations¹), access road (4 stations), and transmission line corridor (17 stations). Target species for this survey were selected based on known occurrence in the project area, and behaviour (i.e., likelihood of a vocal response to recorded calls). Eleven species were selected: merlin, northern goshawk, Cooper's hawk, sharp-shinned hawk, barred owl, flammulated owl, great gray owl, great horned owl, long-eared owl, northern pygmy-owl, and northern saw-whet owl. One of these, the flammulated owl, is a KI.

Diurnal raptor call/playbacks were conducted in the afternoon between 13:00 and dusk (~21:00 hours). Nocturnal raptor calls were played from dusk until as late as 00:15. Upon arrival at a station, field personnel waited a minimum of two minutes to adjust to the ambient noise and to listen for spontaneous raptor calls. Calls for each species were broadcast using an MP3 player connected to a portable megaphone. Each call was played for a total of three minutes: 30 seconds of recorded calls were followed by 30 seconds of silence, repeated three times. Each 30 seconds of calls was broadcast in a different direction (i.e., 120° apart). When a target species was heard broadcasting ceased and the next species call was played. Owl calls were played in order from smallest to largest species, as calls of larger owls may spook and subsequently silence the responses of smaller owls in the area. Field personnel listened for five-minute intervals between owl species.

Burrowing Owl Survey

In response to the sighting of a burrowing owl in the area (E. O'Brien, UNBC, pers. comm., June 2006) species-specific call/playback surveys were conducted on June 13 and 14, 2006 in the Dog Creek area near the proposed transmission line. Methods used for the burrowing owl were the same as those used for the other raptor surveys (see above); however, because burrowing owls are active during the day calls were played between 09:00 and 13:00. Thirteen stations were surveyed.

Aerial Nest Survey

The locations of active nest sites identified during previous studies in the minesite area were re-visited (overflown) to determine their present status. This survey occurred in

¹ 10 Madrone stations and 9 new stations

conjunction with the aerial (helicopter) surveys for migratory waterfowl conducted in mid-September (see below).

C.2.2 Breeding Bird Survey

Breeding bird surveys were conducted from June 13 to 23, 2006 according to established protocols (RIC 1999). Surveys commenced 0.5 hours before sunrise and continued until approximately 10:30. Point count (PC) stations were established and visual and auditory observations of birds were recorded during a five-minute survey period. Data recorded included the species, date, location (UTM coordinates), start time, end time, and weather conditions. If the wind exceeded three on the Beaufort scale (12–19 km/h) or precipitation was more than a drizzle, surveys were suspended due to the difficulty in detecting bird songs. The radius of detection was variable according to the observer's visual and/or auditory detection ability.

Transects consisting of 15–20 PC stations spaced at 200 m intervals were distributed within the mine site area (total number of stations = 42), transmission line corridor (total number of stations = 167) and along the access road (total number of stations = 17). Transects were stratified by different habitat types within the mine site area, and were placed within SEI units along the transmission line corridor. Twenty-seven of the PC stations surveyed in the mine site for this program had been originally surveyed by Madrone in the 1990s (Madrone 1999).

The species detected were compiled for each project component, and the mean number of birds and species detected were calculated to provide an indication of relative abundance and diversity.

C.2.3 Migratory Bird Surveys

Waterfowl Aerial Survey

Helicopter reconnaissance surveys were conducted during two separate weeks in September 2006. The objectives of the surveys were to document the occurrence of non-breeding waterfowl (moulting or migratory) within the mine site LSA and transmission line RSA. The survey area followed the proposed transmission line corridor and included the mine site area. The survey area included an area of 1 km on either side of the route. The helicopter hovered (≤ 30 m) above the wetland and waterfowl on the wetland were counted by species (RIC 1999b). Incidental wildlife sightings were also recorded. The first survey was conducted on two separate days (September 13 and 16, 2006) due to inclement weather. The second survey was conducted on September 24, 2006.

Migration Watch Survey

Migration watch surveys were conducted along the Fraser River in the vicinity of the proposed transmission line crossing. Surveys were generally conducted between 9:00 and 15:00, with stationary observers scanning the area (360°) for migratory birds. Observation stations were selected based on road access and the availability of unimpeded views. Table C–1 provides a summary of survey effort at each observation station.

