

March 28, 2022

Attention: Ms. Debra Sikora

Review Panel Chair

Marathon Palladium Project

Impact Assessment Agency of Canada

marathonminereview-examenminemarathon@iaac-aeic.gc.ca

SUBJECT: Natural Resources & Forestry (NRF) Marathon Palladium Project Joint Panel Review Undertaking No.: 13 – Can NRF comment on whether in their view it is possible that the proponent is over-estimating the stability of the moose population?

Dear Madame Chair:

Thank you for the Joint Panel Review Team's question set out in **Undertaking No.: 13** Can NRF comment on whether in their view it is possible that the proponent is over-estimating the stability of the moose population, provided in Panel Session held Wednesday March 23, 2022. The Ministry offers the following:

Moose Aerial Inventory (MAI) Surveys:

- Many factors can influence shifts in the relative distribution and abundance of moose on the landscape and it is challenging to estimate the relative influence of any factor (e.g., climate, predation, disease) on a moose population at any given point in time. As such, NDMNRF conducts MAI surveys on a re-current multi-year rotational basis to estimate population abundance and its associated trend. Information on the current size of a moose population and its demographics inform the decision to increase, maintain or decrease a population relative to its population objective range (POR).

Moose Harvest Planning:

- Post-MAI survey, harvest characteristics (i.e., % harvest, bull: cow harvest ratio, % calves in the harvest) are set to enable the population to increase/decrease or remain stable relative to its WMU-specific POR. Based on the harvest characteristics and application of recent tag fill rate information, moose tag quotas are generated for regulated moose hunts.

WMU 21A:

- NDMNRF undertook MAI surveys in winters 2012, 2015 and 2018 in WMU 21A. After the winter 2012 MAI survey, the moose population in WMU 21A was estimated to be 3708 moose. Following the 2015 MAI survey, the moose population was estimated to be 2448 moose. The most recent MAI survey conducted in winter 2018 estimated the moose population at 2888 moose. All estimates are based on projected observed moose. The population trend (estimates from the last three surveys) suggest the population is declining; however, estimates from the last two surveys suggest the moose population in WMU 21A is has started to stabilize.
- Demographic data (i.e., calves/100 cows) from the winter 2012 survey estimated there to be 18.3 calves/ 100 cows, the winter 2015 survey estimated there to be 19.4 calves/ 100 cows, and the winter 2018 survey estimated there to be 18.5 calves/ 100 cows. A threshold of 30 calves/ 100 cows is considered necessary for a stable population. The winter 2012 survey estimated there to be 61 bulls/ 100 cows and the winter 2015 survey estimated there to be 47 bulls/ 100 cows, while in the winter 2018 survey, there was an estimated 72 bulls/ 100 cows in the WMU 21A moose population. Provincially, a threshold of 67 bulls/ 100 cows is considered the base (minimum) threshold necessary to ensure the timely breeding of cow moose.
- Current NDMNRF moose management efforts are directed at growing the WMU 21A moose population further into its WMU-specific moose population objective range (POR) of 2800 - 3800 moose.

WMU 21B:

- NDMNRF undertook moose aerial inventory (MAI) surveys in winters 2011, 2015 and 2020 in WMU 21B. After the winter 2011 MAI survey, the moose population was estimated to be 3857 moose. Following the winter 2015 MAI survey, the moose population was estimated to be 3397 moose. The most recent MAI survey conducted in winter 2020 estimated the moose population at 2346. All estimates are based on projected observed moose. The population estimates from the last three surveys in WMU 21B suggest the population is declining.
- Demographic data (i.e., calves/100 cows) from the winter 2011 survey estimated there to be 27.1 calves/ 100 cows, the winter 2015 survey estimated there to be 23.4 calves/ 100 cows, and the winter 2020 survey estimated there to be 29.3 calves/ 100 cows. A threshold of 30 calves/ 100 cows is considered necessary for a stable population. The winter 2011 survey estimated there to be 67 bulls/ 100 cows and the winter 2015 survey estimated there to be 39.7 bulls/ 100 cows, while in the winter 2020 survey, there was an estimated 79.3 bulls/ 100 cows in the WMU 21B moose population. While the estimated B:C ratio has experienced an increase from 2015 to 2020, the estimated number of cows declined resulting in an increase in the B:C ratio for 2020. Provincially, a threshold of 67 bulls/ 100 cows is considered the base (minimum) threshold necessary to ensure the timely breeding of cow moose.

