ECOLOGICAL REGIONS OF THE NORTHWEST TERRITORIES

TAIGA SHIELD

Photo: B Quinlan

Northwest Territories Environment and Natural Resources

Healthy natural ecosystems are critical to our well-being; they provide us with clean air and clean water, a wide rangeof renewable resources, and the opportunity to enjoy landscapes with their rich diversity of plant and animal communities. Climate and topography act together to produce ecosystems that can range in size from lichen communities on a piece of granite to landscapes the size of Great Slave Lake. Understanding what makes one area different from another is an important part of wisely managing the vast expanses of the Northwest Territories for present and future generations. These differences can be described by dividing larger landscapes into smaller areas that have unique combinations of climate, terrain, vegetation, soils and wildlife; these are called ecological regions (ecoregions).

The Northwest Territories is developing an ecologically based landscape classification for environmental assessment, cumulative effects management, biodiversity monitoring and reporting, forest resource analysis and planning, wildlife habitat evaluation and conservation, and protected area identification. Such a classification is essential for responding to local, regional, national and international enquiries, and the Northwest Territories is working with other Canadian provinces and territories to use a North American continental approach to improve its ecological classification. The increasing pace and scale of mineral development on the Canadian Shield of the Northwest Territories made this area a priority for revision, and this poster describes the ecosystems of the Taiga Shield Ecological Region that occur within the Northwest Territories.

Ecological classification and mapping for the Taiga Shield are presented within an ecoregion framework for continental North America that includes four levels, from very large Level I ecoregions that represent ecosystems of global extent to relatively small Level IV ecoregions that represent ecosystems of several thousand square kilometers. The Northwest Territories includes parts of three Level I ecoregions: Tundra, Taiga and Northwest Forested Mountains. Eight Level II ecoregions including the Taiga Shield are nested within the Level I ecoregions and 17 Level III ecoregions are grouped under the Level II ecoregions. There are four Level III ecoregions within the Taiga Shield: the Taiga Shield High Subarctic (HS), the Taiga Shield Low Subarctic (LS), the Taiga Shield High Boreal (HB), and the Taiga Shield Mid-Boreal (MB). Level III ecoregions are identified primarily by regional climate differences reflected in the soils and vegetation unique to each ecoregion. The Level III ecoregions of the Taiga Shield are further divided into 25 Level IV ecoregions that are typically defined by a unique combination of terrain and vegetation patterns.

Photo: S Kokelj

This poster is associated with the ENR technical report:
"**Ecological Regions of the Northwest Territories – Taiga Shield**"

Additional copies of the poster and report may be obtained from:
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Taiga Shield High Subarctic (HS) Ecoregion

The *Taiga Shield High Subarctic (HS) Ecoregion* occupies nearly 125,000 km^2, and includes 9 Level IV ecoregions that arc across the northern third of the Taiga Shield. Landscapes are dominated by bedrock in the western half, and boulder till and sandy or gravel outwash further east. Slow-growing, open white and black spruce woodlands with lichen and shrub understories grow on lower slopes and valleys, shrub and lichen tundra occupies upper slopes and hilltops, and sedge marshes and polygonal peat plateaus are typical wetland vegetation. Permafrost is continuous along the northern boundary but discontinuous where bedrock is interspersed with mineral soils. Several large rivers including the Coppermine, Snare, Snowdrift, Taltson, Thelon and Dubawnt flow through the Ecoregion; hundreds of large lakes over 50 km^2 in area and thousands of smaller lakes dot the landscape.

Photo: D Downing

Bedrock and boulder till in the *Taiga Shield High Subarctic (HS) Ecoregion* are covered by open and stunted spruce woodlands with understory shrubs such as ground birch, willow, northern Labrador tea, bog cranberry, red bearberry and crowberry, as well as cotton-grass, mosses and lichens. Treeless [tundra] areas consist of low-growing shrubs, along with mountain avens, reindeer lichens and cotton-grass tussocks on hilltops and other exposed sites; these become extensive towards the northern edge of the Ecoregion.

