



**Shorebird Surveys at Beaverhill Lake, 2023**

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## 1.0: Introduction

Beaverhill Lake is recognized as one of the foremost shorebird migration stopovers in Western Canada. The lake is recognized as a site of Regional Importance by the Western Hemisphere Shorebird Reserve Network ([WHSRN. N.d. Beaverhill Lake](#)). Surveys in the late twentieth century suggest that around 20% of the continental population of Pectoral Sandpipers *Calidris melanotos* staged on the lakeshore, alongside significant populations of Long-billed Dowitcher *Limnodromus scolopaceus*, Stilt Sandpiper *Calidris himantopus*, and Black-bellied Plover *Pluvialis squatarola* ([CWS 1988. CANADIAN PRAIRIE SHOREBIRD PROGRAM: AN UPDATE](#)), ([IBA Canada. N.d. Beaverhill Lake AB001](#)). Unofficial surveys in 2005 found 10,000 or more of an additional three migratory shorebird species ([eBird. N.d. Beaverhill Lake](#)). Canadian shorebird populations are generally under-studied and population trends have reflected this, with roughly 25% of species having uncertain status in the country ([Wader Study Group 2012. Population estimates of North American Shorebirds](#)) ([Environment Canada 2014. Status of Birds Canada](#)). Seven of these have been known to occur on Beaverhill Lake.

By the early 2000s, Beaverhill Lake had all but dried up. Grasses and forbs invaded the lakebed leaving little to no mud flats. In the 2010s, especially starting in 2016, lake levels rose almost annually. With autumn dry spells, mud flats reappeared, and large flocks of shorebirds were reported by bird watchers on eBird in the 2020s.

In 2022, bird watchers reported large flocks of shorebirds on the south shore. With no formal surveys being completed since 2005, the Beaverhill Bird Observatory decided to conduct exploratory surveys in 2023, encompassing only the southern end of the lake. The smaller scale of this survey, as well as the creation of a standardized protocol, makes the effort repeatable in future years. By utilizing standards laid out by the International Shorebird Survey ([ISS 2019, Shorebird Survey Protocol](#)), the data collected has been incorporated into a global database focused on the understanding and conservation of shorebirds. The goal of the survey is to obtain a current understanding of shorebird populations at Beaverhill Lake, and to ascertain whether the lake is still as significant a staging area as it has been in previous years.

## 2.0: Method

### 2.1: Location

The surveys were completed on a 4.4 kilometer stretch along the southern shoreline of Beaverhill Lake, between (53.382 N, -112.595 W) and (53.389 N, -112.533 W). This southern expanse of the lake is primarily edge habitat between grassland and the shallow lake, with variable degrees of mudflat habitat exposed, dependent on precipitation. About 3.2 km of the shoreline to the west of the natural area fence was grazed by cattle in summer and 1.2 km of shoreline within the natural area was ungrazed.



Fig. 1:  
*The location of Beaverhill Lake in Alberta (Fig 1.1), the survey area in relation to Beaverhill Lake (Fig. 1.2), the 12 survey points (Fig 1.3)*



Fig. 2:  
*The surveyed shoreline. Water levels fluctuated throughout the year and were often much lower than pictured here.*

## 2.2: Survey Design

Twelve survey points were set up at 400m intervals across the 4.4 kilometer shoreline. If a point became unavailable due to high water, it was moved along the longitudinal axis of its original location, to a maximum of ~25m. Between May 1 and August 31 of 2023, 14 surveys were completed at 7 to 10 day intervals. Surveys consisted of walking the transect, stopping to count shorebirds at each of the 12 points. Observation time at each point varied between 4 and 12 minutes based on the number of birds present. At each point, all shorebirds within a 200m radius were counted and identified as precisely as possible using binoculars and a spotting scope. Due to their heavy influence on shorebird movement, raptors were noted in addition to shorebirds. To avoid double-counting of individuals, birds observed at a survey point which were moving past the observer towards a point which had not yet been surveyed were discounted from the second point's totals.

## 2.3: Considerations

Several variables likely had a significant impact on the surveys. Foremost amongst these was the fluctuation of water levels on the lake. This was difficult to measure with accuracy, but influenced the amount and the quality of shorebird habitat to the point where no survey was completed in the same conditions as the last. Though much of the summer saw drought conditions which caused the lakeshore to recede into the reed beds, a heavy rain in July swelled the shoreline up into the long grasses of the surrounding grassland area. Other weather conditions which may have impacted results included the exceptionally warm spring. This may have allowed shorebirds to begin their northwards migration early, as ice melted abnormally early across much of the province. Whether this caused much actual influence is uncertain.