Table C-1 Location, Dates and Times of Migration Watch Surveys

Station	UTM Coordinates	Date	Time
SW1	10 545676 5726053	September 12 2006	1130-1430
SW2	10 545772 5726827	September 14 2006	0920-1215
SW3	10 547770 5726677	September 14 2006	1235-1500
SW4	10 548393 5724972	September 25 2006	0900-1500
SW4	10 548393 5724972	September 26 2006	0900-1500
SW4	10 548393 5724972	September 27 2006	0900-1500
SW4	10 548393 5724972	September 28 2006	0900-1500

For each bird observation, the following information was recorded: initial bearing, distance from the observer, clinometer angle; and final bearing, distance from observer and clinometer angle. Flight path trajectories and flight heights above the ground were estimated using an algorithm generated in MS Excel[®]. The rate of bird passage was also estimated in birds/hour for non-passerine birds. Passerine species were noted, but they did not fly directionally. Consequently, passerines could not specifically be established as migrants and were not included in passage rate analysis.

Radar Surveys

The nocturnal passage of birds was monitored using a Furuno 1954C 12 kW open array radar unit mounted on top of a four-wheel drive truck, approximately 2 m above the ground. The radar unit was aimed north and scanned a vertical arc of 25°, rotating through 360° horizontally every three seconds to record bird activity in a horizontal plane (i.e., range, direction, speed). The scanning radius of the radar was set to 0.5 nautical miles, covering an estimated area of 920 x 1400 m. Radar works as line-of-sight, such that birds flying in “radar shadows” (ground clutter), behind trees, or hills, were not detected. This impact was reduced by selecting sites that minimized the size, location, and orientation of shadow zones. These sites were in areas where ground clutter or shadow zones were limited, and were a compromise between access, proximity to the proposed transmission line crossing over the Fraser River, and low shadow zones. The protocols for radar surveys were developed from standards established by the province for marbled murrelets (RISC 2006).

Each survey lasted two hours, with morning surveys beginning approximately two hours before sunrise and evening surveys beginning approximately at sunset. Data from the radar screen were manually recorded. For each target (bird or small groups of birds), the following information was recorded: time, number of targets, bearing to target, distance to target, flight bearing, and number of times target appears on screen (hits).

C.2.4 Waterfowl Brood Observations

Incidental observations of waterfowl broods were collected during amphibian surveys conducted June 13–23, 2006 and June 24–July 2, 2006. Other incidental observations of birds or raptor nests were compiled in Appendix 5-6-E.

C.2 Results

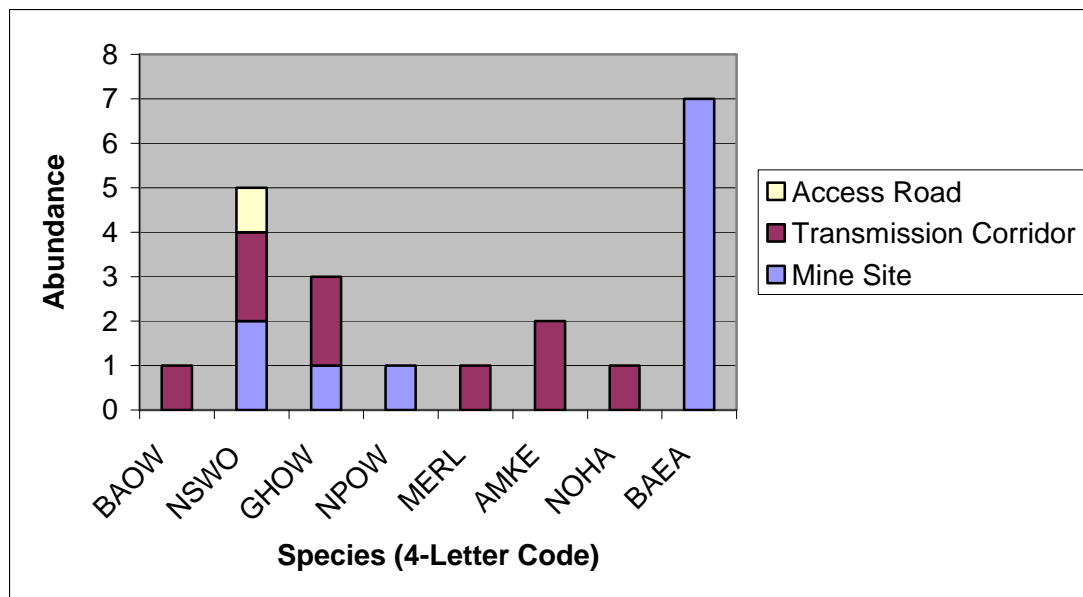
C.2.1 Raptor Surveys

Six species of raptors responded during call/playback surveys, and three additional species were visually observed during the surveys (Table C-2). Figure C-1 shows the cumulative species abundance of raptors observed² according to project component.

