# Mackenzie Valley Highway Project
# Technical Data Report—Vegetation and Wetlands

Prepared for:

**Government of the Northwest Territories**

Prepared by:

**K'alo-Stantec Limited**

December 2022

Project No.: 144903025

K'alo-Stantec

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# Executive Summary

The Government of the Northwest Territories (GNWT), Department of Infrastructure (INF) is proposing the Mackenzie Valley Highway Project (the Project) that will extend the Mackenzie Highway (Northwest Territories Highway #1) from Wrigley to Norman Wells to replace the Mackenzie Valley Winter Road (MVWR) along this portion. The Project includes construction of approximately 281 kilometres (km) of new all-season highway, and the construction and operation of temporary and permanent quarry and borrow sources. The project highway alignment will pass through the Dehcho Region and a portion of the Tulita District of the Sahtu Region within the Northwest Territories (NT).

This technical data report (TDR) presents data and analysis of landcover/plant assemblages, forest characteristics (e.g., tree heights and timber volume), fire, plant species of conservation concern (SOCC), and weeds for the Dehcho and Sahtu regions intersected by the project highway alignment.

Coniferous forest is the most abundant landcover type/plant assemblage in upland areas within the Local Study Area (LSA) (44.8%) and the Regional Study Area (RSA) (32.5%) in the Dehcho Region. Wetlands occupy 19.6% of the LSA and 29.0% of the RSA in the Dehcho Region.

Large portions of the LSA and RSA have burned in the past; however, fires in the LSA are not common: a maximum of two fires have occurred per decade recorded (1990-1999).

No plant SOCC occurrences have been documented within the Dehcho Region of the LSA or RSA; however, several species reported by Dessau (2012) were previously considered plant SOCC but are no longer listed due to changes in territorial rankings. Nine alien and three invasive alien plant species have been documented in the RSA in the Dehcho Region. Appendix B provides a list of additional alien and invasive alien plant species in the RSA that have been documented, although specific distributions of these species are not known.

Upland areas in the Sahtu Region are similarly dominated by coniferous forest in both the LSA (28.3%) and RSA (31.3%). Wetlands occupy 25.5% of the LSA and 25.3% of the RSA.

Fires in the LSA and RSA have occurred in multiple areas with portions within the Sahtu Region burning at least once per decade. Less than 1% to 61.1% of the LSA burned each decade between 1960 and 2019.

In the RSA, seven vascular plant SOCC have been documented, six of which are considered *sensitive* and one considered *may be at risk*, territorially. Ten alien and three invasive alien plant species have been documented in the RSA in the Sahtu Region. Appendix B provides a list of additional alien and invasive alien plant species in the RSA that have been documented, although specific distributions of these species are not known.

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# Abbreviations

| | |
|---|---|
| % | percent |
| AKEPIC | Alaska Exotic Plants Information Clearinghouse |
| cm | centimetre |
| CNFDB | Canadian National Fire Database |
| COSEWIC | Committee on The Status of Endangered Wildlife in Canada |
| DAR | Developer's Assessment Report |
| EOSD | Earth Observation of Sustainable Development of Forests |
| GNWT | Government of the Northwest Territories |
| ha | hectare |
| INF | Department of Infrastructure |
| km | kilometre |
| LSA | Local Study Area |
| m | metre |
| $m^3$ | cubic metre |
| $m^3$/ha | cubic metres per hectare |
| MVWR | Mackenzie Valley Winter Road |
| NT/NWT | Northwest Territories |
| PDA | Project Development Area |
| PDR | Project Description Report |
| ROW | right-of-way |
| RSA | Regional Study Area |
| SARA | *Species At Risk Act* |
| SD | standard deviation |
| SOCC | species of conservation concern |
| TDR | technical data report |
| the Project | Mackenzie Valley Highway Project |
| TK | traditional knowledge |
| TLRU | traditional land and resource use |
| ToR | Terms of Reference |

# Glossary

| | |
|---|---|
| Alien plant species | Plants introduced to the Northwest Territories from Eurasia or other parts of North America as a result of human activities (Oldham and Delisle-Oldham, 2016). |
| Invasive alien plant species | Plants introduced to the Northwest Territories from Eurasia or other parts of North America as a result of human activities and with potential to cause significant ecological harm to native ecosystems, economy, or society (Carriere, 2008 and GNWT, 2015). Invasive alien plant species have the potential to be invasive due to high rates of dispersal and establishment (Snyder and Anions, 2008). |
| May be at Risk | Species that may be at risk of extinction or extirpation. NatureServe S-rank equaling S1 to S2 (Working Group on General Status of NWT Species, 2016). |
| Sensitive | Species that are not at high risk of extinction or extirpation but may require some special attention or protection to prevent them from becoming at risk. NatureServe S-rank equaling S3. May include species assessed as special concern by Committee on The Status of Endangered Wildlife in Canada (COSEWIC) or SARA (Working Group on General Status of NWT Species, 2016). |
| the Project | Mackenzie Valley Highway Project |

# 1 Introduction

The Government of the Northwest Territories (GNWT), Department of Infrastructure (INF) is proposing the Mackenzie Valley Highway Project (the Project) that will extend the Mackenzie Highway (Northwest Territories Highway #1) from Wrigley to Norman Wells to replace the Mackenzie Valley Winter Road (MVWR) along this portion. The Project includes construction of approximately 281 kilometres (km) of new all-season highway, and the construction and operation of temporary and permanent quarry and borrow sources. The project highway alignment will pass through the Dehcho Region and a portion of the Tulita District of the Sahtu Region within the Northwest Territories (NT; Figure 1.1).

The Project is subject to an environmental assessment and the requirements of Part 5 of the *Mackenzie Valley Resource Management Act*. This technical data report (TDR) presents the existing baseline conditions for vegetation to support the Developer's Assessment Report (DAR), as required by the Terms of Reference (ToR; MVEIRB, 2015).

With respect to vegetation and wetlands, this TDR provides a description of existing conditions within the study areas based on available desktop information, including:

- vegetation and vegetation assemblages
- identification of species or assemblages that are considered species of conservation concern (SOCC), valued, protected or designated (e.g., vulnerable, threatened, endangered); for any species at risk or of concern, as well as location, population status, limits and size, sensitivity and limiting factors
- historic and current human use of vegetation, including subsistence and commercial harvesting, (e.g., berry picking, forestry)
- baseline contaminant concentrations in harvested species or vegetation (e.g., berries) that may change as a result of the highway and as available
- locations and quantities of merchantable timber (based on desktop timber volumes)
- listing and locations of existing non-native plant species
- frequency of forest fires; and, post-fire vegetation succession, if applicable

Vegetation and wetland baseline data has important influence on wildlife habitat, including old growth forest, as discussed in Caribou and Moose TDR (EDI, 2022), Wildlife and Wildlife Habitat TDR (K'alo-Stantec, 2022a) and Birds and Bird Habitat TDR (K'alo-Stantec, 2022b). The influence of vegetation on thermal exchange between air and ground, therefore influencing overall ice-rich soils and permafrost distribution is discussed in the Soils, Terrain and Permafrost TDR (K'alo-Stantec, 2022c). Due to low resolution of available permafrost information, permafrost extent could not be quantified or correlated with vegetation assemblages (i.e., land cover) in this TDR.



- Proposed Mackenzie Valley Highway Alignment - Issued for EA 2022
- Granular Borrow / Rock Quarry Site and Access
- Local Study Area
- Regional Study Area
- Community
- All-Season Road
- Winter Road
- District Boundary
- Region Boundary
- Settlement Area Boundary
- Territorial Boundary

0 40 80 Kilometres

(At original document size of 8.5x11)
1:4,500,000

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*Project Location*
Wrigley to Norman Wells, NWT

Prepared by AT on 2022-06-03
TR by AJ on 2022-06-03

*Client/Project*
Government of Northwest Territories
Mackenzie Valley Highway Project

144903025-0048 REVB

*Figure No.*
**1.1**

*Title*
**Project Overview**

***Notes***
**1.** Coordinate System: NAD 1983 Northwest Territories Lambert
**2.** Data Sources: Centre for Geomatics Government of NWT, Government of Canada, Stantec
**3.** Background: World Imagery: Earthstar Geographics World Topographic Map: Esri, FAO, NOAA, NRCan World Hillshade: Esri, USGS

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# 2 Study Areas

The Project is located in the Mackenzie Valley region of the NT between Hodgson Creek (located approximately 1 km north of Wrigley) and Prohibition Creek (located approximately 28 km southeast of Norman Wells) (Figure 1.1). The Project parallels the Mackenzie River, located to the west, and generally follows the MVWR. The Project is located within three ecoregions, each distinguished by different degrees of climatic factors (Figure 2.1).

Two study areas, the Local Study Area (LSA) and the Regional Study Area (RSA), are used to evaluate potential project-related effects and potential cumulative effects. The LSA and RSA are relatively anthropogenically undisturbed except for communities, the existing MVWR, and the Norman Wells Pipeline. Oil and gas exploration and production infrastructure in the RSA occurs on the west side of and in the Mackenzie River near Norman Wells (Auld and Kershaw, 2005). Other existing disturbances include quarries and borrow sources, a fibre optic line, and bridges associated with the MVWR.

## 2.1 Project Development Area

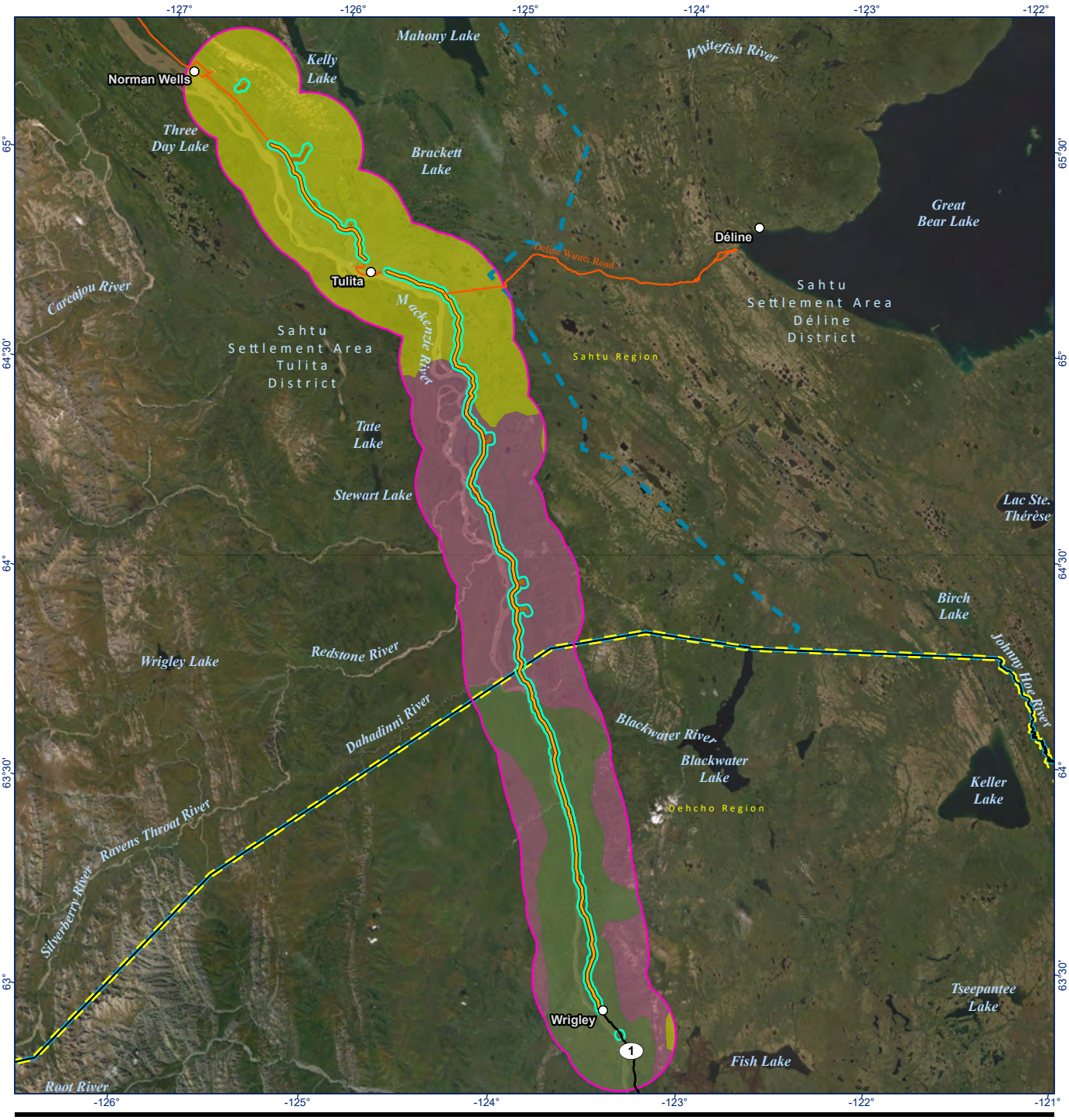
This is the area of direct Project disturbance within which works and activities will occur (footprint), and includes a new two-lane gravel highway, 60 metres (m) wide highway right-of-way (ROW), laydown and staging areas, maintenance yards, construction camps and quarry/borrow sites with access roads on a 30 m ROW.

## 2.2 Local Study Area

The Local Study Area (LSA) for vegetation and wetlands is consistent with that for wildlife and wildlife habitat and is a 1 km buffer around the project highway alignment centreline and proposed borrow/quarry access roads and quarry sites (Figure 2.1). The size of the LSA is based on measurable extent of Project-related effects (direct or indirect) on vegetation and wetlands, while also considering recommended setback distances for wildlife and wildlife habitat features consistent with guidance provided by Environment and Climate Change Canada (Dufour, 2020, pers. comm.). Results of this TDR are presented for the LSA by region; Dehcho Region and Sahtu Region.

## 2.3 Regional Study Area

The Regional Study Area (RSA) for vegetation and wetlands is consistent with that for wildlife and wildlife habitat and is a 15 km buffer around the Project's proposed road alignment centreline (Figure 2.1), which provides context for determining significance of Project-specific effects and potential cumulative effects; the RSA is consistent with other highway projects in the NT (e.g., Inuvik to Tuktoyaktuk Highway [Kiggiak - EBA Consulting Ltd., 2011]) and follows recommendations from Environment and Climate Change Canada (Dufour, 2020, pers. comm.). Results of this TDR are presented for the RSA by region; Dehcho Region and Sahtu Region.





- Proposed Mackenzie Valley Highway Alignment - Issued for EA 2022
- Granular Borrow / Rock Quarry Site and Access
- Local Study Area
- Regional Study Area
- Community
- All-Season Road
- Winter Road
- District Boundary
- Region Boundary

**Ecoregion**

- Boreal Cordillera High Boreal
- Taiga Cordillera Low Subarctic
- Taiga Plains,Low Subarctic
- Settlement Area Boundary

0 10 20 Kilometres
(At original document size of 8.5x11)
1:600,000

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***Notes***

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World Topographic Map: Esri, FAO, NOAA, NRCan
World Hillshade: Esri, USGS

*Project Location*
Wrigley to Norman Wells, NWT

Prepared by AT on 2022-05-20
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*Client/Project*
144903025-0058 REVB

Government of Northwest Territories
Mackenzie Valley Highway Project

*Figure No.*
**2.1**

*Title*
**Vegetation and Wetlands Study Areas**

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## 2.4 Intersected Ecoregions

### 2.4.1 Taiga Plains Low Subarctic

The Taiga Plains Low Subarctic is a Level III ecoregion in the central third of the Taiga Plains (Level II) (Ecosystem Classification Group, 2007). The Taiga Plains Low Subarctic ecoregion extends north to the Taiga Plains High Subarctic ecoregion (Level III) and extends 650 km south to the Taiga Plains High Boreal ecoregion (Level III) and includes outlying Cameron Plateau along the NT-AB border (Ecosystem Classification Group, 2007). To the west, the Taiga Plains Low Subarctic ecoregion is bordered by the Taiga Cordillera ecoregion (Level II); to the east, by the Taiga Shield ecoregion (level II); and to the northeast, by Great Bear Lake (Ecosystem Classification Group, 2007). The ecoregion is characterized by undulating plains, upland communities of white and black spruce, and permafrost-influenced wetlands (Ecosystem Classification Group, 2007). Human activity within the Taiga Plains Low Subarctic ecoregion includes industrial activities such as mining, petroleum extraction, and forestry (Wiken, 1986).

The northern section of the Project is located within the North Mackenzie Plain Low Subarctic ecoregion, a Level IV classification within the Taiga Plains Low Subarctic ecoregion. The North Mackenzie Plain Low Subarctic ecoregion parallels the Mackenzie River and consists of level to undulating terrain. The North Mackenzie Plains ecoregion has been subject to recent burns, which have influenced vegetation community and structure, resulting in a patchwork of low-canopy black spruce and successional shrublands and regenerating forests communities (Ecosystem Classification Group, 2007). Vegetation consists of white and black spruce (*Picea mariana*), Alaska paper birch#(*Betula neoalaskana)*, and dwarf birch *(Betula nana)* communities. Occurrences of trembling aspen and jack pine occur on well-drained sites south of Tulita. Bogs and fens occupy approximately 15% of the ecoregion (Ecosystem Classification Group, 2007).

A small section of the project highway alignment north of Tulita intersects the Norman Range Low Subarctic ecoregion, a Level IV classification within the Taiga Plains Low Subarctic ecoregion. The Norman Range Low Subarctic ecoregion is located northeast of the North Mackenzie Plain ecoregion and is more rugged terrain. Southwest portions of this ecoregion are composed of mixedwood deciduous and coniferous forest. Upland deciduous areas typically contain trembling aspen and Alaska paper birch; and coniferous forests typically contain white and black spruce. Bogs and fens cover approximately 4% of the ecoregion (Ecosystem Classification Group, 2007). The Sahtu Land Use plan states that plants are harvested in Norman Range Low Subarctic ecoregion by Sahtu and Pehdzeh Ki/Dehcho First Nations; this harvesting is discussed in the Cultural and Traditional Land Use TDR (K'alo-Stantec, 2022d).

### 2.4.2 Taiga Cordillera Low Subarctic

The Taiga Cordillera Low Subarctic ecoregion (Level III) consists of mountain ranges, foothills, tundra and spruce woodlands located in the central third of the Taiga Cordillera (Level II). In comparison to the Taiga Plains, the Taiga Cordillera Low Subarctic ecoregion has very few waterbodies and peatland establishment (Ecosystem Classification Group, 2010). Human activity within the Taiga Cordillera Low Subarctic ecoregion includes hunting, fishing, trapping, and tourism (Wiken, 1986).

Central sections of the project highway alignment intersect the Central Mackenzie Plain ecoregion, a Level IV classification within the Taiga Cordillera Low Subarctic ecoregion. The Central Mackenzie Plain is located between the Dahadinni and Blackwater Rivers to the south and the boundary of the Taiga Plains ecoregion to the north. Topography includes level to gently sloping terrain, which supports a diverse array of forest types. Almost half the ecoregion has been exposed to fires, leading to widespread shrubby and deciduous community development. Black spruce – shrub – moss woodlands are common and similar in structure to the North Mackenzie Plain ecoregion. Jack pine *(Pinus banksiana)* and trembling aspen *(Populus tremuloides)* occur but are limited to southern sections. Wetlands occupy approximately 10% to 20% of the ecoregion and consist of mainly peatlands (Ecosystem Classification Group, 2010). The Sahtu Land Use plan states that plants are harvested in Norman Range Low Subarctic ecoregion by Sahtu and Pehdzeh Ki/Dehcho First Nations and is discussed in the Cultural and Traditional Land Use TDR (K'alo-Stantec, 2022d).

### 2.4.3 Boreal Cordillera High Boreal

The Boreal Cordillera High Boreal ecoregion (Level III) is in the southeast portion of the Boreal Cordillera (Level II), south of the Taiga Cordillera Low Subarctic ecoregion. In comparison to the Taiga Cordillera Low Subarctic, the Boreal Cordillera High Boreal has a milder climate, greater precipitation and taller, more dense stands of spruce woodlands. Mixedwood forest of trembling aspen, white spruce, paper birch, and balsam poplar are common (Ecosystem Classification Group, 2010). Human activity includes mining, forestry, and tourism (Wiken, 1986).