Grazing herds of cattle were periodically present on the lake shore and accessed water across the mudflat habitat. Cattle have been present on the shoreline since at least 1984 (G. Holroyd pers.comm.) and likely for decades previously.

Observation may have been impacted for the final 3 surveys as the Viper Vortex spotting scope was damaged and had to be replaced with a less powerful substitute.

### 3.0: Results

#### 3.1: Abstract

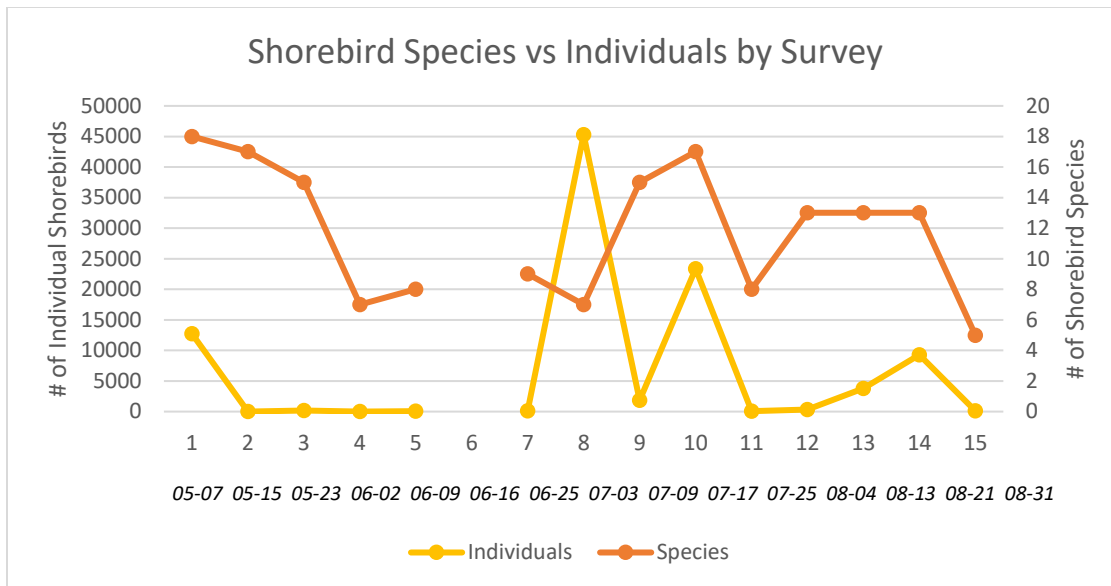
Over the course of the survey period, 25 shorebird species were detected. Of these, Lesser Yellowlegs *Tringa flavipes* was the most consistently detected, present on 12 of the 14 surveys. Across the entirety of the study period, 36,227 individual shorebirds were observed. Long-billed Dowitcher was the most populous species, accounting for 27,957 individuals or 77% of all individuals. The number of species peaked on the first survey, conducted on May 7<sup>th</sup>. There was a significant dip during June, before numbers rose in mid-July and fluctuated thereafter. The highest single-day total of individuals was 12,742 shorebirds, comprised primarily of Long-billed Dowitchers on May 7<sup>th</sup>. This was followed by August 20<sup>th</sup> with 9,285. The lowest totals were June 2<sup>nd</sup>, with 50 individuals and July 25<sup>th</sup> with 69 individuals.

Raptor numbers peaked on the 7<sup>th</sup> of May with 11 raptors hunting the southern shore of the lake. Over the course of the surveys, 4 raptor species were seen using the lake: Bald Eagle *Haliaeetus leucocephalus*, Northern Harrier *Circus cyaneus*, Peregrine Falcon *Falco peregrinus*, and Merlin *Falco columbarius*. Peregrine Falcon and Merlin were the only raptor species observed to actively pursue shorebirds during the surveys. An adult female Peregrine Falcon caught and killed a Lesser Yellowlegs on July 17<sup>th</sup>, the only successful hunt seen. Bald Eagles (12 occurrences) and Northern Harriers (8 occurrences) were the two most commonly observed raptors.

#### 3.2: Data

The detailed observations for each survey can be found appended at the bottom. Raptor observations are included (Fig. 3.0).

