

## Section 3: Level III and Level IV Ecoregions of the Taiga Plains

### 3.1 Introduction

The Level II Taiga Plains Ecoregion, four Level III ecoregions and 45 Level IV ecoregions are described in this Section. Section 3.2 provides an overview of the Level II Taiga Plains Ecoregion. Section 3.3 describes the general layout of Level III and Level IV ecoregion descriptions. Sections 3.3.1 through 3.3.4 provide detailed discussions of each Level III ecoregion and the Level IV ecoregions nested within them. They are presented in approximately the order of their occurrence on the map, reading from top to bottom and left to right, as shown in the lists below. The section numbers correspond to map unit numbers on the ecosystem classification map; for example, Section 3.3.3 presents attributes of the Level III Taiga Plains HB Ecoregion, and Section 3.3.3.4 presents attributes of the Level IV Trout Upland HB Ecoregion.

The 45 Level IV ecoregions are as follows:

#### Taiga Plains High Subarctic (HS) Ecoregion (3.3.1)

- 3.3.1.1 Mackenzie Delta HS
- 3.3.1.2 Arctic Red Plain HS
- 3.3.1.3 Campbell Hills HS
- 3.3.1.4 Sitidgi Plain HS
- 3.3.1.5 Travaillant Upland HS
- 3.3.1.6 Anderson Plain HS
- 3.3.1.7 Colville Upland HS
- 3.3.1.8 Colville Plain HS
- 3.3.1.9 Colville Hills HS
- 3.3.1.10 Great Bear Upland HS
- 3.3.1.11 Great Bear Plain HS
- 3.3.1.12 Grandin Plain HS
- 3.3.1.13 Grandin Upland HS
- 3.3.1.14 Lac Grandin Upland HS

#### Taiga Plains Low Subarctic (LS) Ecoregion (3.3.2)

- 3.3.2.1 Arctic Red Plain LS
- 3.3.2.2 North Mackenzie Plain LS
- 3.3.2.3 Norman Range LS
- 3.3.2.4 Great Bear Upland LS
- 3.3.2.5 Great Bear Plain LS
- 3.3.2.6 Blackwater Upland LS
- 3.3.2.7 Keller Plain LS
- 3.3.2.8 Lac Grandin Plain LS
- 3.3.2.9 Lac Grandin Upland LS
- 3.3.2.10 Bulmer Plain LS
- 3.3.2.11 Ebbutt Upland LS
- 3.3.2.12 Horn Slopes LS
- 3.3.2.13 Horn Plateau LS
- 3.3.2.14 Cameron Plateau LS

#### Taiga Plains High Boreal (HB) Ecoregion (3.3.3)

- 3.3.3.1 Ebbutt Upland HB
- 3.3.3.2 Horn Plain HB
- 3.3.3.3 Sibbeston Upland HB
- 3.3.3.4 Trout Upland HB
- 3.3.3.5 Cameron Upland HB
- 3.3.3.6 Great Slave Plain HB

#### Taiga Plains Mid-Boreal (MB) Ecoregion (3.3.4)

- 3.3.4.1 South Mackenzie Plain MB
- 3.3.4.2 Liard Plain MB
- 3.3.4.3 Liard Upland MB
- 3.3.4.4 Trout Upland MB
- 3.3.4.5 Horn Slopes MB
- 3.3.4.6 Great Slave Lowland MB
- 3.3.4.7 Tathlina Plain MB
- 3.3.4.8 Cameron Slopes MB
- 3.3.4.9 Slave Upland MB
- 3.3.4.10 Slave Delta MB
- 3.3.4.11 Slave Lowland MB

## 3.2 The Taiga Plains

### 3.2.1 Biophysical Summary of the Taiga Plains

The Level II Taiga Plains Ecoregion occurs mainly within the Northwest Territories and northern Alberta, with small extensions southward into British Columbia and westward into the Yukon. This Ecoregion is part of the Level I Taiga Ecoregion. It is characterized by subdued relief with a few significant hill systems; within the Northwest Territories, it covers 480,493 km<sup>2</sup>. Much of the Taiga Plains drains to

the Arctic Ocean via Canada's largest river, the Mackenzie River, and its main tributaries, the Liard, Root, Peel, Keele, Carcajou, Mountain, Great Bear, and Arctic Red Rivers. Two of Canada's largest freshwater bodies, Great Slave Lake and Great Bear Lake, occur within the Taiga Plains, along with over a hundred thousand smaller lakes and ponds averaging less than 10 ha in size. The total area covered by water is over 88,000 km<sup>2</sup>, or about 18 percent of the Taiga Plains within the Northwest Territories. The Mackenzie River Delta occurs mainly within the Taiga Plains, and is the largest delta in Canada.