Southern portions of the project highway alignment intersect the Central Mackenzie Valley ecoregion, a Level IV classification within the Taiga Cordillera High Boreal ecoregion. The Central Mackenzie Valley ecoregion is bordered by the Dahadinni and Blackwater Rivers to the north and by higher elevation slopes to the south, east, and west. Topography is undulating terrain, rolling slopes, and level plains. Northern sections consist of closed black spruce woodlands and peat plateaus. Southern sections near Wrigley are composed of productive mixedwood stands of trembling aspen and white spruce *(Picea glauca).* Wetlands occupy less than 10% of the entire ecoregion and consist mainly of peat plateaus, sedge fens, northern ribbed fens, and horizontal fens (Ecosystem Classification Group, 2010). The Sahtu Land Use plan states that plants are harvested within the Dehcho Region along portions of the Mackenzie River by Sahtu Dene and Métis and is discussed in K'alo-Stantec (2022d).

# 3 Review of Existing Data

## 3.1 Traditional Knowledge and Traditional Land and Resource Use

This section presents a review of relevant traditional knowledge (TK) and traditional land and resource (TLRU) use information summarized from publicly available sources for consideration for baseline reporting that provides information on existing conditions and potential Project effects, as identified by Indigenous groups.

### 3.1.1 Methods

TK and TLRU plant information for the Dehcho and Sahtu regions was determined using publicly available reports:

Dehcho Region

- IMG-Golder Corporation (2006) – Renewable Resource Assessment of the Pehdzeh Ki Ndeh Area of Interest. Prepared for the Canadian Parks and Wilderness Society, Northwest Territories Chapter. Yellowknife.
- Dehcho Land Use Planning Committee (2006) – Respect for the Land: The Dehcho Land Use Plan – Final Draft
- Dehcho First Nations. 2011. Traditional Knowledge Assessment of Boreal Caribou (Mbedzih) in the Dehcho Region. Prepared by Dehcho First Nations for the Canadian Wildlife Service. Published by the Dehcho First Nations Fort Simpson, Northwest Territories.
- Dessau. 2012. Mackenzie Valley Highway Extension Pehdzeh Ki Ndeh – Dehcho Region. Project Description Report. Prepared for Government of the Northwest Territories, Department of Transport.
- NWT Bureau of Statistics. 2018. NWT Community Survey. NWT Bureau of Statistics.

Sahtu Region

- EBA Engineering Consultants (2006) – Traditional Knowledge Study Report Tulita, NT, Great Bear River Bridge.
- The Sahtu Heritage Places and Sites Joint Working Group (2000) – Rakekée Gok'é Godi: Places We Take Care Of.
- McDonald, R. 2010. Boreal Caribou Traditional Knowledge Collection Study: The Sahtu Settlement Area. Edited by Andrea Hrynkiw and Glen Guthrie and McDonald. For the Canadian Wildlife Service, Environment Canada.
- 5658 NWT Ltd. and the Government of Northwest Territories (2011) – Project Description Report for Construction of the Mackenzie Valley Highway Tulita District, Sahtu Settlement Area.

- Sahtu Land Use Planning Board (2013) – Sahtu Land Use Plan. Government of Northwest Territories. Good Hope.
- Golder. 2015. Central Mackenzie Surface Water and Groundwater Baseline Assessment. Report 1: Technical State of Knowledge. Report Number: 1401835 Final Report 1. May 21, 2015.
- Tulita Renewable Resource Council (2019) – Traditional Knowledge Study for the Great Bear River Bridge Project. Prepared by Tulita Renewable Resource Council.

Information was also obtained from the Tulita Renewable Resources Council's Project-specific TLRU study (Tulita Renewable Resource Council, 2022).

## 3.1.2 Results

### *3.1.2.1 Dehcho Region*

A review of the available information indicates 140 plants or groups of plants are used for traditional purposes in the Dehcho Region (Table 3.1 and Table 3.2), with 122 expected in the ecoregions intersected by the LSA and RSA. Most of the expected plants, 101, are ranked *secure* in the NT, three are ranked *sensitive* and seven are ranked *may be at risk* (GNWT, 2016a). Many plant species serve different purposes, such as for medicine, food, craft, ritual ceremonies, spiritual endeavours, and home fuel. For example, birch bark (*Betula papyrifera, Betula neoalaskana*) is used for baskets, berries are collected for food and for dyeing materials (e.g., blueberries [*Vaccinium* spp.]), and pasture sage (*Artemisia frigida*) is used for spiritual, ritual or medicinal purposes (IMG-Golder Corporation, 2006).

Both wood and wood pellets are an important fuel for heating homes in the Dehcho Region. Within the Dehcho Region, wood is used for house heating in 388 (36%) households with 265 (24%) homes reporting wood as their main heat source (NWT Bureau of Statistics, 2018). Wood pellets are used for house heating in 65 (6%) households with 30 (3%) homes reporting wood pellets as their main heat source (NWT Bureau of Statistics, 2018).

The most common berry picking location in the Dehcho Region is adjacent to the Mackenzie Highway towards Fort Simpson and along existing trails through Pehdzeh Ki Ndeh. People also pick berries along an existing pipeline corridor near Wrigley (IMG-Golder Corporation, 2006). Within the Dehcho Region, 38% of the general population reported gathering berries (NWT Bureau of Statistics, 2020), with 50% of indigenous population of Wrigley reporting engaging in berry gathering (NWT Bureau of Statistics, 2019a).

Recent changes in climate are include warmer temperatures, increased rain in November, milder winters and increasing summer storms. Boreal woodland caribou food sources are affected by precipitation. During colder times, food becomes less accessible because it is covered by more snow, making it harder for caribou to access. Climate change does not yet appear to be affecting ground or hanging lichens, although some monitoring of future changes to lichen due to climate change should be undertaken (Dehcho First Nations, 2011).

Contaminants may be a concern for certain traditional foods, including berries and medicinal teas, in some areas (GNWT, 2017). The GNWT publishes contaminant fact sheets on many traditional meats, but no fact sheets are published for plant species (GNWT, 2016b). The Northern Contaminants Program focuses on heavy metals and on persistent organic pollutants that can bioaccumulate in wildlife and human populations (Government of Canada, 2021). There are some studies that link increased industrial activity and dust generation to increases in concentrations of some heavy metals in berries (Shotyk, 2020). Heavy metals linked to dust by Shotyk (2020) include aluminum, chromium, iron, lead, scandium, thorium, vanadium, yttrium, and lanthanides. No specific data on contaminants in berries and plants has been found for the Dehcho Region.

**Table 3.1 Traditional Plant Species – Dehcho Region**

| Form | Scientific Name [1] | Common Name(s) | Rank[2] |
|---|---|---|---|
| Tree | *Abies lasiocarpa** | alpine fir | - |
| Tree | *Betula papyrifera* | white birch, paper birch | Secure |
| Tree | *Larix laricina* | tamarack | Secure |
| Tree | *Picea glauca* | white spruce | Secure |
| Tree | *Picea mariana* | black spruce | Secure |
| Tree | *Pinus banksiana* | jack pine | Secure |
| Tree | *Pinus contorta* | lodgepole pine | Secure |
| Tree | *Populus balsamifera* | balsam poplar | Secure |
| Tree | *Populus tremuloides* | trembling aspen | Secure |
| Shrub | *Alnus rugosa** | mountain alder | - |
| Shrub | *Alnus tenufolia** (*Alnus tenuifolia*) | speckled alder, river alder | - |
| Shrub | *Amelanchier alnifolia* | Saskatoon | Secure |
| Shrub | *Andromeda polifolia* | dwarf bog rosemary | Secure |
| Shrub | *Arctostaphylos uva-ursi* | common bearberry, Kinnikinnick, | Secure |
| Shrub | *Arctostaphylos alpina* (Arctous alpina)* | alpine bearberry, torpedoberry | Secure |
| Shrub | *Arctostaphylos rubra* (Arctous rubra)* | red bearberry | Secure |
| Shrub | *Betula glandulosa* | bog birch | Secure |
| Shrub | *Betula occidentalis* | water birch | Secure |
| Shrub | *Betula pumila* var. *glandulifera* | dwarf birch | Secure |
| Shrub | *Chamaedaphne calyculata* | leatherleaf | Secure |
| Shrub | *Cornus sericea* | red osier dogwood | Secure |
| Shrub | *Potentilla fruticosa* (Dasiphora fruticosa)* | shrubby cinquefoil | Secure |
| Shrub | *Elaegnus commutata* (*Elaeagnus commutata*) | silverberry | Secure |
| Shrub | *Empetrum nigrum* | crowberry, black berry | Secure |
| Shrub | *Gaultheria hispidula** | creeping wintergreen, teaberry | - |

| Form | Scientific Name [1] | Common Name(s) | Rank[2] |
|---|---|---|---|
| Shrub | *Hudsonia tomentosa* | sand heather | Sensitive |
| Shrub | *Juniperus communis* | common juniper | Secure |
| Shrub | *Juniperus horizontalis* | creeping juniper | Secure |
| Shrub | *Kalmia polifolia* | northern bog laurel, pale bog laurel | Secure |
| Shrub | *Ledum groenlandicum* | common Labrador tea | Secure |
| Shrub | *Lonicera dioica* | twinning/ red honeysuckle | Secure |
| Shrub | *Lonicera involucrata** | bracted honeysuckle, black twin berry | - |
| Shrub | *Myrica gale* | sweet gale | Secure |
| Shrub | *Prunus pensylvanica* | pin cherry | Secure |
| Shrub | *Prunus virginiana* | choke cherry | Sensitive |
| Shrub | *Ribes americanum** | wild black currant | - |
| Shrub | *Ribes glandulosum* | skunk currant, wild red currant | Secure |
| Shrub | *Ribes hudsonianum* | northern black currant | Secure |
| Shrub | *Ribes lacustre* | bristly black currant | Secure |
| Shrub | *Ribes oxyacanthoides* | northern gooseberry, Canada gooseberry | Secure |
| Shrub | *Ribes triste* | wild red currant | Secure |
| Shrub | *Rosa acicularis* | prickly rose, rose hips | Secure |
| Shrub | *Rubus idaeus* | wild red raspberry red raspberry | Secure |
| Shrub | *Salix* spp. | multiple willow species, including diamond willow and red willow | N/A multiple species |
| Shrub | *Sorbus scopulina* | western mountain ash | Secure |
| Shrub | *Shepherdia canadensis* | buffaloberry, soopolallie, soapberry, | Secure |
| Shrub | *Symphoricarpos albus* | common snowberry | Undetermined |
| Shrub | *Symphoricarpos occidentalis* | western snowberry | Secure |
| Shrub | *Vaccinium myrtilloides* | common blueberry, velvet leaf blueberry | Sensitive[+] |
| Shrub | *Vaccinium caespitosum* | dwarf blueberry | Undetermined |
| Shrub | *Vaccinium oxycoccus* (*Vaccinium oxycoccos*) | small bog cranberry | Secure |
| Shrub | *Vaccinium vitis-idaea* | lingonberry, bog cranberry, cowberry, mountain cranberry | Secure |
| Shrub | *Viburnum edule* | low bush cranberry, mooseberry | Secure |
| Shrub | *Viburnum opulus** | high bush cranberry | - |
| Graminoid | *Acorus americanus (Acorus calamus)* | sweetflag, calamus | May Be At Risk[+] |
| Graminoid | *Calamagrostis canadensis* | blue-jointed reed grass, marsh reedgrass | Secure |
| Graminoid | *Carex aquatilis* | water sedge | Secure |
| Graminoid | *Phragmites australis** *(Phragmites communis)* | common reed | Undetermined |

| Form | Scientific Name [1] | Common Name(s) | Rank[2] |
|---|---|---|---|
| Graminoid | *Hierochloe odorata* | sweet-grass | Secure |
| Graminoid | *Hordeum jubatum* | fox-tail barley | Secure |
| Graminoid | *Schoenoplectus acutus* | bulrush | Secure |
| Graminoid | *Typha latifolia* | broad-leaf cattail | Secure |
| Graminoid | *Triglochin maritima* | seaside arrow-grass | Secure |
| Forb | *Achillea millefolium* | yarrow | Secure |
| Forb | *Actaea rubra* | red baneberry | Secure |
| Forb | *Agastache foeniculum* | giant hyssop | May Be At Risk+ |
| Forb | *Allium textile** | wild onion and chives | - |
| Forb | *Androsace septentrionalis* | pygmyflower, fairy candelabra | Secure |
| Forb | *Angelica lucida (Coelopleurum gmelinii)* | seaside angelica | May Be At Risk |
| Forb | *Apocynum androsaemifolium* | spreading dogbane | Secure |
| Forb | *Artemisia campestris* | field sagewort | Secure |
| Forb | *Artemisia frigida* | pasture sage | Secure |
| Forb | *Aralia nudicalis* (*Aralia nudicaulis*) | wild sarsaparilla | Secure |
| Forb | *Aster ciliolatus** (*Symphyotrichum ciliolatum)* | Lindley's aster, fringed aster | Secure |
| Forb | *Aster laevis** (*Symphyotrichum laeve)* | smooth aster | Presence Expected |
| Forb | *Aster puniceus** (*Symphyotrichum puniceum)* | purple-stemmed aster | Undetermined |
| Forb | *Aster umbellatus** | flat-topped white aster | - |
| Forb | *Astragalus americanus* | American milk-vetch | Secure |
| Forb | *Boschniakia rossica* | northern ground-cone | Secure |
| Forb | *Calla palustris* | water calla | Secure |
| Forb | *Campanula rotundifolia** | bluebell | - |
| Forb | *Chenopodium album* | lamb's quarters | Alien |
| Forb | *Chenopodium capitatum* | strawberry blite | Secure |
| Forb | *Cicuta maculata* | water hemlock, spotted water-hemlock | Secure |
| Forb | *Claytonia tuberosa* | tuberous spring beauty | Secure |
| Forb | *Chimaphila umbellata* | pipsissewa | May Be At Risk+ |
| Forb | *Cornus canadensis* | bunchberry | Secure |
| Forb | *Dryopteris carthusiana (Dryopteris spinulosa)* | spiney wood fern | May Be At Risk |
| Forb | *Epilobium angustifolium* | fireweed | Secure |
| Forb | *Equisetum arvense* | horsetail | Secure |
| Forb | *Fragaria vesca* | woodland strawberry, wild strawberry | Secure |
| Forb | *Fragaria virginiana* | wild strawberry, | Secure |

| Form | Scientific Name [1] | Common Name(s) | Rank[2] |
|---|---|---|---|
| Forb | *Galeopsis tetrahit* | hemp nettle | Alien |
| Forb | *Galium boreale* | northern bedstraw | Secure |
| Forb | *Geocaulon lividum* | northern comandra | Secure |
| Forb | *Geum aleppicum* | yellow avens | Secure |
| Forb | *Geum rivale** | purple avens | - |
| Forb | *Grindelia squarrosa** | gumweed | - |
| Forb | *Hedysarum alpinum* | American alpine sweet-vetch, sweetbroom | Secure |
| Forb | *Hellenium atumnale** *(Helenium autumnale)* | sneezeweed | Secure |
| Forb | *Heracleum lanatrum** *(Heracleum maximum, Heracleum lanatum)* | cow parsnip | Secure |
| Forb | *Heuchera richardsonii* | alum root | May Be At Risk+ |
| Forb | *Leucanthemum vulgare* | ox-eye daisy | Invasive Alien |
| Forb | *Lycopodium annotinum* | clubmoss | Secure |
| Forb | *Maianthemum canadense* | wild lily-of-the-valley | Secure |
| Forb | *Matteauccia struthiopteris** *(Matteuccia struthiopteris)* | ostrich fern | Sensitive |
| Forb | *Mentha arvensis* | wild mint | Secure |
| Forb | *Mertensia paniculata* | lungwort, tall bluebells | Secure |
| Forb | *Mitella nuda* | mitrewort | Secure |
| Forb | *Oxyria digyna* | mountain sorrel | Secure |
| Forb | *Pedicularis langsdorffii* | lousewort | Secure |
| Forb | *Petasites sagittatus* | arrow-leaved coltsfoot | Not Assessed |
| Forb | *Plantago major* | broad-leaved plantain | Alien |
| Forb | *Polygonum amphibium* | water smartweed | Secure |
| Forb | *Polygonum viviparum* (*Bistorta vivipara*) | bistort, serpent grass | Secure |
| Forb | *Polypodium vulgare* | rock polypody fern | Secure |
| Forb | *Potentilla gracilis** | cinquefoil | - |
| Forb | *Pyrola asarifolia* | pink wintergreen | Secure |
| Forb | *Rubus arcticus* | dewberry, dwarf raspberry | Secure |
| Forb | *Rubus chamaemorus* | cloudberry, baked apple berry, yellowberry | Secure |
| Forb | *Rumex aquaticus* | western dock | Secure |
| Forb | *Sagittaria cuneata* | arrowhead | Secure |
| Forb | *Sarracenia purpurea* | pitcher plant | Secure |
| Forb | *Scutellaria galericulata* | marsh skullcap | Secure |
| Forb | *Sium suave* | water parsnip | Secure |

| Form | Scientific Name [1] | Common Name(s) | Rank[2] |
|---|---|---|---|
| Forb | *Solidago canadensis* | Canadian goldenrod | Secure |
| Forb | *Taraxacum officinale* | dandelion | Alien |
| Forb | *Urtica dioica* | stinging nettle | Secure |
| Forb | *Utricularia macrorhiza* | bladderwort | Secure |
| Forb | *Veratrum viride* | false hellebore | Secure |
| Forb | *Zigadenus elegans* | mountain death camus | Secure |

**Notes:**

[1] Scientific name as reported by Dehcho Land Use Planning Committee (2006). Associated accepted synonym is provided in brackets where available.

[2] General NWT Rank as per NWT Species list (GNWT, 2016a) unless invasive. Alien plant rankings as described in Carriere (2008) and in Oldham and Delisle-Oldham (2016).

* Plant names that do not appear on the NWT Species list (GNWT, 2016a).

+ Sensitive and At Risk Species not expected to occur in the Dehcho RSA.

**Source:** Adapted from Dehcho Land Use Planning Committee (2006) and IMG-Golder Corporation (2006).

**Table 3.2 Additional Potential Traditional Plant Species – Dehcho Region**

| Form | Scientific Name [1] | Common Name(s) | Rank[2] |
|---|---|---|---|
| Tree | *Abies bifolia* | rocky mountain subalpine fir | Secure |
| Tree | *Betula neoalaskana* | Alaska paper birch | Secure |
| Shrub | *Alnus alnobetula (Alnus viridis)* | green alder | Secure |
| Shrub | *Alnus incana (Alnus incana* ssp. *tenuifolia)* | speckled alder (mountain alder, gray alder, hoary alder) | Secure |
| Forb | *Allium schoenoprasum* | wild chives | Secure |
| Forb | *Campanula alaskana* | bluebell, Alaska bellflower | Undetermined |
| Forb | *Campanula gieseckeana* | bluebell, Giesecke bellflower | Undetermined |
| Forb | *Nuphar polysepala (Nuphar lutea* ssp *polysepala)* | rocky mountain pond lily | May Be At Risk |
| Forb | *Nuphar variegata (Nuphar variegatum, Nuphar lutea)* | variegated pond lily | Secure[+] |

**Notes:**

[1] Scientific name as per NWT Species list (GNWT, 2016a).

[2] Ranks as per GNWT 2016a.

[+] Species not expected to occur in the Dehcho RSA.

**Source:** NWT Plant list (GNWT, 2016a) of similar plants to those identified by Dehcho Land Use Planning Committee (2006) and IMG-Golder Corporation (2006) that reportedly do not occur in the NT.

### *3.1.2.2 Sahtu Region*

A review of the available information indicates 24 plants or groups of plants are used for traditional purposes in the Sahtu Region and all 24 are expected to occur in the ecoregions intersected by the LSA and RSA (Table 3.3). Most of the plants, or plant groups, are ranked *secure* in the NT, with none of the of the identified traditional use species considered *sensitive* or *may be at risk* (GNWT, 2016a).

