

Memorandum



To: Travis Ritchie, Yukon Energy Corporation
From: EDI Environmental Dynamics Inc.
Date: June 30, 2022
Project No: 22Y0197
Re: Marsh Lake Low Water Investigations — Monitoring Event 7 Fieldwork Summary

Monitoring Event 7

Table 1. Monitoring event information.

Date of monitoring event	June 23 & 27, 2022
Field staff	EDI personnel: James McGrath and Matt Kitchen (June 23), James McGrath and Kara Nyland (June 27) TKC personnel: Brooklyn Massie and Belit Peters (June 27)
Weather	Variable
Marsh Lake elevation (12 pm June 6 to 3 pm June 8 average)	655.884 m (2.08 m above 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 the Judas Creek wetland. (Map 1).
Access	Pickup truck, 19' boat, 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 completed on June 27 via small mesh gillnetting. This sampling was focused in Lewes Marsh including the river channel and adjoining areas of connected wetland confluence areas.

Results

General Site Conditions

Conditions were similar across all monitoring locations. Green-up of the wetland and riparian vegetation is occurring in both the Lewes Marsh and Marsh Lake areas. Water levels continue to rise, decreasing the size of mudflats along the Marsh Lake shoreline and within Lewes Marsh. Representative photos of each site are shown in Photo 1 to Photo 11 at the end of this summary.

Bird Observations

A total of 35 bird species were detected during the monitoring event (Table 2). Given the seasonal timing of the monitoring event, the species observed are indicative of probable local breeders. A decrease in the abundance of waterfowl and waterbirds within the Yukon River channel was observed during this week's survey compared to previous weeks. This decrease in abundance is expected as we have passed the primary spring migratory bird window for the Southern Lakes Ecoregion.

The Arctic Tern nest that was observed near the LM3 wetland on June 8 was flooded from rising water levels in Lewes Marsh. An active Bald Eagle nest was observed in the LM3 wetland connection to main channel of the Yukon River.

Wildlife Observations

Wildlife observations during the current monitoring event were limited to one juvenile beaver at the wetland connection of LM1 and one coyote near the wetland connection of LM3.



Fish Sampling

Fish sampling was completed through small mesh gillnetting with the sampling efforts focused around the confluence areas of connected wetlands and inside the connected wetlands. Sampling included 12 small mesh gillnet sets and resulted in the capture of 9 juvenile lake whitefish, 5 adult lake whitefish, 3 adult least cisco, 4 juvenile round whitefish, 5 adult round whitefish, 1 northern pike, and 1 juvenile longnose sucker. The majority of the fish were captured in the channel that joins site LM3 with the main channel of the Yukon River. No fish were captured within the main channel itself, highlighting the importance of the productive wetlands as rearing habitats for fish. This pattern will be confirmed during future sampling events.



Table 2. Summary of bird species observed during the June 23, 2022, monitoring event.

Species	LM1	LM2	LM3a	LM3b	LM3c	LM4	LM5	ML1	ML2 POND	ML2	JC
Canada Goose			✓	✓							
Trumpeter Swan			✓	✓							✓
Blue-winged Teal											✓
Northern Shoveler									✓		
American Wigeon											✓
Mallard											✓
Gadwall											
Northern Pintail											
Green-winged Teal											
Unidentified dabbling duck	✓						✓	✓			✓
Canvasback											
Redhead											
Ring-necked Duck											
Greater/Lesser Scaup											
Common Goldeneye											
Barrow's Goldeneye											
Unidentified diving duck											
Semi-palmated Plover											
Spotted Sandpiper											
Solitary Sandpiper									✓		
Lesser Yellowlegs									✓		
Wilson's Snipe									✓		✓
Bonaparte's Gull											
Short-billed Gull				✓					✓	✓	
Herring Gull											
Unidentified Gulls				✓	✓						✓



Species	LM1	LM2	LM3a	LM3b	LM3c	LM4	LM5	ML1	ML2 POND	ML2	JC
Belted Kingfisher											
Northern Flicker							✓				
Bald Eagle	✓			✓	✓	✓					
Black-billed Magpie			✓					✓	✓		
Canada Jay				✓					✓		
Common Raven			✓			✓					✓
Boreal Chickadee									✓		
Violet-green Swallow											✓
Tree Swallow											
Bank Swallow							✓		✓		
Barn Swallow											
Cliff Swallow						✓	✓				
Unidentified Swallow					✓		✓			✓	✓
Alder Flycatcher	✓	✓									
Northern Shrike	✓										
Ruby-crowned Kinglet	✓							✓			
American Robin	✓	✓				✓					✓
Swainson's Thrush								✓			
Rusty Blackbird					✓						
American Tree Sparrow											
Purple Finch											
Dark-eyed Junco			✓								
White-crowned Sparrow										✓	✓
White-throated Sparrow											✓
Chipping Sparrow	✓		✓								✓
Savannah Sparrow											
Lincoln's Sparrow											



Species	LM1	LM2	LM3a	LM3b	LM3c	LM4	LM5	ML1	ML2 POND	ML2	JC
Fox Sparrow											✓
Northern Waterthrush											
Common Yellowthroat											✓
Orange-crowned Warbler											
Yellow Warbler											
Yellow-rumped Warbler	✓		✓		✓					✓	✓
Wilson's Warbler											
Western Tanager											

