PROJECT BACKGROUND

This map was produced as part of a biophysical mapping pilot study carried out in the Watson Lake (NTS 105A/2) area in 2004. Biophysical mapping (also known as ecological land classification) is an integrated system of mapping describing terrain conditions (surficial geology, slope, landscape position, drainage and permafrost conditions), as well as ecological values (vegetation community and structure, and soil moisture and nutrient regimes). At a local (1:50 000) scale, biophysical maps are an essential tool for facilitating stewardship and sustainable development of energy, mineral and land resources.

This map accompanies the report "Local scale biophysical mapping for integrated resource management, Watson Lake area (NTS 105A/2), Yukon" (Lipovsky and McKenna, 2005). Please refer to this report, as well as the accompanying surficial geology map (Lipovsky et. al., 2005) for more detailed background, methodology and descriptions of map units. For users with GIS capability, it should be noted that while the biophysical map presented here is extremely complex, it is much easier to interpret and/or filter digitally using the associated GIS data (which is included on CD-ROM inside the report).

KEY TO INTERPRETING ECOSYSTEM UNIT MAP LABELS

The polygons on this map represent ecosystem units, as described in Table 4. The green labels found within each polygon are built from a composite group of letters and numbers each representing a particular aspect of the ecological conditions within that polygon (see example label to right). All codes used are outlined in Tables 1, 2 and 3 below.

M4C-WSw-L[6]
G3B-SbP[3]
O7C-SxCx:Wf[1]

- Parent material is indicated by the first letter.
- Moisture regime is indicated by the next number.
- Vegetation association is indicated by the group of letters following the dash.
- Wetland class (if applicable) follows the vegetation association, and is preceded by a colon.
- Disturbance modification (logging, agriculture or other development) is indicated by the capital letter following the second dash.
- Percent cover decile is indicated by the superscript digit (between 1 and 10) shown at the end of the component (multiply by 10 to get percent cover).

There may be up to four ecosystem types or components defined for a single polygon when different ecosystems are intermixed or too small to outline at map scale. Where multiple types are defined, the most dominant (by percent cover) is listed first, followed by the next dominant listed beneath it. The proportion of each type, in deciles, is indicated by the superscript number.

The hypothetical map label above summarizes the ecosystem designations for a single map polygon, which in this case consists of three ecosystem types:

1) M4C-WSw-L[6]: 60% till parent material, mesic soil moisture regime, mesotrophic nutrient regime, logged, Alaska birch / white spruce vegetation association.

2) G3B-SbP[3]: 30% glaciofluvial parent material, submesic soil moisture regime, submesotrophic nutrient regime, black spruce / lodgepole pine vegetation association.

3) O7C-WiCx:Wf[1]: 10% organic parent material, subhydric soil moisture regime, mesotrophic nutrient regime, willow / sedge / fen wetland vegetation association.

SOIL MOISTURE REGIME

Moisture regime is classified between 0 and 9, based on an assessment of environmental factors, soil properties, and indicator plants. The following definitions for classes 0 through 8 are based on the BC Field Manual for Describing Terrestrial Ecosystems (1998). Class 9 was added specifically for this project.

Table 1. Soil moisture regime classes.

0 - Very xeric: water removed extremely rapidly in relation to supply; soil is moist for a negligible time after precipitation. Precipitation is the primary water source.

1 - Xeric: water removed very rapidly in relation to supply; soil is moist for brief periods following precipitation. Precipitation is the primary water source.

2 - Subxeric: water removed rapidly in relation to supply; soil is moist for short periods following precipitation. Precipitation is the primary water source.

3 - Submesic: water removed readily in relation to supply; water available for moderately short periods following precipitation. Precipitation is the primary water source.

4 - Mesic: water removed somewhat slowly in relation to supply; soil may remain moist for a significant, but sometimes short period of the year. Available soil moisture reflects climatic inputs. Precipitation in moderate- to fine-textured soils and limited seepage in coarse-textured soils is the primary water source.

5 - Subhygric: water removed slowly enough to keep soil wet for a significant part of growing season; some temporary seepage and possibly mottling below 20 cm. Precipitation and seepage are the primary water sources.

6 - Hygric: water removed slowly enough to keep soil wet for most of growing season; permanent seepage and mottling; gleyed colours common. Seepage is primary water source.

