

To: *James Matthewson*
Senior Environmental Officer

From: *Trevor Barker*
Jonathan Wiens

Manitoba Hydro

Manitoba Hydro

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Reference: Field Survey Report – Lake Winnipeg East System Improvement Project – Mammals Monitoring- Aerial Survey

OBJECTIVE

The objective of this field survey report is to outline the results of an intensive minimum count moose population survey at the Lake Winnipeg East System Improvement Transmission Project. The study design followed the intensive survey technique utilized in Gassaway style moose surveys and replicates the same survey conducted in 2017 and 2018. This survey was conducted on March 4th to 7th.

METHODS

Manitoba Hydro identified 47 survey blocks ('3 minute grid' – 3.5km x 5.5km) (908 km²) that intersect a five kilometer buffer of the LWESI project. These survey blocks were derived from the spatial grid Manitoba Sustainable Development utilizes in conducting modified Gassaway-style moose population surveys in Game Hunting Area 26.

A Bell 206 Jet Ranger helicopter was used to fly intensive grid survey at 500 meter spacing at a 122 meter altitude with an average air speed of 100km/hr. Pre-loaded GPS flight lines ensured complete coverage on east to west orientation. Two experienced observers recorded observations of moose, white-tailed deer, wolves, and tracks of moose, deer, wolves and snowmobiles. If not immediately identifiable, moose were circled to identify age and sex. Sex was determined using the presence of antlers or the presence of a vulva patch (Mitchell 1970), nose coloration, and bell size and shape. Calves were identified on the basis of size and behavior. In some cases, where very fresh moose tracks were encountered, the immediate area was circled for no more than 30 seconds to identify the age and sex of moose. A Garmin GPS 67x and notepads were used to record survey data.

RESULTS

Data from the surveys are stored in the MH Environmental Protection Information Management System.

Weather conditions on: March 4th: -11.0 C, clear visibility, no precipitation
 March 5th: -10.9 C, afternoon developed poor visibility, gusting winds, precipitation
 March 6th: -12.6 C, clear visibility, minimal precipitation,
 March 7th: -10.7 C, clear visibility, minimal precipitation

Snow cover was greater than 25cm in depth.

A total of 120 moose were detected during the survey with a bull:cow:calf ratio of 45:53:22. The percentage of cows with twins was 2% (one cow). Moose density equated to 13.2 moose/100 km². Although they were not specifically identified or surveyed for, three collared moose were detected within the study area. According to a report from Manitoba Sustainable Development, eight collared moose occurred in the study area during the time of the survey. Since every cow moose was not circled to identify if she was wearing a collar, this information does not support sight ability calculations. Of the 8 collared moose known to present in this area during the survey, only 1 was in an area where no moose were otherwise detected.

Table 1. Comparative moose population data from the 2016, 2017, 2018, 2019 LWESI mammal monitoring aerial survey.

	Bull	Cow	Calf	Total	% cows w/twins	Density/km²
2016	16	60	24	100	7	0.11
2017	30	58	38	128	10	0.14
2018	35	40	19	94	7.5	0.10
2019	45	53	22	120	2	0.13

Moose appeared to have an uneven distribution in the survey area and were generally found in higher numbers to the east of the project area.

Table 2. Comparative moose distance data from the 2016, 2017, 2018, 2019 LWESI mammal monitoring aerial survey.

2016 (n=100)					
Distance To (m)	Min	Max	Median	Mean	SD
FPR	294	9207	3817	3915	2219
PTH 304	303	8631	3549	3525	2080
Snowmobile Tracks	237	10782	3216	3703	2466
Wolf Activity	953	33302	18037	17330	8066

2017 (n=128)					
Distance To (m)	Min	Max	Median	Mean	SD
FPR	197	11520	3752	3753	2228
PTH 304	138	11834	2684	3093	2169
Snowmobile Tracks	87	7241	2454	2752	1989
Wolf Activity	61	8134	2925	3122	1961