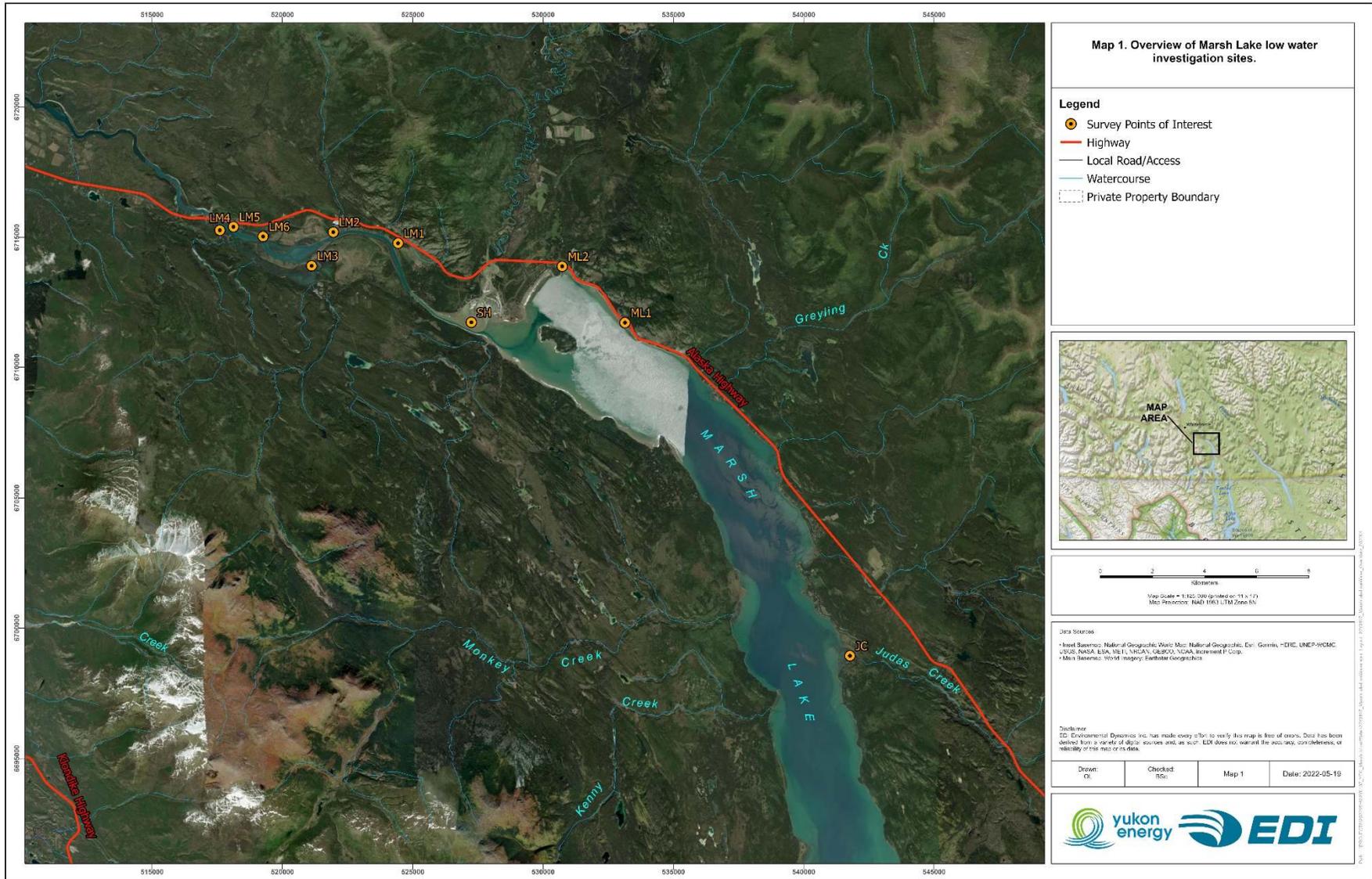




Photo 1. Conditions at monitoring site LM1 (Yukon River wetland 3.7 km downstream of Marsh Lake) on June 23, 2022.



Photo 2. Conditions at monitoring site LM2 (Kettley's Canyon wetland) on June 23, 2022.



Photo 3. Conditions at monitoring site LM3-A (Lewes Marsh adjacent to Sawmill Road) on June 23, 2022.



Photo 4. Conditions at monitoring site LM3-B (Lewes Marsh adjacent to Sawmill Road) on June 23, 2022.



Photo 5. Conditions at monitoring site LM3-C (Lewes Marsh adjacent to Sawmill Road) on June 23, 2022.



Photo 6. Conditions at monitoring site LM4 (Lewes Marsh adjacent to Sawmill Road) on June 23, 2022.



Photo 7. Conditions at monitoring site LM5 (Lewes Marsh) on June 23, 2022.



Photo 8. Conditions at monitoring site LM6 (Lewes Marsh) on June 27, 2022.



Photo 9. Conditions at monitoring site ML1 (unnamed creek mouth on Marsh Lake) on June 23, 2022.



Photo 10. Conditions at monitoring site ML2 (north end of Marsh Lake) on June 23, 2022.



Photo 11. Conditions at monitoring site JC (Judas Creek) on June 23, 2022.