- Current NDMNRF moose management efforts are directed at growing the WMU 21B moose population into its WMU-specific moose population objective range (POR) of 2400 - 3100 moose.

SUMMARY:

Population Estimates

Moose population estimates in both WMU 21A and WMU 21B suggest the populations are declining at the WMU scale over the last three MAI surveys, while WMU 21A also appears to be stabilizing given estimates from the last two surveys. Moose population estimates are just within (WMU 21A) or just below (WMU 21B) their respective WMU-specific moose population objective ranges. Current NDMNRF moose management efforts are being directed towards growing these populations into their WMU-specific moose population objective ranges.

Table 1. WMU-specific moose population objective range and three most recent MAI population estimates for WMU 21A and WMU 21B.

WMU	Year 2030 Moose Population Objective Range	Third Previous Population Estimates (Year)	Second Previous Population Estimates (Year)	Most Recent Population Estimates (Year)	Population Trend (based on last three surveys)
21A	2,800-3,800	3,708 (2012)	2,448 (2015)	2,888 (2018)	Declining
21B	2,400-3,100	3,857 (2011)	3,397 (2015)	2,346 (2020)	Declining

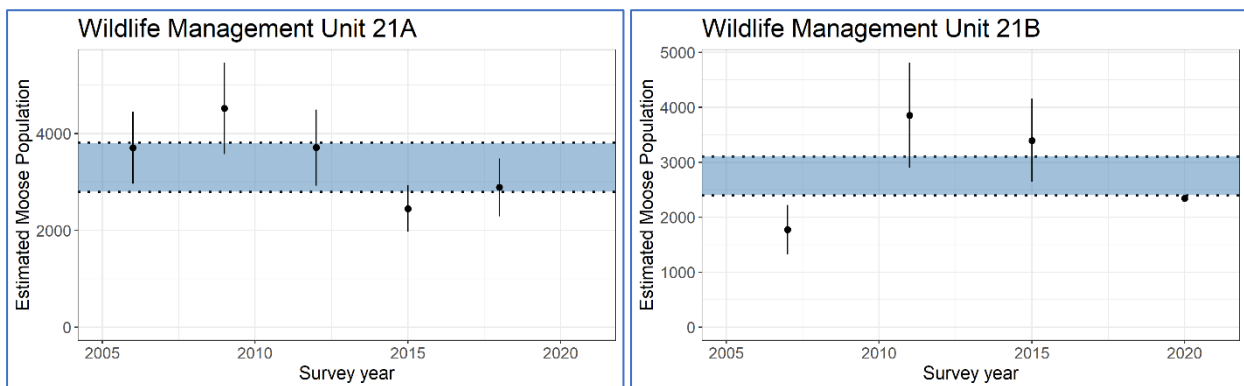


Figure 1. Historical moose population estimates in relation to the WMU-specific moose population objective range for WMU 21A and WMU 21B.

Demographic Data

Moose population stability between surveys can vary because of several factors. Two of the demographic factors NDMNRF uses along with current population estimates to

inform decisions regarding moose harvest are calves per 100 cows and bulls per 100 cows ratios.

Table 2. Provincial moose calves per 100 cows threshold and three most recent MAI estimates for

WMU 21A and WMU 21B.