2018 (n=94)					
Distance To (m)	Min	Max	Median	Mean	SD
FPR	149	8264	3483	3914	2338
PTH 304	249	7547	3064	3418	2066
Snowmobile Tracks	543	10524	4075	4368	2657
Wolf Activity	620	9010	3521	3824	1743

2019 (n=120)					
Distance To (m)	Min	Max	Median	Mean	SD
FPR	64	8469	2716	3484	2200
PTH 304	480	8841	2894	3150	1951
Snowmobile Tracks	525	14364	6834	5982	3217
Wolf Activity	533	12079	3364	3967	2389

Change 2016 vs 2017					
Distance To (m)	Min	Max	Median	Mean	SD
FPR	-97	2312	-66	-162	9
PTH 304	-165	3202	-865	-432	88
Snowmobile Tracks	-150	-3541	-762	-951	-477
Wolf Activity	-892	-25168	-15111	-14208	-6105

Change 2017 vs 2018					
Distance To (m)	Min	Max	Median	Mean	SD
FPR	-48	-3256	-268	161	110
PTH 304	111	-4287	380	325	-103
Snowmobile Tracks	456	3283	1621	1616	668
Wolf Activity	559	875	596	702	-218

Change 2018 vs 2019					
Distance To (m)	Min	Max	Median	Mean	SD
FPR	-85	206	-767	-430	-138
PTH 304	231	1295	-170	-268	-115
Snowmobile Tracks	-18	3840	2760	1614	560
Wolf Activity	-86	3069	-158	143	646

Average distance of moose to LWESI ROW was 3,484m, a small decrease from 3,914m in 2018, but similar to 2017 and 2016. Average distance to PTH 304 was 3,150m, also a small decrease from 3,418m in 2018 but similar to 2017 and 2016.

A total of four white-tailed deer were detected during the survey. Otter, fox, and coyote were also detected. No woodland caribou or woodland caribou tracks were detected.

Three maps outlining the survey results are attached. Each survey block is colour coded based on number of moose detected. Yellow blocks represent 0-3 moose, orange blocks represent 4-6 moose, and the red block represents > 7 moose (10).

INFORMATION AND RECOMMENDATIONS

This survey provided a valuable snapshot of distribution and relative abundance of moose near the project area. The results show similar total moose numbers between 2019, 2018 and 2017.

Moose detection locations between 2017 and 2018 indicate that moose appeared to avoiding the project area to a greater degree in 2018 than 2017; however this is likely a function of overall lower density of total moose. In 2019, moose density increased with an indication of lower level of avoidance of the LWESI project and PTH 304.

As identified in 2016, 2017, 2018 it appears that whitetail deer are not plentiful in the project area, with the exception of the southernmost blocks. Snowmobile tracks have been found commonly throughout the study area, in 2016, 2017, 2018 and 2019.

This survey helps in understanding changes in moose distribution and provide some inferences on relative abundance of both moose and white-tailed deer over time.

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APPENDIX A – SURVEY MAPS

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**APPENDIX B – LAKE WINNIPEG EAST SYSTEM IMPROVEMENT PROJECT SURVEY
PROTOCOL, WINTER 2019**

**Helicopter Survey Protocols – Winter 2019
Lake Winnipeg East - Mammal Monitoring Project**

Transects:

500 meter transect spacing flying east to west

Flight Conditions:

Altitude should be 122 meters (400 ft) above ground level (AGL).

Delay the survey under the following conditions:

- Less than 25cm of snow
- -30C (not including wind chill)
- Ceiling below 500 feet
- Wind speed 30 km/hr +
- Snowing/blowing snow
- Fog
- Hoar frost

Conduct an intensive population survey for moose and deer using Gassaway technique (intensive)

Record the following GPS waypoint files and track files during the survey:

Flying Conditions:

- Visibility
- Temperature
- Wind Speed and Direction
- Ceiling

Wildlife:

- Moose; (Bull, Cow, Calf)
- White-tailed deer;
- Any incidental wolves or wolf kills.

Humans:

- Access Trails (Snowmobile trails) – Disregard project construction equipment and related access trails.