None of the previously identified nests were found during the 2006 survey. However, new nests observed during surveys (and incidentally) were recorded and are shown in Figure C-5 along with the previously identified nest site locations. A large stick nest was observed on the transmission corridor (10U 498500 5726053) on September 24, 2006 during the aerial waterfowl survey. While the species that used it could not be identified and its current activity status was undetermined, based on its size and the characteristics of the nest and tree, it was suspected to be that of a bald eagle.

Table C-2 Raptor Species Identified during Call/Playback Surveys

Species	Mine Site	Transmission Line Corridor	Access Road
American kestrel		X	
Bald eagle	X		
Barred owl		X	
Great-horned owl	X		
Merlin		X	
Northern harrier		X	
Northern pygmy-owl	X		
Northern saw-whet owl	X	X	X
Red-tailed hawk			X



² Includes incidental observations

Figure C–1 Cumulative Species Abundance for Raptors

C.2.2 Breeding Bird Survey

A total of 1626 birds from 75 species were detected during the breeding bird survey (Table C–3). The most common observations were of forest-dwelling passerines (Figure C–2). This is consistent with the Madrone data that listed the ten most abundant species (in descending order) as ruby-crowned kinglet, yellow-rumped warbler, white-winged crossbill, dark-eyed junco, pine siskin, American robin, Clark’s nutcracker, northern flicker and olive-sided flycatcher (Madrone 1999). The PC stations along the proposed transmission line yielded the largest number of species; however, the mean species diversity for the PC stations was similar between all three project components. A total of 25 birds from 13 species were recorded as incidental observations (Appendix 5-6-E).

Mine Site

A total of 254 birds were detected at 42 PC stations (Table C–3). Of these, 244 individuals were assigned to one of 31 species³. The number of birds detected at each station ranged from 2–16 (mean = 6, SD = 3.1). The number of species detected at each station ranged from 2–10 (mean = 4.3, SD = 1.9).

Transmission Line Corridor

A total of 1241 birds were detected at 167 PC stations (Table C–3). Of these, 1200 individuals were assigned to one of 67 species⁴. The number of birds detected at each station ranged from 1–19 (mean = 7.4, SD = 3.1). The number of species ranged from 1–12 (mean = 4.8, SD = 2).

Access Road

A total of 131 birds were detected at 17 PC stations (Table C–3). Of these, 130 were assigned to one of 29 species⁵. The number of birds detected at each station ranged from 4–12 (mean = 7.8, SD = 2.4). The number of species ranged from 4–9 (mean = 6.1, SD = 1.7).

Table C–3 Birds Detected during Breeding Bird Surveys in each Project Component Area

Species	Transmission Line Corridor		Mine Site		Access Road	
	#	Stations Detected	#	Stations Detected	#	Stations Detected
Alder Flycatcher	2	2	4	2		
American Bittern	1	1				
American Coot	4	4				
American Crow	4	4				
American Robin	132	89	23	15	13	9

³ Remaining birds consisted of 3 unidentified woodpeckers, 3 unidentified shorebirds, and 4 of unknown group

⁴ Remaining birds consisted of 13 unidentified woodpeckers, 3 unidentified flycatchers, and 25 of unknown group

