



CMD 26-H105.1-REF2

Part 4 of 4

Date: 2026-06-29

**Written Submission from
Orano Canada Inc.**

**Mémoire d'
Orano Canada Inc.**

In the matter of

À l'égard d'

Orano Canada Inc.

Orano Canada Inc.

Application to renew the McClean Lake
Operating Licence for 2-year term

Demande pour le renouvellement du
permis d'exploitation de McClean Lake
pour une période de deux ans

**Hearing in writing based on written
submissions**

**Audience par écrit fondée sur des
mémoires**

September 2026

Septembre 2026

Appendix V.4 Habitat Classification Within the Local Assessment Boundary (LAB)

List of Included Materials

Habitat Classification Approach (24 p.).

Draft Habitat Classification Maps (11 figures.).

Habitat Classification Approach

To: Elizaveta Petelina
Orano Canada Inc.

From: Katie Hamilton and
Andrea Ambrose

Project/File: 111473090

Date: November 21, 2025

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

1 Overview

Orano Canada Inc. (Orano) retained Stantec Consulting Ltd. (Stantec) to refine ecosite classification and conduct terrestrial habitat mapping for the McClean Lake Operation Local Assessment Area (LAA), building on the framework that our teams established in the 2023 McClean Lake Operations Area Habitat Classification Report¹ (2023 Habitat Classification Report). The refined ecosite classification will be used as a foundation to classify terrestrial habitat types using 'dominant habitat' terminology from the Saskatchewan Ministry of Environment's (ENV) current Species Detection loadform (SDLf)².

Dominant habitat types presented in this memorandum will be evaluated based on their potential to support vascular plant, bryophyte, and lichen Species of Conservation Concern (SOCC) and provide suitable habitat for woodland caribou (*Rangifer tarandus caribou*) and moose (*Alces alces*) foraging. Habitat evaluations will account for the seasonal behavioral patterns and varying habitat preferences of woodland caribou and moose, while treating all seasons equally in importance.

2 Ecosite-Based Classification and Dominant Habitat Types

2.1 Ecosite Mapping Foundation

The LAA's terrestrial habitats have been classified and refined using key natural ecosite groups first presented by Stantec in the 2023 Habitat Classification Report¹. These groups were developed by Stantec

¹ Stantec (Stantec Consulting Ltd.). 2023. McClean Lake Operations Area Habitat Classification Report. Issued December 28, 2023

² Saskatchewan Ministry of Environment (ENV). 2025. Species Detection Loadform (SDLf). Available at: <https://publications.saskatchewan.ca/#/products/104163>. Accessed November 2025.

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

based on the *Field Guide to the Ecosites of Saskatchewan's Provincial Forests*³ using Object-Based Image Analysis (OBIA). Additional groups were added to describe habitats impacted by wildfire or human activity. The refined 2025 ecosite map of the Midwest LAA is the foundation for identifying broader habitat categories.

2.2 Dominant Habitat Types

Key natural ecosite groups were aligned with the 'dominant habitat' terminology provided in the current SDLf^{Error! Bookmark not defined.} based on shared identifying characteristics, such as forest canopy composition and wetland classification (Table 1). Wetland habitat types listed in the SDLf are described according to the *Canadian Wetland Classification System* (CWCS)⁴ while upland habitat types (e.g., woodlands) are not described by ENV⁵. To address this deficiency, Stantec has developed working descriptions for SDLf upland habitat types using land cover class definitions adapted from the Saskatchewan Digital Land Cover (DLC) dataset⁶. Some land cover classes from the dataset were combined to conform with the SDLf upland habitat types (e.g., the jack pine, spruce, and mixed softwood cover classes are all consistent with the coniferous woodland habitat type). Habitat types not listed in the SDLf were named and described by Stantec to be consistent with the corresponding ecosite groups described in the 2023 Habitat Classification Report¹.

³ McLaughlan, M.S., R.A. Wright, and R.D. Jiricka. 2010. *Field Guide to the Ecosites of Saskatchewan's Provincial Forests*. Saskatchewan Ministry of Environment, Forest Service, Prince Albert, SK.

⁴ National Wetlands Working Group. 1997. *The Canadian Wetland Classification System*. 2nd Edition. Warner, B.G. and C.D.A. Rudec (eds.). The Wetlands Research Centre, University of Waterloo, Waterloo, ON. 75 pp.

⁵ Burns, Sara. 2024. Species at Risk Biologist, Biodiversity Analysis and Conservation Unit, Fish and Wildlife Branch, Saskatchewan Ministry of Environment. Email correspondence. May 28, 2024.

⁶ Government of Saskatchewan (GOS). Saskatchewan Digital Land Cover dataset. Updated November 21, 2023. Available at:

<https://geohub.saskatchewan.ca/datasets/a287612147ab4f0a9863148f76170f00/about>. Accessed November 2025.

Table 1 Dominant Habitat /Ecosite Group Alignment

Ecosite /Habitat Class	Dominant Habitat Type Name ¹	Dominant Habitat Type Description ²	Key Natural Ecosite Group Code ³	Key Natural Ecosite Group Description ³	Ecosites ⁴ Included in Key Natural Ecosite Group
forest (upland)	coniferous woodland	>75% softwood species by area; >10% crown closure	BS3/4	jack pine (<i>Pinus banksiana</i>) dominant	BS3 – jack pine (<i>Pinus banksiana</i>) / blueberry (<i>Vaccinium myrtilloides</i>) / lichen: moderately fresh sand
					BS4 – jack pine (<i>Pinus banksiana</i>) - black spruce (<i>Picea mariana</i>) / feathermoss: moderately dry sand
			BS5/6	jack pine (<i>Pinus banksiana</i>) mixedwood	BS5 – jack pine (<i>Pinus banksiana</i>) - white birch (<i>Betula papyrifera</i>) / feathermoss: moderately dry sand
					BS6 – jack pine (<i>Pinus banksiana</i>) - trembling aspen (<i>Populus tremuloides</i>) / green alder (<i>Alnus viridis</i>): moderately fresh loamy sand
			BS7/8/9/10	black spruce (<i>Picea mariana</i>) dominant	BS7 – black spruce (<i>Picea mariana</i>) / blueberry (<i>Vaccinium myrtilloides</i>) / lichen: moderately dry sand
					BS8 – black spruce (<i>Picea mariana</i>) - white birch (<i>Betula papyrifera</i>) / lichen: moderately dry sandy loam
					BS9 – black spruce (<i>Picea mariana</i>) - jack pine (<i>Pinus banksiana</i>) / feathermoss: moderately fresh sandy loam
					BS10 – black spruce (<i>Picea mariana</i>) - white birch (<i>Betula papyrifera</i>) / feathermoss: fresh sand
	mixed woodland	softwood/hardwood mixtures in which neither softwood nor hardwood account for >75% of species by area; >10% crown closure	BS5/6	jack pine (<i>Pinus banksiana</i>) mixedwood	BS5 – jack pine (<i>Pinus banksiana</i>) - white birch (<i>Betula papyrifera</i>) / feathermoss: moderately dry sand
					BS6 – jack pine (<i>Pinus banksiana</i>) - trembling aspen (<i>Populus tremuloides</i>) / green alder (<i>Alnus viridis</i>): moderately fresh loamy sand
			BS13	white birch (<i>Betula papyrifera</i>) - black spruce (<i>Picea mariana</i>)	BS13 – white birch (<i>Betula papyrifera</i>) - black spruce (<i>Picea mariana</i>) - trembling aspen (<i>Populus tremuloides</i>): moderately fresh sand
	deciduous woodland	>75% hardwood species by area; >10% crown closure	BS14	white birch (<i>Betula papyrifera</i>) dominant	BS14 – white birch (<i>Betula papyrifera</i>) / lingonberry (<i>Vaccinium vitis-idaea</i>) - Labrador tea (<i>Rhododendron groenlandicum</i>): moderately dry sand

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Ecosite /Habitat Class	Dominant Habitat Type Name ¹	Dominant Habitat Type Description ²	Key Natural Ecosite Group Code ³	Key Natural Ecosite Group Description ³	Ecosites ⁴ Included in Key Natural Ecosite Group
			BS15	aspen (<i>Populus tremuloides</i>) dominant	BS15 – trembling aspen (<i>Populus tremuloides</i>) - white birch (<i>Betula papyrifera</i>) / green alder (<i>Alnus viridis</i>): moderately fresh loamy sand
wetland	bog	peatland receiving water exclusively from precipitation and not influenced by groundwater; dominated by peat (<i>Sphagnum</i> spp.) mosses	BS17	black spruce (<i>Picea mariana</i>) treed bog	BS17 – black spruce (<i>Picea mariana</i>) treed bog: very moist mesic organic
			BS18	Labrador tea (<i>Rhododendron groenlandicum</i>) shrubby bog	BS18 – Labrador tea (<i>Rhododendron groenlandicum</i>) shrubby bog: moderately wet mesic organic
			BS19/20	graminoid/open bog	BS19 – graminoid bog: very wet humic organic
					BS20 – open bog: moderately wet fibric organic
	fen ⁵	peatland with a fluctuating water table receiving water high in dissolved minerals; vegetation cover dominated by graminoids and mosses	BS21	tamarack (<i>Larix laricina</i>) treed fen	BS21 – tamarack (<i>Larix laricina</i>) treed fen: wet fibric organic
			BS22/23	shrubby fen	BS22 – leatherleaf (<i>Chamaedaphne calyculata</i>) shrubby poor fen: very wet fibric organic
					BS23 – willow (<i>Salix</i> spp.) shrubby rich fen: wet fibric organic
			BS24/25	graminoid/open fen	BS24 – graminoid fen: very wet humic organic
					BS25 – open fen: wet mesic organic
	swamp (treed wetland)	mineral wetland or peatland with periodically standing surface water and gently moving, nutrient-rich groundwater at least 20 cm below the ground surface; dominated by woody plants (i.e., >30% cover) often >1 m in height	BS16	treed swamp >10 m	BS16 – black spruce (<i>Picea mariana</i>) / balsam poplar (<i>Populus balsamifera</i>) / river alder (<i>Alnus incana</i>) swamp: very moist mesic organic
sparsely vegetated	sparsely vegetated ⁶	surface material is predominantly rock; vascular and/or bryophyte cover <10%	BS2	surface material predominantly rock; largely unvegetated boulder field or bedrock	BS2 – lichen/felsenmeer - bedrock: dry nonsoil
			BS27	surface material predominantly rock; rocky/sandy shore conditions	BS27 – sedge (<i>Carex</i> spp.) rocky shore: very moist sand
disturbed	disturbed – anthropogenic ⁶	disturbance due to human causes	disturbed – anthropogenic ⁷	disturbance due to human causes	-

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Ecosite /Habitat Class	Dominant Habitat Type Name ¹	Dominant Habitat Type Description ²	Key Natural Ecosite Group Code ³	Key Natural Ecosite Group Description ³	Ecosites ⁴ Included in Key Natural Ecosite Group
	disturbed – recent fire ⁶	disturbance due to forest fires that have occurred since 2021	disturbed – recent fire ⁷	disturbance due to forest fires that have occurred since 2021	-
	regenerating ⁶	regenerating habitats lacking features required to be classified to the ecosite level (e.g., pioneer or young seral communities)	regenerating ⁷	regenerating habitats lacking features required to be classified to the ecosite level (e.g., pioneer or young seral communities)	-

Notes:

- ¹ Dominant habitat types obtained from the current SDLfError! Bookmark not defined.. Forest habitat types were combined to include closed canopy and open canopy woodlands.
- ² Upland (i.e., forested) habitat type definitions adapted from the Saskatchewan DLC dataset (GOS 2023)⁶, wetland habitat definitions obtained from the CWCS⁴.
- ³ Key natural ecosite groups identified and described by Stantec¹ following the *Field Guide to the Ecosites of Saskatchewan's Provincial Forests*³.
- ⁴ Ecosites obtained from the *Field Guide to the Ecosites of Saskatchewan's Provincial Forests*³.
- ⁵ Listed as ‘class 7 – fen’ in the current SDLfError! Bookmark not defined..
- ⁶ Dominant habitat type added by Stantec. Habitat types matching the corresponding ecosite groups are not listed in the current SDLfError! Bookmark not defined..
- ⁷ Ecosite groups added by Stantec¹ to describe habitats impacted by anthropogenic and natural disturbances.

3 Habitat Suitability for Vegetation SOCC

Stantec has ranked the key natural ecosite groups and the corresponding dominant habitat types based on their potential to support vascular plant Species of Conservation Concern (SOCC). The rankings were developed using the following inputs:

- SOCC occurrence data presented in the McClean Lake Operation Flora Inventory Update⁷, including previously collected data provided by Orano^{8,9} and data collected during the 2024 vegetation field program
- SOCC occurrence data retrieved from the Hunting, Angling, and Biodiversity Information of Saskatchewan (HABISask) online mapping application¹⁰
- Information on SOCC habitat associations obtained from a literature review
- Remote sensing data used in the 2023 and 2025 habitat mapping, including a Normalized Difference Vegetation Index (NDVI) and a Normalized Difference Moisture Index (NDMI)¹¹

The rankings only include vascular plant SOCC with recorded occurrences in the LAA. Eligible SOCC occurrences were identified based on their estimated reliability. Unreliable data (e.g., HABISask occurrences collected prior to 2000), occurrences identified as 'not detected' or 'not found' by CanNorth⁹ (e.g., *Carex buxbaumii*), aquatic occurrences (i.e., occurrences that exclusively overlap the 'water' land cover type), and duplicate occurrences were eliminated from the dataset.

Each eligible occurrence was evaluated to verify that the intersecting key natural ecosite group(s) and subsequently aligned dominant habitat type(s) have the potential to support the SOCC in question based on the literature review results. The literature review findings are summarized in Table 2, with potential habitat associations sorted according to location. The use of Saskatchewan specific sources was prioritized, followed by sources from neighbouring provinces. Generalized North American sources (e.g., the Flora of North America) and other regional floras were also included to address information gaps. If an occurrence partially overlapped an ecosite group inconsistent with the literature review findings (e.g., an obligate wetland species occurrence partially located in an upland ecosite group), the unsuitable ecosite group was not considered during ranking system development. Occurrences located exclusively in unsuitable ecosite groups were eliminated from the dataset.

⁷ Stantec. 2025. McClean Lake Operation Flora Inventory Update Draft Report. Revision 0. Issued January 15, 2025.

⁸ AREVA (AREVA Resources Inc.). 2016. McClean Lake Operation Technical Information Document – Environmental Performance. Volume 1 of 2 – Environmental Monitoring. Version 3. Revision 0.

⁹ CanNorth (Canada North Environmental Services Limited Partnership). 2023. Technical Memorandum 2023 Orano McClean Lake and Midwest Lease Rare Plant Status Checks. Revision 1.

¹⁰ GOS. 2025. HABISask Online Mapping Application. Available at: <https://gisappl.saskatchewan.ca/Html5Ext/?viewer=habisask>. Accessed November 2025.