7 - Subhydric: water removed slowly enough to keep water table at or near surface for most of year; gleyed mineral or organic soils; permanent seepage <30 cm below surface. Seepage or permanent water table is primary water source.

8 - Hydric: water removed so slowly that water table is at or above soil surface all year; gleyed mineral or organic soils. Permanent water table is primary water source.

9 - Shallow open water: water is at the surface all year. This moisture regime consists of shallow water wetlands of the Canadian Classification System characterized by emergent or aquatic vegetation. This is applied to small wetlands not included in the NTDB hydrographic base.

NUTRIENT REGIME

Nutrient regime is classified between A and F, based on an assessment of soil properties, indicator plants and site characteristics. The following table is from the British Columbia field manual for describing terrestrial ecosystems (1998).

Table 2. Nutrient regime classes.

	Oligotrophic A Very Poor	Submesotrophic B Poor	Mesotrophic C Medium	Permesotrophic D Rich	Eutrophic E Very Rich	Hypereutrophic F Saline
Available Nutrients	very low	low	average	plentiful	abundant	excess salt accum.
Humus Form	Mor		Moder	Mull		
A horizon	Ae horizon present		A horizon absent	Ah horizon present		
Organic Matter Content	low (light coloured)	medium (inter. in colour)	high (dark coloured)			
C:N Ratio	high		moderate	low		
Soil Depth	extremely shallow	very shallow to deep				
Soil Texture	coarse textured	medium to fine textured				
% Coarse Fragments	high	moderate to low				
Parent Material Mineralogy	base-low	base-medium		base-high		
Soil pH	extremely – mod. acid	moderately acid – neutral		slightly acid – mildly alk.		
Water pH (Wetlands)	<4 - 5	4.5 - 5.5	5.5 - 6.5	6.5 - 7.4	7.4+	
Seepage			temporary ⟶		permanent	

Table 3. Codes used in ecosystem labels.

VEGETATION

A	Populus tremuloides (trembling aspen)
Al	Alnus sp. (alder species)
Au	Arctostaphylos uvaursi (bearberry)
B	Populus balsamifera (balsam poplar)
Bt	Betula species (birch species)
Ca	Carex aquatilis (water sedge)
Cc	Calamagrostis canadensis (bluejoint grass)
Cl	Carex limosa (shore sedge)
Cu	Carex utriculata (beaked sedge)
Cx	Carex sp. (Carex species)
Eq	Equisetum sp. (horsetail species)
F	Abies lasiocarpa (subalpine fir)
Fb	forb species
Fm	feathermoss
Gr	graminoid species
L	Larix laricina (larch)
Li	lichen species
P	Pinus contorta (lodgepole pine)
Ra	Rosa acicularis (prickly rose)
Sb	Picea mariana (black spruce)
Sh	shrub species
Sp	Sphagnum sp. (sphagnum species)
Sw	Picea glauca (white spruce)
Wi	Salix sp. (willow species)
W	Betula neoalaskana (Alaska birch)

PARENT MATERIALS

C	colluvial
F	fluvial
G	glaciofluvial
L	lacustrine
M	till
O	organic
R	rock
W	water

DISTURBANCE MODIFIERS

-B	burned
-C	cultivated
-D	developed
-L	logged

NON-VEGETATED CODES

NV	non-vegetated
Rb	rock (basalt)

WETLANDS		Environment	Cover types	Species groups
Wb	bog	+/- ombrotrophic; pH < 5.5; >40 cm fibric/mesic peat	conifer treed or low shrub	Sphagnum mosses, ericaceous shrubs and conifers
Wf	fen	groundwater-fed; pH > 5.0; >40 cm fibric/mesic peat	graminoid or low shrub	deciduous shrubs, sedges and brown mosses
Wm	marsh	mineral soils or well-humified peat; protracted shallow flooding (0.1-2 m)	graminoid or forb	large emergent sedge, grass, forb or horsetail species
Ws	swamp	mineral soils or well-humidified peat; temporary shallow flooding (0.1-1 m); significant water flow	tall shrub or forested	conifers, willows, alders, forbs, grasses and leafy mosses
Ww	shallow water	permanent deep flooding (0.5-2 m)	aquatic	aquatic species, emergent vegetation <10% cover

(Wetland classes from MacKenzie and Moran, 2004).