⁵ Remaining bird was an unidentified woodpecker

Species	Transmission Line Corridor		Mine Site		Access Road	
	#	Stations Detected	#	Stations Detected	#	Stations Detected
Barn Swallow	1	1	5	2		
Black-backed Woodpecker	3	3	6	5		
Black-capped Chickadee	68	44			7	7
Brown-headed Cowbird	11	8	1	1	1	1
Blue Grouse	1	1	1	1		
Black Tern	2	2				
Boreal Chickadee	3	3				
Brewer's Blackbird	2	1				
Cassin's Vireo	4	4				
Cedar Waxwing	3	2				
Chipping Sparrow	109	75	13	10	10	7
Common Loon			2	2		
Common Raven	18	14			3	3
Common Snipe	8	8	1	1	2	2
Common Yellowthroat	4	3	7	5		
Dark-eyed Junco	107	62	28	23	10	8
Downy Woodpecker	3	3				
Evening Grosbeak	1	1				
Golden-crowned Kinglet	1	1				
Golden-crown Sparrow	1	1				
Gray Jay	24	20	1	1	3	2
Greater Yellowlegs			2	2		
Hermit Thrush	22	17	5	5	15	9
House Wren	2	2			1	1
Killdeer					1	1
Least Flycatcher	3	3				
Lincoln's Sparrow	1	1				
Marsh Wren	23	7				
MacGillivray's Warbler	69	48	4	3	1	1
Mountain Bluebird	11	9	1	1		
Northern Flicker	5	5	3	3	3	3
Northern Waterthrush					5	3
Northern Goshawk			1	1		
Orange-crowned Warbler	13	10	4	4	3	3
Olive-sided Flycatcher	36	28	4	3	9	7
Pine Siskin	5	1				
Pileated Woodpecker	3	3				
Red-breasted nuthatch	14	14	3	3	1	1
Ruby-crowned Kinglet	159	95	51	33	5	4
Red Crossbill	1	1				
Red-winged Blackbird			3	3		
Red-eyed Vireo	5	4			1	1
Ring-necked Duck	9	3				
Red-naped Sapsucker	1	1				

Species	Transmission Line Corridor		Mine Site		Access Road	
	#	Stations Detected	#	Stations Detected	#	Stations Detected
Red-tailed Hawk	1	1			1	1
Ruddy Duck	1	1				
Ruffed Grouse	7	7			5	5
Red-winged Blackbird	13	8				
Sandhill Crane	1	1				
Savannah Sparrow			10	6		
Sora	5	5				
Song Sparrow	37	18	21	11	5	2
Solitary Vireo					1	1
Swamp Sparrow	2	1	7	6		
Swainson's Thrush	76	53			6	5
Townsend's Solitaire	3	3	2	2		
Townsend's Warbler	22	15				
Tree Swallow	8	4				
Three-toed Woodpecker	1	1				
Varied Thrush	4	2				
Vesper Sparrow	8	5				
Violet-green Swallow	1	1				
Warbling Vireo	23	14			3	3
White-crowned Sparrow	1	1	5	4	4	4
Western Meadowlark	12	8				
Willow Flycatcher	7	5				
Wilson's Warbler	9	5	6	5		
Winter Wren			1	1	1	1
Western Wood-Pee wee	2	2			1	1
Yellow Warbler	1	1				
Yellow-rumped Warbler	56	42	19	16	10	8
Unknown Flycatcher	3	2				
Unknown Shorebird			3	2		
Unknown Woodpecker	13	13	3	3	1	
Unknown	25	19	4	3		
Total	1241	167	254	42	132	17