¹¹ NDVI and NDMI indices derived from August 2022 Sentinel-2 multispectral satellite imagery

Table 2 Vascular Plant SOCC Literature Review Results

Scientific Name	Common Name	Provincial Rank ¹²	Potentially Suitable Key Natural Ecosite Groups in the LAA	Saskatchewan Habitat Associations	Alberta and/or Manitoba Habitat Associations ¹	North American Habitat Associations ¹
<i>Athyrium filix-femina</i> var. <i>angustum</i>	northern lady-fern	S3	BS2, BS3/4, BS7/8/9/10, BS16, BS21	moist woods and streambanks ^{13,14}	mature mixedwood forest, mature white spruce (<i>Picea glauca</i>) forest, and shrubby swamps ¹⁵	moist to wet forests, swamps, thickets, and along streambanks ^{16,17}
<i>Carex michauxiana</i>	Michaux' sedge	S3	BS17, BS18, BS19/20, BS21, BS22/23, BS24/25	wet sedge fens, open bogs, and treed bogs ^{13,18}	-	bogs, fens, lakeshores, streambanks, wet meadows, ditches; in sandy or peaty, often acidic soils ^{19,20}
<i>Diphasiastrum sitchense</i>	Alaskan clubmoss	S3	BS2, BS3/4, BS5/6, BS7/8/9/10, disturbed - anthropogenic, regenerating	dry coniferous (often pine) woods with sandy soil ^{13,14}	-	alpine meadows, open rocky barrens, open coniferous woods, exposed gravel ²¹
<i>Drosera anglica</i>	English sundew	S3	BS21, BS22/23, BS24/25	very wet rich calcareous fens, wet mossy or marshy quiet shores ²²	-	floating <i>Sphagnum</i> mats, calcareous fens, bogs, swamps, marly shores, wet areas between dunes; often growing in <i>Sphagnum</i> moss ^{17,19,23}
<i>Eleocharis mamillata</i> ssp. <i>mamillata</i>	soft-stem spike-rush	S1	BS16, BS19/20, BS22/23, BS24/25	margins of streams, creeks, and shallow ponds ²⁴	single recorded occurrence in Alberta found in bog ²⁵	moist to wet peaty sites in bogs and fens, floating mats, shallow standing water, and the shores of freshwater lakes, streams, ponds, and ditches ^{25,26}
<i>Huperzia selago</i> var. <i>selago</i>	mountain club-moss	S1	BS16, BS17, BS18, BS19/20, BS21, BS22/23, BS24/25, BS27	moist, peaty places in spruce woods, muskeg, bogs, organic shores, and sometimes in rock crevices ^{13,14}	damp, shady, non-calcareous outcrops and boulders; damp sedge tundra ²⁷	cedar swamps, streambanks, sandy lakeshores, usually where mossy; also, in wet, sandy borrow pits; rarely on acidic igneous rock or calcareous coast cliffs ^{19,28}

¹² Saskatchewan Conservation Data Centre. 2025. Species Conservation Rankings. Available at: <https://biodiversity.sk.ca/ranking.htm>. Accessed November 2025.

¹³ W.P. Fraser Herbarium. 2023. SASK Herbarium Rare Plant Database Search. University of Saskatchewan, Saskatoon, SK.

¹⁴ Harms, V.L. and A.L. Leighton. 2011a. *Flora of Saskatchewan Fascicle 1: Ferns and Fern Allies of Saskatchewan*. Flora of Saskatchewan Association and Nature Saskatchewan, Regina, SK. 192 pp.

¹⁵ ABMI (Alberta Biodiversity Monitoring Institute). 2023a. Lady Fern (*Athyrium filix-femina*). Available at: <https://abmi.ca/species/athyrium-filix+femina>. Accessed November 2025.

¹⁶ Kato, M. 2024. *Athyrium filix-femina* var. *angustum* (Willdenow) G. Lawson. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 2. Available at: https://floranorthamerica.org/Athyrium_filix-femina_var._angustum. Accessed November 2025.

¹⁷ Johnson, D., L. Kershaw, A. MacKinnon, J. Pojar. 1995. *Plants of the Western Boreal Forest and Aspen Parkland*. Lone Pine Publishing, Edmonton, AB. 392 pp.

¹⁸ Leighton, A.L. 2012. *Flora of Saskatchewan Fascicle 3: Sedges (Carex) of Saskatchewan*. Flora of Saskatchewan Association and Nature Saskatchewan, Regina, SK. 280 pp.

¹⁹ Chadde, S.W. 2019. Minnesota Flora: *An Illustrated Guide to the Vascular Plants of Minnesota*. 2nd Edition. Orchard Innovations, Sullivan, Indiana. 784 pp.

²⁰ Reznicek, A.A. 2020. *Carex michauxiana* Boeckeler. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 23. Available at: https://floranorthamerica.org/Carex_michauxiana. Accessed November 2025.

²¹ Wagner Jr., W.H., and J.M. Beitel. 2024a. *Diphasiastrum sitchense* (Ruprecht) Holub. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 2. Available at: https://floranorthamerica.org/Diphasiastrum_sitchense. Accessed November 2025.

²² Harms, V.L. 1978. *The Native Carnivorous Plants of Saskatchewan*. Blue Jay 36(2): 71-81.

²³ Mellichamp, T.L. 2020. *Drosera anglica* Hudson. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 6. Available at: http://floranorthamerica.org/Drosera_anglica. Accessed January 2025.

²⁴ Harms, V.L., A.L. Leighton, and M.A. Vetter. 2018. *Flora of Saskatchewan Fascicle 6: Rushes, Bulrushes, and Pondweeds Plus the Remaining Monocots of Saskatchewan*. Flora of Saskatchewan Association and Nature Saskatchewan, Regina, SK. 432 pp.

²⁵ Fryer, G., J. Lancaster, K. Ottenbreit, C. Metke, D. Cherniawsky, A. Griffiths, K. Foreman, and J. Mischkolz. 2022. *Rare Vascular Plants of Alberta*. 2nd Edition. The Alberta Native Plant Council, Edmonton, AB. 664 pp.

²⁶ Smith, S.G., J.J. Bruhl, M.S. González-Elizondo, and F.J. Menapace. 2020. *Eleocharis mamillata* subsp. *mamillata*. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 23. Available at: https://floranorthamerica.org/Eleocharis_mamillata_subsp._mamillata. Accessed November 2025.

²⁷ Staniforth, R.J. and D.F. Brunton. 2022. *A synopsis of lycophytes in Manitoba, Canada: their status, distribution, abundance, and habitats*. Canadian Field-Naturalist 136(2): 107–121.

²⁸ Wagner Jr., W.H., and J.M. Beitel. 2022. *Huperzia selago* (Linnaeus) Bernhardt ex Schrank & Martius. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 2. Available at: https://floranorthamerica.org/Huperzia_selago. Accessed November 2025.

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Scientific Name	Common Name	Provincial Rank ¹²	Potentially Suitable Key Natural Ecosite Groups in the LAA	Saskatchewan Habitat Associations	Alberta and/or Manitoba Habitat Associations ¹	North American Habitat Associations ¹
<i>Juncus stygius</i> ssp. <i>americanus</i>	moor rush	S3	BS16, BS17, BS18, BS19/20, BS21, BS22/23, BS24/25	wet mossy woods, peaty lake shores, bog pools, and calcareous fen margins ^{13,24}	-	open bogs, wet moss, marshes, and shallow water ^{19,29}
<i>Lobelia dortmanna</i>	water lobelia	S3	BS27, water	-	shallow water at the margins of ponds and lakes and sandy shores (submerged or emergent) ²⁵	shallow water of acidic lakes and ponds, wet sandy shores, waterbodies with gravelly, silty, or muddy bottoms ^{19,25}
<i>Lycopodiella inundata</i>	northern bog clubmoss	S1	BS18, BS19/20, BS22/23, BS24/25, disturbed - anthropogenic	wet bogs, fens, and organic lakeshores ^{13,14}	wet bogs (sometimes disturbed), creeks, shores, moist sandy soils near forest edges, and moist depressions between dunes ^{25,27}	fens, open <i>Sphagnum</i> bogs, wet sandy shores and streambanks, marshes, disturbed wetlands, and sandy borrow pits ^{19,25,30}
<i>Lycopodium hickeyi</i>	Hickey's clubmoss	S1	BS3/4, BS5/6, BS7/8/9/10, BS13, BS14, BS15	-	open to shaded deciduous, mixed, and coniferous forest (including forest edges and openings); secondary growth and shrubby habitats; mesic to dry, often well-drained soils ^{25,27}	deciduous forests and second-growth shrubby habitats ^{31,32}
<i>Malaxis paludosa</i>	bog adder's-mouth orchid	S3	BS17, BS18, BS19/20, BS21, BS22/23, BS24/25	wet spring-fed black spruce woods, bogs, and fens ^{13,33}	mossy ground, usually on <i>Sphagnum</i> in bogs and fens ²⁵	<i>Sphagnum</i> moss hummocks bogs and open black spruce swamps ¹⁹
<i>Pedicularis labradorica</i>	Labrador lousewort	S3	BS7/8/9/10, BS16, BS17, BS18, BS21, BS22/23, regenerating	open black spruce woods, treed bogs, regenerating burns, and lichen-tundra ¹³	shrubby and treed fens, shrubby bogs, graminoid fens, black spruce stands, and grassy sites ³⁴	dry to moist open forests, bogs, thickets, tundra, heathlands, and rocky slopes ^{17,35}
<i>Pedicularis parviflora</i>	purple lousewort	S3	BS16, BS17, BS18, BS19/20, BS21, BS22/23, BS24/25, BS27	wet marshy fens and bogs ¹³	fens (treed and non-treed), marshes, and black spruce bogs ³⁶	muskeg, boggy flood plains, gravel stream bars, moist to wet meadows, sedge meadows, fens, bogs, and black spruce – tamarack wetlands ^{17,37}
<i>Phegopteris connectilis</i>	long-beech fern	S3	BS5/6, BS7/8/9/10, BS14, BS16, BS17	moist woods, wooded streamsides ^{13,14}	moist to wet woodlands, riparian areas, depressions, rocky slopes, and rock crevices ²⁵	moist woods, thickets, streambanks, <i>Sphagnum</i> hummocks, shaded rock crevices; often in moist, strongly to moderately acidic soil ^{19,25,38}
<i>Pinguicula villosa</i>	hairy butterwort	S3	BS16, BS17, BS18, BS21, BS22/23, BS24/25	<i>Sphagnum</i> hummocks in black spruce or tamarack treed bogs and in muskeg ^{13,22}	-	<i>Sphagnum</i> hummocks in bogs, edges of pools and rivulets ¹⁷
<i>Pinguicula vulgaris</i>	common butterwort	S3	BS21, BS22/23, BS24/25	springy seepages, calcareous fens, and wet mossy lakeshores ^{13,22}	-	moist sites, often on bare calcareous soil and/or near water ¹⁷

²⁹ Brooks, R.E. and S.E. Clemants. 2020. *Juncus stygius* var. *americanus* Buchenau. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 22. Available at: https://floranorthamerica.org/Juncus_stygius_var._americanus. Accessed November 2025.

³⁰ Wagner Jr., W.H., and J.M. Beitel. 2024b. *Lycopodiella inundata* (Linnaeus) Holub. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 2. Available at: https://floranorthamerica.org/Lycopodiella_inundata. Accessed November 2025.

³¹ Wagner Jr., W.H., and J.M. Beitel. 2024c. *Lycopodium hickeyi* W. H. Wagner. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 2. Available at: https://floranorthamerica.org/Lycopodium_hickeyi. Accessed November 2025.

³² Catling, P.M., and L.K. Magrath. *Malaxis paludosa* (Linnaeus) Swartz. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 26. Available at: https://floranorthamerica.org/Malaxis_paludosa. Accessed November 2025.

³³ Harms, V.L. and A.L. Leighton. 2011b. *Flora of Saskatchewan Fascicle 2: Lilies, Irises, and Orchids of Saskatchewan*. Flora of Saskatchewan Association and Nature Saskatchewan, Regina, SK. 184 pp.

³⁴ ABMI. 2023b. Labrador Lousewort (*Pedicularis labradorica*). Available at: <https://abmi.ca/species/pedicularis-labradorica>. Accessed November 2025.

³⁵ Robart, B.W. 2020a. *Pedicularis labradorica* Wirsing. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 17. Available at: http://floranorthamerica.org/Pedicularis_labradorica. Accessed November 2025.

³⁶ ABMI. 2023c. Purple Lousewort (*Pedicularis parviflora*). Available at: <https://abmi.ca/species/pedicularis-parviflora>. Accessed November 2025.

³⁷ Robart, B.W. 2020b. *Pedicularis parviflora* Smith. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 17. Available at: http://floranorthamerica.org/Pedicularis_parviflora. Accessed November 2025.

³⁸ Smith, A.G. 2024. *Phegopteris connectilis* (Michaux) Watt. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 2. Available at: https://floranorthamerica.org/Phegopteris_connectilis. Accessed November 2025.

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Scientific Name	Common Name	Provincial Rank ¹²	Potentially Suitable Key Natural Ecosite Groups in the LAA	Saskatchewan Habitat Associations	Alberta and/or Manitoba Habitat Associations ¹	North American Habitat Associations ¹
<i>Rhinanthus minor</i> ssp. <i>minor</i>	little yellow-rattle	S3	disturbed - anthropogenic	-	anthropogenically disturbed sites ³⁹	clearings, rocky slopes, meadows, open forest, forest margins, and roadsides ^{17,40}
<i>Salix glauca</i> var. <i>villosa</i>	grey-leaf willow	S2	BS16, BS17, BS18, BS19/20, BS21, BS22/23, BS24/25, BS27, disturbed - anthropogenic, regenerating	mesic-moist riparian forests, moist forest openings, muskeg, sedge meadows, treed bogs, shores, and talus slopes/boulder fields ⁴¹	riverbanks, streams, and on the edges of wetlands; will also grow away from water in wet meadows and forest openings; grows readily on disturbed wet, soils and is an early colonizing species on mine sites ⁴²	riparian forests, forest openings, sedge meadows, thickets, treed bogs, talus slopes, boulder fields, snowflush areas, alpine tundra, limestone shale, schist, granite, quartzite substrates ^{17,43}
<i>Sorbus scopulina</i>	western mountain-ash	S3	BS3/4, BS5/6, BS7/8/9/10, BS16	-	older, more open coniferous forest ⁴⁴	open forests, forest edges, thickets, riparian zones, and lakeshores; mostly in open sites but also in closed coniferous forest ^{17,45}
<i>Subularia aquatica</i> ssp. <i>americana</i>	water awlwort	S3	BS24/25, BS27, water	shallow lake bottoms (submerged) ¹³	-	shallow water up to 1.5 m deep; muddy pool margins, rocky gravelly bottoms, shallow streams, wet sedge meadows, shallow sandy water flats, muddy tidal flats, salt marshes, and gravelly lake beaches ^{19,46}
<i>Viola macloskeyi</i>	smooth white violet	S2	BS16, BS17, BS18, BS19/20, BS21, BS22/23, BS24/25	marshy fens and bogs ¹³	-	open bogs, open swamps, alder thickets, marshes, sedge meadows, seeps, lake margins, stream banks, floodplains, swampy woods, mesic roadside depressions; often among mosses ^{19,47}

Notes:

¹ Species-level habitat association information was used for Alberta, Manitoba, and North America generally if subspecies or variety specific information could not be found.

³⁹ ABMI. 2023d. Yellow Rattle (*Rhinanthus minor*). Available at: <https://abmi.ca/species/rhinanthus-minor>. Accessed November 2025.

⁴⁰ Tucker, G.C. and B.M. Daugherty. 2020. *Rhinanthus minor* subsp. *minor*. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 17. Available at: http://floranorthamerica.org/Rhinanthus_minor_subsp._minor. Accessed January 2025.

⁴¹ Argus, G.W., V.L. Harms, A.L. Leighton, and M.A. Vetter. 2016. *Flora of Saskatchewan Fascicle 5: Conifers and Catkin-bearing Trees and Shrubs of Saskatchewan*. Flora of Saskatchewan Association and Nature Saskatchewan, Regina, SK. 272 pp.