Peatlands are extensive; the Mackenzie Valley is one of the major peatland areas of Canada (Robinson 2002), and data supplied by Tarnocai *et al.* (2005) indicate that over 218,000 km<sup>2</sup> of peatlands occur across the Taiga Plains, nearly half the total area. Upland areas are predominantly level to undulating variable-textured and often bouldery till plains derived from the last major glaciation. Glacial Lake McConnell, an enormous postglacial lake, once covered all of the lowlands from the Northwest Territories – Alberta border north to Great Bear Lake; extensive lacustrine deposits, wave-cut bedrock escarpments and beach ridges (wave-washed, typically coarse-textured linear features) well above the current shorelines of Great Slave Lake and Great Bear Lake attest to its former volume.

The Taiga Plains and adjacent Taiga Shield are sometimes called “the land of little sticks”, where long, cold winters and short cool summers limit tree and other plant growth, and contribute to large areas of permanently frozen soil. Climate is, however, highly variable throughout the Taiga Plains for reasons described in Section 1, and four main climatic – physiographic divisions (Level III ecoregions) defined by vegetation and permafrost features occur within it. The Level III Taiga Plains Mid-Boreal (MB) Ecoregion has the mildest climates and includes a narrow belt across the southernmost third of the Taiga Plains; permafrost is discontinuous to sporadic, and species-rich mixed-wood forests are common. The Taiga Plains High Boreal (HB) Ecoregion is slightly cooler, occurring at higher elevations within the same area as the Taiga Plains MB Ecoregion or at slightly higher latitudes. Permafrost is discontinuous, and mixed-wood forests are usually found on southerly and

westerly aspects where conditions are somewhat warmer. The Taiga Plains Low Subarctic (LS) Ecoregion occupies the middle third of the Taiga Plains, with outliers at higher elevations to the south; permafrost features are common. Closed-to open canopied slow-growing coniferous forests with comparatively low species diversity and black spruce-dominated wetlands are the main community types, and jack pine and trembling aspen are uncommon except on well-drained southerly slopes. The Taiga Plains High Subarctic (HS) Ecoregion occupies the northern third of the Taiga Plains, with outliers at higher elevations to the south. It is characterized by continuous permafrost, fewer wetlands because of lower precipitation, and open, stunted forests of mainly white spruce that grade into treeless arctic tundra at the northern extreme.

Soil development in the Taiga Plains is related to climate, and to local moisture and drainage conditions. *Luvisolic* soils develop under relatively mild climates on medium- to fine-textured soils, where fine particles are leached from the upper horizons; these soils are found mainly in the southern third of the Taiga Plains. *Brunisolic* soils are widespread throughout the region, often on coarse-textured, well-drained soils. *Regosolic* soils have little or no horizon development and are associated with newly deposited materials, such as those found on river terraces; these soils are also distributed throughout the region. *Gleysolic* soils occur on imperfectly- to poorly-drained mineral soils and are most common in the southern third of the Taiga Plains. *Cryosolic* soils are permanently frozen. In the southern third of the Taiga Plains, they occur mainly with frozen peatlands (*Organic Cryosols*); as climates become colder to the north, both mineral and organic materials develop permafrost, and Cryosols develop in both types of materials.

### 3.2.2 Relationship to Other Level II Ecoregions

The Taiga Plains in the Northwest Territories is surrounded by four Level II ecoregions; to the north, the *Southern Arctic Ecoregion*, to the east, the *Taiga Shield Ecoregion*, and to the west, the *Taiga Cordillera* and *Boreal Cordillera Ecoregions* (Figure 13). The borders are not always clearly defined. The sharpest boundary lies between the Taiga Shield and Taiga Plains Ecoregions and is defined by the westward extent of Precambrian granites that are characteristic elements of the Taiga Shield.