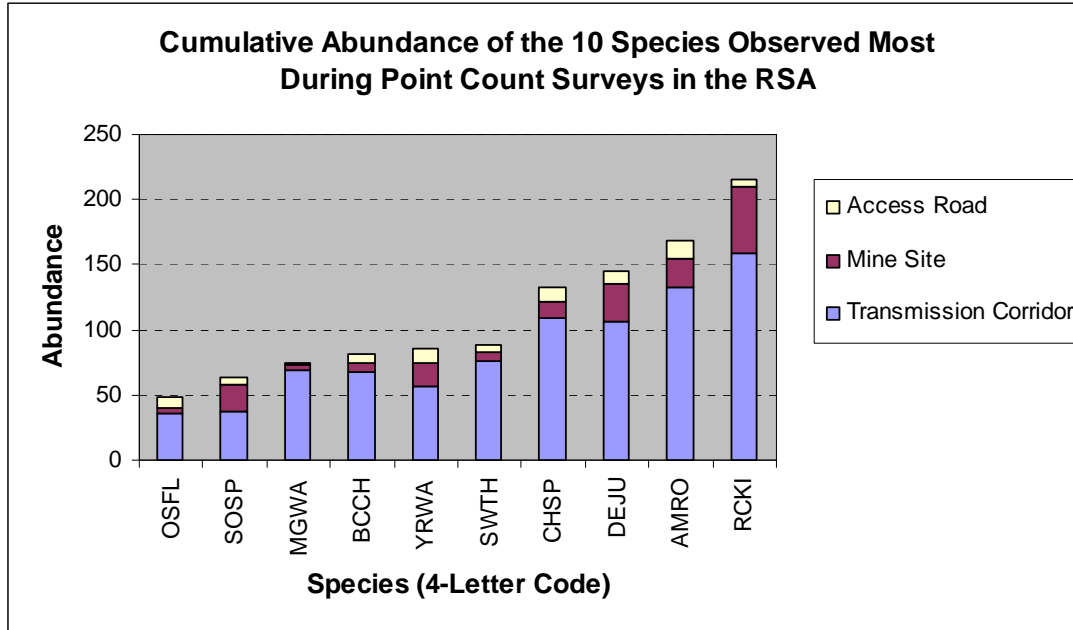


Figure C–2 Cumulative Species Abundance for the Most Common Birds Observed during the 2006 Breeding Bird Survey

C.2.3 Migratory Bird Surveys

During helicopter surveys conducted on September 13 and 16, 1100 waterfowl were observed on 34 wetlands, and 12 species were identified and five unknown groups were recorded (Table C–4). During the September 24 survey, 968 waterfowl were observed on 38 wetlands, and 11 species, including one shorebird species (great blue heron), were identified and four unknown groups were recorded (Table C–5).

Table C–4 Relative Abundance and Frequency of Waterfowl Observed during the Week 1 Aerial Survey (September 13 and 16, 2006)

Common Name	# Observed	# of Wetlands With Species
American Coot	101	11
American Widgeon	53	6
Barrow’s Goldeneye	2	1
Bufflehead	50	4
Blue-winged Teal	24	6
Canada Goose	28	2
Common Goldeneye	20	1
Common Loon	4	1
Diver Species	6	2
Goldeneye Species	70	6
Grebe Species	2	1
Lesser Scaup	169	5

Common Name	# Observed	# of Wetlands With Species
Mallard	472	25
Northern Shoveler	19	4
Ruddy Duck	4	1
Teal Species	20	1
Unknown	56	6
Total	1100	34

Table C–5 Relative Abundance and Frequency of Waterfowl Observed during the Week 2 Aerial Survey (September 24, 2006)

Common Name	# Observed	No. of Wetlands with Species
Green-winged Teal	10	1
American Coot	36	3
Bufflehead	99	8
Canada Goose	80	5
Common Goldeneye	4	1
Common Loon	2	1
Diver Species	69	9
Great Blue Heron	3	2
Goldeneye Species	22	4
Grebe Species	3	3
Lesser Scaup	111	16
Mallard	505	32
Northern Pintail	11	1
Northern Shoveler	6	2
Ruddy Duck	1	1
Unknown	9	3
Total	971	38

For both weeks combined, 2071 individuals were recorded in 15 species and 5 unidentified groups. Mallard was the most commonly observed species followed by lesser scaup, bufflehead, and American coot. Unidentified diving ducks were mainly comprised of late-moult birds that could not be identified due to the lack of speculum and other identifying plumage features. The majority of this group was likely female lesser scaup, (and to a lesser extent bufflehead and goldeneye). Table C–6 provides a list of waterfowl observed on each wetland and the survey date.

Table C–6 Species Abundance and Composition of each Wetland Observed during Aerial Surveys

W1	Mallard	60	10
	Great Blue Heron		2
	Lesser Scaup		2
	Bufflehead		70
	Diver Species		20