**Table 3.3 Traditional Plant Species – Sahtu Region**

| Form | Scientific Name[1] | Common Name(s) | Rank[2] |
|---|---|---|---|
| Tree | *Betula neoalaskana* | resin birch, Alaska paper birch | Secure |
| Tree | *Betula papyrifera* | white birch, paper birch | Secure |
| Tree | *Picea glauca* | white spruce | Secure |
| Tree | *Picea mariana* | black spruce | Secure |
| Shrub | *Arctostaphylos uva-ursi* | common bearberry, Kinnikinnik, | Secure |
| Shrub | *Arctous alpina* | alpine bearberry, torpedoberry | Secure |
| Shrub | *Arctous rubra* | red bearberry | Secure |
| Shrub | *Betula glandulosa* | bog birch | Secure |
| Shrub | *Betula occidentalis* | water birch | Secure |
| Shrub | *Betula pumila var. glandulifera* | dwarf birch | Secure |
| Shrub | *Empetrum nigrum* | crowberry, black berry | Secure |
| Shrub | *Rosa acicularis* | prickly rose, rose hips | Secure |
| Shrub | *Ribes glandulosum* | skunk currant, wild red currant | Secure |
| Shrub | *Ribes hudsonianum* | northern black currant | Secure |
| Shrub | *Ribes lacustre* | bristly black currant | Secure |
| Shrub | *Ribes triste* | wild red currant | Secure |
| Shrub | *Rubus idaeus* | wild red raspberry red raspberry | Secure |
| Shrub | *Salix* spp. | multiple willow species, including diamond willow and red willow | N/A multiple species |
| Shrub | *Vaccinium caespitosum* | dwarf blueberry | Undetermined |
| Shrub | *Vaccinium oxycoccus* | small bog cranberry | Secure |
| Shrub | *Vaccinium vitis-idaea* | lingonberry, bog cranberry, cowberry, mountain cranberry | Secure |
| Shrub | *Viburnum edule* | low bush cranberry, mooseberry | Secure |
| Forb | *Rubus arcticus* | dewberry, dwarf raspberry | Secure |
| Forb | *Rubus chamaemorus* | cloudberry, baked apple berry, yellowberry | Secure |

**Notes:**
1 Scientific name as per NWT Species list (GNWT, 2016a).
2 Ranks as per GNWT, 2016a.
**Sources:** EBA, 2006; 5658 NWT Ltd. and GNWT, 2011; Tulita Renewable Resource Council, 2019.

Wood for fuel and tools, and berries were identified as important for traditional use (EBA, 2006; 5658 NWT Ltd. and GNWT, 2011). Both wood and wood pellets are an important fuel for heating homes in the Sahtu Region. Within the Sahtu Region, wood is used for house heating in 274 (34%) households with 109 (13%) homes reporting wood as their main heat source (NWT Bureau of Statistics, 2018). Wood pellets are used for house heating in 18 (2%) households with 14 (2%) homes reporting wood pellets as their main heat source (NWT Bureau of Statistics, 2018).

Within the Sahtu Region, 34% of the general population reported gathering berries (NWT Bureau of Statistics, 2020), with 28% of the Indigenous population of Tulita and 32% of the Indigenous population of Norman Wells reporting they were engaged in berry gathering (NWT Bureau of Statistics, 2019b, 2019c).

Contaminants may be a concern for certain traditional foods, including berries and medicinal teas, in some areas (GNWT, 2017). The GNWT publishes contaminant fact sheets on many traditional meats, but no fact sheets are published for plant species (GNWT, 2016b). The Northern Contaminants Program focuses on heavy metals, and persistent organic pollutants, which can bioaccumulate in wildlife and human populations (Government of Canada, 2021). There are some studies that link increased industrial activity and dust generation to increases in concentrations of some heavy metals in berries (Shotyk, 2020). Heavy metals linked to dust (Shotyk, 2020) include aluminum, chromium, iron, lead, scandium, thorium, vanadium, yttrium, and lanthanides. No specific data on contaminants in berries and plants has been found for the Sahtu Region.

The Tulita Renewable Resources Council TLRU study developed for the Project (Tulita Renewable Resource Council, 2022) reports that:

- Country food is an important part of community residents' diet, and is shared among the community, family members, and friends in all seasons (particularly during spring and winter); and the community relies on and is in constant need of wildlife/country food for sustenance.
- Changes in the LSA such as increase of fires and disappearing plants have affected the ability to conduct TLRU.
- Harvesting plants and berries within the LSA, and along the MVWR in the summertime.
- Healing wood is harvested in the LSA.
- Firewood is harvested along the MVRW during the wintertime.
- More invasive species and vegetation in the LSA that have affected ability to conduct TLRU and recommend further studies to assess change / impact.
- Birch barks, willows and spruce branches are collected in the LSA and are used for medicinal purposes in the LSA.
- Plants and wildlife are still needed to conduct TLRU, food and hides (personal use).
- A berry harvesting area on the west side of Bear River, and near Plane Lake.
- Willows, birch bark and spruce boughs are harvested within the LSA.
- Blueberries are harvested within the LSA.

## 3.2 Literature Review

### 3.2.1 Methods

Available vegetation and wetland information was compiled to identify conditions in the study areas. The following data sources were reviewed:

- Earth Observation of Sustainable Development (EOSD) of Forests Northwest Territories geospatial database raster data – (Natural Resources Canada and GNWT, 2017)
- Canadian Wildland Fire Information System Datamart – Canadian National Fire Database fire polygon data (Canadian Forest Service, 2020)
- Species at Risk Act (SARA) Public Registry threatened and endangered species occurrences and ranking data – (Government of Canada, 2019)
- NWT species 2016-2020 – general status ranks of wild species in the Northwest Territories – (Working Group on General Status of NWT Species, 2016)
- Northwest Territories species monitoring Infobase – (GNWT, 2016a)
- Alien and invasive alien plant species occurrence data – (AKEPIC, 2020)
- Project Description Report (PDR) for Construction of the Mackenzie Valley Highway Tulita District, Sahtu Settlement Area – (5658 NWT Ltd. and GNWT, 2011)
- Project Description Report for Mackenzie Valley Highway Extension Pehdzeh Kı Ndeh – Dehcho Region – (Dessau, 2012)

#### *3.2.1.1 Landcover/Plant Assemblages and Timber*

Landcover/plant assemblages and timber within the LSA and RSA were quantified using EOSD NWT data (Natural Resources Canada and GNWT, 2017). This dataset is part of the Multisource Inventory Project (Natural Resources Canada, 2020) and uses an unsupervised classification and cluster analysis to classify landcover/plant assemblages.

The EOSD NWT dataset includes modelled cover type and density classes, as well as forest structure height and volume information based on Landsat TM imagery collected from 2007 to 2013. Mapping was done at a scale of 1:250,000 and refined through field evaluation by the GNWT (Natural Resources Canada and GNWT, 2017).

Crown Closure Class uses three categories with a range of percentage to quantify canopy closure coverage: sparse (6-25%), open (26-55%), and dense (56-100%).

Merchantable timber is defined by timber supply plans and, if timber supply plans are not available, by the Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual (GNWT Environment and Natural Resources, 2005). Generally, this includes soft-wood species with a diameter-at-breast-height of 18 centimetres (cm) and larger. Available timber data from EOSD does not include species-specific data; therefore, estimates of merchantable timber volumes were not completed. Included in this TDR are estimates of coniferous and mixedwood volumes in the LSA and RSA, which can be used

to inform future field data collection for determination of merchantable timber locations and volumes. Future merchantable timber estimates should address the amount of merchantable timber removed during ROW clearing and the potential for facilitating use of waste timber by communities.

No vegetation assemblages are considered rare in the Boreal Cordillera ecoregion or the Taiga Cordillera ecoregion (Working Group on General Status of NWT Species, 2016).

#### *3.2.1.2 Fire History*

Forest fire polygon data from the Canadian National Fire Database (CNFDB) (Canadian Forest Service, 2020) was examined for the frequency and extent of fire in the LSA and RSA and differences with landcover types/plant assemblages. CNFDB fire polygon data is compiled by Canadian fire agencies (provincial, territories and Parks Canada) and can be used for spatial and temporal analysis of fire effects at a landscape scale. CNFDB fire polygon data for NT is current as of 2019 (Canadian Forest Service, 2020). Frequency of burns, area burned (hectares [ha]), and proportion of area burned were determined by decade (1960 to 2019) for the LSA and RSA.

#### *3.2.1.3 Plant SOCC*

The Northwest Territories Species Monitoring Infobase was searched to identify known vascular and non-vascular plant SOCC that could potentially occur in the LSA and RSA (GNWT, 2016a).

Plant SOCC observations from the Mackenzie Gas Project (Mackenzie Project Environment Group, 2004) detailed in the Mackenzie Valley Highway Tulita District PDR (5658 NWT Ltd. and GNWT, 2011) and the PDR for Mackenzie Valley Highway Extension Pehdzeh Ki Ndeh – Dehcho Region (Dessau, 2012) were also reviewed for documented plant SOCC in the RSA.

#### *3.2.1.4 Alien and Invasive Alien Plant Species*

Alien plant species are defined as plants introduced to the NT from Eurasia or other parts of North America as a result of human activities (Oldham and Delisle-Oldham, 2016). Invasive alien plant species are those with potential to cause significant ecological harm to native environments through high rates of dispersal and establishment (Snyder and Anions, 2008). Some human developments and activities can promote the establishment and spread of alien and invasive alien plant species through introduction of propagules and increasing habitat invasiveness. Changes in disturbance frequency and intensity of natural habitats can alter species composition, including invasion by alien and invasive alien plant species. Invasive alien plant species are plants listed in Carriere (2008). Additional invasive alien plant species are plants which are described as ‘priority invasive plant species’ in Oldham and Delisle-Oldham (2016). Alien plant species are plants which appear in Oldham and Delisle-Oldham (2016) and GNWT (2015), but the latter does not specifically identify plant species as “Invasive Alien”; however, the report does list species that are invasive by nature. Additionally, alien species are identified in Working Group on General Status of NWT Species (2016). That report also does not specifically identify plant species as invasive alien.

Alien and alien invasive plant species potentially occurring in the RSA were identified using Oldham and Delisle-Oldham (2016), for which a field survey was conducted to identify occurrences of alien and invasive alien plant species along the Mackenzie Highway from the northern Alberta border to Wrigley, NT, and conducting a search of the Northwest Territories Species Monitoring Infobase (GNWT, 2016a) to identify potential alien and invasive alien plant species occurring within Level II ecoregions (Taiga Plains, Taiga Cordillera and Boreal Cordillera) intersected by the RSA. Occurrences identified in this TDR do not directly overlap the Project Development Area (PDA); however, they are within the RSA and indicate plants that may occur in the vegetation LSA or project PDA. Known occurrences of alien and invasive alien plant species in the RSA were determined using the Alaska Exotic Plants Information Clearinghouse (AKEPIC), a geospatial mapping tool which tracks occurrences of alien species (AKEPIC, 2020).

## 3.2.2 Results

### *3.2.2.1 Dehcho Region*

#### Landcover/Plant Assemblages

Coniferous forest is the most abundant landcover type/plant assemblage in the Dehcho Region of the LSA, occupying 44.8% (9,512.2 ha), with similar proportions of sparse, open and dense stands present (Table 3.4). Broadleaf and mixedwood forests are also present, but are less common, with broadleaf forest occupying 3.5% (733.2 ha) and mixedwood forest occupying 4.4% (932.8 ha). Most coniferous forest cover types are located east of the Mackenzie River, whereas most broadleaf and mixedwood forest cover types are located west of the Mackenzie River, which has historically been burned (Figure 3.1). Figure 3.2 shows areas of sparse and open forest cover in the Dehcho Region portion of the LSA.

Remaining upland areas in the Dehcho Region of the LSA are largely composed of exposed land, 5.9% of the LSA (1,255.3 ha), low shrub, 1.6% of the LSA (347.4 ha), and tall shrub, 1.4% of the LSA (307.4 ha) (Table 3.4). Exposed land includes areas that naturally have less than 5% vegetative cover, such as shorelines of rivers and lakes, exposed rock, recently burned areas, and moraines; the areas also include cleared areas such as roads and areas of infrastructure development, including the two existing cleared ROW for the Norman Wells Pipeline and MVWR. Exposed land occurs predominantly along the east side of the Mackenzie River in the LSA in the Dehcho Region (Figure 3.1). Tall and low shrub are distributed predominately west of the Mackenzie River and, typically, associated with broadleaf stands and lower areas with open water.

Wetlands occupy 19.6% of the LSA in the Dehcho Region (4,152.9 ha). Treed and shrub wetlands are the most common wetland types, occupying 8.3% (1,768.5 ha) and 7.9% (1,667.2 ha), respectively. Wetlands are located throughout the LSA in the Dehcho Region, with the highest concentrations of wetlands occurring along watercourses adjacent to Mackenzie River (Figure 3.1).

**Table 3.4 Landcover/Plant Assemblage Types in the LSA and RSA – Dehcho Region**

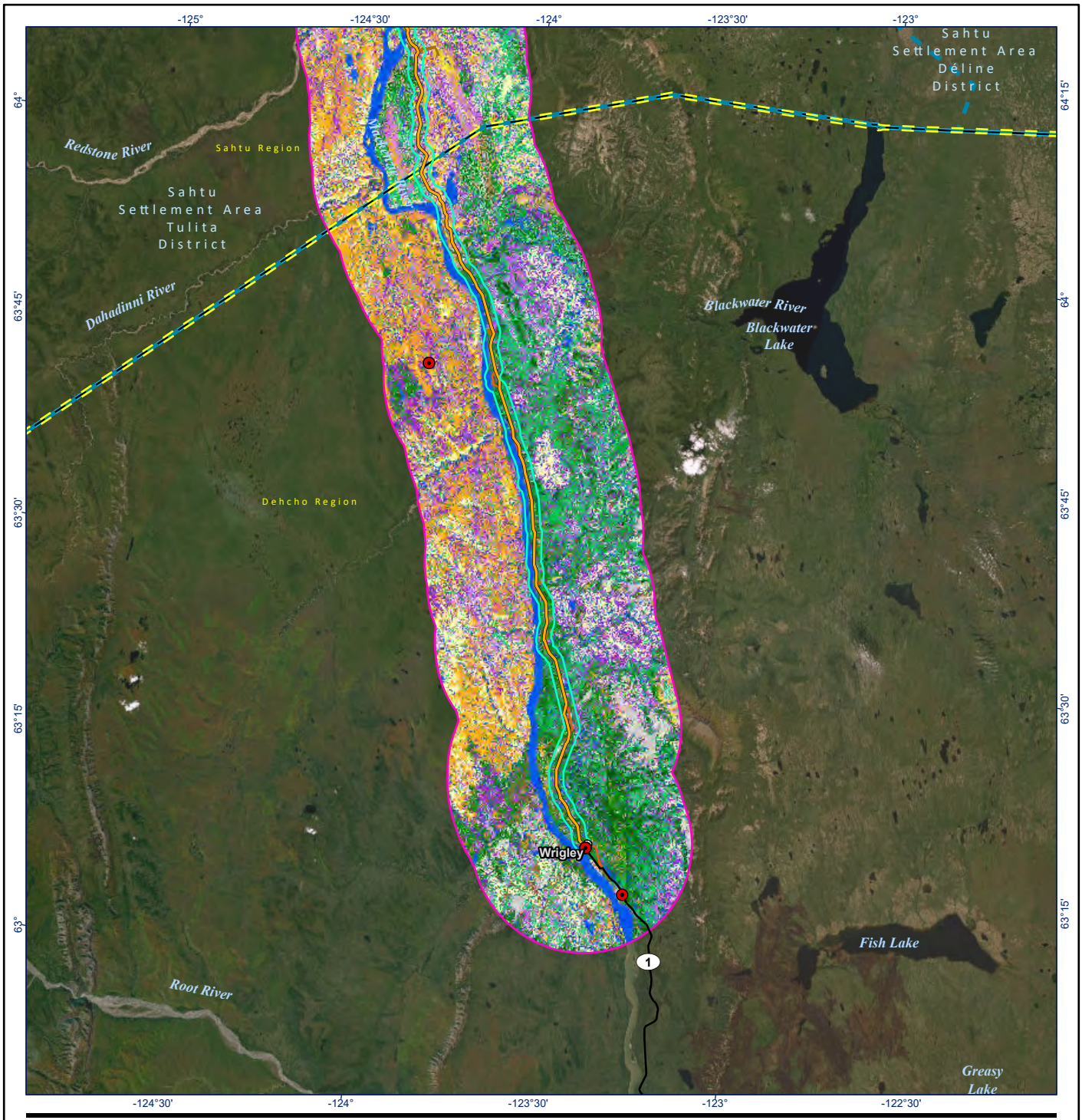
| Landcover/Plant Assemblage Type | Cover Type Class | LSA | | RSA | |
|---|---|---|---|---|---|
| | | ha | % | ha | % |
| Broadleaf Forest | Broadleaf – Dense | 665.0 | 3.1 | 43,789.4 | 12.2 |
| | Broadleaf – Open | 68.3 | 0.3 | 4,129.7 | 1.2 |
| | **Broadleaf Subtotal** | **733.2** | **3.5** | **47,919.1** | **13.4** |
| Coniferous Forest | Coniferous – Dense | 2,724.7 | 12.8 | 25,081.4 | 7.0 |
| | Coniferous – Open | 3,694.9 | 17.4 | 40,004.2 | 11.2 |
| | Coniferous – Sparse | 3,092.7 | 14.6 | 51,385.1 | 14.3 |
| | **Coniferous Subtotal** | **9,512.2** | **44.8** | **116,470.7** | **32.5** |
| Mixedwood Forest | Mixedwood – Dense | 825.5 | 3.9 | 6,772.1 | 1.9 |
| | Mixedwood – Open | 107.3 | 0.5 | 2,727.8 | 0.8 |
| | **Mixedwood Subtotal** | **932.8** | **4.4** | **9,499.9** | **2.6** |
| Shrubland | Shrub – Tall | 307.4 | 1.4 | 1,642.0 | 0.5 |
| | Shrub – Low | 347.4 | 1.6 | 38,961.7 | 10.9 |
| | **Shrubland Subtotal** | **654.8** | **3.1** | **40,603.7** | **11.3** |
| Herbaceous and Un-vegetated | Herb | 42.7 | 0.2 | 1,248.9 | 0.3 |
| | Bryoids | 7.0 | <0.1 | 20.3 | <0.1 |
| | Rock/Rubble | 44.1 | 0.2 | 4,877.5 | 1.4 |
| | Exposed Land[1] | 1,255.3 | 5.9 | 4,844.1 | 1.4 |
| | **Herbaceous and Un-vegetated Subtotal** | **1,349.1** | **6.4** | **10,990.8** | **3.1** |
| | **Upland Subtotal[2]** | **13,182.0** | **62.1** | **225,484.3** | **62.9** |
| Wetland | Wetland – Treed | 1,768.5 | 8.3 | 46,837.6 | 13.1 |
| | Wetland – Shrub | 1,667.2 | 7.9 | 44,668.8 | 12.5 |
| | Wetland – Herb | 717.3 | 3.4 | 12,623.9 | 3.5 |
| | **Wetland Subtotal[2]** | **4,152.9** | **19.6** | **104,130.4** | **29.0** |
| Open Water | | 3,894.1 | 18.3 | 28,828.2 | 8.0 |
| No data | | 0.0 | 0.0 | 95.5 | 0.0 |
| **Total[2]** | | **21,229.0** | **100.0** | **358,538.4** | **100.0** |

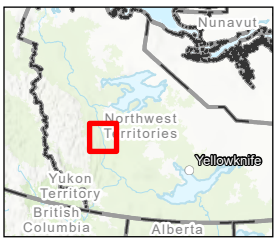
**Notes:**

[1] Exposed land includes areas which naturally have less than 5% vegetative cover such as shorelines of rivers and lakes, exposed rock, recently burned areas, and moraines, and includes cleared areas such as roads and areas of infrastructure development.