WMU	Calves/100 Cows Threshold for a Stable Population	Third Previous Calves/100 Cows Estimate (Year)	Second Previous Calves/100 Cows Estimate (Year)	Most Recent Calves/100 Cows Estimate (Year)
21A	30	18.3 (2012)	19.4 (2015)	18.5 (2018)
21B	30	27.1 (2011)	23.4 (2015)	29.3 (2020)

Table 3. Provincial bulls per 100 cows minimum threshold and three most recent MAI estimates for

WMU 21A and WMU 21B.

WMU	Bulls/100 Cows Minimum Threshold for Timely Breeding	Third Previous Bulls/100 Cows Estimate (Year)	Second Previous Bulls/100 Cows Estimate (Year)	Most Recent Bulls/100 Cows Estimate (Year)
21A	67	61.0 (2012)	47.0 (2015)	72.0 (2018)
21B	67	67.0 (2011)	39.7 (2015)	79.3 (2020)

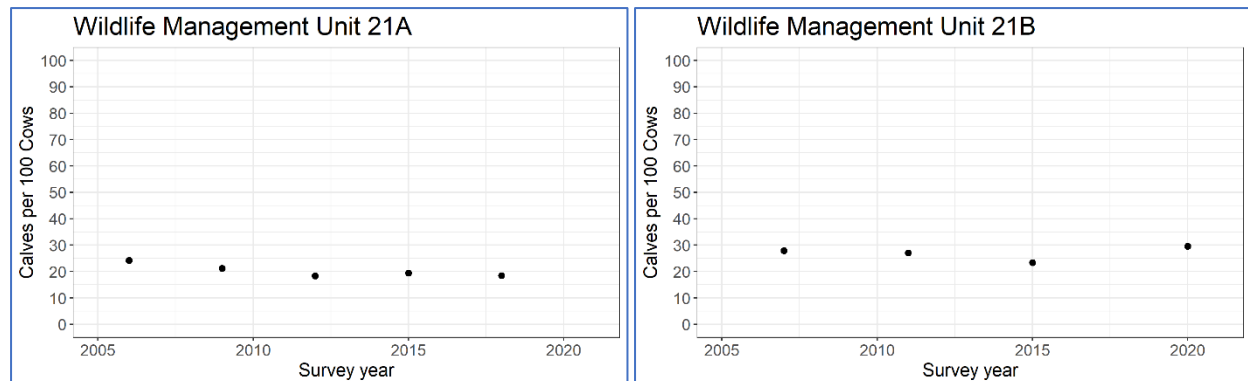


Figure 2. Historical MAI estimates for calves per 100 cows for WMU 21A and WMU 21B.

Generation PGM Moose Population Status Assessment

In the EIS Addendum (Chapter 6.2.7.6.1; Page 6.297; CIAR# 727), Generation PGM states that:

Historical moose observations for both WMU 21A and 21B suggest that moose populations have been relatively stable over the last 25 years (Figure 6.2.7-3), while recent surveys indicate approximately 2,828 and 3,539 moose currently in WMU 21A and WMU 21B respectively (Table 6.2.7-4). [...] Therefore, potential impacts on moose populations from the Project due o habitat loss appear limited, particularly given that moose population levels currently meet (WMU 21A) or exceed (WMU 21B) target objectives at the landscape scale.

Table 6.2.7-4: Moose population objectives and estimates within the Wildlife Management Units (WMU) overlapping the Project (McDonald 2021)

WMU	Year 2030 Moose Population Objective	Population Objectives (moose/100km ²)	Current Density (moose/100km ²)	Current Population Estimates (Year)
21A	2,800 – 3,800	21.0 – 28.5	22.0	2,928 (2018)
21B	2,400 – 3,100	17.8 – 23.0	26.2	3,539 (2015)

