

Memorandum



To: Travis Ritchie, Yukon Energy Corporation
From: EDI Environmental Dynamics Inc.
Date: May 18, 2022
Project No: 22Y0197
Re: Marsh Lake Low Water Investigations - Monitoring Event 4 Fieldwork Summary

Monitoring Event 4

Table 1. Monitoring event information.

Date of monitoring event	May 18, 2022
Field staff	Ben Schonewille and Sean Munro (EDI)
Weather	Partly cloudy, 11°C
Marsh Lake elevation (9 am to 5 pm average)	653.778 m (0.022 m below low supply level)
Areas monitored	Lewes Marsh area near Sawmill Road and Alaska Highway, Kettley's Canyon wetland, Yukon River connected wetland 3.7 km downstream of Marsh Lake, Marsh Lake at unnamed creek mouth, north end of Marsh Lake, and Judas Creek wetland (Map 1)
Access	Pickup truck and walking

Methods

Drone Imagery Collection

Drone imagery was collected at each monitoring location along pre-determined flight paths at a consistent height of 80 m using a mini drone (DJI Mavic Mini 2) by operators with a valid drone operator's certificate. Identical flight paths will be used for subsequent monitoring events to ensure consistent imagery collection. During each flight, field staff monitored the imagery for areas of interest and recorded any wildlife observations. Following the completion of all monitoring events, the recorded imagery will be reviewed to compare conditions at different water levels throughout the duration of monitoring period.



Collection of Bird and Wildlife Observations

Bird and wildlife observations were recorded by field staff on the ground and in the air (via drone) at each monitoring location. Species and number of individuals were recorded for each observation, as well as any signs of wildlife activity (tracks, muskrat push ups, etc.).

Fish Sampling

Fish sampling was not completed during the May 18 monitoring visit; the next fish sampling event is planned for mid-June.

Results

General Site Conditions

Conditions were similar across all monitoring locations. Pockets of open water and mudflats in the wetlands associated with creeks and groundwater seeps continue to increase in size, with snow and ice now covering less than 30% of the general area. The Yukon River open channel that extends from the outlet of Marsh Lake downstream through the Lewes Marsh is getting wider as ice begins to break up and melt on the riverbanks. Representative photos of each site are shown in Photo 1 to Photo 11 at the end of this summary.

Marsh Lake continues to remain ice covered with the area of open water at the lake outlet increasing in size along with small open water patches where tributaries flow into the lake. The ice cover on the lake is still relatively intact and it appears that it will still be some time before the lake is ice free.

Bird Observations

A total of 65 bird species were detected during the monitoring event (Table 2) including three Species at Risk (Olive-sided Flycatcher, Horned Grebe and Rusty Blackbird). One unusual bird species (White-throated Sparrow) was heard singing from the upland deciduous forest adjacent to the Judas Creek wetland. Given the seasonal timing, the bird species observed includes primarily migrants either passing through or using the area as stopover habitat. The bird species observed included a range of waterfowl/waterbirds using open water habitats, shorebirds using exposed mudflats, and other species either flying through the area (raptors) or using the riparian and surrounding forest areas (passerines). The open Yukon River channel continues to contain a relatively high diversity of waterfowl and waterbirds, particularly diving birds. There was also an apparent increase in the number and diversity of shorebird species observed in comparison to the previous surveys.

Wildlife Observations

Wildlife observations were recorded at some sites during the monitoring event. A coyote was observed walking along the Marsh Lake shoreline near the north end of the lake. Three muskrats were observed in small ponds adjacent to the north end of Marsh Lake (Photo 10). Fresh moose tracks were also observed at site LM2 (Kettley's Canyon wetland).



Table 2. Summary of bird species observed during the May 18, 2022, monitoring event.

Species							
	LM1	LM2	LM3	Yukon River channel	ML1	ML2	JC
Canada Goose			✓	✓			✓
Snow Goose			✓				✓
Trumpeter Swan			✓	✓			✓
Tundra Swan				✓			✓
Unidentified Swan				✓			
Blue-winged Teal							✓
Northern Shoveler		✓	✓				✓
American Wigeon		✓	✓	✓		✓	✓
Mallard	✓	✓	✓	✓		✓	✓
Northern Pintail			✓			✓	✓
Green-winged Teal		✓	✓	✓	✓	✓	✓
Unidentified dabbling duck			✓	✓			
Canvasback				✓			
Redhead				✓			
Ring-necked Duck				✓			✓
Greater/Lesser Scaup				✓			✓
Surf Scoter				✓			✓
Harlequin Duck				✓			
Bufflehead			✓	✓		✓	✓
Common Goldeneye							✓
Barrow's Goldeneye		✓	✓			✓	
Common Merganser		✓					
Red-breasted Merganser				✓		✓	✓
Unidentified diving duck			✓	✓			
Common Loon				✓			