Photo: B Stelter

Widely spaced and narrow spires of stunted spruce on nutrient-poor and often frozen soils that are insulated by a thick organic blanket are common in the *Taiga Shield High Subarctic (HS) Ecoregion*. Open white spruce forests with a shrub and lichen understory are common in the northwest portion of the Ecoregion as well as along the Thelon River valley to the east.

Photo: S Kokelj

Eskers are a common glacial landscape feature of the Taiga Shield and are particularly extensive in the *Taiga Shield High Subarctic (HS) Ecoregion*. They provide a wide range of conditions for plants, from sheltered lower slopes with enough moisture for good tree growth to upper slopes that support only low shrubs and lichens. Eskers provide important habitat for many different wildlife species including barren-ground caribou, muskoxen, grizzly bears, wolves, foxes, wolverines, and ground squirrels.

Photo: D Downing

Gyrfalcons are rare visitors throughout most of the Taiga Shield but commonly breed in the *Taiga Shield High Subarctic (HS) Ecoregion*. Gyrfalcons prey on birds and mammals ranging in size from songbirds to geese, and from voles to Arctic hares. Although they usually nest on cliffs, they will use trees when cliffs are unavailable.

Photo: A Lamarre

Tundra-dwelling Arctic ground squirrels range south into the subarctic regions of the Taiga Shield, wherever suitable habitat conditions occur. They are most common in the *Taiga Shield High Subarctic (HS) Ecoregion* and can be locally abundant in sites where permafrost and surface bedrock are limited and thereby allow easier burrowing.

Photo: D Downing

Pingo is an Inuit word that refers to small hill. These mounds of earth-covered ice are formed when water freezes and forces the overlying soil upward; they can reach heights up to 70 metres along the Arctic coast. "Muskox Hill", a classic pingo that lies just north of the Northwest Territories-Nunavut border near the Thelon River in the *Taiga Shield High Subarctic (HS) Ecoregion*, is a very rare permafrost feature in the Northwest Territories outside of the lower Mackenzie River delta and associated coastal plains.

Photo: D Downing

Treeless peat plateaus occur in low, wet or permanently frozen areas throughout the *Taiga Shield High Subarctic (HS) Ecoregion* and the northern parts of the *Taiga Shield Low Subarctic (LS) Ecoregion*. The reddish-brown colour of these "polygonal" peat plateaus indicates an eroding peat surface, due to melting permafrost and drier surface conditions. These deteriorating peat formations may be an indicator of changing climate.

Photo: A Lamarre

The Taiga Shield provides important fall and winter habitat for several major herds of barren-ground caribou. Barren-ground caribou are considered a "keystone" species in that the survival and abundance of many other wildlife species are dependent on them.

Taiga Shield Low Subarctic (LS) Ecoregion

The *Taiga Shield Low Subarctic (LS) Ecoregion* contains 10 Level IV ecoregions with an area of almost 115,000 km^2 in a broad, northwest-southeast band across the centre of the Taiga Shield.It includes the gently sloping bedrock plateaus north of Great Slave Lake and the nearly level to hummocky plains south and east of Great Slave Lake. Level to rolling and hilly bedrock with thin boulder till, open black spruce-lichen woodlands and forests, and large burned areas regenerating with dwarf birch and black spruce are characteristic landscapes. Drumlins are extensive and conspicuous landforms in the southeastern portion of the Ecoregion, as are peatlands underlain by permafrost. About one-quarter of the Ecoregion is covered by water; the East Arm of Great Slave Lake and Hottah Lake are the two largest lakes, and the Snare, Lockhart, Snowdrift, Taltson, and Dubawnt are the largest rivers.