[2] Sub-totals and totals may not equal sums of individual values due to rounding.

**Source:** Natural Resources Canada and GNWT (2017).




Alien and Alien Invasive (weed) Occurrence*

**Landcover Type**

- Water
- Rock/Rubble
- Exposed Land
- Bryoids
- Shrub - Tall
- Shrub - Low
- Wetland - Treed
- Wetland - Shrub
- Wetland - Herb
- Herb
- Coniferous - Dense
- Coniferous - Open
- Coniferous - Sparse
- Broadleaf - Dense
- Broadleaf - Open
- Mixedwood - Dense
- Mixedwood - Open
- Mixedwood - Sparse

* More than one alien or alien invasive plant may occur at each mapped location

- Proposed Mackenzie Valley Highway Alignment - Issued for EA 2022
- Granular Borrow / Rock Quarry Site and Access
- Local Study Area
- Regional Study Area
- Community
- All-Season Road
- Winter Road
- District Boundary
- Region Boundary
- Settlement Area Boundary

0 7.5 15 Kilometres

(At original document size of 8.5x11)
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Kálo-Stantec

*Project Location*
Wrigley to Norman Wells, NWT

Prepared by AT on 2023-03-07
TR by AJ on 2023-03-07

*Client/Project*
144903025-0010-REVB

Government of Northwest Territories
Mackenzie Valley Highway Project

*Figure No.*
**3.1**

*Title*
**Landcover/Plant Assemblage Types within the Mackenzie Valley Highway Project LSA and RSA – Dehcho Region**

***Notes***

**1.** Coordinate System: NAD 1983 Northwest Territories Lambert
**2.** Data Sources: Centre for Geomatics Government of NWT, Government of Canada, Stantec
**3.** Background: World Topographic Map: Esri, FAO, NOAA, USGS, NRCan
World Imagery: Earthstar Geographics
World Hillshade: Esri, USGS

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**Figure 3.2 Upland Landcover/Plant Assemblage – Dehcho Region**

Areas of open water (i.e., lakes, rivers and streams) are also common in the Dehcho Region of the LSA, occupying 18.3% of the LSA (3,894.1 ha), which occur primarily at Mackenzie River and associated watercourses (Figure 3.1). Herb, and rock/rubble areas are also present, both occupying 0.2% of the LSA at 42.7 ha and 44.1 ha, respectively. Bryoid dominated areas are uncommon, occupying less than 0.1% of the Dehcho Region of the LSA (7.0 ha).

Like the LSA, the RSA in the Dehcho Region is dominated by coniferous forest 32.5% (116,470.7 ha); however, cover decreases with stand density (Table 3.4). Broadleaf forests in the RSA occupy a greater proportion of landcover 13.4% (47,919.1 ha) than in the LSA. Compared to the LSA, relative abundance of mixedwood forest within the RSA is lower, representing just 2.6% (9,499.9 ha). Broadleaf and mixedwood forests are dominated by dense stands with 56% to 100% tree closure.

The remaining upland composition in the RSA in the Dehcho Region is mostly low shrub 10.9% (39,961.7 ha), followed by rock/rubble 1.4% (4,877.5 ha), exposed land 1.4% (4,844.1 ha), and tall shrub 0.5% (1,642.0 ha). Herb dominated areas are also present in the RSA, occupying 0.3% (1,248.9 ha). Small amounts of bryoid landcover/plant assemblage is also present in the RSA, but they are found at less than 0.1% (Table 3.4).

Wetlands cover 29.0% (104,130.4ha) of the RSA in the Dehcho Region, with similar proportions of treed wetlands and shrub wetlands, occupying 13.1% (46,837.6 ha) and 12.5% (44,668.8 ha), respectively. Herb wetlands are also present at 3.5% (12,623 ha). Wetlands are predominately located in areas associated with open water and broadleaf stands, occurring primarily adjacent to watercourses throughout the Dehcho Region.

A lower percentage of open water areas are observed in the RSA in the Dehcho Region 8.0% (28,828.2 ha), compared to the LSA (Table 3.4). This difference is due to the presence of the Mackenzie River in the LSA (Figure 3.1). Smaller areas of open water also occur and are surrounded by various wetland classes (Figure 3.3).

Coniferous forest has an average stand volume density of 40.2 cubic metres per hectare ($m^3$/ha; Standard Deviation [SD] = 17.7) (Table 3.5). Tree height in conifer stands in the LSA range from 5 m to 19 m with an average height of 9.1 m (SD = 2.2). Mixedwood forest has a greater average stand volume density (42.2 $m^3$/ha, SD = 13.6) than coniferous (40.2 $m^3$/ha, SD = 17.7), and deciduous forests (34.6 $m^3$/ha, SD = 17.9). Deciduous forest has slightly shorter minimum tree height (5 m) than mixedwood forest (6 m), but both have similar maximum tree heights of 17 m. Average tree height for deciduous forest is 8.5 m (SD = 2.2), whereas average tree height for mixedwood forest is 9.5 m (SD = 1.6) (Table 3.5). More detailed species information from ground data is needed to provide detailed merchantable timber volume estimates, but from volume metrics, merchantable timber is expected in the Dehcho Region of the LSA.

**Figure 3.3 Open Water and Wetland Landcover/Plant Assemblage – Dehcho Region**

**Table 3.5 Tree Height, Stand Volume Density and Total Volume by Forest Type in the LSA – Dehcho Region**

| Landcover/Plant Assemblage Type | Tree Height (m) | | | | Stand Volume Density ($m^3$/ha) | | | | Total Volume[2] ($m^3$) |
|---|---|---|---|---|---|---|---|---|---|
| | Minimum | Maximum | Average | SD[1] | Minimum | Maximum | Average | SD[1] | |
| Coniferous | 5 | 19 | 9.1 | 2.2 | 13 | 148 | 40.2 | 17.7 | 448,465 |
| Deciduous | 5 | 17 | 8.5 | 2.2 | 13 | 125 | 34.9 | 17.9 | 15,209 |
| Mixedwood | 6 | 17 | 9.5 | 1.6 | 17 | 125 | 42.2 | 13.6 | 26,803 |

**Notes:**
[1] Standard Deviation.
[2] Total volume determined by multiplying average stand volume by land cover area (ha) in the LSA.
**Source:** Natural Resources Canada and GNWT (2017).

Average stand volume density of coniferous forest in the RSA is lower than that of the LSA at 31.0 $m^3$/ha (SD = 21.7) (Table 3.6). Average tree height in coniferous forest is also shorter in the RSA than the LSA, equaling 7.7 m (SD = 2.5), with heights ranging from 4 m to 22 m (Table 3.6). Deciduous forest in the Dehcho Region of the RSA shares the same range of stand heights as coniferous forest; however, average height is 6.7 m and tree height is less variable (SD = 1.9). Mixedwood forest has an average stand volume density of 38.7 $m^3$/ha (SD = 19). Mixedwood forest ranges from 5 m to 21 m in height with an average tree height of 8.9 m (SD = 2.1). Average stand volume density of deciduous and mixedwood stands in the RSA is lower than the LSA. Average tree heights of deciduous and mixedwood stands in the LSA are taller than the RSA.

**Table 3.6 Tree Height, Stand Volume Density and Total Volume by Forest Type in the RSA – Dehcho Region**

| Landcover/Plant Assemblage Type | Tree Height (m) | | | | Stand Volume Density ($m^3$/ha) | | | | Total Volume[2] ($m^3$) |
|---|---|---|---|---|---|---|---|---|---|
| | Minimum | Maximum | Average | SD[1] | Minimum | Maximum | Average | SD[1] | |
| Coniferous | 4 | 22 | 7.7 | 2.5 | 10 | 180 | 31.0 | 21.7 | 3,927,036 |
| Deciduous | 4 | 22 | 6.7 | 1.9 | 10 | 182 | 23.2 | 14.9 | 1,190,127 |
| Mixedwood | 5 | 21 | 8.9 | 2.1 | 13 | 174 | 38.7 | 18.8 | 276,288 |

**Notes:**
[1] Standard Deviation
[2] Total volume determined by multiplying average stand volume by land cover area (ha) in the RSA.
**Source:** Natural Resources Canada and GNWT (2017).

## Fire History

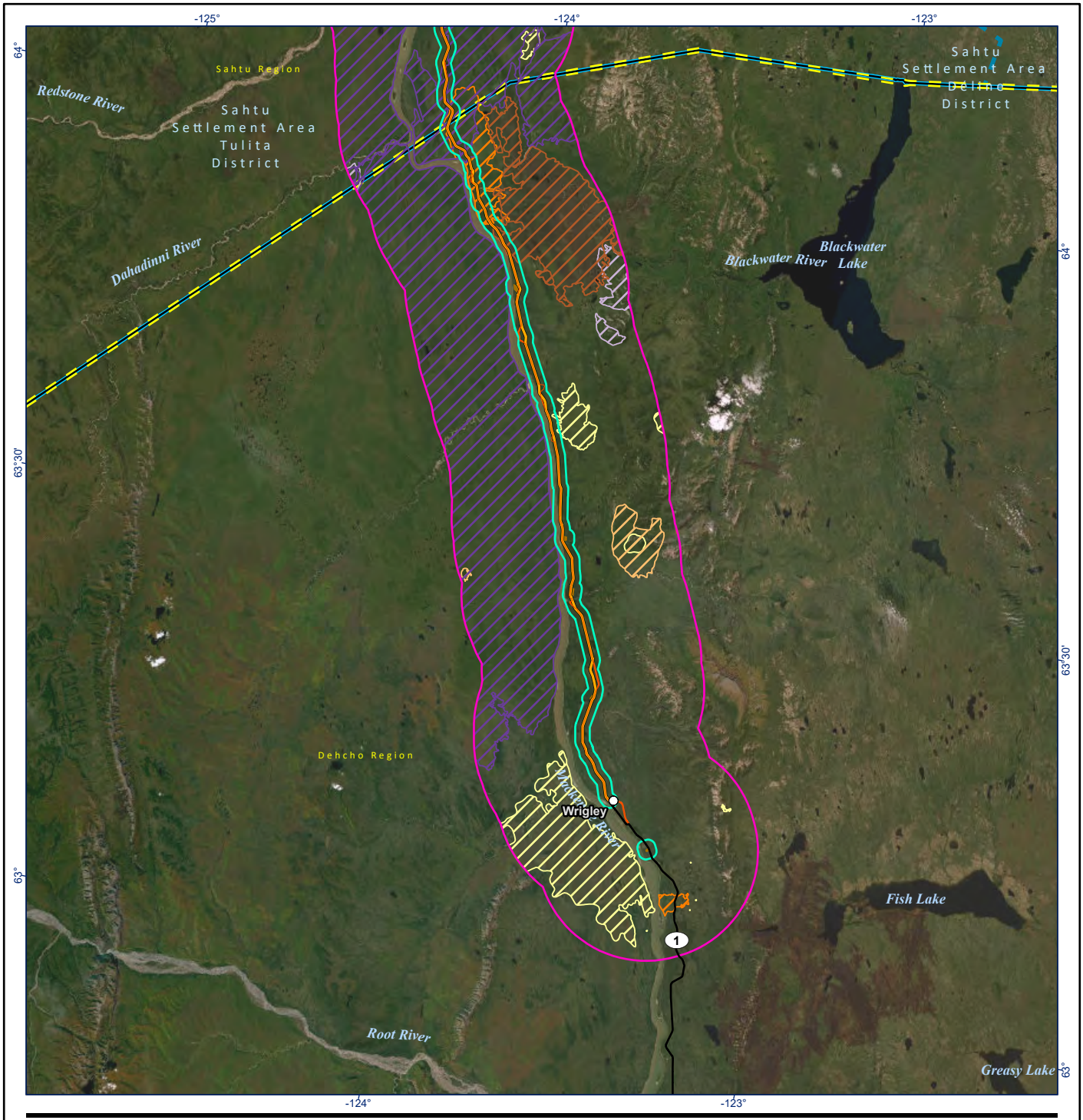
Between 1960 and 2019, five fires occurred within some portion of the LSA in the Dehcho Region, burning a total area of 4,830.3 ha (22.8% of the LSA) (Table 3.7). Total area burned within the Dehcho Region of the LSA ranged from 0 to 2,713.0 ha, with zero to two fires occurring per decade. Some areas burned more than once during this time, with certain areas experiencing burns in more than one decade. Most of the recorded fires have occurred west and northeast of the Mackenzie River. During the period of 1990-2009, the majority of the LSA west of the Mackenzie River had been affected by fire (Figure 3.4).

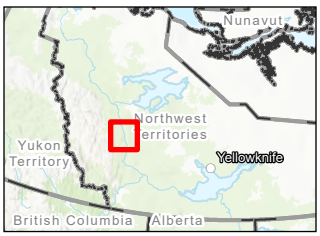
There were 24 fires within the RSA in the Dehcho Region between 1960 and 2019, burning a total of 182,269.2 ha (50.8% of the RSA) (Table 3.7). Fire sizes within the RSA ranged from 3,390.3 ha to 115,739.5 ha. In comparison to the LSA, the RSA burned more frequently, and had a greater proportion burned. This is likely an artifact of the size of the LSA and is not suspected to reflect a greater resistance to burning.

**Table 3.7 Forest Fire Occurrence within the LSA and RSA from 1960 to 2019 – Dehcho Region**

| Time Period | Number of Fires | | Total Area Burnt (ha) | | Percent Area Burnt (%) | |
|---|---|---|---|---|---|---|
| | LSA | RSA | LSA | RSA | LSA | RSA |
| 1960-1969 | 0 | 2 | 0.0 | 4,864.3 | 0.0 | 1.4 |
| 1970-1979 | 1 | 2 | 2,713.0 | 7,523.0 | 12.8 | 2.1 |
| 1980-1989 | 0 | 3 | 0.0 | 3,390.3 | 0.0 | 0.9 |
| 1990-1999 | 2 | 4 | 1,466.5 | 115,739.5 | 6.9 | 32.3 |
| 2000-2009 | 1 | 9 | 36.1 | 26,066.8 | 0.2 | 7.3 |
| 2010-2019 | 1 | 4 | 614.7 | 24,685.3 | 2.9 | 6.9 |
| **TOTAL** | 5 | 24 | 4,830.3 | 182,269.2 | 22.8 | 50.8 |

**Source:** Canadian Forest Service (2020).




National Fire Database
- 1960-1969
- 1970-1979
- 1980-1989
- 1990-1999
- 2000-2009
- 2010-2019

Proposed Mackenzie Valley Highway Alignment - Issued for EA 2022

- Granular Borrow / Rock Quarry Site and Access
- Local Study Area
- Regional Study Area
- Community
- All-Season Road
- Winter Road
- Region Boundary
- District Boundary
- Settlement Area Boundary

0 7.5 15 Kilometres

(At original document size of 8.5x11)
1:40,000,000

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Kálo-Stantec

*Project Location*
Wrigley to Norman Wells, NWT

Prepared by AT on 2023-03-07
TR by AJ on 2023-03-07

*Client/Project*
144903025-0009 REVB

Government of Northwest Territories
Mackenzie Valley Highway Project

*Figure No.*
**3.4**

*Title*
**Area Burnt per Decade within the Mackenzie Valley Highway LSA and RSA between 1960 and 2019 - Dehcho Region**

***Notes***
**1.** Coordinate System: NAD 1983 Northwest Territories Lambert
**2.** Data Sources: Centre for Geomatics Government of NWT, Government of Canada, Stantec
**3.** Background: World Topographic Map: Esri, FAO, NOAA, USGS, NRCan
World Imagery: Earthstar Geographics
World Hillshade: Esri, USGS

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Fires within the LSA of the Dehcho Region affected 2,819.8 ha of upland areas and 1,757.1 ha of wetland areas (Table 3.8). Fires within the RSA of the Dehcho Region affected 114,208.9 ha of upland areas and 59,383.3 ha of wetland areas (Table 3.8). All upland and wetland types were burned at least once in the LSA and RSA between 1960 and 2019. Areas burned of rock/rubble, exposed land and open water reflect the coarse scale of available data in fact, these areas likely did not actually burn.

Figure 3.5 is a box plot, which shows the median area burned per landcover/plant assemblage type in the LSA and RSA in the Dehcho Region between 1960 and 2019. The heavy horizontal bar in each box indicates median value, with inter-quartile range represented as upper and lower boundaries on opposite areas in the box. Standard deviation is represented as bars and outliers as points. This figure shows that fire size in the LSA and RSA of the Dehcho Region is highly variable.

Data on changes in plant composition with varying time since burned (i.e., succession) were not found for the LSA or RSA. Available studies indicate burned areas are dominated by plants capable of vegetative reproduction following fire, with a later increase in abundance of plants reproducing by seed and slower growing plants capable of vegetative reproduction. Plants with light abundant seeds and species also colonize burned areas rapidly and abundance decreases after a few years due to short life spans of the plants (Johnson, 1981). Trees required 5 to 6 years, on average, to reach a height of 0.3 m following high severity fires in High Boreal, Low Subarctic, and High Subarctic ecoregions of the Taiga Shield (Lewis et al., 2018). Following low to mixed-severity fires, trees took 10.7 years, on average, in the High Boreal ecoregion and 15.5 years in the Low Subarctic. Tree regeneration times may differ for the ecoregions intersected by the RSA.