The Taiga Plains – Southern Arctic Ecoregion boundary is defined by tree line<sup>9</sup>, north of which trees are restricted to isolated patches usually along rivers, on coarse-textured deposits, and on south-facing slopes where the growing season is long enough to permit conifer survival. This boundary is somewhat arbitrary; in the northernmost parts of the Taiga Plains, extensive treeless, usually shrubby, areas are embedded within a vast expanse of open coniferous forest with a lichen and ericaceous shrub understory. Slow regeneration following fires may contribute to the long-term treeless status of burned areas in the most northerly portions of the Taiga Plains.

The boundary between the Taiga Plains Ecoregion and the Taiga Cordillera Ecoregion is defined by the eastern extent of mountain ranges. From north to south, the foothills of the British-Richardson Mountains, the Franklin Mountains, and the Nahanni Range mark the eastern edge of the Taiga Cordillera. In the extreme southwest, the Kotanalee Range and the Hyland Highlands define the limits of the Boreal Cordillera. The

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<sup>9</sup> Scott (1995) summarizes the work of several researchers; the commonly accepted definition of tree line is the boundary between tundra where trees do not take tree growth form and forest, where trees are typically over 3 m tall. Three mapped representations of tree line (two from the work of previous researchers in the Northwest Territories and one derived from 1:1,000,000 National Topographic Series maps) were reviewed during the mapping process. Oblique large-scale aerial photographs taken during the 2005 field season were examined along with these lines to establish the current boundary between the Southern Arctic and Taiga Plains. This boundary is mostly enclosed within the broad forest-tundra transition area shown by Timoney *et al.* (1992). Tree line also marks the transition from subalpine to treeless alpine areas at higher elevations to the south of the Taiga Plains-Southern Arctic Ecoregions and similarly indicates the climatic limits of tree growth.

transition from Taiga Plains to Taiga Cordillera is clearly marked by an abrupt change from the forested Mackenzie Delta to treeless foothills west of Aklavik, nearly at sea level. Elsewhere, the 400 m contour line arbitrarily defines the boundary between the Taiga Plains and the two Cordilleran ecoregions, reflecting the generally more pronounced topography and greater occurrence of thin soils and exposed bedrock above this elevation.

### 3.3 Ecoregion Descriptions

Each Level III and Level IV ecoregion description in Section 3 begins with a one or two sentence *overview statement* and a *summary* outlining the distinguishing ecosystem characteristics. *Climate* statistics (mean annual temperature, mean temperatures of the warmest and coldest months, mean annual precipitation, wettest and driest months, mean annual daily solar radiation input, mean daily solar radiation input in June and December) are summarized to the Level III ecoregion rank; for most Level IV ecoregions there is insufficient information to provide a meaningful summary. Where information is available, local climatic influences are discussed.

Within each Level III and Level IV ecoregion, the following attributes are described to the degree possible with the existing data:

- *Total area and elevation range* (source: GIS spatial data);
- *Area and size-class distribution of lakes and major rivers* (source: GIS spatial data provided by Government of the Northwest Territories). Used to produce the bar chart included with each ecoregion;
- *Peatland areas* (source: *Peatlands of Canada 2005* by Tarnocai *et al.* 2005). Used to produce the bar chart included with each ecoregion;
- *General description of ecoregion characteristics*;
- *Discussion of geology and geomorphology*, including dominant surficial landforms and parent material characteristics and underlying geologic features that influence ecosystems (source: Soil Landscapes of Canada polygon attributes within ecoregions, surficial and bedrock geology or soils maps where

available, and 2005 digital photographs and field visits);