⁴² ABMI. 2023e. Smooth Willow (*Salix glauca*). Available at: <https://abmi.ca/species/salix-glauca>. Accessed November 2025.

⁴³ Argus, G.W. 2020. *Salix glauca* var. *villosa* Andersson. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 7. Available at: http://floranorthamerica.org/Salix_glauca_var._villosa. Accessed November 2025.

⁴⁴ ABMI. 2023f. Western Mountain Ash (*Sorbus scopulina*). Available at: <https://abmi.ca/species/sorbus-scopulina>. Accessed November 2025.

⁴⁵ Zika, P.F. and S.M. Bailleul. 2020. *Sorbus scopulina* Greene. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 9. Available at: https://floranorthamerica.org/Sorbus_scopulina. Accessed November 2025.

⁴⁶ Al-Shehbaz, I.A. 2020. *Subularia aquatica* subsp. *americana* G. A. Mulligan & Calder. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 7. Available at: https://floranorthamerica.org/Subularia_aquatica_subsp._americana. Accessed November 2025.

⁴⁷ Little, R.J. and L.E. McKinney. 2020. *Viola macloskeyi* F. E. Lloyd. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America [Online]. New York and Oxford. Vol. 6. Available at: https://floranorthamerica.org/Viola_macloskeyi. Accessed November 2025.

Once the dataset was complete, Stantec calculated the number of SOCC recorded in each ecosite group (i.e., species richness) and the number of SOCC occurrences recorded in each ecosite group. These two values were normalized relative to the total number of species and occurrences and then summed. The results were divided into three percentiles for the purpose of assigning ranks. Ecosite groups in the bottom 33.3rd percentile were ranked as low potential, groups from 33.4th percentile to the 66.6th percentile were ranked as moderate potential, and ecosite groups in the 66.7th to 100th percentile were ranked as high potential. The final ecosite group and dominant habitat type rankings are provided in Table 3. The number of SOCC occurrences detected in each ecosite group are shown in Figure 1. SOCC abundance data (i.e., the number of plants observed per occurrence) were not available for most of the occurrences and were therefore excluded from the analysis. Abundance data would improve the SOCC rating analysis by identifying ecosite groups that not only support more occurrences but a greater number of the plants in each occurrence.

Table 3 *Vascular Plant SOCC Habitat Suitability Rankings*

Key Natural Ecosite Group	Dominant Habitat Type(s)	Vascular Plant SOCC Detected	Vascular Plant SOCC Habitat Suitability Rank
BS2 (lichen/felsenmeer - bedrock)	sparsely vegetated	Alaskan clubmoss	moderate
BS3/4 (jack pine [<i>Pinus banksiana</i>] dominant)	coniferous woodland	Alaskan clubmoss, Hickey's clubmoss	high
BS5/6 (jack pine [<i>Pinus banksiana</i>] mixedwood)	coniferous woodland, mixed woodland	Alaskan clubmoss, long beech-fern, western mountain-ash	moderate
BS7/8/9/10 (black spruce [<i>Picea mariana</i>] dominant)	coniferous woodland	Alaskan clubmoss, long beech-fern	moderate
BS13 (white birch [<i>Betula papyrifera</i>] - black spruce [<i>Picea mariana</i>])	mixed woodland	-	low
BS14 (white birch [<i>Betula papyrifera</i>] dominant)	deciduous woodland	-	low
BS15 (aspen [<i>Populus tremuloides</i>] dominant)	deciduous woodland	-	low
BS16 (treed swamp >10 m)	swamp	hairy butterwort, long beech-fern, moor rush, mountain club-moss, northern lady-fern, purple lousewort, western mountain-ash	high
BS17 (black spruce [<i>Picea mariana</i>] treed bog)	bog	hairy butterwort, long-beech fern, Michaux's sedge, moor rush, purple lousewort	moderate

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Key Natural Ecosite Group	Dominant Habitat Type(s)	Vascular Plant SOCC Detected	Vascular Plant SOCC Habitat Suitability Rank
BS18 (Labrador tea [<i>Rhododendron groenlandicum</i>] shrubby bog)	bog	grey-leaf willow, hairy butterwort, labrador lousewort, Michaux's sedge, moor rush, soft-stem rush	high
BS19/20 (graminoid/open bog)	bog	-	low
BS21 (tamarack [<i>Larix laricina</i>] treed fen)	fen	bog adder's mouth orchid, English sundew, hairy butterwort, Michaux's sedge, moor rush, mountain club-moss, purple lousewort	high
BS22/23 (shrubby fen)	fen	bog adder's mouth orchid, common butterwort, English sundew, hairy butterwort, Michaux's sedge, moor rush, mountain club-moss, northern bog clubmoss, purple lousewort, water awlwort	high
BS24/25 (graminoid/open fen)	fen	bog adder's mouth orchid, English sundew, hairy butterwort, Labrador lousewort, moor rush, mountain club-moss, purple lousewort	high
BS27 (sedge [<i>Carex</i> spp.] rocky shore)	sparsely vegetated	-	low
disturbed - anthropogenic	disturbed - anthropogenic	Alaskan clubmoss, northern bog clubmoss	moderate
disturbed - recent fire	disturbed - recent fire	-	low
regenerating	regenerating	Alaskan clubmoss	moderate

4 Habitat Suitability for Caribou and Moose

The key objectives of refining the ecosite classifications and completing habitat mapping are to describe how each habitat category supports foraging by woodland caribou and moose, and to incorporate knowledge of seasonal use patterns. Caribou and moose have different foraging ecologies, though their ranges overlap in the LAA's boreal landscape. Woodland caribou are specialized to feed on lichens (especially in winter) and to avoid predators by spacing out on the landscape and selecting isolated

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

habitats^{48,49,50}, whereas moose are generalist browsers that seek abundant shrubby forage and aquatic plants, with high nutritional needs year-round^{51,52}. The refined ecosite classifications account for these differences by noting the relative habitat value of each ecosite type to caribou and moose in each season. All seasons are considered equally to avoid biasing the classification toward one season.

4.1 Seasonal Habitat Use Patterns

Table 4 summarizes typical habitat use and foraging behavior of caribou and moose in each season within the boreal LAA, which guided how habitat suitability was labelled in the classification.

⁴⁸ Cumming, H.G., D.B. Beange, and G. Lavoie. 1994. *Habitat partitioning between woodland caribou and moose in Ontario: the potential role of shared predation risk*. Rangifer Special Issue No. 9: 81–94.

⁴⁹ James, A.R.C., S. Boutin, D.M. Hervet, and A.B. Rippin. 2004. *Spatial separation of caribou from moose and its relation to predation by wolves*. Journal of Wildlife Management 68(4): 799–809.

⁵⁰ Walker, P.D., A.R. Rodgers, J. Shuter, J.M. Fryxell, and E.H. Merrill. 2024. *Woodland caribou calving fidelity: Spatial location, habitat, or both?* Ecology and Evolution 2024;14:e11480.

⁵¹ Romito, T., K. Smith, B. Beck, J. Beck, M. Todd, R. Bonar, and R. Quinlan. 1999. *Moose Winter Habitat Suitability Index Model Version 5*. Available at: https://firesearch.ca/data/null/HSP_1999_10_Rpt_MooseWinterHabitat.pdf. Accessed November 2025.

⁵² Stewart, A., P.E. Komers, and D.J. Bender. 2010. *Assessing landscape relationships for habitat generalists*. Ecoscience 17(1): 28–36.

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Table 4 *Woodland Caribou and Moose Seasonal Habitat Use*

Season	Typical Woodland Caribou Habitat ^{53,54}	Typical Moose Habitat ^{55,56,57,58,59}
Winter (Foraging, mid-November to early March ⁶⁰)	In winter, caribou rely heavily on lichen-rich habitats. They favour open mature coniferous forests (upland black spruce or jack pine stands) where terrestrial and arboreal lichens are abundant and snow depth is shallow or crusted enough to dig. Caribou also use treed bogs and mixed forests as winter foraging areas, and they may use frozen lakes or muskegs as travel routes to avoid deep snow. Dominant habitat types such as coniferous woodland and also mixed woodland, bog, and treed swamp are therefore important winter foraging habitats for caribou.	In winter, snow conditions hinder movement, and moose reduce their metabolic rate, food consumption, and activity levels. Moose must browse on woody vegetation in winter when deciduous foliage and aquatic plants are unavailable. They move into areas with abundant willow, red-osier dogwood, birch, or aspen twigs and bark for food. Moose often concentrate in dense conifer forest with reduced snow density and depth or recently burned areas where regenerating shrubs are accessible above the snow. They seek south-facing slopes or riparian corridors with shallower snow. Habitat categories like mixed woodland (aspen or birch stands) offer winter browse and mature conifer woodland provides winter cover. Overall, moose winter habitat is defined by availability of woody browse and cover.

⁵³ Committee on the Status of Endangered Wildlife in Canada. 2014. *COSEWIC Assessment and Status Report on the Caribou Rangifer tarandus, Northern Mountain Population, Central Mountain Population and Southern Mountain Population in Canada*. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON. xxii + 128 pp.

⁵⁴ Environment and Climate Change Canada. 2020. *Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada. Species at Risk Act Recovery Strategy Series*. Environment and Climate Change Canada, Ottawa, ON. xiii + 143 pp.

⁵⁵ Timmermann, H.R. and J.G. McNicol. 1988. *Moose habitat needs*. The Forestry Chronicle: 238–245.

⁵⁶ Dussault, C., J.-P. Ouellet, R. Courtois, J. Huot, L. Breton, and H. Jolicœur. 2005. *Linking moose habitat selection to limiting factors*. Ecography 28: 619–628.

⁵⁷ Dussault, C., R. Courtois, and J.-P. Ouelett. 2006. *A habitat suitability index model to assess moose habitat selection at multiple spatial scales*. Canadian Journal of Forest Research 36: 1097–1107.

⁵⁸ Patterson, B.R., K.J. Mills, K.R. Middel, J.F. Benson, and M.E. Obbard. 2016. *Does predation influence the seasonal and diel timing of moose calving in central Ontario, Canada?* PLoS ONE 11(4): e0150730. doi:10.1371/journal.pone.0150730.

⁵⁹ McLaren, A.A.D., J.F. Benson, and B.R. Patterson. 2017. *Multi-scale habitat selection by cow moose (Alces alces) at calving sites in central Ontario*. Papers in Natural Resources 968. Available at: <https://digitalcommons.unl.edu/natrespapers/968>.

⁶⁰ Ontario Ministry of the Environment, Conservation and Parks. 2025. *General habitat description for the forest-dwelling woodland caribou*. Available at: <https://www.ontario.ca/page/general-habitat-description-forest-dwelling-woodland-caribou>. Accessed November 2025.

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Season	Typical Woodland Caribou Habitat ^{53,54}	Typical Moose Habitat ^{55,56,57,58,59}
Spring (Calving, early May to mid-July ⁶⁰)	In spring, pregnant caribou females seek isolated, predator-resistant areas for calving. They select habitats like peatland bogs, treed muskeg islands, small lakes, and lakeshores, which offer isolation from wolves and bears. These areas still have some lichens and new growth for nutrition, but security is the main driver. After calving, caribou forage on early green-up vegetation (grasses, sedges, fungi, and still-available lichens) in fens and bogs. Bog, as well as open water adjacent habitats are particularly important in spring for caribou calving and nursery areas.	Moose give birth in late spring (May). Cows typically seek dense cover in conifer, hardwood, and mixed woodland near water for calving, such as islands in rivers or lakes and wetlands. These areas provide seclusion from predators and abundant browse for the nutrient demands of lactation. During spring green-up (April to June), moose shift to feeding on fresh growth of willow and birch shoots, grasses, sedges, and aquatic plants. Fens and swamps are prime spring habitats offering both cover for calves and new forage. The classification therefore highlights fen and swamp habitats as important for moose in spring (calving areas with food and cover).
Summer (Post-calving, mid-July to mid-November ⁶⁰)	In summer, caribou expand their diet to include grasses, sedges, forbs, and leaves in addition to ground lichens. They often use mature, dense conifer and mixed forest stands. Treed muskeg, wooded lakeshores, islands, and sparsely treed rock are also selected. They may also venture into recently burned areas or more open shrub lands to feed on regrowing vegetation. However, they still avoid very open areas that lack cover. Key dominant habitat types include coniferous woodland, bog, swamp (treed wetland), and predominantly rock.	Deciduous tree and shrub leaves compose a large portion of the moose diet in summer. Aquatic feeding continues through mid-September. Moist, cool lowland habitats are selected in summer for feeding, body temperature regulation, and refuge from insects. Key habitat categories for summer moose foraging include fen and swamp (aquatic plants, sedges) and deciduous woodland edges (with young aspen and willow). Open water and adjacent wetland areas are high-value summer habitat for aquatic feeding. Moose roam widely in summer but tend to select areas near water with abundant vegetation.
Autumn (Rut and pre-winter, mid- to late October ⁶¹)	In autumn, caribou gradually shift back to a more lichen-focused diet as plants die back. During the rut (mating season) in early fall, adult caribou may move more and form small groups. They use sparse and dense conifer and mixed forests, and	In autumn (early September to early November), moose enter the rut. Bulls roam widely in search of females, and moose are found in a variety of habitats. They feed heavily to gain weight before winter, browsing shrubs and any remaining

⁶¹ Manitoba Natural Resources and Indigenous Futures. 2025. *Boreal woodland caribou*. Available at: https://www.gov.mb.ca/nrnd/fish-wildlife/wildlife/boreal_caribou/index.html. Accessed November 2025.

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Season	Typical Woodland Caribou Habitat ^{53,54}	Typical Moose Habitat ^{55,56,57,58,59}
	also open riparian habitats. Travel between summer and winter ranges is in large peatland complexes. By late fall (post-rut), caribou seek areas with shallow snow and abundant lichens in preparation for winter—essentially their winter range. Important dominant habitat types are mainly coniferous woodland mixed woodland.	green forage. As leaves drop, moose shift to a woody diet. Disturbed areas (such as regenerating forest stands with a dense shrub layer) and also mixed or deciduous woodland provide food in autumn. In autumn, moose habitat overlaps both summer feeding areas and winter foraging areas. Moose continue to use wetlands and riparian zones until freeze-up and increasingly use mixed woodland and edges for woody browse as the season progresses. Deciduous woodland, mixed woodland, and regenerating burns are important because of the availability of browse and rutting habitat. By late autumn, moose concentrate in areas with high browse production, where they spend the winter.

4.2 Key Habitat Attributes by Species

Key habitat attributes for caribou and moose are described as follows.

4.2.1 Caribou

Caribou strongly associate with lichen-rich coniferous habitats (coniferous woodland and bog). They require large undisturbed areas for security.

Seasonal highlights:

1. foraging (mid-November to early March) = ground and tree lichens in mature conifers
2. calving (early May to mid-July) = low-predation bog/fen refuges for calving
3. post-calving (mid-July to mid-November) = low-predation bog/fen refuges, dense forest
4. rut and pre-winter (mid- to late October) = continued reliance on lichens in forest, increasing as winter nears

The classification therefore marks coniferous woodland and mixed woodland habitats as high suitability for winter foraging; bog habitat as high suitability for spring calving; coniferous woodland, mixed woodland, bog, swamp (treed wetland), and predominantly rock habitats as high suitability for summer post-calving; and coniferous woodland and mixed woodland as high suitability for autumn rutting and pre-winter habitat (Table 4).