DOMINANT VEGETATION ASSOCIATION

The biophysical map is coloured and cross-hatched by the dominant vegetation species and disturbance conditions of the primary ecosystem unit found in each polygon. Where multiple ecosystem units have been identified in a polygon (up to four), polygons are coloured only according to the primary ecosystem unit. The only exception to this is if any wetland or disturbance is mapped within a polygon, the corresponding hatching is applied to the entire polygon. Please refer to the polygon label and the accompanying type description (Table 4) for a more extensive description of representative vegetation species.

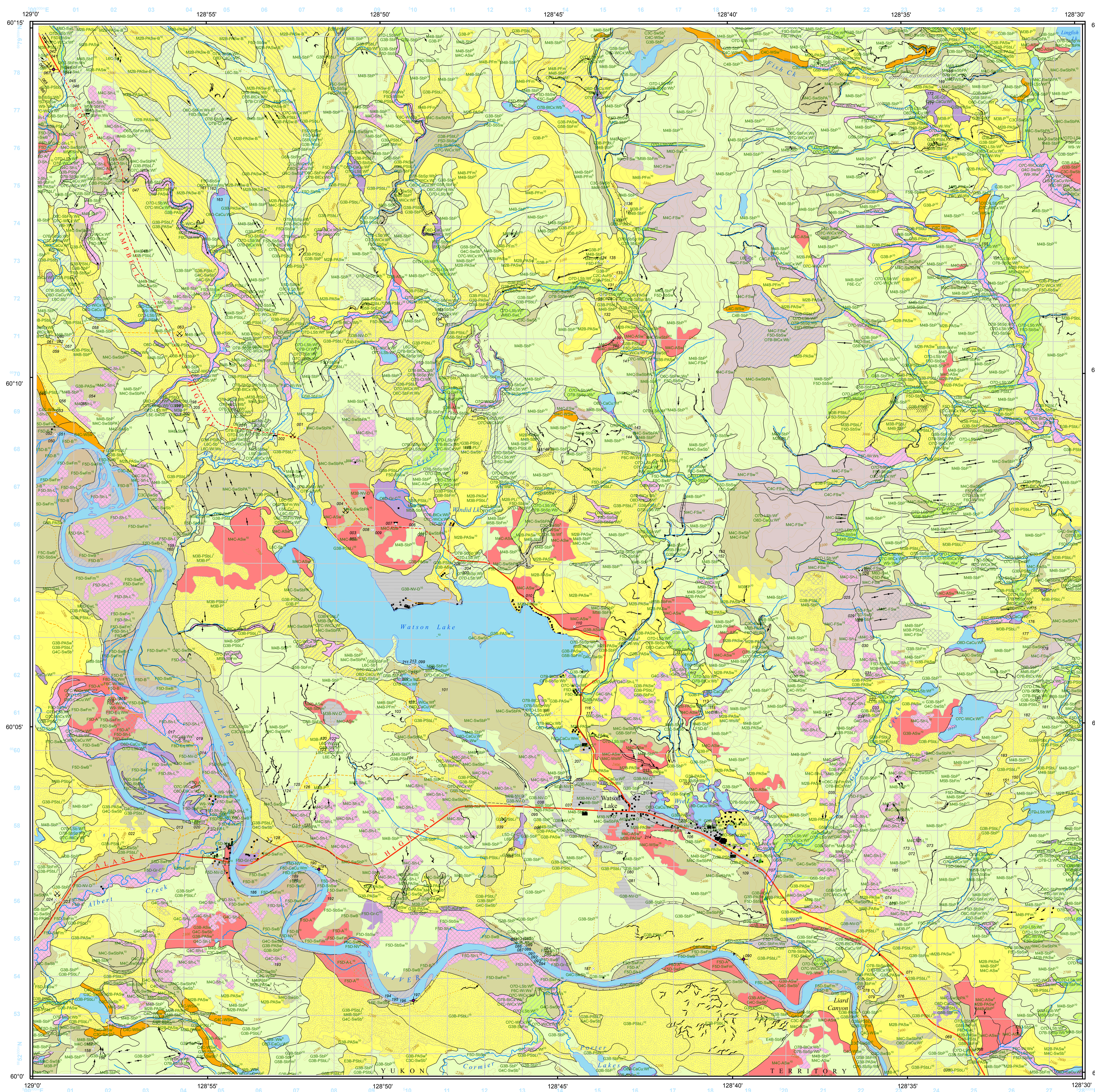
balsam poplar	white spruce	lichen
aspen	fir - white spruce	wetland
birch - white spruce	shrub	cultivated
pine	grass - sedge - horsetail	logged
black spruce	non-vegetated	developed
larch - black spruce	water	burned