The cumulative counts of individual shorebirds by species, maximum single day count, and the number of surveys on which that species was detected is as follows:



**Fig. 3.0:** A comparison of the number of shorebird species observed to the number of individual shorebirds observed by survey date.

Species	Count	Max	Frequency	Species	Count	Max	Frequency	Species	Count	Max	Frequency
Long-billed Dowitcher	27957	9097	11	Wilson's Phalarope	138	34	11	Black-bellied Plover	32	20	3
Pectoral Sandpiper	2150	1876	9	Semipalmated Plover	119	102	3	Killdeer	28	11	7
Semipalmated Sandpiper	1547	964	7	Greater Yellowlegs	104	57	10	Baird's Sandpiper	25	14	5
Lesser Yellowlegs	1105	233	12	White-faced Ibis	81	39	10	dowitcher sp.	25	15	2
Stilt Sandpiper	750	330	7	American Avocet	73	33	6	Short-billed Dowitcher	22	12	5
peep sp.	600	400	3	Marbled Godwit	64	34	9	American Golden-Plover	9	6	2
Least Sandpiper	599	499	8	Wilson's Snipe	55	34	4	Dunlin	1	1	1
Red-necked Phalarope	329	96	7	Willet	53	11	10	Solitary Sandpiper	1	1	1
Black-necked Stilt	321	128	11	Hudsonian Godwit	38	21	3	Red Knot (C.c. rufa)	1	1	1

Total Count and Frequency of Shorebirds by Species



### 3.3: eBird Observations

The citizen science platform eBird provides some information from years during which no surveys were completed. Since January 1<sup>st</sup> 2020, 30 species of shorebird have been reported to eBird from Beaverhill Lake ([eBird. N.d. Beaverhill Lake](#)). This includes 5 species not observed during the official surveys, these being Piping Plover *Charadrius melodus* (May 5<sup>th</sup> 2020), White-rumped Sandpiper *Calidris fuscicollis* (May 20<sup>th</sup> 2020, May 9<sup>th</sup> 2021, May 27<sup>th</sup> 2022), Sanderling *Calidris alba* (July 28<sup>th</sup> 2022, May 9<sup>th</sup> 2023), Whimbrel *Numenius phaeopus* (May 24<sup>th</sup> 2023) and Spotted Sandpiper *Actitis macularius* (46 separate observations ranging between May 7<sup>th</sup> and October 15<sup>th</sup>). These observations cover the entirety of the lake rather than just the southern shore, but they do provide some insight into what may have been missed during the official surveys.

### 4.0: Conclusions

Beaverhill Lake is still an important location for migrating shorebirds. Despite sharp declines in most species, the survey found high enough shorebird traffic on the lake to suggest that there is still adequate habitat to support a large number of staging shorebirds. White-faced Ibis *Plegadis chihi* and Black-necked Stilt *Himantopus mexicanus* have shown significant increases from the previous surveys, following province-wide trends. Long-billed Dowitcher was the most common species in 2023. A month-long period with no observations of the species during the summer displayed a clear split between north-bound movement in the spring and birds on their southward migration in the fall. Because of this, 18,818 Long-billed Dowitchers can be safely assumed to have passed through on fall migration. This represents 3.8% of the estimated Canadian population of 500,000. One Red Knot *Calidris canutus* of the *C.c. rufa* subspecies was observed on July 17<sup>th</sup>. *C.c. rufa* are in decline and listed as Endangered under the Species at Risk Act. This was the only 'Endangered' shorebird species observed. The survey results indicate more than 20,000 shorebirds use the lake annually, as well as over 1% of the country's Long-billed Dowitcher population, both of which are factors qualifying Beaverhill Lake for continued Regionally Important designation under WHSRN standards.

For most species, shorebird numbers in 2023 were undeniably and drastically lower than in either the 2005 or 1990s surveys. Buff-breasted Sandpiper *Tryngites subruficollis*, White-rumped Sandpiper, Piping Plover, and Sanderling were all found at Beaverhill Lake to varying degrees during the previous efforts, but none

were observed during the 2023 surveys. Numbers in excess of 1,000 Baird's Sandpiper *Calidris bairdii*, Semipalmated Sandpiper *Calidris pusilla*, Stilt Sandpiper and Red-necked Phalarope *Phalaropus fulicarius* were not observed at any point – a stark contrast to 2005 when each was observed to number 10,000 or more. The impact of fluctuating water levels and grazing cattle is not known.