Table 5 Woodland Caribou Habitat Potential

Ecosite /Habitat Class	Dominant Habitat Type Name	Dominant Habitat Type Description ²	Key Natural Ecosite Group Code	Key Natural Ecosite Group Description	Ecosites Included in Key Natural Ecosite Group	Season			
						Foraging	Calving	Post-calving	Rut and Pre-winter
forest (upland)	coniferous woodland	>75% softwood species by area; >10% crown closure	BS3/4	jack pine (<i>Pinus banksiana</i>) dominant	BS3 – jack pine (<i>Pinus banksiana</i>) / blueberry (<i>Vaccinium myrtilloides</i>) / lichen: moderately fresh sand	high	low	high	high
					BS4 – jack pine (<i>Pinus banksiana</i>) - black spruce (<i>Picea mariana</i>) / feathermoss: moderately dry sand	high	low	high	high
			BS5/6	jack pine (<i>Pinus banksiana</i>) mixedwood	BS5 – jack pine (<i>Pinus banksiana</i>) - white birch (<i>Betula papyrifera</i>) / feathermoss: moderately dry sand	high	low	high	high
					BS6 – jack pine (<i>Pinus banksiana</i>) - trembling aspen (<i>Populus tremuloides</i>) / green alder (<i>Alnus viridis</i>): moderately fresh loamy sand	high	low	high	high
			BS7/8/9/10	black spruce (<i>Picea mariana</i>) dominant	BS7 – black spruce (<i>Picea mariana</i>) / blueberry (<i>Vaccinium myrtilloides</i>) / lichen: moderately dry sand	high	low	high	high
					BS8 – black spruce (<i>Picea mariana</i>) - white birch (<i>Betula papyrifera</i>) / lichen: moderately dry sandy loam	high	low	high	high
					BS9 – black spruce (<i>Picea mariana</i>) - jack pine (<i>Pinus banksiana</i>) / feathermoss: moderately fresh sandy loam	high	low	high	high
					BS10 – black spruce (<i>Picea mariana</i>) - white birch (<i>Betula papyrifera</i>) / feathermoss: fresh sand	high	low	high	high
	mixed woodland	softwood/hardwood mixtures in which neither softwood nor hardwood account for >75% of species by area; >10% crown closure	BS5/6	jack pine (<i>Pinus banksiana</i>) mixedwood	BS5 – jack pine (<i>Pinus banksiana</i>) - white birch (<i>Betula papyrifera</i>) / feathermoss: moderately dry sand	high	low	high	high
					BS6 – jack pine (<i>Pinus banksiana</i>) - trembling aspen (<i>Populus tremuloides</i>) / green alder (<i>Alnus viridis</i>): moderately fresh loamy sand	high	low	high	high
			BS13	white birch (<i>Betula papyrifera</i>)/black spruce (<i>Picea mariana</i>)	BS13 – white birch (<i>Betula papyrifera</i>) - black spruce (<i>Picea mariana</i>) - trembling aspen (<i>Populus tremuloides</i>): moderately fresh sand	high	low	high	high
	deciduous woodland	>75% hardwood species by area; >10% crown closure	BS14	white birch (<i>Betula papyrifera</i>) dominant	BS14 – white birch (<i>Betula papyrifera</i>) / lingonberry (<i>Vaccinium vitis-idaea</i>) - Labrador tea (<i>Rhododendron groenlandicum</i>): moderately dry sand	high	low	low	low
			BS15	aspen (<i>Populus tremuloides</i>) dominant	BS15 – trembling aspen (<i>Populus tremuloides</i>) - white birch (<i>Betula papyrifera</i>) / green alder (<i>Alnus viridis</i>): moderately fresh loamy sand	high	low	low	low

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Ecosite /Habitat Class	Dominant Habitat Type Name	Dominant Habitat Type Description ²	Key Natural Ecosite Group Code	Key Natural Ecosite Group Description	Ecosites Included in Key Natural Ecosite Group	Season			
						Foraging	Calving	Post-calving	Rut and Pre-winter
wetland	bog	peatland receiving water exclusively from precipitation and not influenced by groundwater; dominated by peat (<i>Sphagnum</i> spp.) mosses	BS17	black spruce (<i>Picea mariana</i>) treed bog	BS17 – black spruce (<i>Picea mariana</i>) treed bog: very moist mesic organic	low	high	high	low
			BS18	Labrador tea (<i>Rhododendron groenlandicum</i>) shrubby bog	BS18 – Labrador tea (<i>Rhododendron groenlandicum</i>) shrubby bog: moderately wet mesic organic	low	high	high	low
			BS19/20	graminoid/open bog	BS19 – graminoid bog: very wet humic organic	low	low	low	moderate
					BS20 – open bog: moderately wet fibric organic	low	low	low	moderate
	fen	peatland with a fluctuating water table receiving water high in dissolved minerals; vegetation cover dominated by graminoids and mosses	BS21	tamarack (<i>Larix laricina</i>) treed fen	BS21 – tamarack (<i>Larix laricina</i>) treed fen: wet fibric organic	low	moderate	moderate	moderate
			BS22/23	shrubby fen	BS22 – leatherleaf (<i>Chamaedaphne calyculata</i>) shrubby poor fen: very wet fibric organic	high	moderate	moderate	moderate
					BS23 – willow (<i>Salix</i> spp.) shrubby rich fen: wet fibric organic	high	moderate	moderate	moderate
			BS24/25	graminoid/open fen	BS24 – graminoid fen: very wet humic organic	high	moderate	moderate	moderate
					BS25 – open fen: wet mesic organic	high	moderate	moderate	moderate
	swamp (treed wetland)	mineral wetland or peatland with periodically standing surface water and gently moving, nutrient-rich groundwater at least 20 cm below the ground surface; dominated by woody plants (i.e., >30% cover) often >1 m in height	BS16	treed swamp	BS16 – black spruce (<i>Picea mariana</i>) / balsam poplar (<i>Populus balsamifera</i>) / river alder (<i>Alnus incana</i>) swamp: very moist mesic organic	high	moderate	high	moderate
sparsely vegetated	sparsely vegetated	surface material is predominantly rock; vascular and/or bryophyte cover <10%	BS2	surface material predominantly rock – largely unvegetated boulder field or bedrock	surface material is predominantly rock; vascular and/or bryophyte cover <10%	low	low	high	moderate
			BS27	surface material predominantly rock – rocky/sandy shore conditions	surface material is predominantly rock; vascular and/or bryophyte cover <10%	low	moderate	high	moderate
disturbed	disturbed – anthropogenic	disturbance due to human causes	disturbed – anthropogenic	disturbance due to anthropogenic causes	-	low	low	low	low
	disturbed – recent fire ⁶	disturbance due to forest fires that have occurred since 2021	disturbed – recent fire	disturbance due to forest fires that have occurred since 2021	-	low	low	low	low
	regenerating	regenerating habitats lacking features required to be classified to the ecosite level (e.g., pioneer or young seral communities)	regenerating	regenerating habitats lacking features required to be classified to the ecosite level (e.g., pioneer or young seral communities)	-	low	low	low	low

4.2.2 Moose

Moose strongly associate with shrubby and aquatic food sources, often near water or in early-successional stages.

Seasonal highlights:

1. foraging (mid-November to early March) = woody browse (willow, birch, aspen twigs) in shrub-rich areas or cutovers; coniferous woodland for cover
2. calving (early May to mid-July) = nutritious new growth in open water, fen, and swamp; dense cover for calves
3. post-calving (mid-July to mid-November) = aquatic vegetation in ponds and deciduous tree and shrub foliage
4. rut and pre-winter (mid- to late October) = increasing use of woody browse and wide movements for mating

Fen, swamp, and deciduous and mixed woodland habitats are rated highly for moose summer feeding, along with riparian edges of water (mapped as fen or water). Coniferous uplands are important to moose for thermal cover or travel corridors in winter; bogs are used opportunistically (moose may wade into bogs with some willow, but generally plants are nutrient-poor and are less preferred by moose). Disturbed (recently burned) and regenerating areas are very productive moose habitats because of abundant shrubs. Moose are generalists and use a broad range of habitats; however, the richest feeding often occurs in wetland complexes and deciduous forests (Table 6).

Table 6 Moose Habitat Potential

Ecosite /Habitat Class	Dominant Habitat Type Name	Dominant Habitat Type Description ²	Key Natural Ecosite Group Code	Key Natural Ecosite Group Description	Ecosites Included in Key Natural Ecosite Group	Season			
						Foraging	Calving	Post-calving	Rut and Pre-winter
forest (upland)	coniferous woodland	>75% softwood species by area; >10% crown closure	BS3/4	jack pine (<i>Pinus banksiana</i>) dominant	BS3 – jack pine (<i>Pinus banksiana</i>) / blueberry (<i>Vaccinium myrtilloides</i>) / lichen: moderately fresh sand	high	high	low	low
					BS4 – jack pine (<i>Pinus banksiana</i>) - black spruce (<i>Picea mariana</i>) / feathermoss: moderately dry sand	high	high	low	low
			BS5/6	jack pine (<i>Pinus banksiana</i>) mixedwood	BS5 – jack pine (<i>Pinus banksiana</i>) - white birch (<i>Betula papyrifera</i>) / feathermoss: moderately dry sand	high	high	moderate	moderate
					BS6 – jack pine (<i>Pinus banksiana</i>) - trembling aspen (<i>Populus tremuloides</i>) / green alder (<i>Alnus viridis</i>): moderately fresh loamy sand	high	high	moderate	moderate
			BS7/8/9/10	black spruce (<i>Picea mariana</i>) dominant	BS7 – black spruce (<i>Picea mariana</i>) / blueberry (<i>Vaccinium myrtilloides</i>) / lichen: moderately dry sand	high	high	low	low
					BS8 – black spruce (<i>Picea mariana</i>) - white birch (<i>Betula papyrifera</i>) / lichen: moderately dry sandy loam	high	high	moderate	moderate
					BS9 – black spruce (<i>Picea mariana</i>) - jack pine (<i>Pinus banksiana</i>) / feathermoss: moderately fresh sandy loam	high	high	low	low
					BS10 – black spruce (<i>Picea mariana</i>) - white birch (<i>Betula papyrifera</i>) / feathermoss: fresh sand	high	high	moderate	moderate
	mixed woodland	softwood/hardwood mixtures in which neither softwood nor hardwood account for >75% of species by area; >10% crown closure	BS5/6	jack pine (<i>Pinus banksiana</i>) mixedwood	BS5 – jack pine (<i>Pinus banksiana</i>) - white birch (<i>Betula papyrifera</i>) / feathermoss: moderately dry sand	high	high	moderate	moderate
					BS6 – jack pine (<i>Pinus banksiana</i>) - trembling aspen (<i>Populus tremuloides</i>) / green alder (<i>Alnus viridis</i>): moderately fresh loamy sand	high	high	moderate	moderate
			BS13	white birch (<i>Betula papyrifera</i>)/black spruce (<i>Picea mariana</i>)	BS13 – white birch (<i>Betula papyrifera</i>) - black spruce (<i>Picea mariana</i>) - trembling aspen (<i>Populus tremuloides</i>): moderately fresh sand	high	high	high	high
	deciduous woodland	>75% hardwood species by area; >10% crown closure	BS14	white birch (<i>Betula papyrifera</i>) dominant	BS14 – white birch (<i>Betula papyrifera</i>) / lingonberry (<i>Vaccinium vitis-idaea</i>) - Labrador tea (<i>Rhododendron groenlandicum</i>): moderately dry sand	high	high	high	high
			BS15	aspen (<i>Populus tremuloides</i>) dominant	BS15 – trembling aspen (<i>Populus tremuloides</i>) - white birch (<i>Betula papyrifera</i>) / green alder (<i>Alnus viridis</i>): moderately fresh loamy sand	high	high	high	high

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Ecosite /Habitat Class	Dominant Habitat Type Name	Dominant Habitat Type Description ²	Key Natural Ecosite Group Code	Key Natural Ecosite Group Description	Ecosites Included in Key Natural Ecosite Group	Season			
						Foraging	Calving	Post-calving	Rut and Pre-winter
wetland	bog	peatland receiving water exclusively from precipitation and not influenced by groundwater; dominated by peat (<i>Sphagnum</i> spp.) mosses	BS17	black spruce (<i>Picea mariana</i>) treed bog	BS17 – black spruce (<i>Picea mariana</i>) treed bog: very moist mesic organic	low	low	moderate	low
			BS18	Labrador tea (<i>Rhododendron groenlandicum</i>) shrubby bog	BS18 – Labrador tea (<i>Rhododendron groenlandicum</i>) shrubby bog: moderately wet mesic organic	low	low	moderate	low
			BS19/20	graminoid/open bog	BS19 – graminoid bog: very wet humic organic	low	low	high	moderate
					BS20 – open bog: moderately wet fibric organic	low	low	high	moderate
	fen	peatland with a fluctuating water table receiving water high in dissolved minerals; vegetation cover dominated by graminoids and mosses	BS21	tamarack (<i>Larix laricina</i>) treed fen	BS21 – tamarack (<i>Larix laricina</i>) treed fen: wet fibric organic	low	high	low	low
			BS22/23	shrubby fen	BS22 – leatherleaf (<i>Chamaedaphne calyculata</i>) shrubby poor fen: very wet fibric organic	moderate	high	low	low
					BS23 – willow (<i>Salix</i> spp.) shrubby rich fen: wet fibric organic	high	high	high	high
			BS24/25	graminoid/open fen	BS24 – graminoid fen: very wet humic organic	low	high	high	high
					BS25 – open fen: wet mesic organic	low	high	high	high
	swamp (treed wetland)	mineral wetland or peatland with periodically standing surface water and gently moving, nutrient-rich groundwater at least 20 cm below the ground surface; dominated by woody plants (i.e., >30% cover) often >1 m in height	BS16	treed swamp	BS16 – black spruce (<i>Picea mariana</i>) / balsam poplar (<i>Populus balsamifera</i>) / river alder (<i>Alnus incana</i>) swamp: very moist mesic organic	moderate	high	high	high
sparsely vegetated	sparsely vegetated	surface material is predominantly rock; vascular and/or bryophyte cover <10%	BS2	surface material predominantly rock – largely unvegetated boulder field or bedrock	surface material is predominantly rock; vascular and/or bryophyte cover <10%	low	low	low	low
			BS27	surface material predominantly rock – rocky/sandy shore conditions	surface material is predominantly rock; vascular and/or bryophyte cover <10%	low	low	low	low
disturbed	disturbed – anthropogenic	disturbance due to human causes	disturbed – anthropogenic	disturbance due to anthropogenic causes	-	low	low	low	low
	disturbed – recent fire ⁶	disturbance due to forest fires that have occurred since 2021	disturbed – recent fire	disturbance due to forest fires that have occurred since 2021	-	low	low	high	high
	regenerating	regenerating habitats lacking features required to be classified to the ecosite level (e.g., pioneer or young seral communities)	regenerating	regenerating habitats lacking features required to be classified to the ecosite level (e.g., pioneer or young seral communities)	-	high	low	high	high