Photo: D Downing

Open spruce – lichen woodlands and closed stands of black spruce are typical of well-drained sites in the *Taiga Shield Low Subarctic (LS) Ecoregion*. Understory vegetation consists mostly of lichens, with bog cranberry, bog bilberry, crowberry, common Labrador tea and mosses. Peatlands are vegetated by low shrubs such as ground birch, willow, heaths, as well as lichens, sphagnum mosses and sedges in wet depressions; black spruce and larch [tamarack] are stunted and scattered on the elevated peat plateaus. Exposed bedrock and boulder terrain are covered by lichens, and trees are scattered or absent.

Photo: B Stelter

Peatlands such as at this site east of Selwyn Lake, are widespread throughout the *Taiga Shield Low Subarctic (LS) Ecoregion*. Sedge and cotton-grass meadows in wet depressions and surrounded by open forests of stunted black spruce with northern Labrador tea and lichens on elevated plateaus of frozen organic soil, is a recurring pattern.

Photo: C Hall

Photo: D Downing

Ospreys are fish-eating birds of prey that are closely associated with larger lakes and rivers in the Taiga Shield. They are particularly abundant in the *Taiga Shield Low Subarctic (LS) Ecoregion* southeast of Great Slave Lake, where they often nest on small protruding offshore boulders in lakes and shallow ponds. These boulders provide nesting sites secure from many potential predators.

Photo: A Lamarre

White-crowned Sparrows are common breeders in the *Taiga Shield Low Subarctic (LS) Ecoregion*. They forage for seeds and insects near the ground and favour open woodlands, recently burned forest and shrubby areas – habitats that are abundant within this Ecoregion.

Photo: B Quinlan

Glacial landscape features like outwash and eskers are common in the *Taiga Shield Low Subarctic (LS) Ecoregion*; open lichen woodlands dominate these sandy or gravelly, well-drained sites. Black spruce is most common, but paper birch and white spruce can be locally abundant. Along the southern limits of the Ecoregion jack pine occupies similar areas with black spruce. Common bearberry, bog cranberry and reindeer lichens dominate the ground vegetation. North-facing slopes, as in this photo of an esker near Gameti, can support robust and diverse growth, including dense stands with multiple tree species South-facing slopes are very dry and often have patches of bare ground.

Photo: A Lamarre

Muskoxen have recently expanded their range southward into the *Taiga Shield Low Subarctic (LS) Ecoregion* and are now found in small numbers near the east end of Great Slave Lake and to the southeast. They are commonly associated with productive sedge-grass meadows throughout the year.

Photo: D Downing

Both timber wolves, which establish and maintain territorial year-round home ranges, and nomadic tundra wolves, occur in the Taiga Shield. Timber wolves are most common in the southern portions, including the *Taiga Shield High Boreal (HB) Ecoregion*. They occupy large home ranges and hunt moose year-round, and other prey including caribou, when available. Tundra wolves are dependent on and follow the migratory herds of barren-ground caribou. They occur in the Ecoregion whenever these caribou are present, usually only during winter.

Photo: A Lamarre

Chipping Sparrows are widely distributed in North America. They range throughout the forested regions of the Northwest Territories and are common in the *Taiga Shield High Boreal (HB) Ecoregion*, where they prefer to nest in conifer forests.

Taiga Shield High Boreal (HB) Ecoregion

The *Taiga Shield High Boreal (HB) Ecoregion* occupies the south-western third of the Taiga Shield and also includes the somewhat lower elevations east and north of Great Slave Lake. It contains 5 Level IV ecoregions totaling nearly 85,000 km^2. Eskers and outwash deposits occur mainly in the southeast on higher terrain. Mixed white spruce and trembling aspen forests are common in the western portion of the Ecoregion on moist, rich sites, and extensive young jack pine stands have developed on huge burns. Open jack pine-spruce woodlands and lichen-shrub communities grow on rock outcrops, thin boulder till and outwash. Permafrost is discontinuous and typically associated with peatlands and fine-textured soils. Lakes account for nearly one-third of the area, and Great Slave Lake is the largest water body. Major rivers flowing through the Ecoregion north of Great Slave Lake include the Camsell, Snare, Yellowknife and Beaulieu; south of Great Slave Lake, the Snowdrift, Taltson and Tazin are the largest rivers.