**Figure 3.5 Area Burned by Landcover/Plant Assemblage Type from 1960 to 2019 in the LSA and RSA – Dehcho Region**

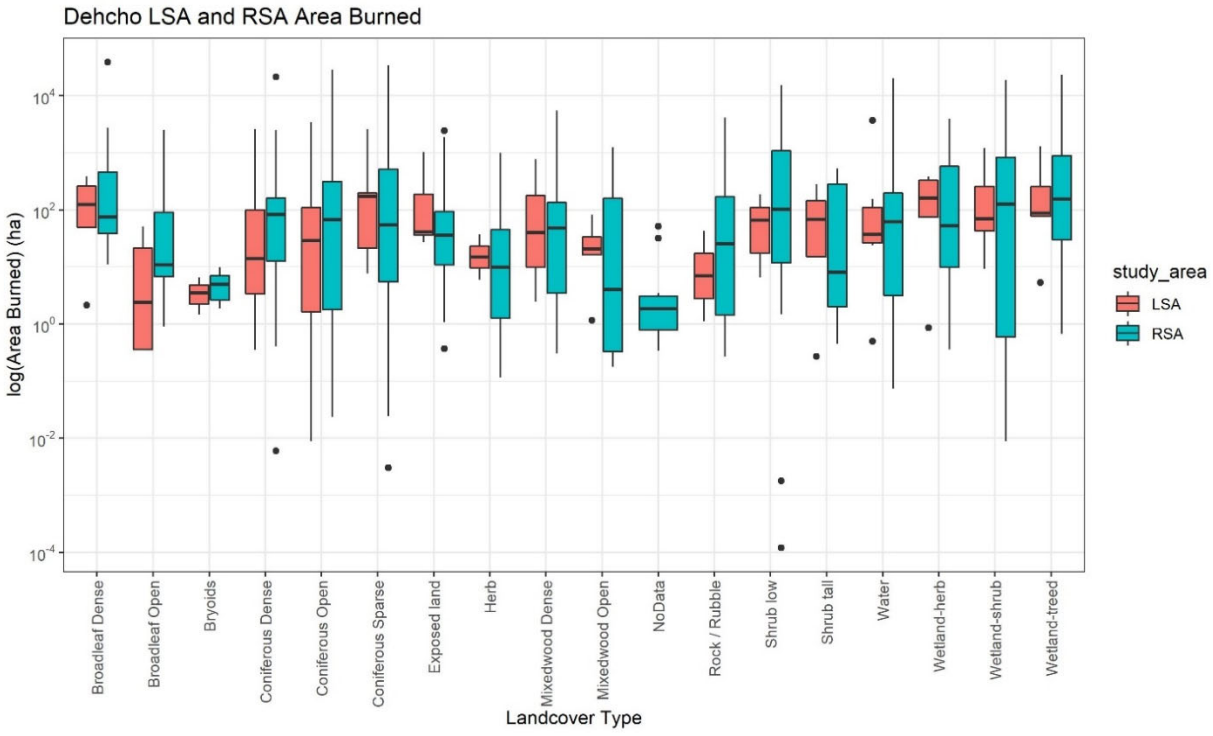


**Table 3.8 Number of Fires per Landcover/Plant Assemblage Type and Total Area Burned from 1960 to 2019 – Dehcho Region**

| Landcover/Plant Assemblage Type [1] | Cover Type Class | Total number of Fires [2] | | Total area burned (ha) | |
|---|---|---|---|---|---|
| | | LSA | RSA | LSA | RSA |
| Broadleaf Forest | Broadleaf – Dense | 10 | 47 | 565.3 | 41,556.8 |
| | Broadleaf – Open | 4 | 29 | 16.7 | 3,196.0 |
| **Broadleaf Subtotal** | | **-** | **-** | **582.0** | **44,752.8** |
| Coniferous Forest | Coniferous – Dense | 6 | 34 | 117.1 | 3,847.3 |
| | Coniferous – Open | 8 | 45 | 225.5 | 11,819.8 |
| | Coniferous – Sparse | 11 | 50 | 568.6 | 17,743.1 |
| **Coniferous Subtotal** | | **-** | **-** | **911.2** | **33,110.2** |
| Mixedwood Forest | Mixedwood – Dense | 2 | 24 | 42.7 | 1,322.8 |
| | Mixedwood – Open | 10 | 33 | 133.5 | 1,583.7 |
| **Mixedwood Subtotal** | | **-** | **-** | **176.2** | **2,906.5** |
| Shrubland | Shrub – Low | 11 | 54 | 341.3 | 27,963.2 |
| | Shrub – Tall | 10 | 36 | 498.8 | 1,578.6 |
| **Shrubland Subtotal** | | **-** | **-** | **840.1** | **29,541.8** |
| Herbaceous and Un-vegetated | Herb | 1 | 20 | 6.0 | 268.3 |
| | Bryoids | 9 | 14 | 11.6 | 23.8 |
| | Rock/Rubble | 1 | 10 | 1.1 | 827.9 |
| | Exposed Land [3] | 13 | 38 | 291.6 | 2,477.6 |
| **Herbaceous and Un-vegetated Subtotal** | | **-** | **-** | **310.3** | **3,597.6** |
| **Upland Subtotal** | | **-** | **-** | **2,819.8** | **114,208.9** |
| Wetland | Wetland – Herb | 10 | 47 | 564.4 | 9,136.9 |
| | Wetland – Shrub | 11 | 52 | 577.6 | 26,273.5 |
| | Wetland – Treed | 11 | 49 | 615.1 | 23,972.9 |
| **Wetland Subtotal** | | **-** | **-** | **1,757.1** | **59,383.3** |
| Open Water | | 11 | 49 | 253.5 | 8,630.6 |
| No Data | | - | 16 | - | 46.3 |
| **Total** | | **-** | **-** | **4,830.3** | **182,269.2** |

**Notes:**

[1] Landcover/plant assemblage type in 2020. Landcover/plant assemblage may have been different prior to fire events.

[2] Many fires affected more than one vegetation type; therefore, the total number of fires are given for each vegetation type but cannot be summed among vegetation types.

[3] Exposed land includes areas which naturally have less than 5% vegetative cover such as shorelines of rivers and lakes, exposed rock, recently burned areas, and moraines, and includes cleared areas such as roads and areas of infrastructure development.

**Source:** Canadian Forest Service (2020)

## Plant SOCC

A search of the Northwest Territories Species Monitoring Infobase (Working Group on General Status of NWT Species, 2016)—queried to the ecoregions (Boreal Cordillera and Taiga Cordillera) that are intersected by the RSA of the Dehcho Region—identified 107 vascular plant, bryophytes and lichen SOCC with potential to occur within the RSA, including 77 vascular plants, six mosses, and 24 lichens (Appendix A.1). Of the 77 vascular plants identified, 33 are listed territorially as *may be at risk* and 44 are listed as *sensitive* under the NWT General Species Rankings. Of the six moss species identified, four are listed territorially as *may be at risk* and two are listed as *sensitive* under the NWT General Species Rankings. Two lichen species are listed as *may be at risk* and 22 as *sensitive* (GNWT, 2016a). No plant or lichen SOCC occurring in the Boreal Cordillera ecoregion or the Taiga Cordillera ecoregion are listed under SARA or Committee on The Status of Endangered Wildlife in Canada (COSEWIC), and no vegetation assemblages are considered *rare*.

No plant SOCC occurrences have been documented within the Dehcho Region of the LSA or RSA (Dessau, 2012). Several species reported by Dessau (2012) were previously considered SOCC but have since been downgraded. Pre-construction field surveys should be conducted to evaluate plant SOCC occurrences of higher potential areas potentially impacted by the Project (e.g., riparian areas, uncommon plant assemblages).

## Alien and Invasive Alien Plant Species

A search of the AKEPIC Data Portal (AKEPIC, 2020) found 14 locations of 12 alien and invasive alien plant species within the RSA in the Dehcho Region (Table 3.9). Nine of the species are classified as alien plant species and three as invasive alien species. Oldham and Delisle-Oldham (2016) identified 34 alien and invasive alien plant species, of which 22 species were classified as alien and 12 as invasive alien in the RSA in the Dehcho Region (Appendix B). Specific locations of these occurrences are not available; however, locations were sampled in ditches along human infrastructure.

**Table 3.9 Alien and Invasive Alien Plant Species Recorded within the RSA – Dehcho Region**

| Listing | Scientific Name | Common Name | Number of Occurrences | Closest Occurrence to the PDA (km) |
|---|---|---|---|---|
| Alien | *Taraxacum officinale* | common dandelion | 1 | 0.56 |
| Alien | *Erucastrum gallicum* | common dog mustard | 1 | 0.56 |
| Alien | *Lappula squarrosa* | European stickseed | 1 | 0.56 |
| Alien | *Brassica rapa* | field mustard | 1 | 8.77 |
| Alien | *Thlaspi arvense* | field pennycress | 1 | 8.77 |
| Alien | *Matricaria discoidea* | pineapple weed | 1 | 0.56 |
| Alien | *Taraxacum erythrospermum* | rock dandelion | 1 | 0.56 |
| Alien | *Phleum pratense* | timothy | 1 | 0.56 |
| Alien | *Lepidium virginicum* | wild peppergrass | 1 | 8.78 |
| Invasive Alien | *Crepis tectorum* | narrow-leaf hawksbeard | 3 | 0.56 |
| Invasive Alien | *Phalaris arundinacea* | reed canary grass | 1 | 6.39 |
| Invasive Alien | *Melilotus albus* | white sweet-clover | 1 | 8.78 |

**Source:** AKEPIC (2020)

#### *3.2.2.2 Sahtu Region*

### Landcover/Plant Assemblages

Coniferous forest dominates upland area within the LSA in the Sahtu Region, occupying 28.3% (11,798.9 ha), with open and sparse stands being most abundant (Table 3.10). Broadleaf and mixedwood forests are also present, but less common, with broadleaf forest occupying 6.9% (2,892.5 ha) and mixedwood forest occupying 5.6% (2,315.2 ha) of the LSA. Coniferous forests are primarily distributed west and northeast of the Mackenzie River, broadleaf forests occur in the southwest portion of the LSA, and mixedwood forests are distributed throughout (Figure 3.6). Remaining upland areas in the LSA in the Sahtu Region are largely composed of low shrub at 16.6% (6,935.0 ha), followed by exposed land 4.1% (1,688.2 ha), and tall shrub 4.1% (1,688.7 ha) (Table 3.10). Exposed land occurs predominately adjacent to the Mackenzie River (Figure 3.6). Tall and low shrub landcover/plant assemblage types are located predominately in the northwest portion of the LSA and typically adjacent to conifer stands and near wetlands (Figure 3.6).

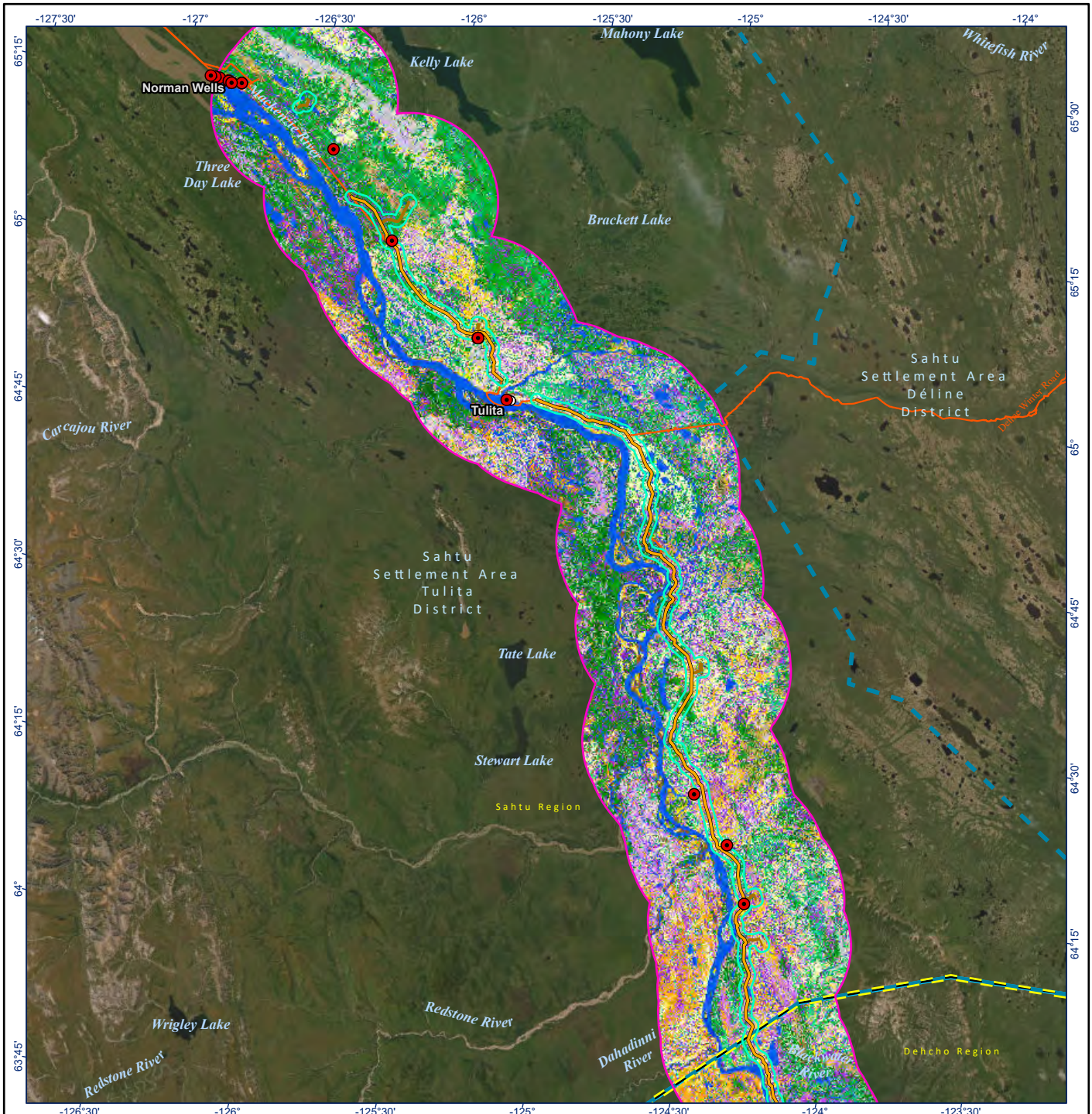
**Table 3.10 Landcover/Plant Assemblage Types in the LSA and RSA – Sahtu Region**

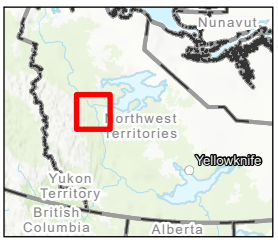
| Landcover/Plant Assemblage Type | Cover Type Density | LSA | | RSA | |
|---|---|---|---|---|---|
| | | ha | % | ha | % |
| Broadleaf Forest | Broadleaf – Dense | 2,004.4 | 4.8 | 34,264.7 | 5.3 |
| | Broadleaf – Open | 888.1 | 2.1 | 14,627.8 | 2.2 |
| | **Broadleaf Subtotal** | **2,892.5** | **6.9** | **48,892.5** | **7.5** |
| Coniferous Forest | Coniferous – Dense | 893.2 | 2.1 | 18,581.1 | 2.9 |
| | Coniferous – Open | 5,555.5 | 13.3 | 113,324.1 | 17.4 |
| | Coniferous – Sparse | 5,350.3 | 12.8 | 71,839.7 | 11.0 |
| | **Coniferous Subtotal** | **11,798.9** | **28.3** | **203,744.8** | **31.3** |
| Mixedwood Forest | Mixedwood – Dense | 318.9 | 0.8 | 7,492.9 | 1.1 |
| | Mixedwood – Open | 1,991.2 | 4.8 | 23,821.0 | 3.7 |
| | Mixedwood – Sparse | 5.1 | <0.1 | 11.7 | <0.1 |
| | **Mixedwood Subtotal** | **2,315.2** | **5.6** | **31,325.7** | **4.8** |
| Shrubland | Shrub – Tall | 1,688.7 | 4.1 | 16,523.1 | 2.5 |
| | Shrub – Low | 6,935.0 | 16.6 | 72,610.1 | 11.1 |
| | **Shrubland Subtotal** | **8,623.7** | **20.7** | **89,133.2** | **13.7** |
| Herbaceous and Un-vegetated | Herb | 191.0 | 0.5 | 4,093.5 | 0.6 |
| | Bryoids | 5.9 | <0.1 | 137.1 | 0.0 |
| | Rock/Rubble | 62.2 | 0.1 | 10,281.4 | 1.6 |
| | Exposed Land [1] | 1,688.2 | 4.1 | 9,900.7 | 1.5 |
| | **Herbaceous and Un-vegetated Subtotal** | **1,947.3** | **4.7** | **24,412.6** | **3.7** |
| | **Upland Subtotal** | **27,577.4** | **66.2** | **397,508.9** | **61.0** |
| Wetland | Wetland – Treed | 4,121.8 | 9.9 | 64,770.4 | 9.9 |
| | Wetland – Shrub | 3,819.0 | 9.2 | 55,334.7 | 8.5 |
| | Wetland – Herb | 2,666.8 | 6.4 | 44,856.6 | 6.9 |
| | **Wetland Subtotal** | **10,607.6** | **25.5** | **164,961.7** | **25.3** |
| Open Water | | 3,489.1 | 8.4 | 89,310.5 | 13.7 |
| No Landcover Data | | 0.0 | 0.0 | 164.4 | 0.0 |
| **Total** | | **41,674.1** | **100.0** | **651,945.4** | **100.0** |

**Note:**

[1] Exposed land includes areas which naturally have less than 5% vegetative cover, such as on the shorelines of rivers and lakes, exposed rock, recently burned areas, and moraines; it includes cleared areas, such as roads and areas of infrastructure development.

**Source:** Natural Resources Canada and GNWT (2017).




Alien and Alien Invasive (weed) Occurrence*

**Landcover Type**

- Water
- Rock/Rubble
- Exposed Land
- Bryoids
- Shrub - Tall
- Shrub - Low
- Wetland - Treed
- Wetland - Shrub
- Wetland - Herb
- Herb
- Coniferous - Dense
- Coniferous - Open
- Coniferous - Sparse
- Broadleaf - Dense
- Broadleaf - Open
- Mixedwood - Dense
- Mixedwood - Open
- Mixedwood - Sparse
- Proposed Mackenzie Valley Highway Alignment - Issued for EA 2022
- Granular Borrow / Rock Quarry Site and Access
- Local Study Area
- Regional Study Area
- Community
- All-Season Road
- Winter Road
- Settlement Area Boundary
- Region Boundary
- District Boundary

* More than one alien or alien invasive plant may occur at each mapped location

0 10 20 Kilometres

(At original document size of 8.5x11)
1:1,000,000

N

Kálo-Stantec

*Project Location*
Wrigley to Norman Wells, NWT

Prepared by AT on 2023-03-07
TR by AJ on 2023-03-07

*Client/Project*
144903025-0010-REVB

Government of Northwest Territories
Mackenzie Valley Highway Project

*Figure No.*
**3.6**

*Title*
**Landcover/Plant Assemblage Types within the Mackenzie Valley Highway Project LSA and RSA – Sahtu Region**

***Notes***

**1.** Coordinate System: NAD 1983 Northwest Territorries Lambert
**2.** Data Sources: Government of Canada
**3.** Background: World Topographic Map: Esri, FAO, NOAA, USGS, NRCan
World Imagery: Earthstar Geographics
World Hillshade: Esri, USGS

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Wetlands occupy 25.5% of the LSA in the Sahtu Region (10,607.6 ha). Treed and shrub wetlands are the most common wetland types in the LSA, occupying 9.9% (4,121.8 ha) and 9.2% (3,819.0 ha) of the LSA in the Sahtu Region, respectively. Wetlands are located throughout the LSA in the Sahtu Region with the highest concentrations occurring near areas of open water (Figure 3.6). Areas of open water (i.e., lakes, rivers, and streams) are also common in the LSA in the Sahtu Region, occupying 8.4% (3,489.1 ha) and primarily associated with the Mackenzie River and Three Day Lake in the northwest portion of the LSA (Figure 3.6). Herb, bryoid dominated areas and rock/rubble areas are uncommon, occupying less than 0.1% or less within the LSA in the Sahtu Region.

Like the LSA, the RSA in the Sahtu Region is dominated by coniferous forest, 31.3% (203,744.8 ha), with abundance decreasing with increased stand density (Table 3.10). In comparison to the LSA, proportions of broadleaf forest within the RSA were greater, 7.5% (48,892.5 ha), while proportions of mixedwood forest were lower, at 4.8% (31,325.7 ha). Remaining upland areas in the RSA in the Sahtu Region are largely composed of low shrub 11.1% (72,610.1 ha), followed by tall shrub 2.5% (16,523.1 ha), with similar proportions of rock/rubble 1.6% (10,281.4 ha) and exposed land 1.5% (9,900.7 ha) (Table 3.10). Areas of rock/rubble are located on steeper slopes (Figure 3.7) and other scattered areas in the LSA and RSA.

**Figure 3.7 Unvegetated Rock/Rubble (foreground) in the LSA – Sahtu Region**

Wetlands cover 25.3% (164,961.7 ha) of the RSA in the Sahtu Region, predominantly as treed wetlands 9.9% (64,770.4 ha). Shrub wetlands and herb wetlands are also present in the RSA in the Sahtu Region, occupying 8.5% (55,334 ha) and 6.9% (44,856.6 ha), respectively. Wetlands are located throughout the RSA in the Sahtu Region and are often located adjacent to areas of open water (Figure 3.8) and watercourses east of the Mackenzie River (Figure 3.6). Areas of open water are also present in the RSA, occupying 13.7% (89,310.5 ha) of the RSA.

**Figure 3.8 Open Water Surrounded by Herb and Shrub Wetland in the LSA – Sahtu Region**

Coniferous forest of the LSA in the Sahtu Region has an average stand volume density of 23.7 $m^3$/ha (SD = 12.4) (Table 3.11). Conifer forest tree heights range from 5 m to 17 m with an average height of 6.9 m (SD = 1.7). Mixedwood forest has a greater average stand volume density (32.2 $m^3$/ha, SD = 14.5) than deciduous forest (23.0 $m^3$/ha, SD = 10.6). Although deciduous cover types have a greater maximum height (18 m) than mixedwood cover types (15 m), the average tree height in mixedwood stands is greater than in deciduous stands, at 8.2 m (SD = 1.9) and 6.8 m (SD = 1.5), respectively (Table 3.11). More detailed species information from ground data is needed to provide detailed merchantable timber volume estimates, but from volume metrics, merchantable timber is expected in the Sahtu Region LSA.