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

Appendix A Figures

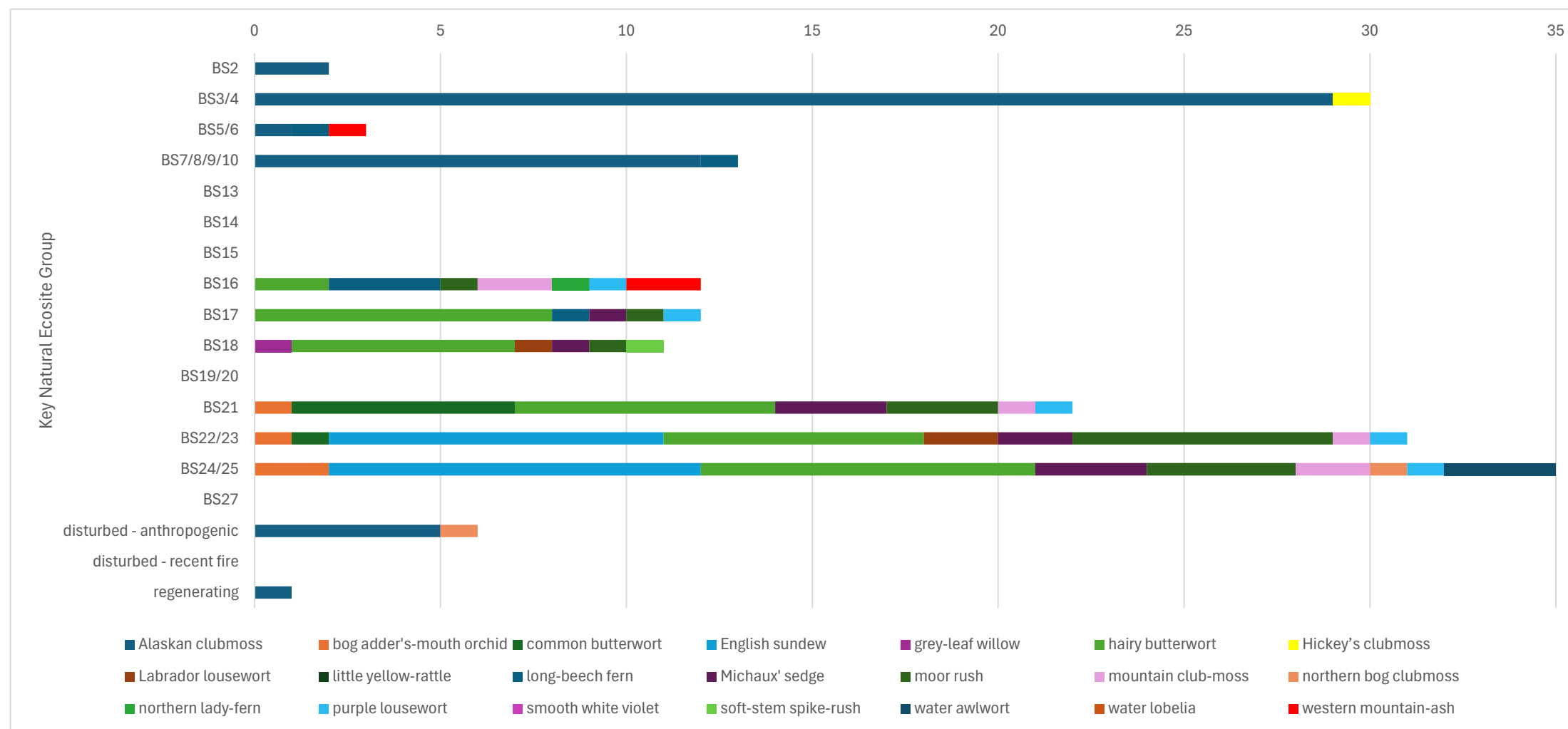


Figure 1 Number of Vascular Plant SOCC Occurrences per Key Natural Ecosite Group

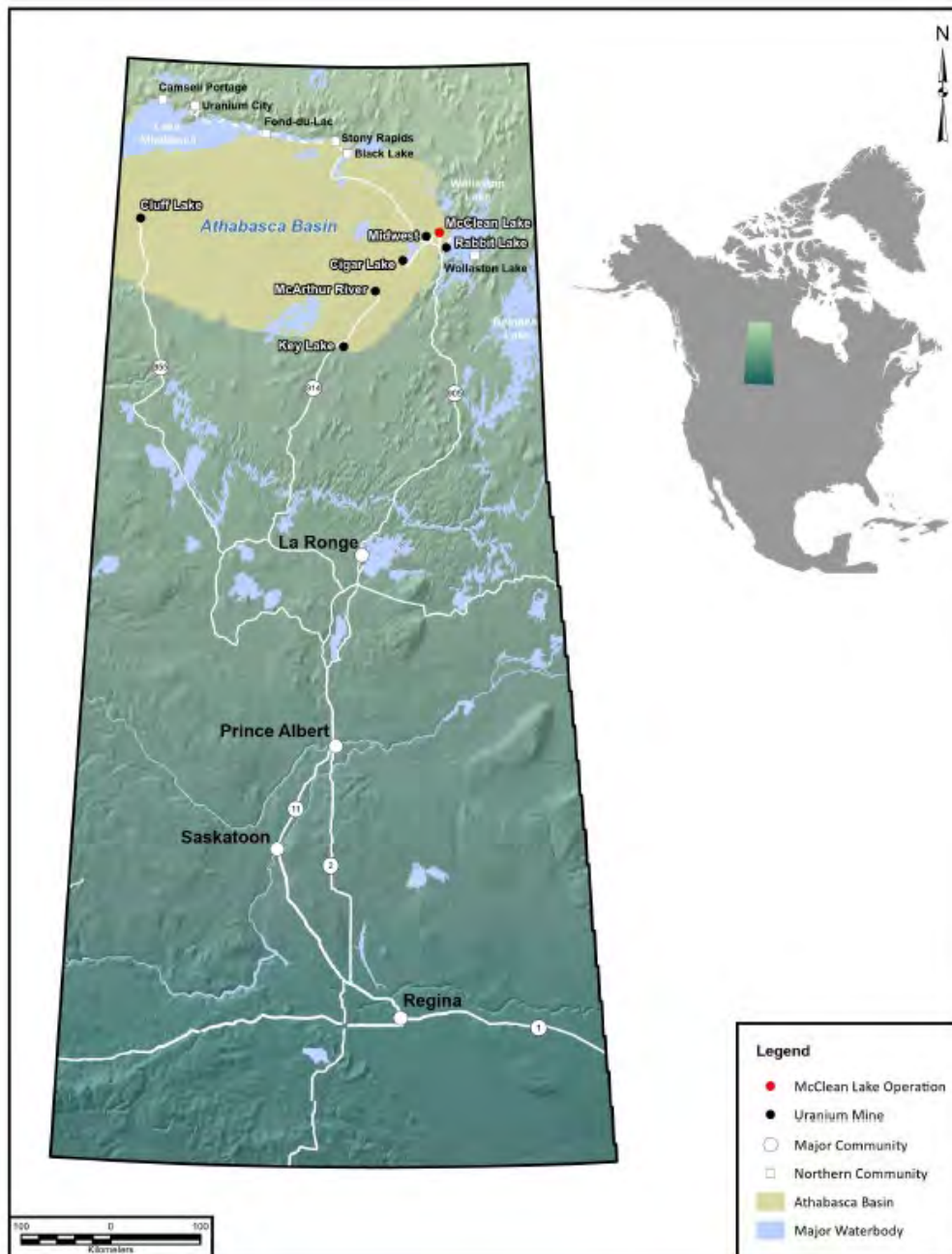


Figure 2 McClean Lake Operation Location

Reference: McClean Lake Operation Project Ecosite Refinement: Terrestrial Habitat Mapping and Habitat Suitability

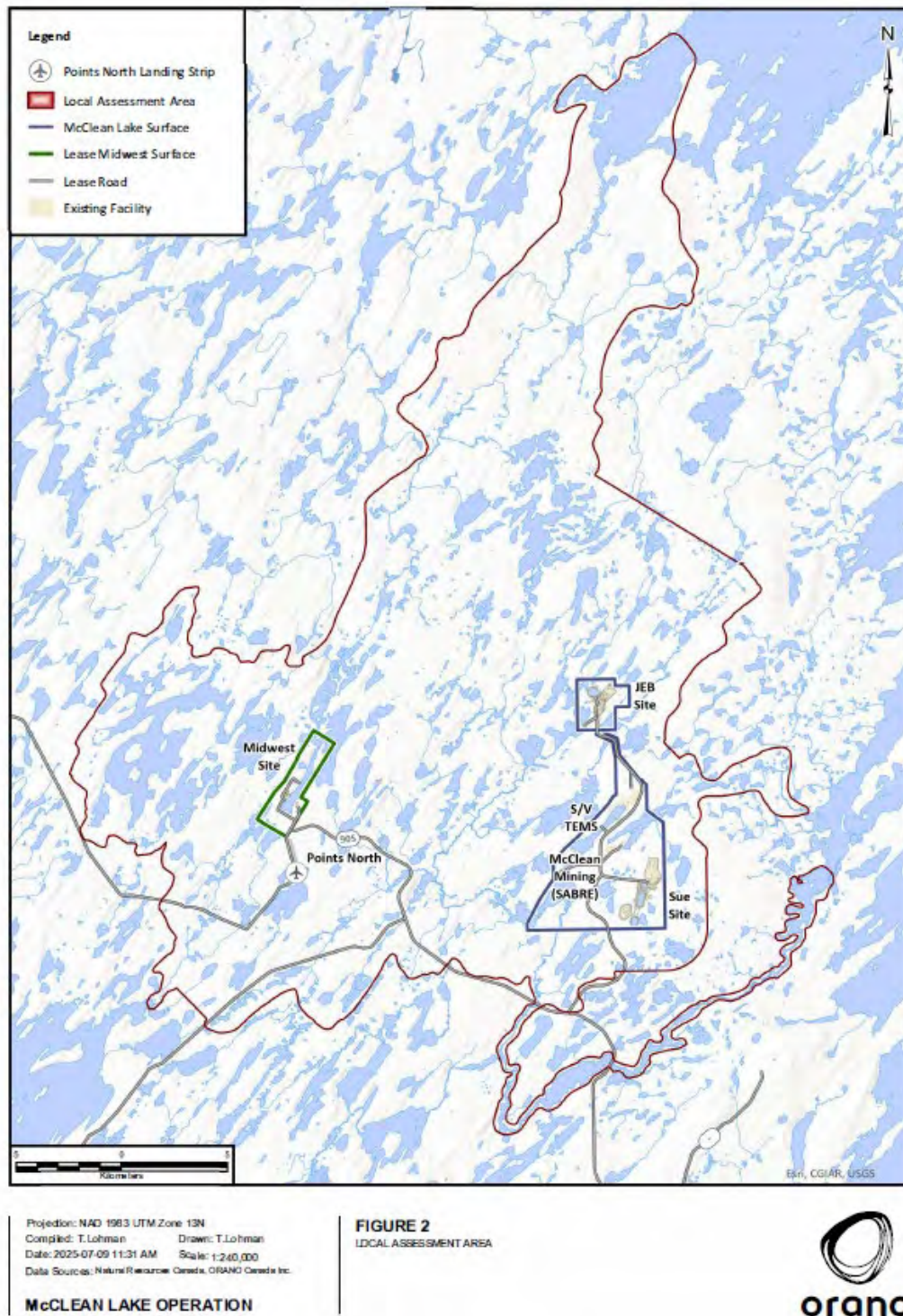
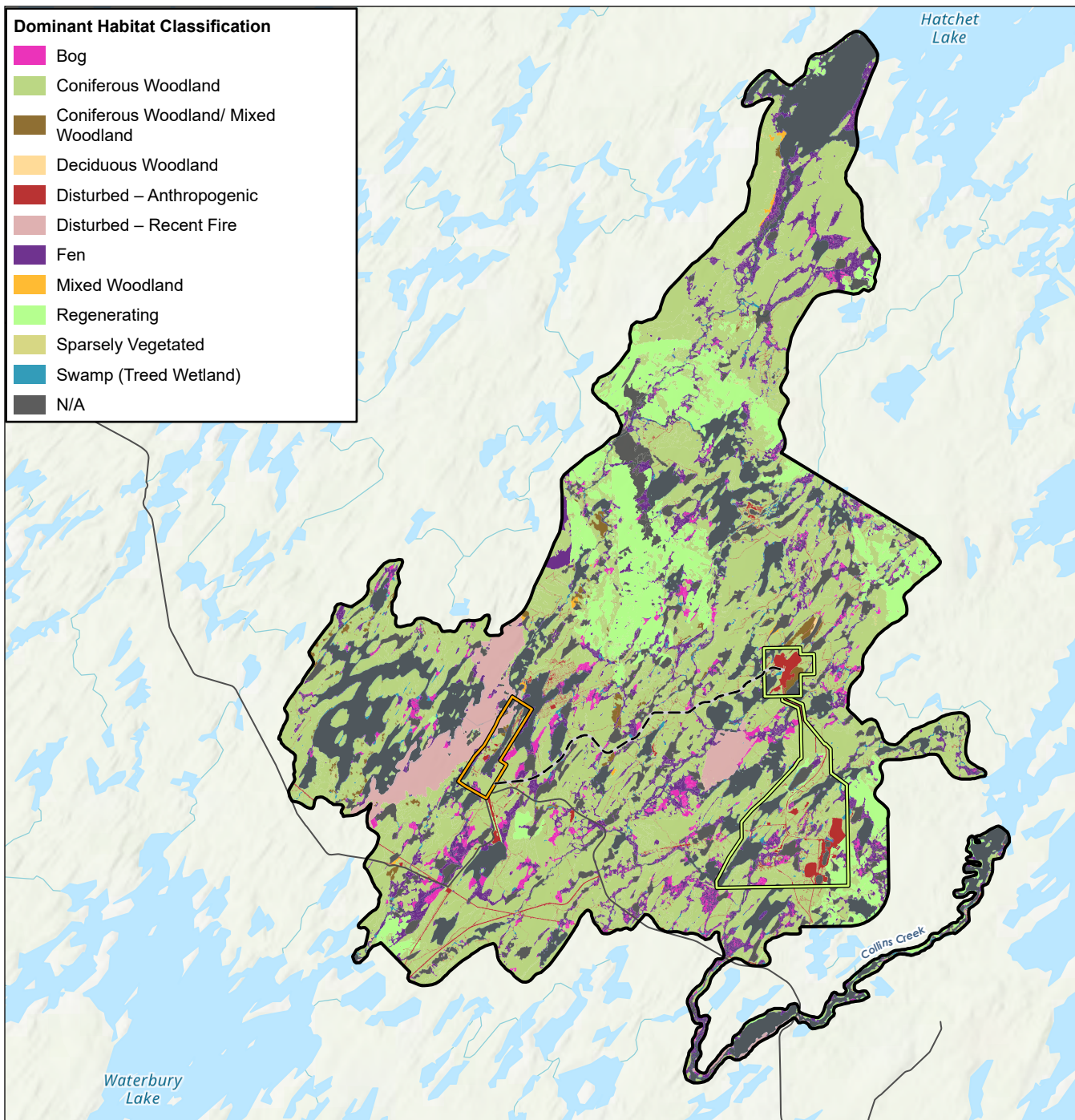


Figure 3 Local Assessment Area

Draft Habitat Classification Maps

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Legend

- Local Assessment Area (LAA)
- Midwest Surface Lease
- McClean Surface Lease
- Proposed Midwest Haul Road
- Road

0 2.5 5 km
(At original document size of 8.5x11)
1:300,000



Stantec



Project Location
Near McClean Lake,
Saskatchewan

Prepared by JH on 2025-11-27
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IR by XX on 2025-11-27