W2	Mallard	12	
	Lesser Scaup		23
	Ruddy Duck		1
W3	Mallard	6	8
	Lesser Scaup		3
W4	American Widgeon	35	
	Mallard	65	100
W5	Blue-winged Teal	3	
	Mallard	65	
	American Coot		20
	Grebe Species		1
W6	Northern Shoveler		3
	Mallard	110	10
	Lesser Scaup		6
	Canada Goose	2	
	Bufflehead		3
	American Coot	10	10
	Teal Species	20	
W7	American Widgeon	4	
	Mallard	20	3
	American Coot	10	
W8	American Widgeon	4	
	Mallard	12	10
	Canada Goose		15
W9	Mallard		5
	Lesser Scaup		3
	Bufflehead		6
	American Coot	9	
W10	Lesser Scaup		3
	Mallard	1	24
	American Coot	2	
	Diver Species		3
W11	American Widgeon	4	
	Blue-winged Teal	4	
	Mallard		65
	Lesser Scaup		4
W12	Mallard	2	20
	American Coot	4	
	Diver Species		20
W13	Mallard	14	19
W14	Mallard		8
	Lesser Scaup		10
	Canada Goose		22
	Bufflehead		4
	American Coot	10	
	Goldeneye species	20	3
W15	Mallard	15	50
W16	Mallard	2	6
	Diver Species		2
W17	Mallard	2	
W18	Bufflehead	18	
	Unidentified		1
W19*	Mallard	3	5

	Great Blue Heron		1
	Bufflehead	18	4
	Common Loon	4	2
	Diver Species	2	
	Unidentified		2
W21	Lesser Scaup		5
	American Coot	1	
	Diver Species		5
W22	American Widgeon	2	
	Mallard	2	2
	Goldeneye Species	4	
	Diver Species		3
W23	Mallard	10	
W24	Northern Shoveler	5	
	Mallard	3	
	Bufflehead	20	
	American Coot	42	
	Goldeneye Species	20	
	Unidentified	13	
W25	Northern Shoveler	6	
	Mallard	12	3
	American Coot	1	
	Diver Species		2
W26	Northern Shoveler	6	
	Mallard	24	4
	Lesser Scaup		12
	Bufflehead	10	
	American Coot	10	6
W27	Mallard		1
	Lesser Scaup	3	
	Canada Goose		19
	Grebe Species		1
W28	Mallard	4	
	Lesser Scaup	50	
	Bufflehead	2	
	Barrow's Goldeneye	2	
	Unidentified	10	
W29	Blue-winged Teal	3	
	Mallard	12	7
	Lesser Scaup	80	18
	Canada Goose	26	12
	Bufflehead		6
	Common Goldeneye	20	
	American Coot	2	
	Ruddy Duck	4	
	Grebe Species	2	
	Diver Species	4	
	Goldeneye Species		13
W30	Mallard		1
	Unidentified	6	
W31	Diver Species		4
	Unidentified	1	
W32	Blue-winged Teal	4	

	Mallard	10	17
	Lesser Scaup	30	
	Goldeneye Species	10	
W33	American Widgeon	4	
	Blue-winged Teal	6	
	Lesser Scaup		6
	Goldeneye Species	6	2
W34	Unidentified	20	6
	Northern Pintail		11
	Northern Shoveler	2	
	Mallard	6	20
	Lesser Scaup	6	
	Common Goldeneye		4
	Goldeneye Species	10	4
Unidentified	6		
W40	Mallard		5
W41	Grebe Species		1
W42	Lesser Scaup		2
	Bufflehead		6
W43	Lesser Scaup		2
	Mallard		12
W48	Mallard		1
W49	Lesser Scaup		4
	Mallard		411
W50	Lesser Scaup		5
	Mallard		1
W59	Mallard		29
	Green-winged Teal		10
	Diver Species		10
W64	Mallard		24
	Canada Goose		12
W73	Northern Shoveler		3
NOTE:			
* W19 and W20 were adjoined wetlands; therefore, data were combined			

During 32.3 hours of migration watch surveys, a total of 12 species (140 individuals) of non-passerine birds were observed (Table C-7). Notably, two small flocks of sandhill cranes were observed. In addition, 13 species (49 individuals) of passerines were recorded as incidental observations (Table C-8). Species diversity was similar between weeks, but composition differed slightly (Tables C-7 and C-8).

The passage rates for non-passerine birds ranged from 0.5 birds/hour (September 26 and 27) to 19.2 birds/hour (September 14) (Table C-9). The September 14 passage rate was much higher than the other survey days as it was skewed by a flock of approximately 70 Canada Geese. Large flocks of migratory waterfowl were not observed during other surveys.