**Table 3.11 Cover Type and Stand Volume Density per Landcover/Plant Assemblage Type in the LSA – Sahtu Region**

| Landcover/Plant Assemblage Type | Tree Height (m) | | | | Stand Volume Density ($m^3$/ha) | | | | Total Volume[2] ($m^3$) |
|---|---|---|---|---|---|---|---|---|---|
| | Minimum | Maximum | Average | SD[1] | Minimum | Maximum | Average | SD[1] | |
| Coniferous | 5 | 17 | 6.9 | 1.7 | 10 | 116 | 23.7 | 12.4 | 288,702 |
| Deciduous | 5 | 18 | 6.8 | 1.5 | 11 | 126 | 23.0 | 10.6 | 55,036 |
| Mixedwood | 5 | 15 | 8.2 | 1.9 | 14 | 88 | 32.2 | 14.5 | 47,027 |

**Notes:**
1 Standard deviation.
2 Total volume determined by multiplying average stand volume by land cover area (ha) in LSA.
**Source:** Canadian Forest Service (2020)

Coniferous forest in the RSA in the Sahtu Region has an average stand volume density of 25.7 $m^3$/ha (SD = 15.3) (Table 3.12). Average tree height in coniferous forest is 7.2 m (SD = 2.0), with heights ranging from 4 m to 21 m. Deciduous forest in the Sahtu Region has a similar range of stand height and similar average height as coniferous forest. The average stand volume density in mixedwood forest is 30.2 $m^3$/ha, (SD = 16.5). Mixedwood stands range from 5 m to 22 m with an average tree height of 7.8 m (SD = 2.0) (Table 3.12).

**Table 3.12 Tree Height, Stand Volume Density and Total Volume per Forest Type in the RSA – Sahtu Region**

| Cover Type | Tree Height (m) | | | | Stand Volume Density ($m^3$/ha) | | | | Total Volume[2] ($m^3$) |
|---|---|---|---|---|---|---|---|---|---|
| | Minimum | Maximum | Average | SD[1] | Minimum | Maximum | Average | SD[1] | |
| Coniferous | 4 | 21 | 7.2 | 2.0 | 9 | 166 | 25.7 | 15.3 | 5,590,767 |
| Deciduous | 4 | 19 | 7.0 | 2.0 | 10 | 149 | 24.8 | 15.1 | 1,040,433 |
| Mixedwood | 5 | 22 | 7.8 | 2.0 | 11 | 177 | 30.2 | 16.5 | 665,412 |

**Notes:**
1 Standard deviation.
2 Total volume is determined by multiplying average stand volume by land cover area (ha) in LSA.
**Source:** Canadian Forest Service (2020)

## Fire History

From 1960 to 2019, 17 fires within the LSA in the Sahtu Region burned 33,041.3 ha (79.3% of the LSA) (Table 3.13). Fires were generally common in the LSA with every decade since 1960 experiencing at least one burn. The number of fires ranged from one (1960-1969, 2010-2019) to a maximum of five (1990-1999). The area burned, by decade, within the LSA in the Sahtu Region ranged from 156.8 ha (0.4% of the LSA) to 25,453.9 ha (61.1% of the LSA). Fires from 1960 to 1989 occurred primarily east of Tulita (Figure 3.9). From 1990 to 2019, fires occurred mostly in the southern and central parts of the LSA.

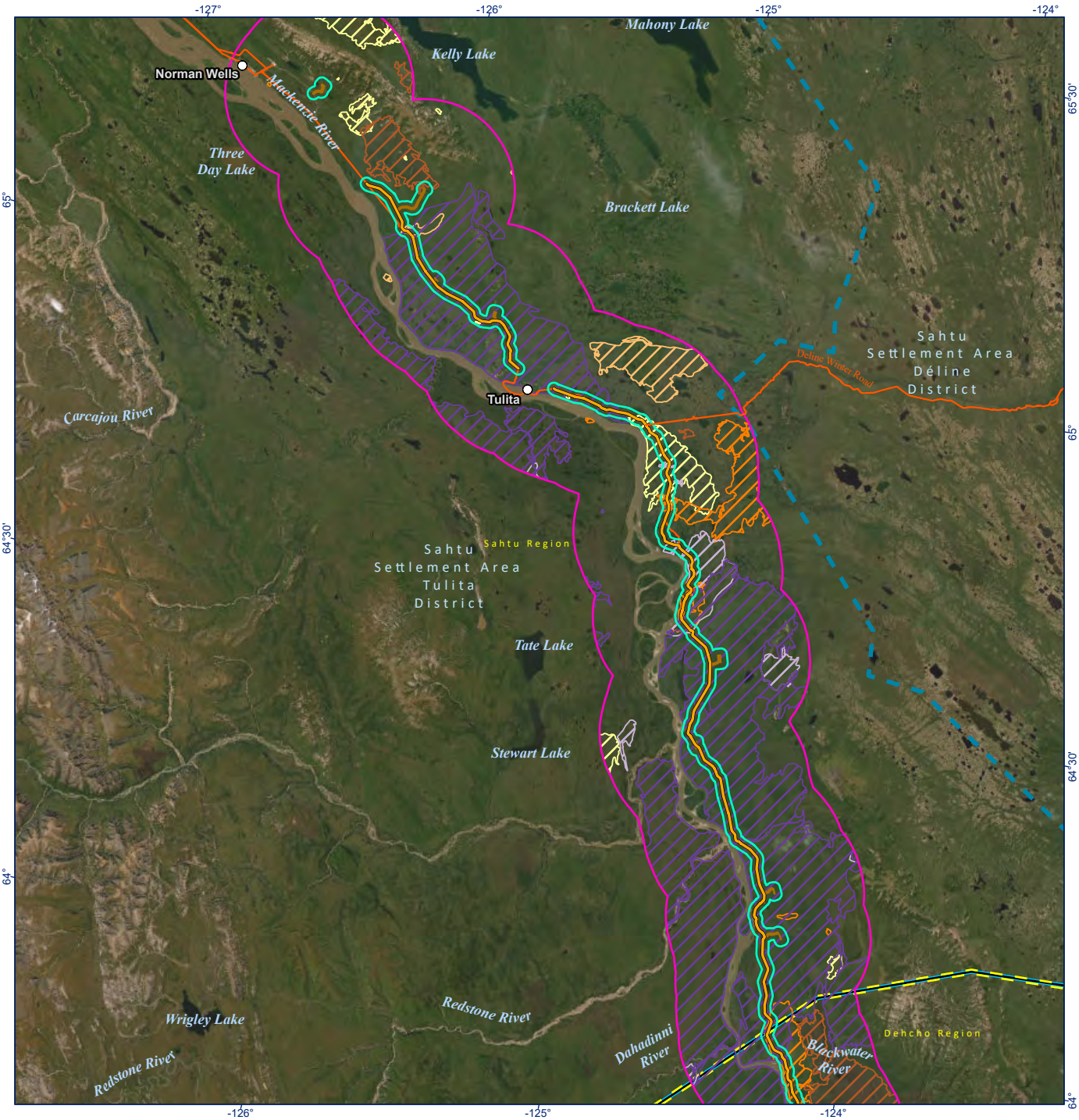
There were 47 fires in the RSA during the same time interval and covered a total of 325,204.0 ha (49.9% of the RSA) (Table 3.13). Like the LSA, the RSA had the highest frequency of burns and largest area burned from 1990 to 1999. During that period, 13 fires occurred in the RSA covering 253,799.8 ha (38.9% of the RSA). Fire size ranged from 8,965.7 ha to 253,799.8 ha.

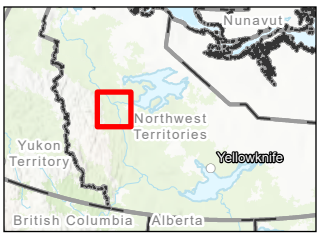
Fires within the LSA of the Sahtu Region affected 22,175.0 ha of upland areas and 8,799.6 ha of wetland areas (Table 3.14). Fires within the RSA of the Sahtu Region burned 203,518.8 ha of upland areas and 99,517.3 ha of wetlands. As with the Dehcho fire metrics, areas burned that were rock/rubble, exposed land and open water, reflecting the coarse scale of available data; in fact, these areas likely did not actually burn.

**Table 3.13 Forest Fire Occurrence within the LSA and RSA from 1960 to 2019 – Sahtu Region**

| | Number of Fires | | Total Area Burnt (ha) | | Percent Area Burnt (%) | |
|---|---|---|---|---|---|---|
| **Time Period** | **LSA** | **RSA** | **LSA** | **RSA** | **LSA** | **RSA** |
| 1960-1969 | 1 | 4 | 257.7 | 11,853.9 | 0.6 | 1.8 |
| 1970-1979 | 3 | 7 | 1,728.4 | 15,807.6 | 4.1 | 2.4 |
| 1980-1989 | 4 | 9 | 2,160.2 | 13,956.9 | 5.2 | 2.1 |
| 1990-1999 | 5 | 13 | 25,453.9 | 253,799.8 | 61.1 | 38.9 |
| 2000-2009 | 3 | 10 | 3,284.3 | 20,820.1 | 7.9 | 3.2 |
| 2010-2019 | 1 | 4 | 156.8 | 8,965.7 | 0.4 | 1.4 |
| **TOTAL** | 17 | 47 | 33,041.3 | 325,204.0 | 79.3 | 49.9 |

**Source:** Canadian Forest Service (2020)




National Fire Database
- 1960-1969
- 1970-1979
- 1980-1989
- 1990-1999
- 2000-2009
- 2010-2019

Proposed Mackenzie Valley Highway Alignment - Issued for EA 2022

Granular Borrow / Rock Quarry Site and Access
Local Study Area
Regional Study Area
Community
All-Season Road
Winter Road
District Boundary
Region Boundary
Settlement Area Boundary

0 10 20 Kilometres
(At original document size of 8.5x11)
1:40,000,000

N

Kálo-Stantec

***Notes***
**1.** Coordinate System: NAD 1983 Northwest Territories Lambert
**2.** Data Sources: Canadian Forest Service (2020), Centre for Geomatics Government of NWT, Government of Canada, Stantec
**3.** Background: World Topographic Map: Esri, FAO, NOAA, USGS, NRCan
World Imagery: Earthstar Geographics
World Hillshade: Esri, USGS

*Project Location*
Wrigley to Norman Wells, NWT

Prepared by AT on 2023-03-07
TR by AJ on 2023-03-07

*Client/Project*
144903025-0009 REVB

Government of Northwest Territories
Mackenzie Valley Highway Project

*Figure No.*
**3.9**

*Title*
**Area Burnt per Decade within the Mackenzie Valley Highway LSA and RSA between 1960 and 2019 - Sahtu Region**

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

**Table 3.14 Number of Fires and Total Area Burned by Landcover/Assemblage Type from 1960 to 2019 – Sahtu Region**

| Landcover/ Assemblage Type [1] | Cover Type Class | Total Number of Fires in Each Cover Type [2] | | Total Area Burned (ha) | |
|---|---|---|---|---|---|
| | | LSA | RSA | LSA | RSA |
| Broadleaf Forest | Broadleaf – Dense | 28 | 101 | 2,054.13 | 27,554.3 |
| | Broadleaf – Open | 14 | 89 | 837.3 | 8,929.6 |
| **Broadleaf Subtotal** | | **-** | **-** | **2,891.43** | **36,483.9** |
| Coniferous Forest | Coniferous – Dense | 21 | 68 | 237.2 | 2,400.1 |
| | Coniferous – Open | 33 | 120 | 2,624.0 | 25,195.7 |
| | Coniferous – Sparse | 37 | 128 | 4,384.3 | 40,470.6 |
| **Coniferous Subtotal** | | **-** | **-** | **7,245.5** | **68,066.4** |
| Mixedwood Forest | Mixedwood – Dense | 18 | 47 | 127.5 | 1,286.6 |
| | Mixedwood – Open | 31 | 89 | 1,518.6 | 11,078.2 |
| | Mixedwood – Sparse | 1 | 2 | 5.1 | 11.7 |
| **Mixedwood Subtotal** | | **-** | **-** | **1,651.2** | **12,376.5** |
| Shrubland | Shrub – Tall | 35 | 97 | 1,703.7 | 12,137.1 |
| | Shrub – Low | 38 | 128 | 6,981.6 | 66,370.1 |
| **Shrubland Subtotal** | | **-** | **-** | **8,685.3** | **78,507.2** |
| Herbaceous and Un-vegetated | Exposed Land [3] | 37 | 72 | 1,475.8 | 3,490.0 |
| | Herb | 10 | 44 | 166.3 | 3,056.5 |
| | Bryoids | 5 | 18 | 4.9 | 46.9 |
| | Rock/Rubble | 4 | 22 | 54.6 | 1,491.4 |
| **Herbaceous and Un-vegetated Subtotal** | | **-** | **-** | **1,701.6** | **8,084.8** |
| **Upland Subtotal** | | **-** | **-** | **22,175.0** | **203,518.8** |
| Wetland | Wetland – Herb | 35 | 126 | 1,905.6 | 20,343.5 |
| | Wetland – Shrub | 37 | 122 | 3,829.7 | 48,900.2 |
| | Wetland – Treed | 35 | 123 | 3,064.3 | 30,273.6 |
| **Wetland Subtotal** | | **-** | **-** | **8,799.6** | **99,517.3** |
| Open Water | | 35 | 120 | 2,066.6 | 22,113.4 |
| No Data | | - | 32 | - | 54.7 |
| **Total** | | **-** | **-** | **33,041.3** | **325,204.0** |

**Notes:**

[1] Landcover/assemblage type in 2020. Landcover/assemblage may have been different prior to fire events.

[2] Many fires affected more than one vegetation type; therefore, the total number of fires are given for each vegetation type but cannot be summed among vegetation types.

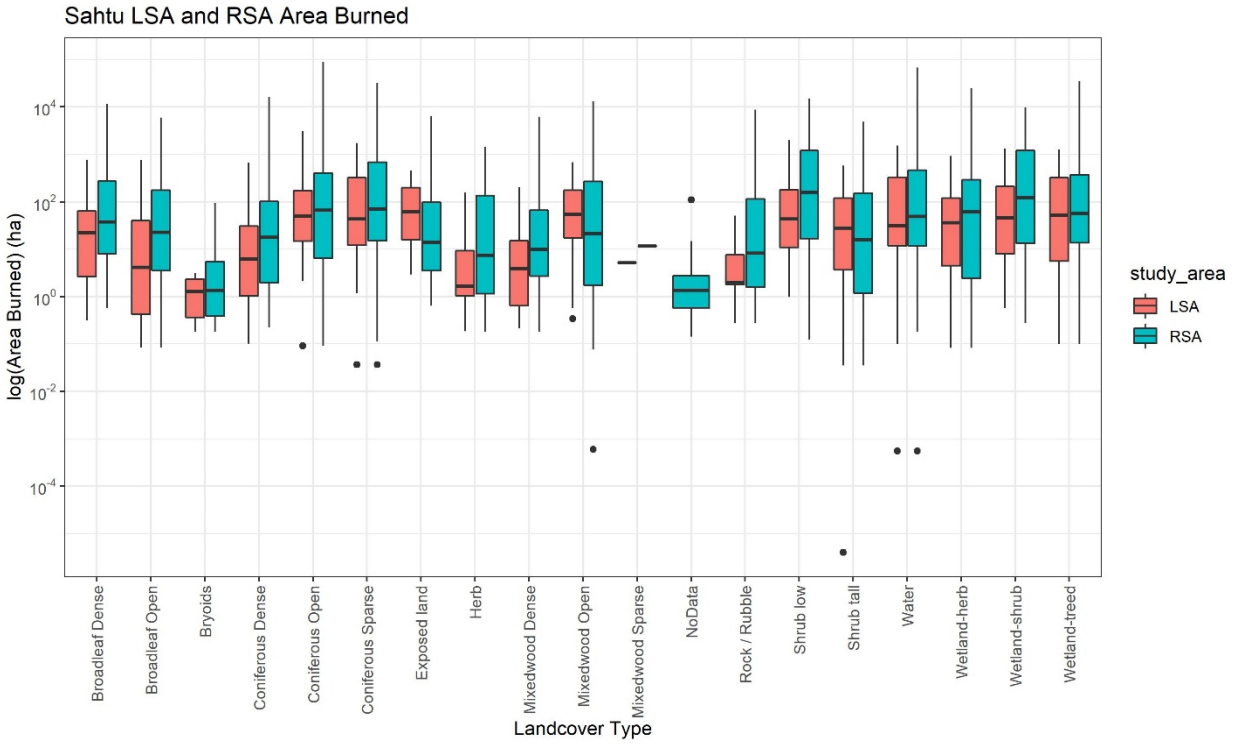
[3] Exposed land includes areas, which naturally have less than 5% vegetative cover, such as shorelines of rivers and lakes, exposed rock, recently burned areas, and moraines; the areas also include cleared areas such as roads and areas of infrastructure development.

**Source:** Canadian Forest Service (2020)

Figure 3.10 is a box plot showing the median area burned per landcover/assemblage type in the LSA and RSA in the Sahtu Region between 1960 and 2019. The heavy horizontal bar in each box indicates the median value, with inter-quartile ranges indicating upper and lower boundaries on opposite areas in the box. The standard deviation is represented by bars and by outliers as points. This figure shows fire size in the LSA and RSA of the Sahtu Region is highly variable.

Data on changes in plant composition with varying time since burned (i.e., succession) were not found for the LSA or RSA. Available studies indicated burned areas are dominated by plants capable of vegetative reproduction following fire, with a later increase in abundance of plants reproducing by seed and slower growing plants capable of vegetative reproduction. Plants with light abundant seeds and species also colonize burned areas rapidly; abundance decreases after a few years due to short life spans of the plants (Johnson, 1981). Trees required 5 to 6 years, on average, to reach a height of 0.3 m following high severity fires in High Boreal, Low Subarctic, and High Subarctic ecoregions of the Taiga Shield (Lewis et al., 2018). Following low to mixed-severity fires, trees took 10.7 years, on average, in the High Boreal ecoregion and 15.5 years in the Low Subarctic to reach a height of 0.3 m (Lewis et al., 2018). Tree regeneration times may differ for the ecoregions intersected by the RSA.

**Figure 3.10 Area Burned by Landcover/Assemblage Type from 1960 to 2019 in the LSA and RSA – Sahtu Region**



## Plant SOCC

A search of the Northwest Territories Species Monitoring Infobase (Working Group on General Status of NWT Species, 2016)—queried to the Taiga Plains, Taiga Cordillera, and Boreal Cordillera ecoregions—identified 215 vascular, non-vascular plant and lichen SOCC with potential to occur within the Sahtu Region of the RSA (Appendix A.2). Of the 215 plants, 167 are vascular plants, 42 are lichens, and 6 are moss.

Of the 167 vascular plants identified, 85 are listed as *may be at risk* and 82 are listed as *sensitive* in the NT. Yukon aster (*Symphyotrichum yukonense*) and Tyrrell's willow (*Salix tyrrellii*) are on the SARA registry but were downgraded to *not at risk* in 1996 and 1999. Both species are still listed as *may be at risk* under NWT General Species Rankings (Working Group on General Status of NWT Species, 2016). Of the 42 lichen species identified, 6 are listed as *may be at risk* and 36 are listed as *sensitive*. No lichen species with potential to occur within the RSA are listed under COSEWIC. Of the eight moss species identified, four are listed as *may be at risk* and two are listed as *sensitive*, territorially. No moss species with potential to occur within the RSA are listed under COSEWIC (Working Group on General Status of NWT Species, 2016). No vegetation assemblages are considered SOCC.

5658 NWT Ltd. and GNWT (2011) identified seven plant SOCC documented during field surveys for the Mackenzie Gas Project in the Sahtu Region of the RSA. All seven plant SOCC occurrences were vascular plants, of which six were listed as *sensitive* and one as *may be at risk* in the NT (Table 3.15). None of these species are listed by SARA or COSEWIC (Government of Canada, 2019). The locations of these plants are within the Sahtu RSA, and, therefore, their potential presence in the Sahtu LSA is unknown. Pre-construction field surveys should be conducted to evaluate plant SOCC occurrences of higher potential areas potentially impacted by the Project (e.g., riparian areas, uncommon plant assemblages).