The southern shore of Beaverhill Lake supports migrating shorebirds to a significant degree. The decline from previous surveys is alarming but there is little reason to believe this is due to a decline in the productivity of the lake. Rather, it is more likely in a reflection of larger scale long-term population trends in the study species. More research will be needed to determine trends and ascertain whether the declining numbers at Beaverhill Lake are consistent with the wider scale issue that is shorebird conservation.

Since the largest number of shorebirds were recorded on the first survey of May 7, I recommend the surveys of shorebirds begin earlier in future years to better record the first arrivals of spring migrants. Also other sections of shoreline should be surveyed to determine the full population of migrant shorebirds around the lake and which shorelines are most important.



# Appendix

## Shorebird Totals:

Shorebird observations during the 2023 surveys by survey date. Individual and species totals are included.

	May 7	May 15	May 23	June 2	June 9	June 16	June 25	July 3	July 9	July 17	July 25	August 4	August 13	August 20	August 31
<b>Long-billed Dowitcher</b>	8615	519	5		-			20	1103	5105	4	124	3347	9097	18
<b>Pectoral Sandpiper</b>	1876	11	1		-				2	220	23	3	4	10	
<b>Semipalmated Sandpiper</b>	964	254	6		-				3	305			2	13	
<b>Lesser Yellowlegs</b>	90	1			1	-	103	12	233	136	36	132	204	67	90
<b>Stilt Sandpiper</b>	35	83	20			-			330	271			7	4	
<b>peep sp.</b>	400	75				-							125		
<b>Least Sandpiper</b>	499	4				-	7	7		20		3	20	39	
<b>Red-necked Phalarope</b>	5	62	96			-		42	10	85		29			
<b>Black-necked Stilt</b>	1	4	15	14	18	-	5		96	128		14	6	20	
<b>Wilson's Phalarope</b>	2	4	13	17	21	-			22	34	2	14	8	1	
<b>Semipalmated Plover</b>	102	4				-				13					
<b>Greater Yellowlegs</b>	57					-	8	8	8	5	1	5	6	2	4
<b>White-faced Ibis</b>			3	1	7	-	4	3	7	39	1	1	15		
<b>American Avocet</b>	33	21	10	1	4	-			4						

Shorebird Totals (cont.):

*Shorebird observations during the 2023 surveys by survey date. Individual and species totals are included.*

	May 7	May 15	May 23	June 2	June 9	June 16	June 25	July 3	July 9	July 17	July 25	August 4	August 13	August 20	August 31
Marbled Godwit	34	11	3	6	2	-	4			1	1	2			
Wilson's Snipe			1			-							14	6	34
Willet	11	10	4	1	10	-	10			3	1	2			1
Hudsonian Godwit	14					-				21		3			
Black-bellied Plover		20	2			-						10			
Killdeer	1	1	1	10	11	-	3		1						
Baird's Sandpiper	2					-			2	14			3	4	
dowitcher sp.						-		15						10	
Short-billed Dowitcher		1				-	2		6				1	12	
American Golden-Plover		6	3			-									
Dunlin	1					-									
Solitary Sandpiper						-			1						
Red Knot						-				1					
<b>TOTAL #:</b>	12742	1091	183	50	74	-	146	107	1828	6401	69	342	3762	9285	147
<b>TOTAL SPECIES:</b>	19	18	14	7	8	-	9	7	15	17	8	13	13	12	4

**Raptor Observations on BBO Shorebird Surveys 2023**

	<b>07-May</b>	<b>15-May</b>	<b>23-May</b>	<b>02-Jun</b>	<b>09-Jun</b>	<b>16-Jun</b>	<b>25-Jun</b>	<b>03-Jul</b>
Bald Eagle	2		1	2		-	3	4
Peregrine Falcon	3				1	-		1
Northern Harrier	6	1		3		-		
Merlin						-		
	<b>09-Jul</b>	<b>17-Jul</b>	<b>25-Jul</b>	<b>04-Aug</b>	<b>13-Aug</b>	<b>20-Aug</b>	<b>31-Aug</b>	
Bald Eagle	5	4	2	5	4	5	2	
Peregrine Falcon		1						
Northern Harrier	1			1	3	2	5	
Merlin	1	1						

*Fig. 3.0: Raptor observations during the shorebird surveys.*