Client/Project

111473090-001 REVA

Orano
Ecosite Refinement and Habitat Classification

Notes

1. Coordinate System: NAD 1983 UTM Zone 13N
2. Data Sources: Orano, Stantec.
3. Background: World Topographic Map; Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
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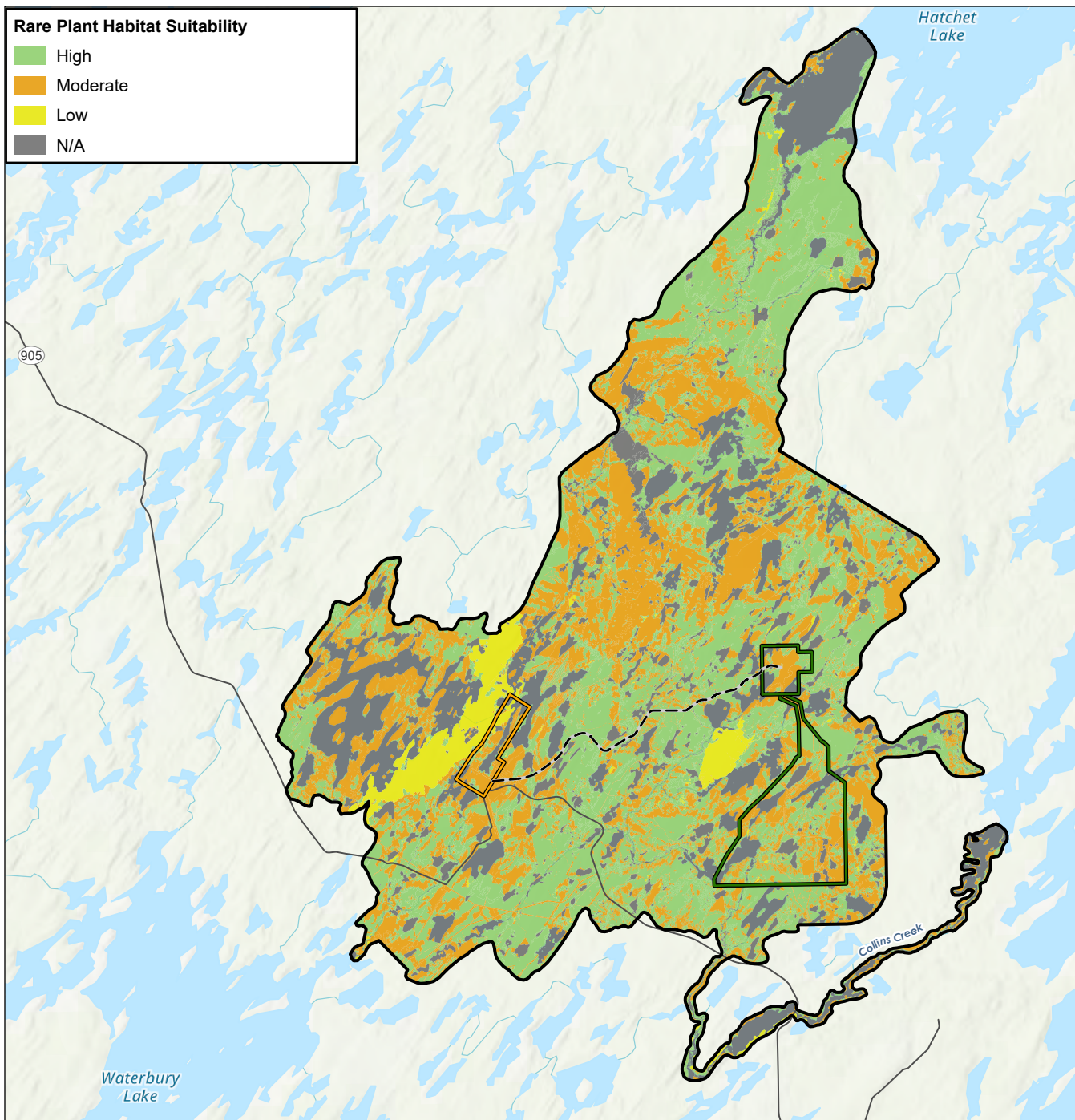
Figure No.

5-2

DRAFT

Title

Dominant Habitat Classification



Legend

- Habitat Classification Local Assessment Area (LAA)
- Midwest Surface Lease
- McClean Surface Lease
- Proposed Midwest Haul Road
- Road

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111473090-003 REVA

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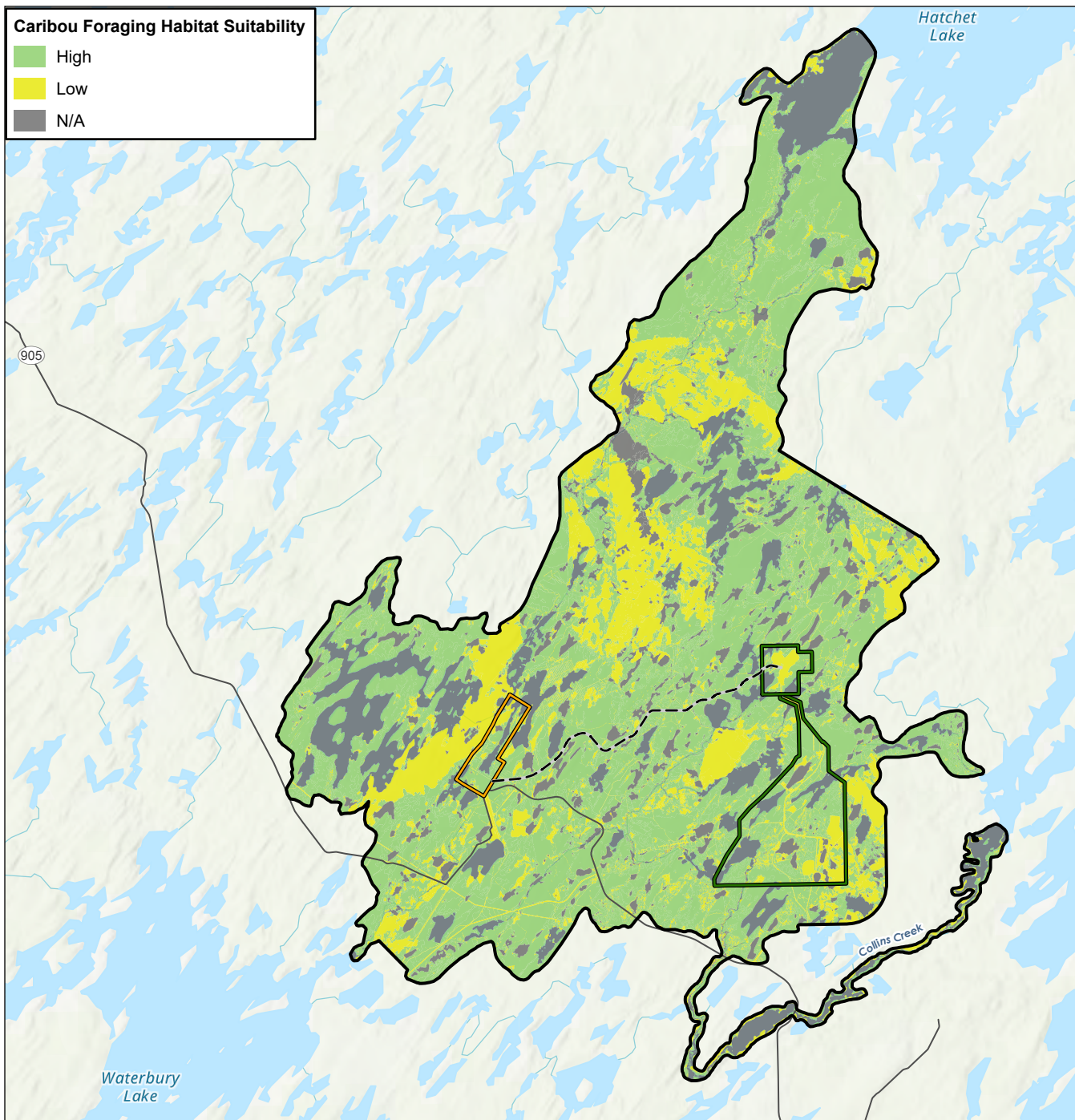
Figure No.

5-3

DRAFT

Title

Rare Plant Habitat Suitability



Legend

- Local Assessment Area (LAA)
- Midwest Surface Lease
- McClean Surface Lease
- Proposed Midwest Haul Road
- Road

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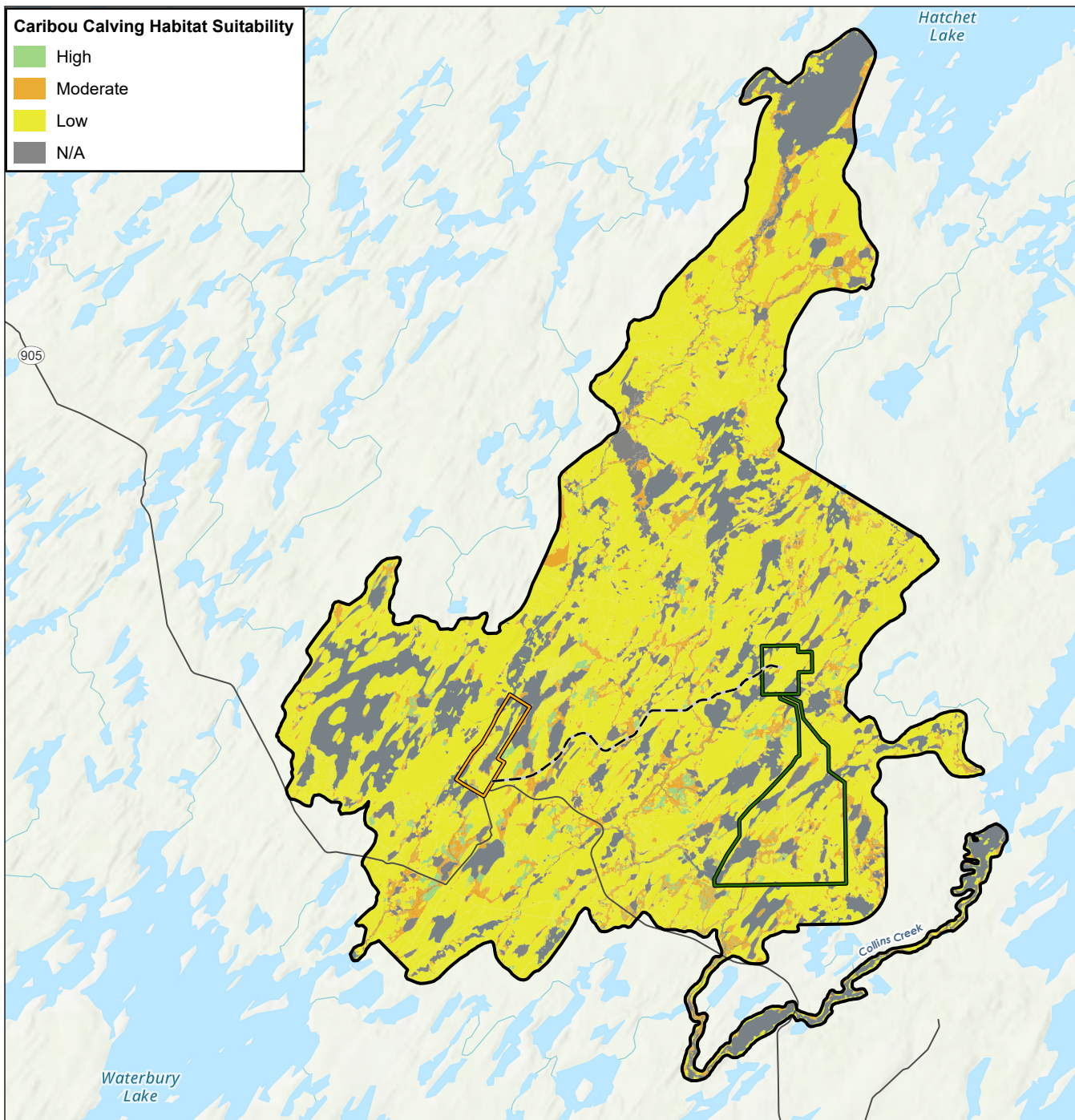
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5-4

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Title

Caribou Foraging Habitat Suitability



Legend

- Local Assessment Area (LAA)
- Midwest Surface Lease
- McClean Surface Lease
- Proposed Midwest Haul Road
- Road

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Ecosystem Refinement and Habitat Classification

Figure No.

5-5

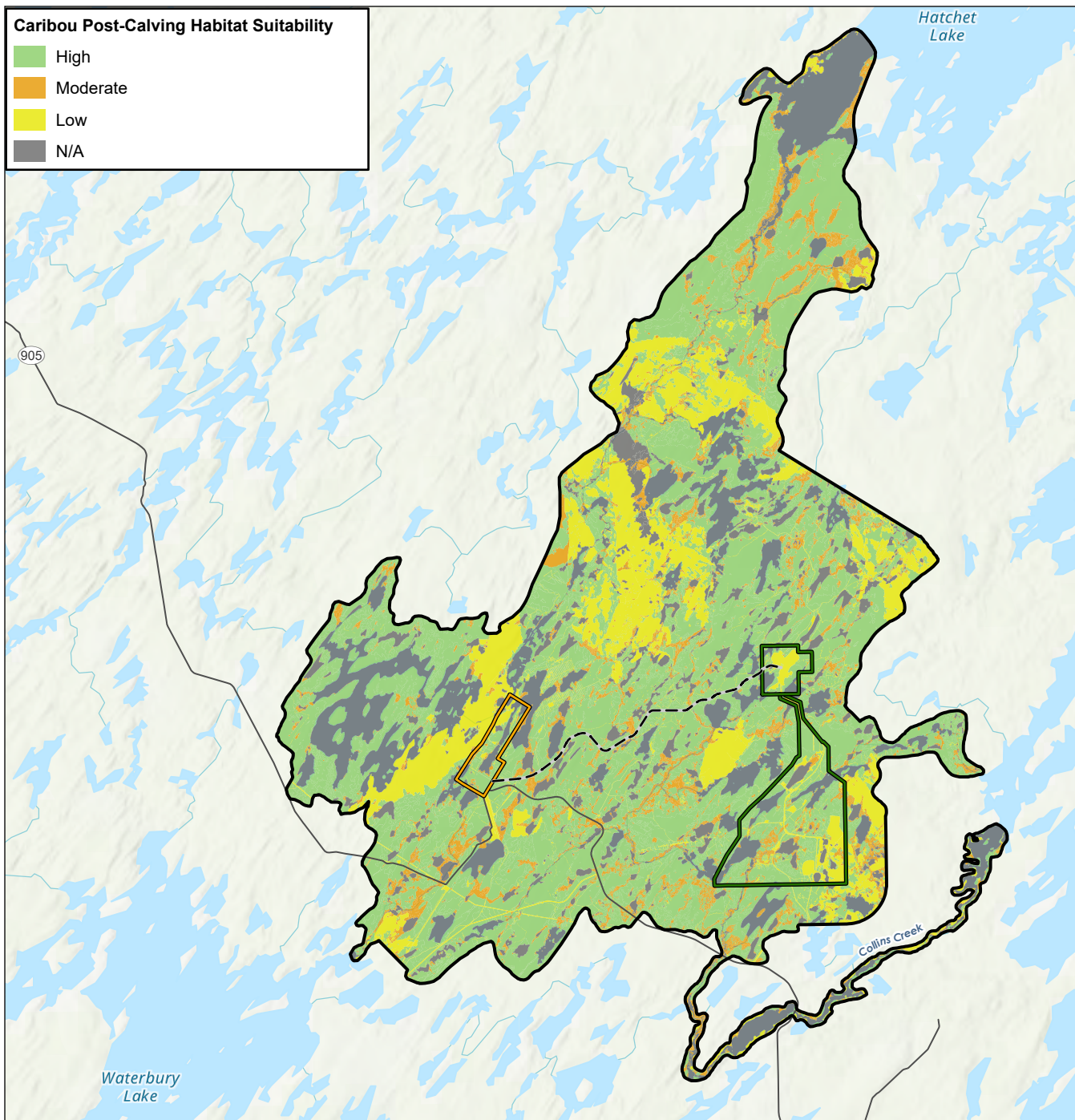
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Title

Caribou Calving Habitat Suitability

Notes

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Legend

- Local Assessment Area (LAA)
- Midwest Surface Lease
- McClean Surface Lease
- Proposed Midwest Haul Road
- Road

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Ecosite Refinement and Habitat Classification

Notes

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Figure No.