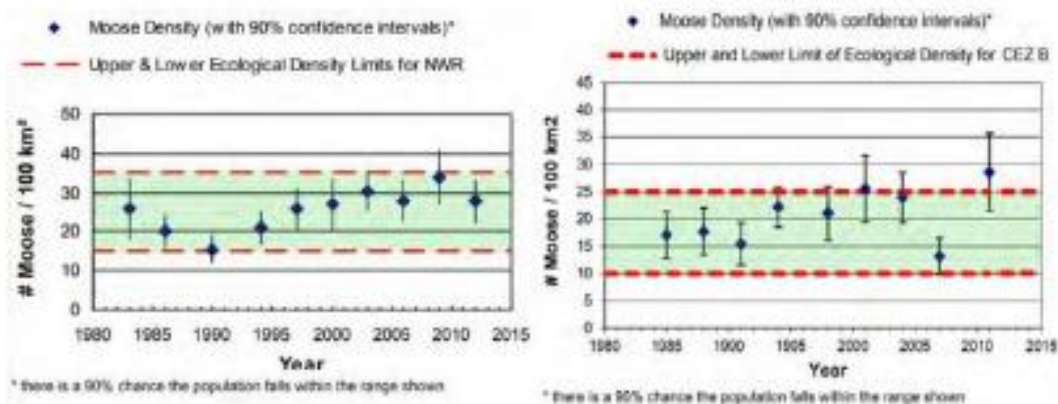


Figure 6.2.7-3: Moose Density Trends in the Wildlife Management Units that Overlap the Project (21A left, 21B right) (McDonald 2021)

NDMNRF Comments regarding Moose Population Status in WMU 21A and WMU 21B

Overall, Generation PGM's suggestion that the moose populations in WMU 21A and WMU 21B are "relatively stable" is dependent upon the temporal scale being examined. Ontario's moose population peaked in early 2000 and has declined by over 20% since 2004. As noted above, the trend over the last three MAI surveys (base to denote a trend) in the two WMUs indicates that the populations have been declining.

More current moose population estimates are available with WMU 21A estimated at 2,888 moose in 2018 and WMU 21B at 2,346 moose in 2020. In addition, the moose density trend graphs provided with the EIS Addendum only includes data up to 2011/2012 (Figure 6.2.7-3; CIAR# 727). Therefore, they do not capture the most recent

population changes and updated population range objectives that came into use for the 2016 harvest plans.

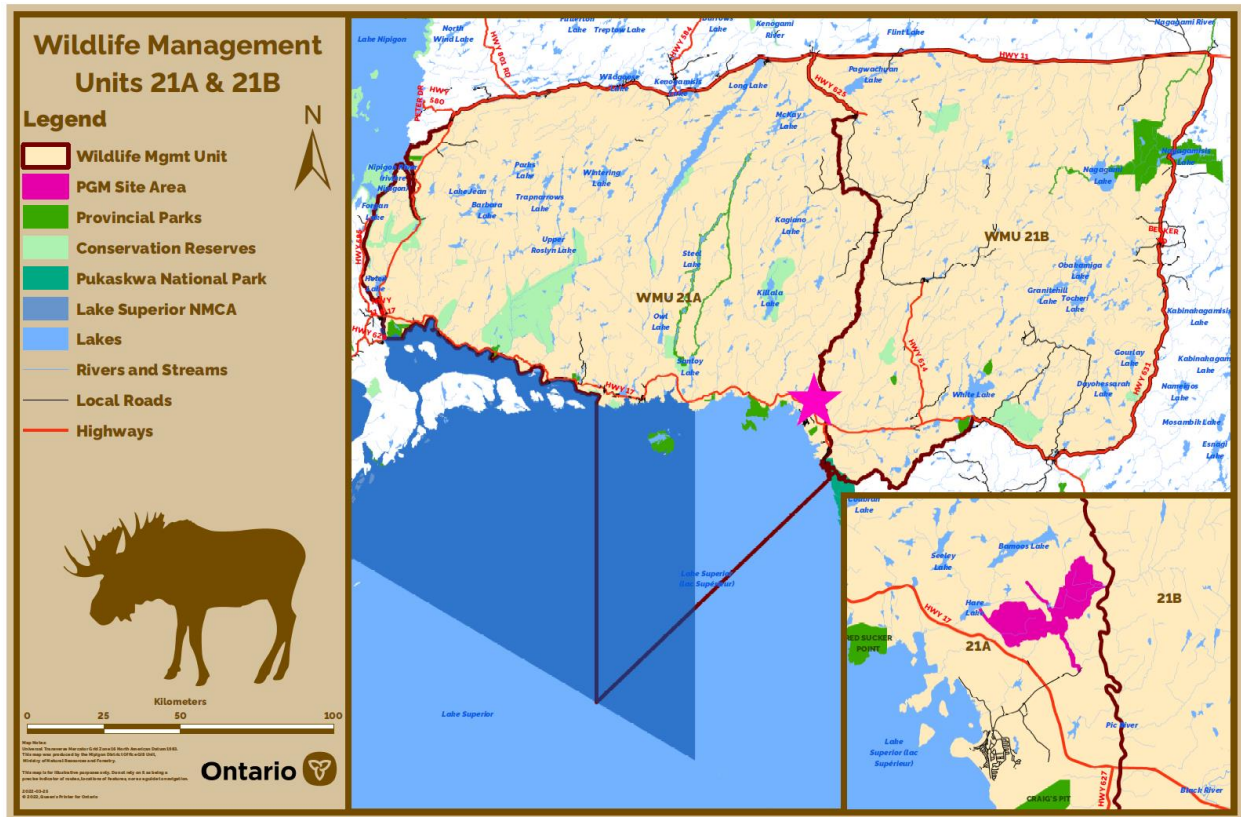
Please do not hesitate to contact me should you have any questions relating to NRF's response to Undertaking No.: 13. Attached and in appendix A you will find the WMU map for 21A and 21B for reference.