**Table 3.15 Documented Plant SOCC Occurrences within the RSA – Sahtu Region**

| Scientific Name[1] | Common Name | NWT General Species Rank[1] | SARA Status[2] | COSEWIC Status[2] |
|---|---|---|---|---|
| *Elymus canadensis* | Canada nodding wild rye | Sensitive | - | - |
| *Potamogeton natans* | floating pondweed | Sensitive | - | - |
| *Potamogeton foliosus* | leafy pondweed | Sensitive | - | - |
| *Juncus stygius* | moor rush | Sensitive | - | - |
| *Danthonia spicata* | poverty wild oat grass | Sensitive | - | - |
| *Najas flexilis* | slender naiad | Sensitive | - | - |
| *Rhynchospora alba* | white beakrush | May Be At Risk | - | - |

**Notes:**
1 Working Group on General Status of NWT Species (2016).
2 Government of Canada (2019)
**Source:** 5658 NWT Ltd. and the GNWT (2011)

## Alien and Invasive Alien Plant Species

Forty-two locations of 13 alien and invasive alien plant species occurrences are documented within the RSA in the Sahtu Region (AKEPIC, 2020) (Table 3.16). Of these 13 species, 10 are classified as alien and 3 as invasive alien. In addition to documented occurrences, 36 alien and 7 invasive alien plant species have been identified in the RSA in the Sahtu Region without specific location attribution by Oldham and Delisle-Oldham (2016). These are presented in Appendix B.

**Table 3.16 Alien and Invasive Alien Plant Species Recorded within the RSA – Sahtu Region**

| Listing | Scientific Name | Common Name | Number of Occurrences | Closest Occurrence to the PDA (km) |
|---|---|---|---|---|
| Alien | *Artemisia biennis* | biennial wormwood | 4 | 0.92 |
| Alien | *Capsella bursa-pastoris* | shepherd's purse | 4 | 0.92 |
| Alien | *Chenopodiastrum simplex (Chenopodium simplex; Chenopodium hybridum* var. *gigantospermum)* | maple-leaved goosefoot | 1 | 0.92 |
| Alien | *Chenopodium album* | lamb's quarters | 4 | 0.92 |
| Alien | *Descurainia sophia* | herb Sophia | 6 | 0.15 |
| Alien | *Lappula squarrosa* | European stickseed | 1 | 14.55 |
| Alien | *Matricaria discoidea* | pineapple weed | 2 | 14.55 |
| Alien | *Plantago major* | common plantain | 6 | 0.15 |
| Alien | *Polygonum aviculare* | prostrate knotweed | 1 | 0.92 |
| Alien | *Thlaspi arvense* | field pennycress | 5 | 0.92 |
| Invasive Alien | *Crepis tectorum* | narrow-leaf hawksbeard | 2 | 0.92 |
| Invasive Alien | *Melilotus albus* | white sweet-clover | 3 | 14.55 |
| Invasive Alien | *Trifolium hybridum* | alsike clover | 3 | 14.55 |

**Source:** AKEPIC (2020)

# 4 Key Results and Findings

## 4.1 Dehcho Region

Coniferous forest is the most abundant landcover/assemblage type in upland areas within the LSA (44.8%) and the RSA (32.5%) in the Dehcho Region. Wetland cover types occupy 19.6% of the LSA and 29.0% of the RSA in the Dehcho Region. The most common wetland types in both LSA and RSA are treed and shrub wetlands. Large portions of the LSA and RSA have burned in the past; however, fires in the LSA are not common with a maximum of 2 fires per decade recorded (1990-1999). Percentage of the LSA burned ranged from 0% to 12.8% per decade from 1960 to 2019. Although coniferous forests had the greatest total volume in the LSA (448,465 $m^3$) and RSA (3,927,036 $m^3$), mixedwood forests had the highest stand volume density.

Except for the existing MVWR and the Enbridge Norman Wells Pipeline the LSA in the Dehcho Region is relatively anthropogenically undisturbed.

No plant SOCC have been documented in the RSA or LSA. Nine alien and three invasive alien plant species have been documented in the RSA in the Dehcho Region. Additional alien and invasive alien plant species documented in the RSA by Oldham and Delisle-Oldham (2016) can be found in Appendix B, although specific distributions of these species are not known.

## 4.2 Sahtu Region

Upland areas in the Sahtu Region are dominated by coniferous forest in both the LSA (28.3%) and RSA (31.3%). Wetlands occupy 25.5% of the LSA and 25.3% of the RSA. As with the Dehcho Region, large portions of the LSA and RSA in the Sahtu Region have burned in the past. Fires in the LSA and RSA are common, with portions within the Sahtu Region burning at least once per decade. Less than 1% to 61.1% of the LSA burned each decade between 1960 and 2019. Similar to the Dehcho Region, coniferous forests had the greatest total volume in the LSA (288,702 $m^3$) and RSA (5,590,767 $m^3$) and mixedwood forests had the highest stand volume density.

Except for the existing MVWR, the Enbridge Norman Wells Pipeline, and communities along these routes (e.g., Hamlet of Tulita), LSA in the Sahtu Region is relatively anthropogenically undisturbed but does contain some disturbance from oil and gas exploration and infrastructure west of Norman Wells (e.g., Auld and Kershaw, 2005).

In the RSA, seven vascular plant SOCC occurrences have been documented, six of which are considered “Sensitive” and one considered “May Be At Risk”. Ten alien and three invasive alien plant species have been documented in the RSA in the Sahtu Region. Additional alien and invasive alien plant species documented in the RSA by Oldham and Delisle-Oldham (2016) can be found in Appendix B, although specific distributions of these species are not known.

# 5 Closure

This TDR was prepared for the sole benefit of GNWT to describe existing conditions related to vegetation within the Project LSA and RSA. If you have any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,

**K'alo-Stantec Limited**

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# Appendix A Plant SOCC Details

## A.1 Potential Plant SOCC Occurrences Within the RSA in the Dehcho Region

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Vascular Plant | *Agrostis exarata* | spike bentgrass | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Angelica lucida* | seaside angelica | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Arenaria longipedunculata* | long-stemmed sandwort | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Arnica latifolia* | mountain arnica | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Asplenium trichomanes-ramosum* | green spleenwort | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Athyrium filix-femina* | subarctic lady-fern | Sensitive | S2S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Blysmopsis rufa* | red clubrush | Sensitive | S3S4 | - | - | Taiga Cordillera |
| Vascular Plant | *Botrychium minganense* | Mingan moonwort | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Botrychium spathulatum* | spatulate moonwort | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Botrypus virginianus* | rattlesnake fern | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Cardamine pensylvanica* | Pennsylvania bittercress | Sensitive | S3S4 | - | - | Taiga Cordillera |
| Vascular Plant | *Cardamine umbellata* | few-seeded bittercress | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Carex bebbii* | Bebb's sedge | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Carex eleusinoides* | goosegrass sedge | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Carex filifolia* | thread-leaved sedge | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Carex heleonastes* | Hudson Bay sedge | Sensitive | S3S4 | - | - | Taiga Cordillera |
| Vascular Plant | *Carex hoodii* | Hood's sedge | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Carex loliacea* | rye-grass sedge | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Carex micropoda* | small-rooted sedge | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Carex peckii* | Peck's sedge | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Carex retrorsa* | retrorse sedge | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Cerastium maximum* | great chickweed | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Chrysosplenium wrightii* | Wright golden saxifrage | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Claytonia megarhiza* | alpine spring beauty | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Cryptogramma sitchensis* | Alaska parsley-fern | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Cryptogramma stelleri* | slender rock-brake | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Cystopteris montana* | mountain bladder-fern | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Danthonia spicata* | poverty wild oat grass | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Draba albertina* | slender whitlow-grass | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Draba incerta* | Yellowstone whitlow-grass | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Draba lonchocarpa* | lance-pod whitlow-grass | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Draba ogilviensis* | Ogilvie Range whitlow-grass | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Draba porsildii* | Porsild's whitlow-grass | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Drosera linearis* | slenderleaf sundew | Sensitive | S3 | - | - | Taiga Cordillera |

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Vascular Plant | *Dryopteris carthusiana* | spinulose wood-fern | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Dryopteris expansa* | northern wood-fern | May Be At Risk | S2 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Eleocharis uniglumis* | one-glume spikerush | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Elymus canadensis* | Canada nodding wild rye | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Epilobium lactiflorum* | white-flower willowherb | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Erigeron denalii* | Denali fleabane (Mex's fleabane) | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Erythranthe guttata* | common large monkey flower | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Festuca lenensis* | tundra fescue | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Gentiana prostrata* | pygmy gentian | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Geranium richardsonii* | Richardson geranium | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Geum glaciale* | glacier avens | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Hieracium albiflorum* | white-flowered hawkweed | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Koenigia islandica* | Iceland purslane | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Liparis loeselii* | Loesel's twayblade | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Listera cordata* | heart-leaved twayblade | Sensitive | S2S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Luetkea pectinata* | segmented luetkea | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Lysimachia europaea* | arctic starflower | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Matteuccia struthiopteris* | ostrich fern | Sensitive | S2S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Monarda fistulosa* | wild bergamot | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Nuphar polysepala* | rocky mountain pond lily | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Oxytropis scammaniana* | Scamman's locoweed | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Packera ogoturukensis* | Ogotoruk Creek groundsel | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Packera pauciflora* | alpine groundsel (few-flower ragwort) | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Penstemon gormanii* | Gorman's beardtongue | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Phegopteris connectilis* | northern beech fern | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Platanthera dilatata* | white bog orchid | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Potamogeton foliosus* | leafy pondweed | Sensitive | S3S4 | - | - | Boreal Cordillera |
| Vascular Plant | *Potamogeton natans* | floating pondweed | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Potentilla villosula* | Beringian hairy potentilla | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Prunus virginiana* | choke cherry | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Pseudocherleria macrocarpa* | long-pod stitchwort | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Ranunculus abortivus* | kidney-leaved buttercup | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Ranunculus turneri* | Turner's buttercup | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Sagina saginoides* | alpine pearlwort | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Salix farriae* | Farr's willow | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Salix raupii* | Raup's willow | May Be At Risk | S2 | - | - | Boreal Cordillera |

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Vascular Plant | *Senecio sheldonensis* | Mount Sheldon ragwort | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Smelowskia media* | alpine smelowskia | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Streptopus amplexifolius* | clasping twisted stalk | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Vascular Plant | Symphyotrichum nahanniense | Nahanni aster | Sensitive | S3 | Not Applicable | Special Concern | Taiga Cordillera |
| Vascular Plant | Tephroseris lindstroemii | twice-hairy groundsel | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Vaccinium membranaceum* | mountain huckleberry | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Valeriana dioica* | wood valerian | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Veronica americana* | American speedwell | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Lichen | *Ahtiana sphaerosporella* | mountain candlewax lichen | Sensitive | S1S3 | - | - | Taiga Cordillera |
| Lichen | *Arctomia interfixa* | rust-brown tiny rosette lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Cladonia digitata* | finger pixie-cup | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Cladonia thomsonii* | blue pork pixie lichen | Sensitive | S1S3 | - | - | Taiga Cordillera |
| Lichen | *Collema furfuraceum* | effervescent tarpaper lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Enchylium bachmanianum* | Caesar's tarpaper lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Enchylium polycarpon* | gilled tarpaper lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Nephroma helveticum* | fringed kidney lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Pannaria conoplea* | mealy-rimmed shingle lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Peltigera didactyla* | temporary pelt lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Peltigera neckeri* | black-saddle pelt lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Physcia phaea* | black-eyed rosette lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Placynthium asperellum* | Lilliput Ink lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Polycauliona polycarpa* | pin-cushion sunburst lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Polychidium muscicola* | eyed mossthorns lichen | Sensitive | S2S3 | - | - | Taiga Cordillera, |
| Lichen | *Solorina spongiosa* | blinking owl lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Stereocaulon arenarium* | sandy foam lichen | May Be At Risk | S2? | - | - | Taiga Cordillera |
| Lichen | *Stereocaulon botryosum* | cauliflower foam lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Stereocaulon vesuvianum* | variegated foam lichen; variegated coral lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Tholurna dissimilis* | arboreal bottle-collection lichen | May Be At Risk | S1S3 | - | - | Boreal Cordillera |
| Lichen | *Umbilicaria arctica* | arctic rocktripe lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Umbilicaria havaasii* | Havaas's rock tripe | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Umbilicaria polyphylla* | petaled rocktripe lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Umbilicaria virginis* | blushing rocktripe lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Bryophyte (Moss) | *Buxbaumia aphylla* | brown shield moss | May Be At Risk | - | - | - | Taiga Cordillera |
| Bryophyte (Moss) | *Cynodontium jenneri* | Jenner's dogtooth moss | Sensitive | - | - | - | Taiga Cordillera |
| Bryophyte (Moss) | *Grimmia torquata* | twisted grimmia moss | May Be At Risk | - | - | - | Taiga Cordillera |

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Bryophyte (Moss) | *Hilpertia velenovskyi* | Velenovsky's moss | May Be At Risk | - | - | - | Taiga Cordillera |
| Bryophyte (Moss) | *Hypnum callichroum* | downy plait moss | Sensitive | - | - | - | Taiga Cordillera |
| Bryophyte (Moss) | *Seligeria oelandica* | Irish bristle moss | May Be At Risk | - | - | - | Taiga Cordillera |

**Notes:**

1 Species scientific names, common names and species ranks from GNWT (2016a).

2 Rare Species List For Boreal Cordillera and Taiga Cordillera From GNWT Species Monitoring Infobase (2016c).

## A.2 Potential Plant SOCC Occurrences within the RSA in the Sahtu Region

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Vascular Plant | *Agoseris glauca* | pale false dandelion | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Agrostis exarata* | spike bentgrass | Sensitive | S3 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Alisma triviale* | northern water plantain | Sensitive | S3S4 | - | - | Taiga Plains |
| Vascular Plant | *Anaphalis margaritacea* | pearly everlasting | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Angelica lucida* | seaside angelica | May Be At Risk | S2 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Arenaria longipedunculata* | long-stemmed sandwort | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Arethusa bulbosa* | dragon's mouth | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Arnica latifolia* | mountain arnica | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Artemisia alaskana* | Alaska sagebrush | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Artemisia ludoviciana* | white sagebrush | May Be At Risk | S2 | - | - | Taiga Plains, Boreal Plains |
| Vascular Plant | *Asplenium trichomanes-ramosum* | green spleenwort | May Be At Risk | S2 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Astragalus canadensis* | Canadian milk-vetch | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Athyrium filix-femina* | subarctic lady-fern | Sensitive | S2S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Avenula hookeri* | Hooker's alpine oat grass | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Blysmopsis rufa* | red clubrush | Sensitive | S3S4 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Boechera calderi* | Calder's rockcress | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Botrychium minganense* | mingan moonwort | May Be At Risk | S2 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Botrychium pinnatum* | northwestern moonwort | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Botrychium spathulatum* | spatulate moonwort | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Botrypus virginianus* | rattlesnake fern | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Cardamine microphylla* | small-leaved bittercress | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Cardamine pensylvanica* | Pennsylvania bittercress | Sensitive | S3S4 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Cardamine umbellata* | few-seeded bittercress | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Carex bebbii* | Bebb's sedge | Sensitive | S3 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Carex crawfordii* | Crawford's sedge | Sensitive | S3 | - | - | Taiga Plains, Boreal Plains |
| Vascular Plant | *Carex duriuscula (* | needle-leaved sedge | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Carex eleusinoides* | goosegrass sedge | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Carex filifolia* | thread-leaved sedge | Sensitive | S3 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Carex heleonastes* | Hudson Bay sedge | Sensitive | S3S4 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Carex hoodii* | Hood's sedge | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Carex lasiocarpa* | slender sedge | Sensitive | S3 | - | - | Taiga Plains, Taiga Shield |
| Vascular Plant | *Carex laxa* | weak sedge | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Carex livida* | livid sedge | Sensitive | S3S4 | - | - | Taiga Plains |
| Vascular Plant | *Carex loliacea* | rye-grass sedge | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Vascular Plant | *Carex mackenziei* | Mackenzie's sedge | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Carex micropoda* | small-rooted sedge | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Carex peckii* | Peck's sedge | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Carex prairea* | prairie sedge | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Carex retrorsa* | retrorse sedge | May Be At Risk | S2 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Carex richardsonii* | Richardson's sedge | Sensitive | S3 | - | - | Taiga Plains, Taiga Shield |
| Vascular Plant | *Carex sychnocephala* | many-headed sedge | Sensitive | S3 | - | - | Taiga Plains, Boreal Plains |
| Vascular Plant | *Cerastium maximum* | great chickweed | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Ceratophyllum demersum* | common hornwort | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Chamaerhodos erecta* | rose chamaerhodos | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Chrysosplenium wrightii* | wright golden saxifrage | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Cirsium drummondii* | Drummond thistle | Sensitive | S3 | - | - | Taiga Plains, Taiga Shield |
| Vascular Plant | *Claytonia megarhiza* | alpine spring beauty | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Coleanthus subtilis* | moss grass | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Corispermum hookeri* | Hooker's bugseed | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Cryptogramma sitchensis* | Alaska parsley-fern | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Cryptogramma stelleri* | slender rock-brake | May Be At Risk | S2 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Cystopteris montana* | mountain bladder-fern | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Danthonia spicata* | poverty wild oat grass | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Descurainia pinnata* | pinate tansy mustard | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Draba albertina* | slender whitlow-grass | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Draba incerta* | Yellowstone whitlow-grass | May Be At Risk | S2 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Draba lonchocarpa* | lance-pod whitlow-grass | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Draba ogilviensis* | Ogilvie range whitlow-grass | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Draba porsildii* | Porsild's whitlow-grass | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Drosera linearis* | slenderleaf sundew | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Dryopteris carthusiana* | spinulose wood-fern | May Be At Risk | S2 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Dryopteris expansa* | northern wood-fern | May Be At Risk | S2 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Eleocharis elliptica* | slender spikerush | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Eleocharis uniglumis* | one-glume spikerush | Sensitive | S3 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Elymus canadensis* | Canada nodding wild rye | Sensitive | S3 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Epilobium lactiflorum* | white-flower willowherb | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Erigeron denalii* | Denali fleabane (Mex's fleabane) | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Erigeron yukonensis* | Yukon fleabane | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Eritrichium splendens* | showy forget-me-not | May Be At Risk | S2 | - | - | Taiga Plains |

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Vascular Plant | *Erythranthe guttata* | common large monkey flower | May Be At Risk | S2 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Festuca auriculata* | lobed fescue | May Be At Risk | S2S3 | - | - | Taiga Plains |
| Vascular Plant | *Festuca brevissima* | Alaska fescue | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Festuca lenensis* | tundra fescue | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Gentiana prostrata* | pygmy gentian | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Gentianopsis virgata* | Macoun's fringed gentian | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Geranium richardsonii* | Richardson geranium | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Geum glaciale* | glacier avens | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Geum triflorum* | prairie-smoke | May Be At Risk | S2 | - | - | Taiga Plains, Boreal Plains |
| Vascular Plant | *Hesperostipa curtiseta* | Canadian needle grass | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Heuchera richardsonii* | Richardson alumroot | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Hieracium albiflorum* | white-flowered hawkweed | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Hippuris tetraphylla* | four-leaved marestail | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Hudsonia tomentosa* | woolly beach-heath (sand heather) | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Isoetes lacustris* | lake quillwort | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Juncus stygius* | moor rush | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Koeleria asiatica* | oriental koeler's grass | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Koeleria macrantha* | prairie koeler's grass | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Koenigia islandica* | Iceland purslane | Sensitive | S3 | - | - | Boreal Cordillera |
| Vascular Plant | *Lathyrus japonicus* | beach pea | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Limosella aquatica* | northern mudwort | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Liparis loeselii* | Loesel's twayblade | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Listera cordata* | heart-leaved twayblade | Sensitive | S2S3 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Luetkea pectinata* | segmented luetkea | May Be At Risk | S2 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Luzula kjellmaniana* | kjellman woodrush | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Luzula rufescens* | rufous wood rush | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Lysimachia europaea* | arctic starflower | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Lysimachia maritima* | sea milkwort | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Malaxis paludosa* | bog adder's-mouth | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Matteuccia struthiopteris* | ostrich fern | Sensitive | S2S3 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Mertensia maritima* | sea bluebell | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Micranthes ferruginea* | rusty-hair saxifrage | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Minuartia michauxii* | bog stitchwort | Sensitive | S3S4 | - | - | Taiga Plains |
| Vascular Plant | *Monarda fistulosa* | wild bergamot | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Myriophyllum alterniflorum* | alternate-flower water milfoil | Sensitive | S3 | - | - | Taiga Plains |