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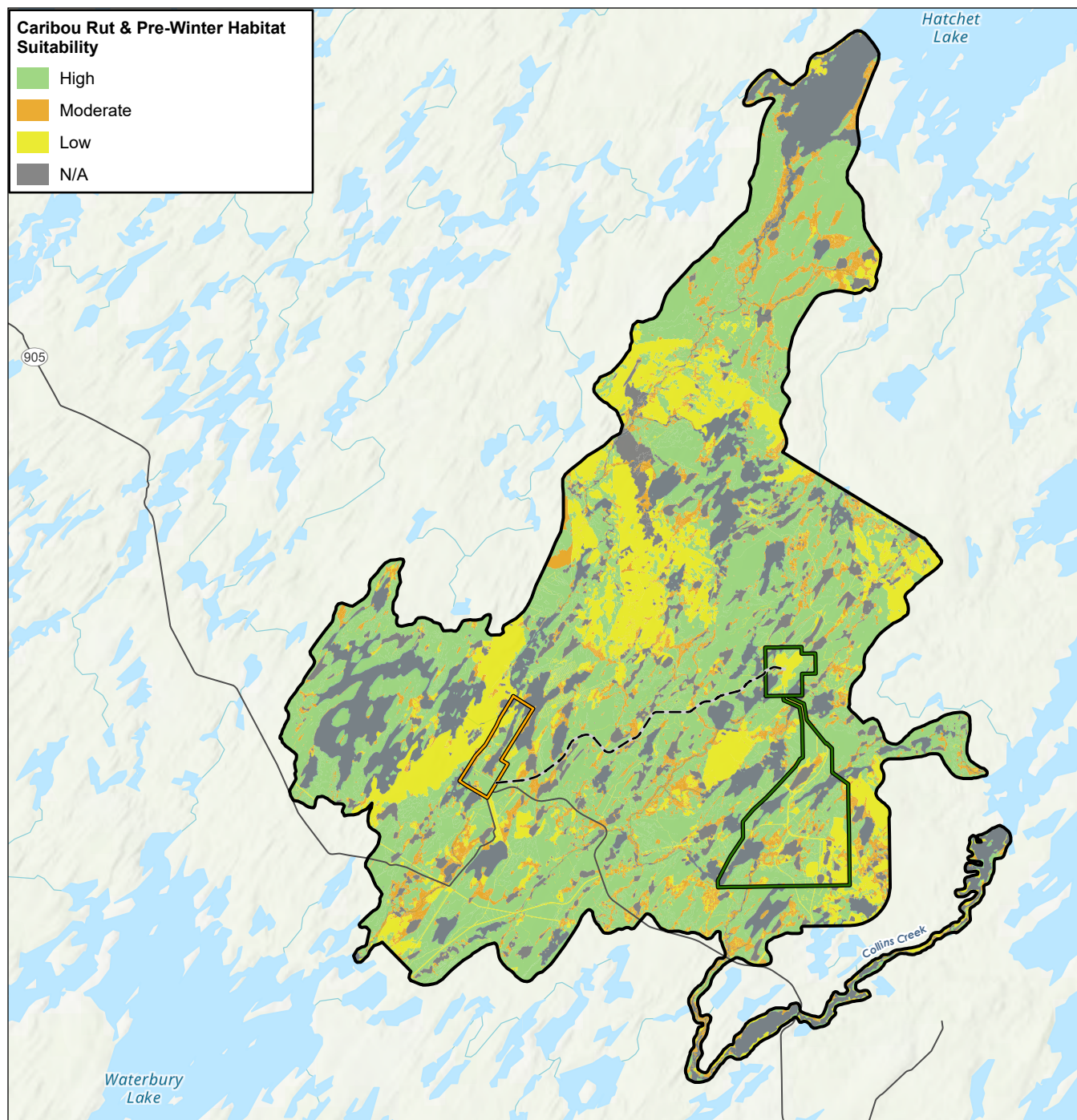
DRAFT

Title

**Caribou Post-Calving Habitat
Suitability**

Caribou Rut & Pre-Winter Habitat Suitability

- High
- Moderate
- Low
- N/A



Legend

- Local Assessment Area (LAA)
- Midwest Surface Lease
- McClellan Surface Lease
- Proposed Midwest Haul Road
- Road

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Ecosite Refinement and Habitat Classification

Figure No.

5-7

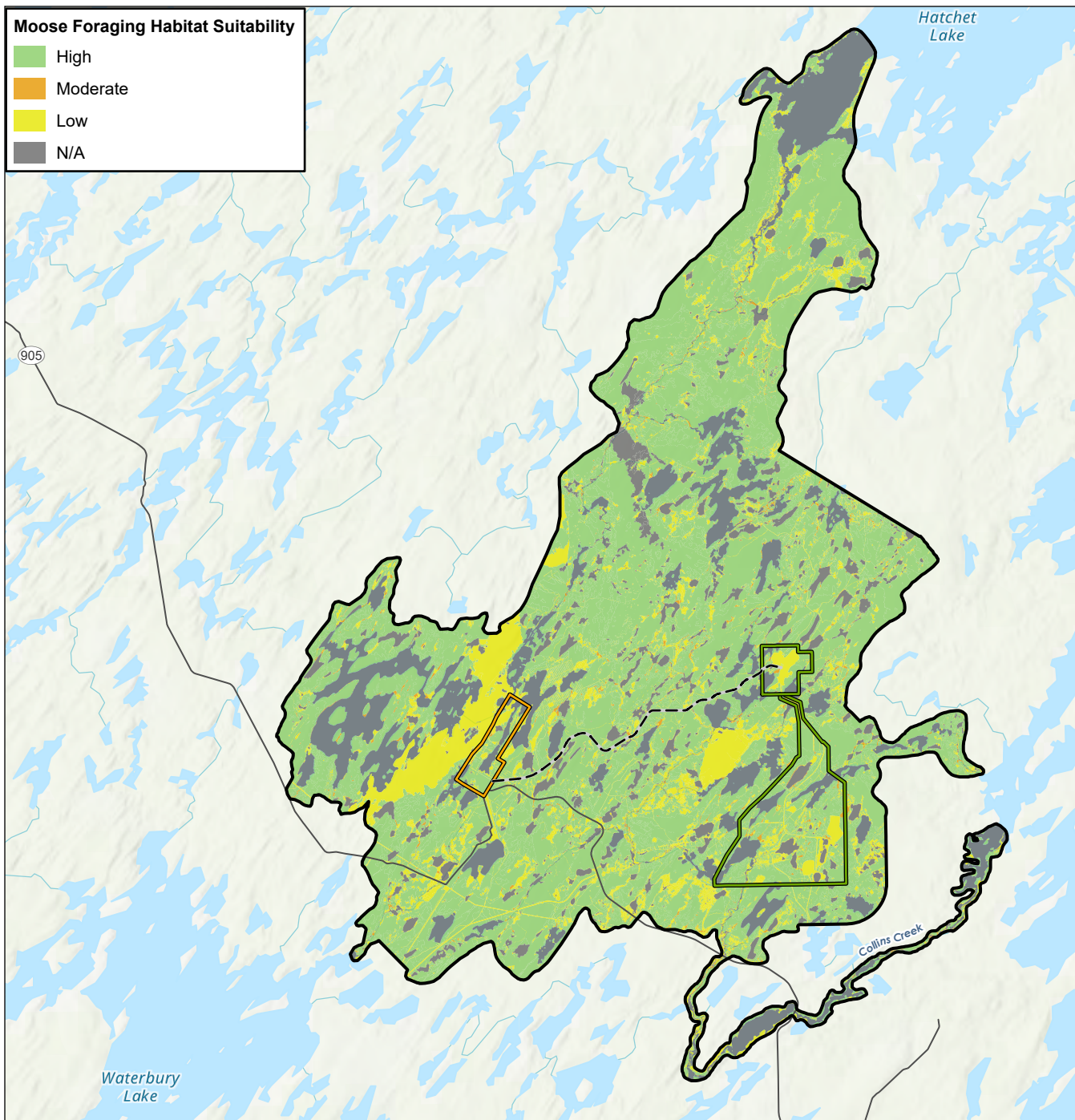
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Title
Caribou Rut & Pre-Winter Habitat Suitability

Notes

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Legend

- Local Assessment Area (LAA)
- Midwest Surface Lease
- McClean Surface Lease
- Proposed Midwest Haul Road
- Road

0 2.5 5 km
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Ecosystem Refinement and Habitat Classification

Figure No.

5-8

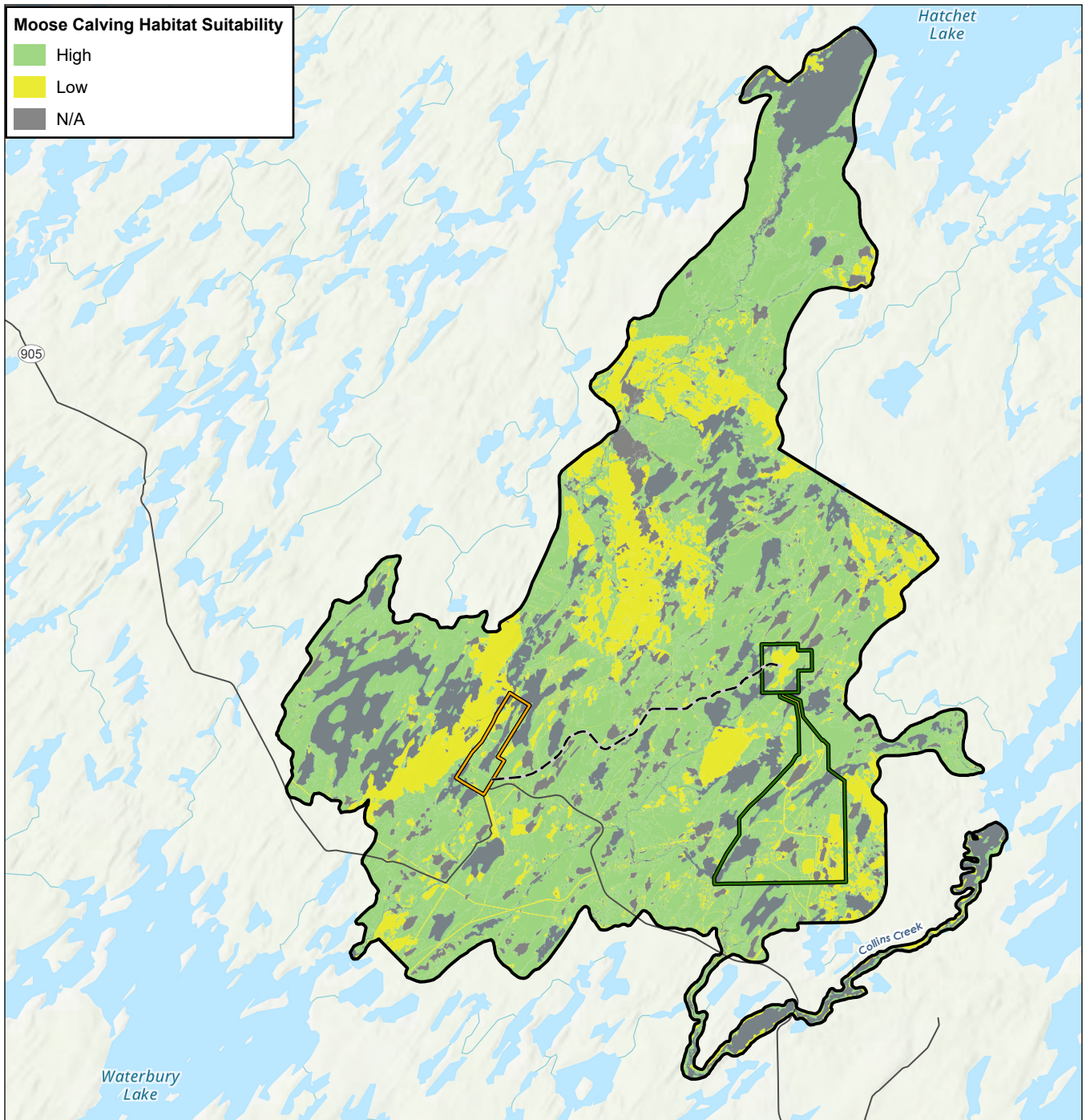
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Title

Moose Foraging Habitat Suitability

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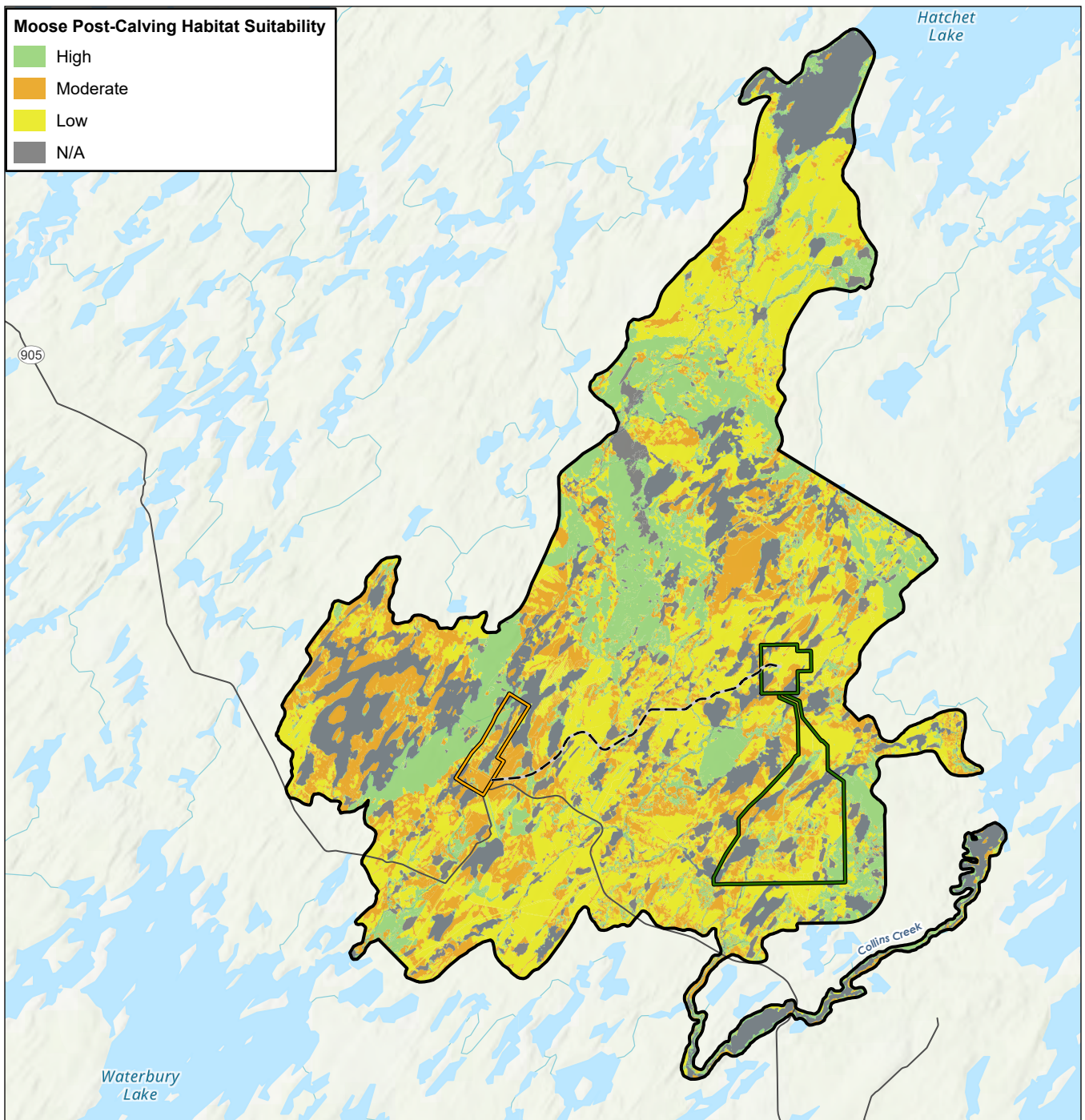
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5-9