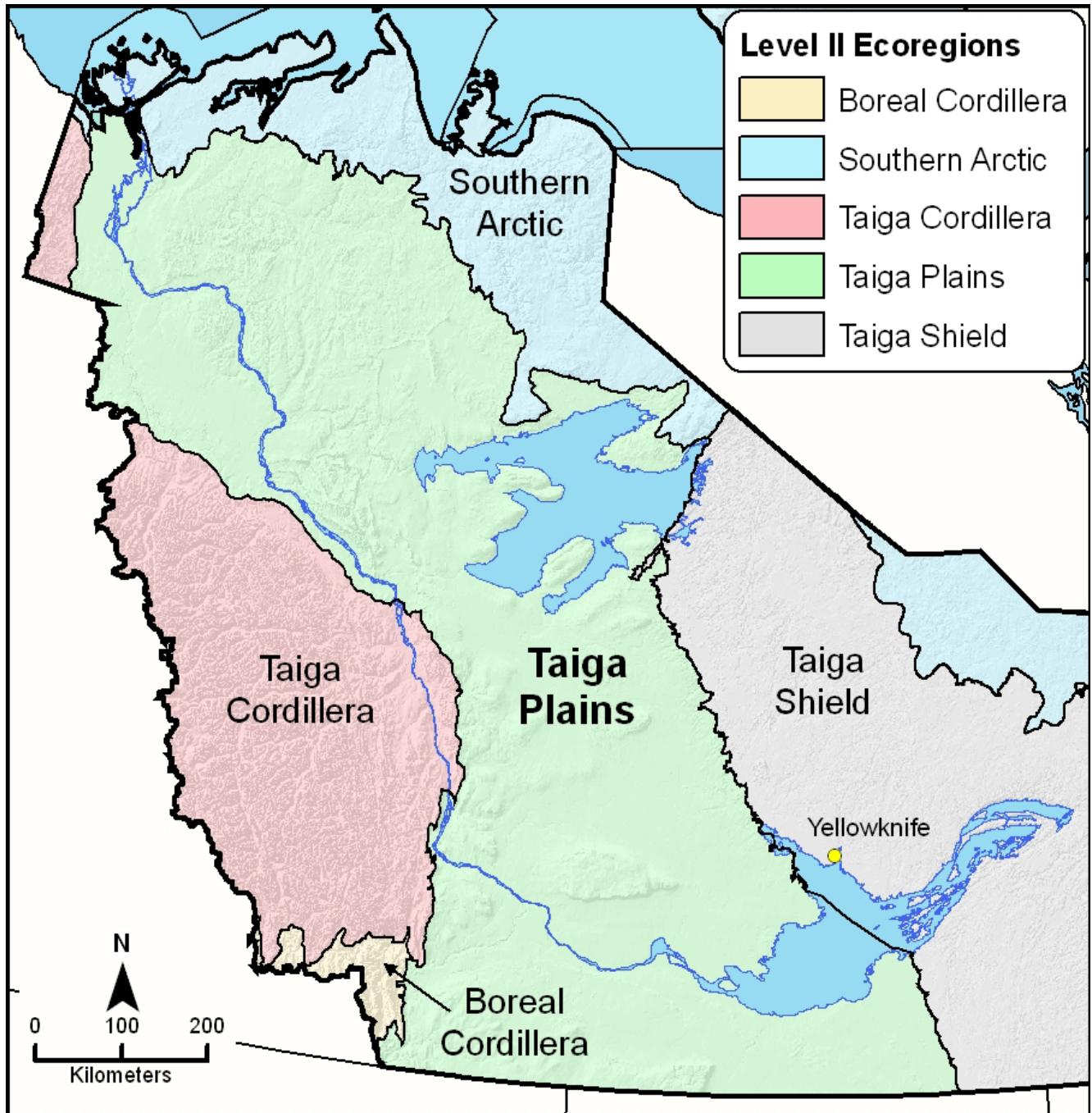
- *Discussion of soil features.* Soils are only described to the Great Group level because this reflects the degree of reliability in the available data, and because Great Groups can be reasonably related to major physiographic features and drainage characteristics (source: Soil Landscapes of Canada polygon attributes within ecoregions, and surficial geology or soils maps where available);
- *Discussion of typical vegetation for the ecoregion* (source: 2005 digital photographs, a small sample plot dataset, and for some ecoregions, existing classification systems);
- *Discussion of water and wetland features;*

- *Discussion of notable features* (source: Government of the Northwest Territories staff and 2005 digital photographs and field visits);

- *Descriptive photographs* are included with each ecoregion on facing pages.

*Ecozones and Ecoregions of Canada* descriptions (Ecological Stratification Working Group 1995) were reviewed and incorporated as appropriate.

A glossary of terms used within this report is provided in Appendix 4.



**Figure 13. Taiga Plains and Neighbouring Level II Ecoregions (2007).**  
 (As of 2007, the Taiga Cordillera, Boreal Cordillera, Taiga Shield and Southern Arctic Ecoregions were all under revision).