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Vascular Plant | *Najas flexilis* | slender naiad | Sensitive | S2S3 | - | - | Taiga Plains |
| Vascular Plant | *Nassella viridula* | green tussock grass (feather grass) | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Nuphar polysepala* | Rocky Mountain pond lily | May Be At Risk | S2 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Nymphaea leibergii* | dwarf white waterlily | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Nymphaea tetragona* | pygmy white waterlily (small white water-lily) | Sensitive | S3 | - | - | Taiga Plains, Taiga Shield |
| Vascular Plant | *Oxybasis glauca* | Rocky Mountain goosefoot | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Oxybasis rubra* | red pigweed (coast-blite goosefoot) | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Oxytropis scammaniana* | Scamman's locoweed | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Packera ogoturukensis* | Ogotoruk Creek groundsel | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Packera pauciflora* | alpine groundsel (few-flower ragwort) | Sensitive | S3 | - | - | Taiga Cordillera, Boreal Cordillera |
| Vascular Plant | *Papaver mcconnellii* | McConnell's poppy | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Pedicularis flammea* | red-tip lousewort | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Pedicularis oederi* | Oeder's lousewort | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Pedicularis verticillata* | whorled lousewort | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Pellaea glabella* | smooth cliff-brake | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Penstemon gormanii* | Gorman's beardtongue | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Phegopteris connectilis* | northern beech fern | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Physaria calderi* | Calder's bladderpod | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Plantago maritima* | seaside plantain | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Platanthera dilatata* | white bog orchid | May Be At Risk | S2 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Platanthera orbiculata* | small round-leaved bog orchid | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Poa ammophila* | sand bluegrass | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Poa pseudoabbreviata* | polar bluegrass | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Podistera macounii* | Macoun's podistera | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Potamogeton foliosus* | leafy pondweed | Sensitive | S3S4 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Potamogeton illinoensis* | Illinois pondweed | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Potamogeton natans* | floating pondweed | Sensitive | S3 | - | - | Taiga Cordillera |
| Vascular Plant | *Potamogeton subsibiricus* | Yenisei River pondweed | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Potentilla villosula* | Beringian hairy potentilla | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Primula pumila* | arctic primrose | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Prunus virginiana* | choke cherry | Sensitive | S3 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Pseudocherleria macrocarpa* | long-pod stitchwort | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Ranunculus abortivus* | kidney-leaved buttercup | Sensitive | S3 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Ranunculus grayi* | tundra buttercup | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Ranunculus turneri* | Turner's buttercup | May Be At Risk | S2 | - | - | Taiga Cordillera, Taiga Plains |

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Vascular Plant | *Rhynchospora alba* | white beakrush | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Rorippa barbareifolia* | hoary yellowcress | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Rorippa crystallina* | Mackenzie River yellowcress (asiatic cress) | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Rumex lapponicus* | Lapland sorrel | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Sagina nodosa* | knotted pearlwort | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Sagina saginoides* | alpine pearlwort | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Salix chamissonis* | Chamisso's willow | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Salix discolor* | pussy willow | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Salix farriae* | Farr's willow | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Salix ovalifolia* | arctic seashore willow | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Salix raupii* | Raup's willow | May Be At Risk | S2 | - | - | Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Salix tyrrellii* | Tyrrell's willow | May Be At Risk | S2 | - | Not At Risk | Taiga Plains |
| Vascular Plant | *Saxifraga bronchialis ssp. Funstonii* | yellowdot saxifrage | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Sceptridium multifidum* | leathery grape-fern | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Schoenoplectus pungens* | three-square bulrush | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Senecio sheldonensis* | Mount Sheldon ragwort | May Be At Risk | S2 | - | - | Taiga Cordillera |
| Vascular Plant | *Smelowskia media* | alpine smelowskia | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Stellaria umbellata* | umbellate stitchwort | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Streptopus amplexifolius* | clasping twisted stalk | Sensitive | S2S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Symphyotrichum yukonense* | Yukon aster | May Be At Risk | S2 | - | Not At Risk | Taiga Plains |
| Vascular Plant | *Tanacetum bipinnatum* | floccose tansy | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Tephroseris lindstroemii* | twice-hairy groundsel | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Utricularia ochroleuca* | northern bladderwort | Sensitive | S3 | - | - | Taiga Plains |
| Vascular Plant | *Vaccinium membranaceum* | mountain huckleberry | May Be At Risk | S2 | - | - | Boreal Cordillera |
| Vascular Plant | *Valeriana dioica* | wood valerian | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains |
| Vascular Plant | *Veronica alaskensis* | Alaska kitten-tail | May Be At Risk | S2 | - | - | Taiga Plains |
| Vascular Plant | *Veronica americana* | American speedwell | Sensitive | S3 | - | - | Taiga Cordillera, Taiga Plains, Boreal Cordillera |
| Vascular Plant | *Zannichellia palustris* | horned pondweed | Sensitive | S3 | - | - | Taiga Plains, Boreal Plains |
| Lichen | *Ahtiana sphaerosporella* | mountain candlewax lichen | Sensitive | S1S3 | - | - | Taiga Cordillera |
| Lichen | *Anaptychia crinalis* | hairy fringe lichen | Sensitive | S2S4 | - | - | Taiga Plains |
| Lichen | *Arctomia interfixa* | rust-brown tiny rosette lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Cetraria kamczatica* | Kamchatka icelandmoss lichen | Sensitive | S2S3 | - | - | Taiga Plains |
| Lichen | *Cladonia digitata* | finger pixie-cup | Sensitive | S2S3 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Cladonia grayi* | Gray's pixie-cup lichen | Sensitive | S2S4 | - | - | Taiga Plains |
| Lichen | *Cladonia scabriuscula* | winged pixie lichen | Sensitive | S1S3 | - | - | Taiga Plains |

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Lichen | *Cladonia thomsonii* | blue pork pixie lichen | Sensitive | S1S3 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Collema furfuraceum* | effervescent tarpaper lichen | Sensitive | S2S4 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Dermatocarpon intestiniforme* | quilted stippleback lichen | Sensitive | S2S3 | - | - | Taiga Plains |
| Lichen | *Enchylium bachmanianum* | Caesar's tarpaper lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Enchylium polycarpon* | gilled tarpaper lichen | Sensitive | S2S3 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Heterodermia speciosa* | powdered fringe lichen | May Be At Risk | S1S2 | - | - | Taiga Plains |
| Lichen | *Lasallia caroliniana* | origami rocktripe lichen | May Be At Risk | S2S3 | - | - | Taiga Plains |
| Lichen | *Lasallia papulosa* | brown-bellied toadskin lichen | Sensitive | S2S4 | - | - | Taiga Plains |
| Lichen | *Lathagrium undulatum* | jelly flakes lichen | Sensitive | S2S3 | - | - | Taiga Plains |
| Lichen | *Lobaria linita* | cabbage lung lichen | Sensitive | S2S3 | - | - | Taiga Plains |
| Lichen | *Masonhalea inermis* | thornless tumbleweed lichen | Sensitive | S2S4 | - | - | Taiga Plains |
| Lichen | *Nephroma helveticum* | fringed kidney lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Pannaria conoplea* | mealy-rimmed shingle lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Peltigera didactyla* | temporary pelt lichen | Sensitive | S2S4 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Peltigera neckeri* | black-saddle pelt lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Peltigera praetextata* | born-again pelt lichen | Sensitive | S2S4 | - | - | Taiga Plains |
| Lichen | *Physcia phaea* | black-eyed rosette lichen | Sensitive | S2S4 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Pilophorus robustus* | robust matchstick lichen | May Be At Risk | S1 | - | - | Taiga Plains |
| Lichen | *Placynthium asperellum* | Lilliput ink lichen | Sensitive | S2S4 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Polycauliona polycarpa* | pin-cushion sunburst lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Polychidium muscicola* | eyed mossthorns lichen | Sensitive | S2S3 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Scytinium tenuissimum* | birdnest vinyl lichen | Sensitive | S2S4 | - | - | Taiga Plains |
| Lichen | *Solorina spongiosa* | blinking owl lichen | Sensitive | S2S4 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Sphaerophorus fragilis* | cushion coral lichen | Sensitive | S2S4 | - | - | Taiga Plains |
| Lichen | *Stereocaulon arenarium* | sandy foam lichen | May Be At Risk | S2? | - | - | Taiga Cordillera |
| Lichen | *Stereocaulon botryosum* | cauliflower foam lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Stereocaulon vesuvianum* | variegated foam lichen; variegated coral lichen | Sensitive | S2S3 | - | - | Taiga Cordillera |
| Lichen | *Tholurna dissimilis* | arboreal bottle-collection lichen | May Be At Risk | S1S3 | - | - | Boreal Cordillera |
| Lichen | *Umbilicaria angulata* | starred rocktripe lichen | Sensitive | S2S3 | - | - | Taiga Plains |
| Lichen | *Umbilicaria arctica* | arctic rocktripe lichen | Sensitive | S2S4 | - | - | Taiga Cordillera |
| Lichen | *Umbilicaria decussata* | netted rocktripe lichen | Sensitive | S2S4 | - | - | Taiga Plains, Taiga Shield |
| Lichen | *Umbilicaria havaasii* | Havaas's rock tripe | Sensitive | S2S3 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Umbilicaria polyphylla* | petaled rocktripe lichen | Sensitive | S2S3 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Umbilicaria virginis* | blushing rocktripe lichen | Sensitive | S2S4 | - | - | Taiga Cordillera, Taiga Plains |
| Lichen | *Vestergrenopsis isidiata* | peppered brownette lichen | May Be At Risk | S1S2 | - | - | Tundra Cordillera, Taiga Plains |

| Group | Scientific Name[1] | Common Name | NWT General Species Rank [1] | NWT S Rank[1] | SARA Status[1] | COSEWIC Status[1] | Ecoregion[2] |
|---|---|---|---|---|---|---|---|
| Bryophyte (Moss) | *Buxbaumia aphylla* | brown shield moss | May Be At Risk | - | - | - | Taiga Plains, Taiga Cordillera |
| Bryophyte (Moss) | *Cynodontium jenneri* | Jenner's dogtooth moss | Sensitive | - | - | - | Taiga Cordillera |
| Bryophyte (Moss) | *Grimmia torquata* | twisted grimmia moss | May Be At Risk | - | - | - | Taiga Cordillera |
| Bryophyte (Moss) | *Hilpertia velenovskyi* | Velenovsky's moss | May Be At Risk | - | - | - | Taiga Cordillera |
| Bryophyte (Moss) | *Hypnum callichroum* | downy plait moss | Sensitive | - | - | - | Taiga Cordillera, Taiga Plains |
| Bryophyte (Moss) | *Seligeria oelandica* | Irish bristle moss | May Be At Risk | - | - | - | Taiga Cordillera |

**Notes:**

1 Species scientific names, common names and species ranks from GNWT (2016a).

2 Rare species list for Boreal Cordillera, Taiga Plains and Taiga Cordillera from GNWT Species Monitoring Infobase (2016c).

# Appendix B Alien and Invasive Alien Plant Details

# B.1 Alien and Invasive Alien Species Occurring and Potentially Occurring within the RSA

| Northwest Territories Listing[1] | Scientific Name | Common Name | Occurrence Within RSA[2] | Observed Along Mackenzie Valley Winter Road[3] | Ecoregion with Potential Occurrences[4] |
|---|---|---|---|---|---|
| Alien | *Achillea millefolium* | common yarrow | - | - | Taiga Plains, Boreal Cordillera |
| Alien | *Agropyron cristatum (Agropyron cristatum ssp pectinatum; Agropyron pectiniforme)* | crested wheatgrass | No | No | Taiga Plains |
| Alien | *Alopecurus arundinaceus* | creeping meadow-foxtail | No | No | Taiga Plains |
| Alien | *Alopecurus pratensis* | field meadow foxtail | No | Yes | - |
| Alien | *Ambrosia artemisiifolia* | annual ragweed | No | No | Taiga Plains |
| Alien | *Artemisia biennis* | biennial wormwood | Yes | Yes | - |
| Alien | *Atriplex patula* | spreading orache | No | No | Taiga Plains |
| Alien | *Bellis perennis* | English daisy | No | No | Taiga Plains |
| Alien | *Brassica rapa* | field mustard | Yes | No | - |
| Alien | *Capsella bursa-pastoris* | shepherd's purse | Yes | No | - |
| Alien | *Caragana arborescens* | Siberian pea-tree | No | No | Taiga Plains |
| Alien | *Carum carvi* | wild caraway | No | No | Taiga Plains |
| Alien | *Cerastium fontanum (Cerastium glomeratum, Cerastium vulgatum)* | common chickweed | No | No | Taiga Plains |
| Alien | *Cerastium nutans* | nodding chickweed | No | No | Taiga Plains |
| Alien | *Chenopodiastrum simplex (Chenopodium simplex; Chenopodium hybridum var gigantospermum)* | maple-leaved goosefoot | Yes | No | Taiga Plains |
| Alien | *Chenopodium album* | lamb's quarters | Yes | Yes | Taiga Plains |
| Alien | *Cirsium arvense* | creeping thistle | No | Yes | - |

| Northwest Territories Listing[1] | Scientific Name | Common Name | Occurrence Within RSA[2] | Observed Along Mackenzie Valley Winter Road[3] | Ecoregion with Potential Occurrences[4] |
|---|---|---|---|---|---|
| Alien | *Clematis tangutica* | golden clematis | No | Yes | - |
| Alien | *Collomia linearis* | narrow-leaved collomia | No | No | Taiga Plains |
| Alien | *Corispermum villosum* | hairy bugseed | No | No | Taiga Plains |
| Alien | *Descurainia sophia* | herb Sophia | Yes | Yes | - |
| Alien | *Dracocephalum thymiflorum* | thyme-leaf dragonhead | No | No | Taiga Plains |
| Alien | *Elymus repens* | creeping wild rye | No | Yes | - |
| Alien | *Elymus sibiricus* | Siberian wild rye | No | No | Taiga Plains, Boreal Cordillera |
| Alien | *Erucastrum gallicum* | common dog mustard | Yes | Yes | - |
| Alien | *Erysimum cheiranthoides* | worm-seed wallflower | No | No | Taiga Cordillera, Taiga Plains, Boreal Cordillera |
| Alien | *Festuca trachyphylla* | hard fescue | No | Yes | - |
| Alien | *Gaillardia aristata* | great blanket-flower | No | No | Taiga Plains |
| Alien | *Helianthus annuus* | common sunflower | No | No | Taiga Plains |
| Alien | *Hordeum vulgare* | barley | No | No | Taiga Plains |
| Alien | *Lactuca serriola* | prickly lettuce | No | No | Taiga Plains |
| Alien | *Lappula squarrosa* | European stickseed | Yes | Yes | - |
| Alien | *Lepidium densiflorum* | dense-flowered pepperwort | No | Yes | - |
| Alien | *Lepidium virginicum* | wild peppergrass | Yes | No | - |
| Alien | *Leymus cinereus* | great basin lymegrass | No | Yes | - |
| Alien | *Lolium multiflorum* | annual rye grass | No | No | Taiga Plains |
| Alien | *Lolium perenne* | perennial rye grass | No | No | Taiga Plains |
| Alien | *Lonicera tatarica* | Tatarian honeysuckle | No | No | Taiga Plains |
| Alien | *Lotus corniculatus* | Bird's-foot trefoil | No | No | Taiga Plains |
| Alien | *Matricaria discoidea* | pineappleweed | Yes | Yes | - |

| Northwest Territories Listing[1] | Scientific Name | Common Name | Occurrence Within RSA[2] | Observed Along Mackenzie Valley Winter Road[3] | Ecoregion with Potential Occurrences[4] |
|---|---|---|---|---|---|
| Alien | *Onobrychis viciifolia* | sainfoin | No | No | Taiga Plains |
| Alien | *Persicaria lapathifolia (Polygonum lapathifolium, Polygonum scabrum)* | pale smartweed | No | No | Taiga Plains, |
| Alien | *Phalaris canariensis* | common canary grass | No | No | Taiga Plains |
| Alien | *Phleum pratense* | common timothy | Yes | Yes | Taiga Cordillera, Taiga Plains |
| Alien | *Plantago major* | common plantain | Yes | Yes | Taiga Plains |
| Alien | *Poa compressa* | flat-stem bluegrass | No | No | Taiga Plains |
| Alien | *Polygonum aviculare* | prostrate knotweed | Yes | Yes | - |
| Alien | *Puccinellia distans* | spreading alkali grass | No | Yes | - |
| Alien | *Rheum rhabarbarum* | rhubarb | No | Yes | - |
| Alien | *Setaria verticillata* | rough bristlegrass | No | No | Taiga Plains |
| Alien | *Setaria viridis (Seteria viridus)* | green bristle grass | No | No | Taiga Plains |
| Alien | *Silene csereii* | Balkan catchfly | No | No | Taiga Plains |
| Alien | *Sonchus oleraceus* | common sow-thistle | No | No | Taiga Plains |
| Alien | *Taraxacum erythrospermum* | rock dandelion | Yes | No | - |
| Alien | *Taraxacum officinale* | common dandelion | Yes | Yes | Taiga Cordillera, Taiga Plains, Boreal Cordillera |
| Alien | *Thinopyrum intermedium* | intermediate quackgrass | No | Yes | Taiga Plains |
| Alien | *Thlaspi arvense* | field pennycress | Yes | No | - |
| Alien | *Trifolium repens* | white clover | No | Yes | - |
| Alien | *Vicia cracca* | tufted vetch | No | Yes | - |
| Invasive Alien | *Bromus inermis* | awnless brome | No | Yes | - |
| Invasive Alien | *Crepis tectorum* | narrow-leaf hawksbeard | Yes | Yes | - |
| Invasive Alien | *Leucanthemum vulgare* | ox-eye daisy | No | Yes | - |

| Northwest Territories Listing[1] | Scientific Name | Common Name | Occurrence Within RSA[2] | Observed Along Mackenzie Valley Winter Road[3] | Ecoregion with Potential Occurrences[4] |
|---|---|---|---|---|---|
| Invasive Alien | *Medicago falcata* | yellow alfalfa | No | Yes | - |
| Invasive Alien | *Medicago sativa* | alfalfa | No | Yes | - |
| Invasive Alien | *Melilotus albus* | white sweet-clover | Yes | Yes | - |
| Invasive Alien | *Melilotus officinalis* | yellow sweet-clover | No | Yes | - |
| Invasive Alien | *Phalaris arundinacea L. (cultivar)* | reed canarygrass | Yes | No | - |
| Invasive Alien | *Sonchus arvensis* | perennial sow thistle | No | Yes | - |
| Invasive Alien | *Tanacetum vulgare* | common tansy | No | Yes | - |
| Invasive Alien | *Trifolium hybridum* | alsike clover | Yes | Yes | - |
| Invasive Alien | *Trifolium pratense* | red clover | No | Yes | - |
| Invasive Alien | *Tripleurospermum inodorum* | scentless chamomile | No | Yes | - |

**Notes:**

1 Invasive alien plant rankings as described in Carriere (2008) as ‘invasive alien’ or occurring as ‘priority invasive plant species’ in Oldham and Delisle-Oldham (2016), others listed as alien as per GNWT (2016a).

2 AKEPIC (2020).

3 Oldham and Delisle-Oldham (2016).

4 Alien and Invasive Alien species list for Taiga Plains, Taiga Cordillera and Boreal Cordillera from Northwest Territories Species Monitoring Infobase (GNWT 2016a).

- indicates occurrence not documented in the Northwest Territories Species Monitoring Infobase for the Taiga Plains, Taiga Cordillera or Boreal Cordillera.

**Source:** GNWT (2016a).