Table C-7 Non-passerine Species Observations at each Migratory Watch Station

Species	Week 1			Week 2	Total
	SW1	SW2	SW3	SW4	

American Kestrel		5	1	1	7
Bald Eagle		2	1	2	5
Canada Goose			70		70
Golden Eagle				1	1
Merlin	2		1	3	6
Northern Goshawk				1	1
Northern Harrier	1	3	10	10	24
Osprey				1	1
Rough-legged Hawk			2	2	4
Red-tailed Hawk	3		1	3	7
Sandhill Crane		6		4	10
Turkey Vulture	1				1
Unknown				3	3
Grand Total	7	16	86	31	140

Table BC-8 Incidental Passerine Observations at each Migratory Watch Station

Species	Week 1			Week 2	Total
	SW1	SW2	SW3	SW4	
American Crow				1	1
Black-billed Magpie				1	1
Black-capped Chickadee	4				4
Common raven		3	1	9	13
Flycatcher Species	1				1
Mountain Bluebird					
Mountain Chickadee				1	1
Red-breasted Nuthatch				1	1
Townsend's Solitaire					
Unknown				7	7
Unknown Sparrow	10				10
Vesper Sparrow		6			6
Western Meadowlark		1			1
Western Tanager				1	1
Yellow-rumped Warbler	1			1	2
Grand Total	16	10	1	22	49

Table C-9 Passage Rates (birds/hr) of Non-passerines during the Migratory Watch Surveys

Survey Date	Rate of Passage (Birds/hr)
12-Sep-06	2.3
14-Sep-06	19.2
25-Sep-06	1.8
26-Sep-06	0.5
27-Sep-06	0.5

28-Sep-06	2.3
Mean	4.4
SD	7.3

Birds were observed consistently during the survey periods, but in Week 2, more raptors appeared to exhibit migratory behaviour than in Week 1. In Week 2 more birds were soaring and flying southward than hunting or perching. This was particularly evident on the last survey (September 26) when all raptors were observed soaring and flying south.

Flight altitudes ranged from 579 to 1262 m. The mean altitude was 843 m (SD = 162 m), but the mode was 598 m suggesting the most common flight altitude was below the mean flight altitude. The mean flight trajectory was estimated using data from Station 4 (SW4) where the majority (74%) of the survey effort was conducted. Birds generally flew south, with a mean bearing of 158° (SE = 8°).

No migratory birds were detected during radar surveys. Table C–10 presents a summary of radar survey effort.

Table C–10 Radar Survey Effort

Site	UTM Zone	UTM E	UTM N	Date	Start Time	End Time
R1	10	544569	5727211	13-Sep-06	18:20	20:44
R2	10	550022	5708443	14-Sep-06	18:45	21:30
R3	10	548528	5724690	17-Sep-06	04:43	06:43
R4	10	549802	5715879	26-Sep-06	19:00	21:00
R4	10	549802	5715879	26-Sep-06	05:07	07:07

C.2.4 Waterfowl Brood Observations

A total of 120 waterfowl from 17 species were identified recorded during the amphibians surveys (Table C–11). The most commonly observed species was bufflehead, followed by mallard, goldeneye species and lesser scaup (Table C–11). Buffleheads were present at the most wetland sites, followed by common loon and mallard. In total, eight waterfowl broods were recorded in the project area. Two bufflehead broods and one Mallard brood were observed at the mine site; and single broods were observed of mallard, horned grebe, American coot, bufflehead, and ruddy duck along the proposed transmission corridor. No broods were observed along the proposed access road.

Table C–11 Number of Waterfowl Observed during 2006 Amphibian Surveys

Species	Access Road	Mine Site	Transmission Line Corridor
American coot			6
American widgeon	4		
Bufflehead	13	12	6
Blue-winged teal	2		
Canada goose		12	
Cinnamon teal	5		

Common loon	2	3	1
Goldeneye sp.	4	10	
Horned grebe			2
Lesser scaup			13
Mallard	13	3	2
Ring-necked duck		2	
Red-necked grebe	1		
Ruddy duck			2
Scaup sp.		2	
Total individuals	44	44	32
Total species	8	7	7

C.3 References

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- Resources Inventory Committee (RIC). 1999a. Inventory Methods for Forest and Grassland Songbirds. Standards for Components of British Columbia's Biodiversity No. 15. Version 2.0. BC Ministry of Environment, Lands and Parks, Victoria, BC.
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