Photo: D Downing

Bedrock uplands, forested by stands of black spruce and jack pine with bog cranberry, common Labrador tea, lichens and mosses, are a common and widespread landscape feature throughout the *Taiga Shield High Boreal (HB) Ecoregion*. Paper birch is the dominant deciduous species while white spruce and aspen are generally restricted to warm, moist, well-drained and nutrient-rich sites. Black spruce, larch [tamarack], paper birch, Labrador tea, bog cranberry, red bearberry, cloudberry, sedges and peat mosses occupy the cold and wet bogs and fens.

Photo: B Stelter

Forests consisting of closed-canopy black spruce and jack pine stands with scattered white spruce and paper birch, as seen here near Yellowknife, are typical of the tree cover throughout much of the *Taiga Shield High Boreal (HB) Ecoregion*. Jack pine can grow in very small crevices or in shallow pockets of dry soil on bedrock. Areas of exposed bedrock with little or no soil are characterized by drought-tolerant lichens, mosses, grasses and low shrubs.

Taiga Shield Mid-Boreal (MB) Ecoregion

The *Taiga Shield Mid-Boreal (MB) Ecoregion* occupies the extreme southwest corner of the Northwest Territories Taiga Shield and includes 1 Level IV ecoregion that covers approximate 6,600 km^2. The Ecoregion occupies the easternmost extent of the former glacial Lake McConnell along the present-day Slave River valley, which over time filled with fine-textured river and lakebed deposits. Compared to the other three Level III ecoregions this Ecoregion has a relatively warm climate that together with the moist, rich parent materials has produced a mosaic of vigorous mixed-wood, deciduous and coniferous forests and extensive wetlands within a complex of low exposed bedrock and outwash deposits. Permafrost is less common than in other Level III ecoregions. In contrast to other parts of the Taiga Shield, peatlands cover nearly one-third of the Ecoregion, and high water tables in the southern portion support extensive wetlands south of Tsu Lake. The Taltson River is the only large river and parallels the western boundary north to Great Slave Lake.

Photo: D Downing

Moist, fine-textured and fertile soils surround granite bedrock knobs in the *Taiga Shield Mid-Boreal (MB) Ecoregion*. Dense and diverse mixed-wood or pure deciduous or coniferous stands develop on these soils. The dry exposed rocks can support scattered jack pine and black spruce, and are usually lichen covered. Poorly-drained sites support stands of black spruce, larch [tamarack] and paper birch with shrubs, lichens and mosses underneath. Productive wetlands that include marshes, shrub fens and sedge fens are common and extensive.

Photo: B Stelter

Mixed or pure stands of aspen, white spruce, jack pine, balsam poplar, paper birch, black spruce and larch [tamarack] occur on upland sites throughout the *Taiga Shield Mid-Boreal (MB) Ecoregion*. Diverse and vigorous shrub growth typically includes willow, green alder, wild sarsaparilla, bunchberry, prickly rose, bog cranberry and common Labrador tea.

Photo: B Bailey

The most northerly breeding population of American White Pelicans occurs in the *Taiga Shield Mid-Boreal (MB) Ecoregion*. The granite islands and numerous rapids along the Slave River near Fort Smith mark the south-eastern edge of the Taiga Shield, and provide important nesting and foraging habitat for this species.

Photo: D Hall

The extensive and productive lowlands and riparian areas that make up much of the *Taiga Shield Mid-Boreal (MB) Ecoregion* provide optimal habitat for moose. This Ecoregion supports the highest density of moose within the Taiga Shield.

Taiga Shield High Subarctic (HS) Ecoregion

Taiga Shield Low Subarctic (LS) Ecoregion

Taiga Shield High Boreal (HB) Ecoregion

Taiga Shield Mid-Boreal (MB) Ecoregion