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Title

Moose Calving Habitat Suitability



Legend

- Local Assessment Area (LAA)
- Midwest Surface Lease
- McClean Surface Lease
- Proposed Midwest Haul Road
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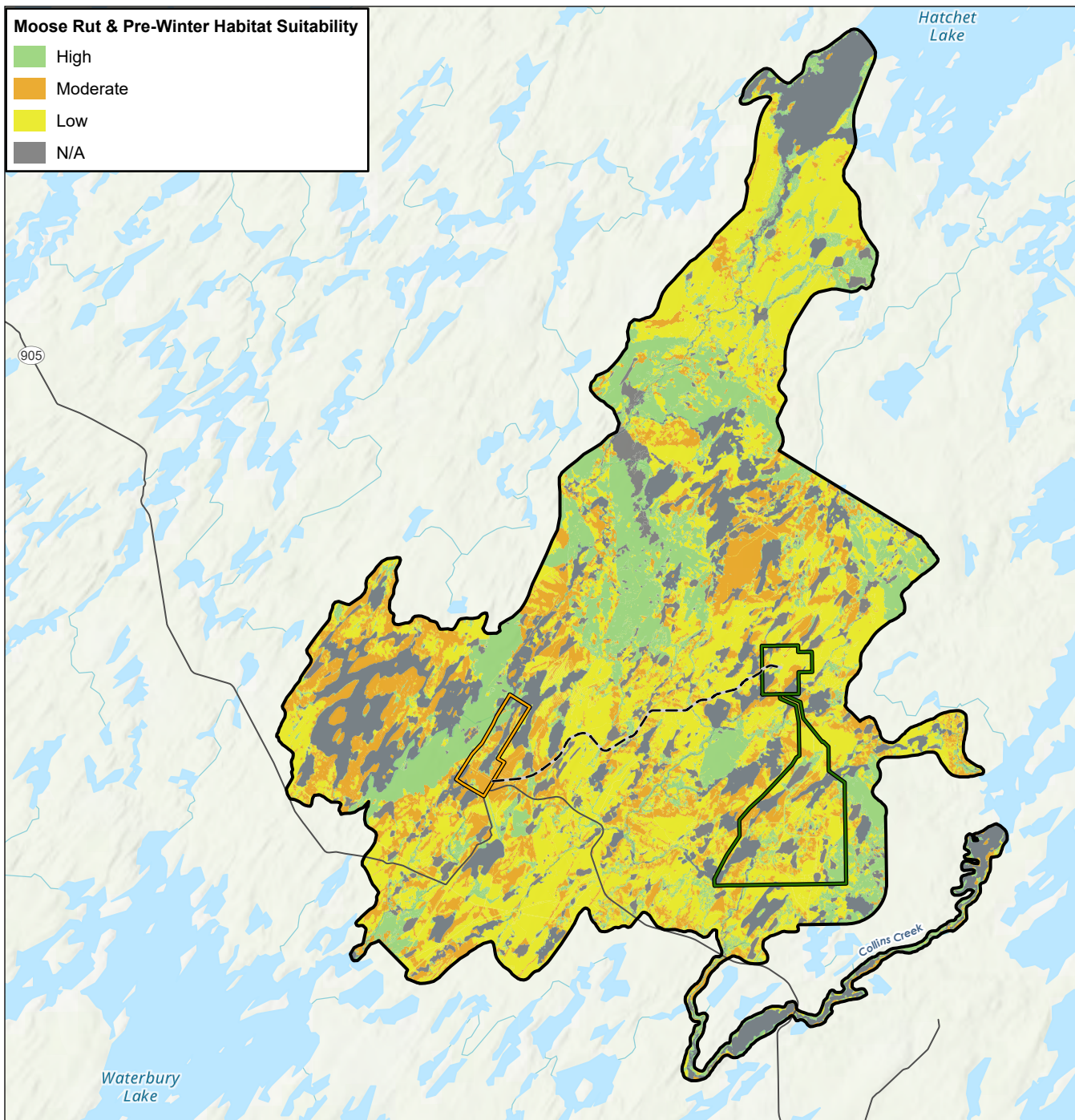
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5-10

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Title
**Moose Post-Calving Habitat
Suitability**

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Legend

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Figure No.

5-11

DRAFT

Title

**Moose Rut & Pre-Winter Habitat
Suitability**

Appendix V.5: Small Mammal Tissue Chemistry Data Tables, August 2024

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Table V.5-2:	Summary of Small Mammal Tissue Sampling Results for S/V TEMS.
Table V.5-3:	Summary of Small Mammal Tissue Sampling Results for the JEB Site.
Table V.5-4:	Summary of Small Mammal Tissue Sampling Results for Mallen Lake.

TABLE V.5-1

Summary of Small Mammal Tissue Sampling Results for Keweenaw Lake.

Parameter	Combined Chemistry Results (n=5)					
	Unit	Mean	SD	Min	Max	n<RDL
Metals						
Aluminum	µg/g	94	62	28	170	
Antimony	µg/g	0.01	-	< 0.01	< 0.01	5
Arsenic	µg/g	0.076	0.025	0.04	0.10	
Barium	µg/g	49.6	36.1	18	101	
Beryllium	µg/g	0.01	-	< 0.01	< 0.01	5
Boron	µg/g	1	0.4	< 1	2	2
Cadmium	µg/g	0.46	0.39	0.05	1.1	
Chromium	µg/g	1.5	0.33	1.1	2.0	
Cobalt	µg/g	0.19	0.056	0.14	0.28	
Copper	µg/g	9.0	2.4	6.8	13	
Iron	µg/g	300	110	220	490	
Lead	µg/g	0.18	0.061	0.13	0.28	
Manganese	µg/g	37	16	14	58	
Mercury	µg/g	0.25	0.063	0.17	0.33	
Molybdenum	µg/g	0.42	0.13	0.28	0.60	
Nickel	µg/g	0.94	0.21	0.67	1.2	
Selenium	µg/g	0.74	0.14	0.59	0.90	
Silver	µg/g	0.02	0.01	< 0.01	0.03	1
Strontium	µg/g	28	11	16	44	
Thallium	µg/g	0.0088	0.0043	< 0.005	0.016	1
Tin	µg/g	0.06	0.01	< 0.05	0.08	2
Titanium	µg/g	3.9	2.1	1.5	6.5	
Uranium	µg/g	0.06	0.02	0.03	0.08	
Vanadium	µg/g	0.1	0.05	< 0.1	0.2	2
Zinc	µg/g	91	9.8	75	100	
Physical Properties						
% Moisture	%	72.60	1.065	71.36	73.68	
Radionuclides (n=2)						
Lead-210	Bq/g	0.10	0.029	0.079	0.12	
Polonium-210	Bq/g	0.14	0.035	0.11	0.16	
Radium-226	Bq/g	0.016	0.0092	0.009	0.022	

SD = standard deviation; RDL = reportable detection limit; n<RDL = number of samples with values below the RDL.

All data are presented on a dry weight basis.

A dash indicates data are not available or that insufficient data were available to capture summary statistics.

All values below the RDL were set equal to the RDL for the calculation of mean and standard deviation.

TABLE V.5-2

Summary of Small Mammal Tissue Sampling Results for S/V TEMS.

Parameter	Combined Chemistry Results (n=11)					
	Unit	Mean	SD	Min	Max	n<RDL
Metals						
Aluminum	µg/g	33	41	6	150	
Antimony	µg/g	0.01	-	<0.01	<0.01	11
Arsenic	µg/g	0.081	0.045	0.04	0.16	
Barium	µg/g	49.4	43.5	7.9	148	
Beryllium	µg/g	0.01	-	<0.01	<0.01	11
Boron	µg/g	1.1	0.3	1.0	2.0	4
Cadmium	µg/g	0.49	0.41	0.17	1.60	
Chromium	µg/g	1.44	0.53	0.85	2.4	
Cobalt	µg/g	0.18	0.06	0.11	0.27	
Copper	µg/g	10	1	8	12	
Iron	µg/g	232	44	190	330	
Lead	µg/g	0.07	0.04	0.03	0.16	
Manganese	µg/g	41	32	8	117	
Mercury	µg/g	0.158	0.038	0.098	0.210	
Molybdenum	µg/g	0.56	0.14	0.34	0.87	
Nickel	µg/g	0.87	0.28	0.56	1.30	
Selenium	µg/g	1.46	0.51	1.10	2.60	
Silver	µg/g	0.04	0.02	0.02	0.07	
Strontium	µg/g	16.1	3.0	12.0	21.0	
Thallium	µg/g	0.012	0.007	0.005	0.024	1
Tin	µg/g	0.10	0.07	0.05	0.27	3
Titanium	µg/g	1.45	2.05	0.30	7.40	
Uranium	µg/g	0.035	0.036	0.010	0.130	2
Vanadium	µg/g	0.2	0.2	0.1	0.8	8
Zinc	µg/g	87	8	76	100	
Physical Properties						
% Moisture	%	74.24	2.19	72.13	77.93	
Radionuclides (n=4)						
Lead-210	Bq/g	0.04	0.02	0.03	0.06	
Polonium-210	Bq/g	0.08	0.01	0.07	0.09	
Radium-226	Bq/g	0.019	0.018	0.003	0.044	

SD = standard deviation; RDL = reportable detection limit; n<RDL = number of samples with values below the RDL.

All data are presented on a dry weight basis.

A dash indicates data are not available or that insufficient data were available to capture summary statistics.

All values below the RDL were set equal to the RDL for the calculation of mean and standard deviation.

TABLE V.5-3

Summary of Small Mammal Tissue Sampling Results for the JEB Site.

Parameter	Combined Chemistry Results (n=2)					
	Unit	Mean	SD	Min	Max	n<RDL
Metals						
Aluminum	µg/g	87	100	13	160	
Antimony	µg/g	0.01	-	< 0.01	< 0.01	2
Arsenic	µg/g	0.66	0.28	0.46	0.85	
Barium	µg/g	30	0.71	29	30	
Beryllium	µg/g	0.01	-	< 0.01	< 0.01	2
Boron	µg/g	2	1	< 1	3	1
Cadmium	µg/g	0.44	0.33	0.20	0.67	
Chromium	µg/g	2.2	2.0	0.77	3.6	
Cobalt	µg/g	0.23	0.0	0.23	0.23	
Copper	µg/g	13	6.2	8.2	17	
Iron	µg/g	270	92	200	330	
Lead	µg/g	0.19	0.050	0.15	0.22	
Manganese	µg/g	55	23	38	71	
Mercury	µg/g	0.15	0.0071	0.14	0.15	
Molybdenum	µg/g	0.56	0.13	0.47	0.65	
Nickel	µg/g	1.4	1.0	0.68	2.1	
Selenium	µg/g	2.0	0.57	1.6	2.4	
Silver	µg/g	0.06	0.04	0.03	0.09	
Strontium	µg/g	17	2.8	15	19	
Thallium	µg/g	0.015	0.0049	0.011	0.018	
Tin	µg/g	0.18	0.028	0.16	0.20	
Titanium	µg/g	3.0	3.4	0.6	5.4	
Uranium	µg/g	0.61	0.52	0.24	0.98	
Vanadium	µg/g	0.2	0.07	< 0.1	0.2	1
Zinc	µg/g	110	7.1	100	110	
Physical Properties						
% Moisture	%	72.87	0.3182	72.64	73.09	
Radionuclides (n=1)						
Lead-210	Bq/g	0.06		0.06	0.06	
Polonium-210	Bq/g	0.14		0.14	0.14	
Radium-226	Bq/g	0.098		0.098	0.098	

SD = standard deviation; RDL = reportable detection limit; n<RDL = number of samples with values below the RDL.

All data are presented on a dry weight basis.

A dash indicates data are not available or that insufficient data were available to capture summary statistics.

All values below the RDL were set equal to the RDL for the calculation of mean and standard deviation.

TABLE V.5-4

Summary of Small Mammal Tissue Sampling Results for Mallen Lake.

Parameter	Combined Chemistry Results (n=5)					
	Unit	Mean	SD	Min	Max	n<RDL
Metals						
Aluminum	µg/g	25	17	6	41	
Antimony	µg/g	0.01	-	< 0.01	< 0.01	5
Arsenic	µg/g	0.06	0.02	0.03	0.08	
Barium	µg/g	46	14	26	59	
Beryllium	µg/g	0.01	-	< 0.01	< 0.01	5
Boron	µg/g	1	0.5	< 1	2	1
Cadmium	µg/g	0.23	0.072	0.12	0.31	
Chromium	µg/g	2.0	0.59	1.4	2.7	
Cobalt	µg/g	0.17	0.049	0.10	0.22	
Copper	µg/g	11	2.0	7.6	12	
Iron	µg/g	300	95	180	410	
Lead	µg/g	0.13	0.074	0.06	0.24	
Manganese	µg/g	52.0	40.5	18	108	
Mercury	µg/g	0.17	0.046	0.12	0.23	
Molybdenum	µg/g	0.49	0.078	0.41	0.60	
Nickel	µg/g	1.3	0.27	0.90	1.6	
Selenium	µg/g	2.3	1.4	1.3	4.8	
Silver	µg/g	0.04	0.03	0.01	0.07	
Strontium	µg/g	25	7.4	14	34	
Thallium	µg/g	0.011	0.0063	0.005	0.021	
Tin	µg/g	0.096	0.056	0.05	0.17	
Titanium	µg/g	1.3	1.1	0.3	2.9	
Uranium	µg/g	0.044	0.040	0.01	0.11	
Vanadium	µg/g	0.1	-	< 0.1	< 0.1	5
Zinc	µg/g	98	2.2	95	100	
Physical Properties						
% Moisture	%	73.92	1.202	72.26	75.22	
Radionuclides (n=2)						
Lead-210	Bq/g	0.045	0.0071	0.04	0.050	
Polonium-210	Bq/g	0.14	0.021	0.12	0.15	
Radium-226	Bq/g	0.006	0.003	0.004	0.008	

SD = standard deviation; RDL = reportable detection limit; n<RDL = number of samples with values below the RDL.

All data are presented on a dry weight basis.

A dash indicates data are not available or that insufficient data were available to capture summary statistics.

All values below the RDL were set equal to the RDL for the calculation of mean and standard deviation.