Species							
	LM1	LM2	LM3	Yukon River channel	ML1	ML2	JC
Horned Grebe				✓			
Red-necked Grebe				✓			✓
Least Sandpiper						✓	
Unidentified 'peep' sandpiper			✓	✓		✓	
American Golden Plover							✓
Semi-palmated Plover		✓	✓				✓
Wilson's Snipe		✓					✓
Spotted Sandpiper				✓			
Solitary Sandpiper						✓	
Lesser Yellowlegs		✓	✓	✓		✓	✓
Bonaparte's Gull			✓	✓		✓	✓
Short-billed Gull		✓	✓	✓		✓	✓
Herring Gull			✓				
Northern Harrier		✓					✓
Bald Eagle	✓	✓	✓				✓
Yellow-bellied Sapsucker							✓
Hairy Woodpecker				✓			
Northern Flicker		✓	✓	✓	✓	✓	✓
Canada Jay			✓				
Black-billed Magpie		✓					
Common Raven		✓	✓	✓			✓
Olive-sided Flycatcher					✓		
Say's Phoebe						✓	
Violet-green Swallow	✓	✓	✓	✓			✓
Tree Swallow		✓	✓	✓		✓	✓
Bank Swallow		✓					
Cliff Swallow		✓		✓			

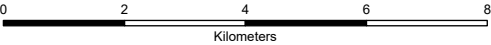
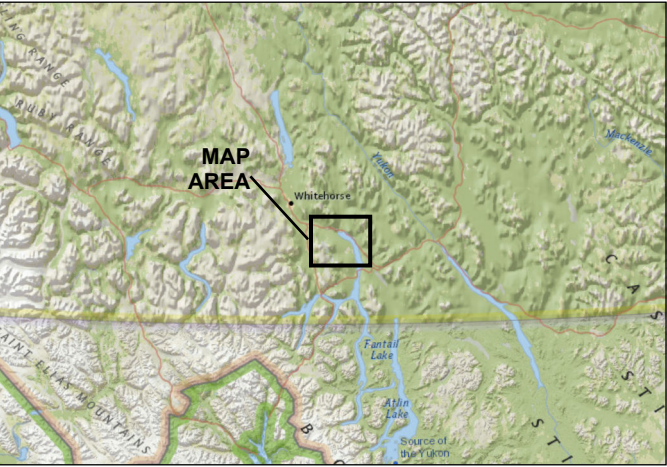


Species							
	LM1	LM2	LM3	Yukon River channel	ML1	ML2	JC
Ruby-crowned Kinglet	✓	✓	✓	✓		✓	✓
Varied Thrush							✓
American Robin		✓	✓	✓			✓
American Pipit	✓	✓	✓	✓			✓
Lapland Longspur			✓	✓			
Common Redpoll		✓	✓				
American Tree Sparrow					✓		
Dark-eyed Junco		✓	✓	✓			✓
White-crowned Sparrow		✓	✓	✓			✓
White-throated Sparrow							✓
Savannah Sparrow	✓	✓	✓	✓			✓
Lincoln's Sparrow							✓
Rusty Blackbird			✓	✓			
Northern Waterthrush			✓		✓		
Orange-crowned Warbler			✓				✓
Yellow-rumped Warbler	✓	✓	✓	✓	✓		✓
Wilson's Warbler		✓					



Map 1. Overview of Marsh Lake low water investigation sites.

- Legend**
- Survey Points of Interest
 - Highway
 - Local Road/Access
 - Watercourse
 - - - Private Property Boundary



Map Scale = 1:125,000 (printed on 11 x 17)
Map Projection: NAD 1983 UTM Zone 8N

Data Sources

- Inset Basemap, National Geographic World Map: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Main Basemap, World Imagery: Earthstar Geographics

Disclaimer
EDI Environmental Dynamics Inc. has made every effort to ensure this map is free of errors. Data has been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

Drawn: OL	Checked: BSc	Map 1	Date: 2022-05-05
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Photo 1. Conditions at monitoring site LM1 (Yukon River wetland 3.7 km downstream of Marsh Lake) on May 18, 2022.



Photo 2. Conditions at monitoring site LM2 (Kettley's Canyon wetland) on May 18, 2022.



Photo 3. Conditions at monitoring site LM3-A (Lewes Marsh adjacent to Sawmill Road) on May 18, 2022.



Photo 4. Conditions at monitoring site LM3-B (Lewes Marsh adjacent to Sawmill Road) on May 18, 2022.



Photo 5. Conditions at monitoring site LM3-C (Lewes Marsh adjacent to Sawmill Road) on May 18, 2022.



Photo 6. Conditions at monitoring site LM4 (Lewes Marsh adjacent to Sawmill Road) on May 18, 2022.



Photo 7. Conditions at monitoring site LM5 (Lewes Marsh) on May 18, 2022.



Photo 8. Conditions at monitoring site LM6 (Lewes Marsh) on May 18, 2022.



Photo 9. Conditions at monitoring site ML1 (unnamed creek mouth on Marsh Lake) on May 18, 2022.



Photo 10. Conditions at monitoring site ML2 (north end of Marsh Lake) on May 18, 2022. Red circles indicate locations where muskrats were observed during the monitoring event.



Photo 11. Conditions at monitoring site JC (Judas Creek) on May 18, 2022.