Sincerely,

James Bennitt
District Supervisor, Nipigon District
Ministry of Northern Development, Mines, Natural Resources & Forestry
<contact information removed>

cc: **Laurie Bruce**, Joint Review Panel Member (by email)
Gay Drescher, Joint Review Panel Member (by email)
Jason Patchell, Panel Manager (by email)
Chris Magee, Nipigon District Manager, NRF (by email)
Kimberley McNaughton, Nipigon District Planner, NRF (by email)

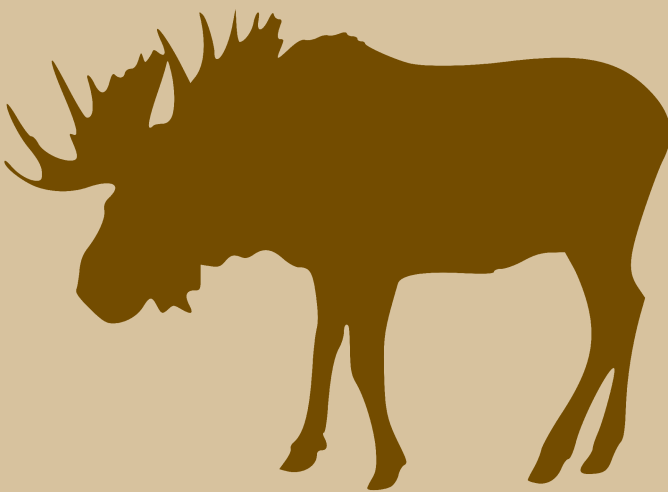
Appendix A – WMU 21A and 21B



Wildlife Management Units 21A & 21B

Legend

-  Wildlife Mgmt Unit
-  PGM Site Area
-  Provincial Parks
-  Conservation Reserves
-  Pukaskwa National Park
-  Lake Superior NMCA
-  Lakes
-  Rivers and Streams
-  Local Roads
-  Highways



Map Notes:
Universal Transverse Mercator Grid Zone 16 North American Datum 1983.
This map was produced by the Nipigon District Office GIS Unit,
Ministry of Natural Resources and Forestry.

This map is for illustrative purposes only. Do not rely on it as being a
precise indicator of routes, locations of features, nor as a guide to navigation.

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