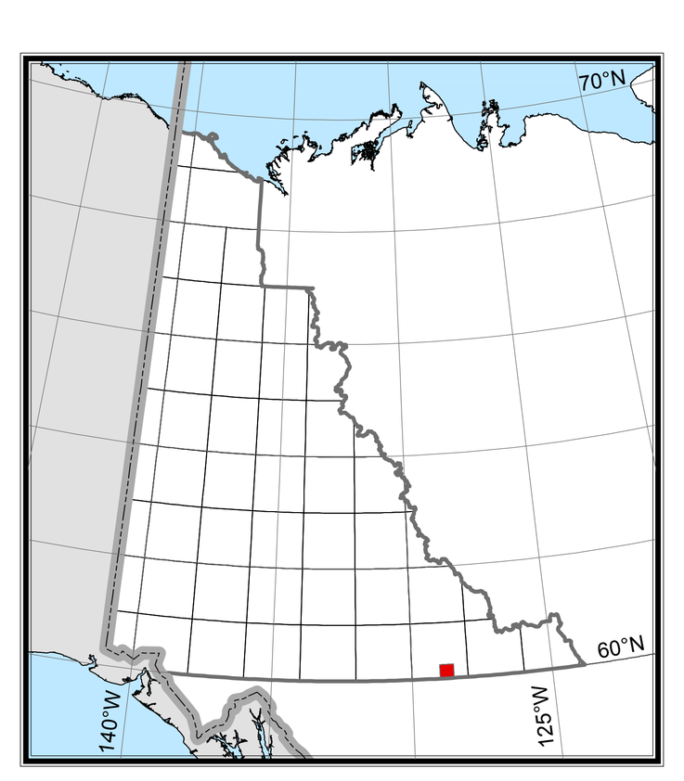
Canada

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada
Knowledge & Innovation Fund

YUKON GEOLOGICAL SURVEY

Yukon Energy, Mines and Resources





1:50 000-scale topographic base data produced by CENTRE FOR TOPOGRAPHIC INFORMATION NATURAL RESOURCES CANADA

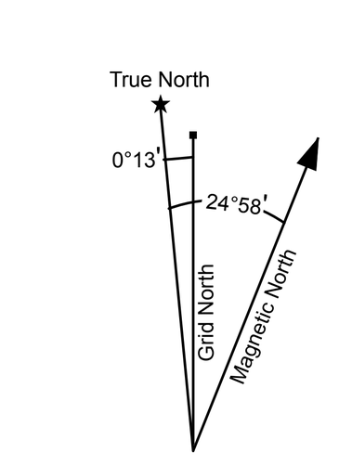
ONE THOUSAND METRE GRID
Universal Transverse Mercator Projection
North American Datum 1983
Zone 9

CONTOUR INTERVAL 100 FEET
elevations in feet above mean sea level

BIOPHYSICAL MAP
WATSON LAKE
YUKON

SCALE 1:50 000

0 1 2 3 4 5
kilometres



Use diagram to obtain numerical values
APPROXIMATE MEAN DECLINATION 2005
FOR CENTRE OF MAP: 24° 58' E
Annual change decreasing 18.4'

105A/6 MIDDLE CANYON	105A/7 TOM LAKE	105A/8 SUNRISE CREEK
105A/3 DODO LAKES	105A/2 **THIS MAP**	105A/1 BLIND LAKE
104P/14 OLD FADDY LAKE	104P/15 LUTZ CREEK	104P/16 LOWER POST

ECOSYSTEM UNIT DESCRIPTIONS

Table 4 outlines the classification system used to define the ecosystem units, or types, on the biophysical map. The 69 types are classified by various combinations of parent material, soil moisture regime, ecological nutrient regime, plant community, and disturbance history as described to the left of the map. Vegetation species are listed in order of mean percent cover; tree, shrub and grass/forb strata are separated by semicolons.

Table 4. Site and vegetation characteristics of ecosystem units.

COLLUVIAL TYPES

C2C-AuFb (Colluvium: Arctostaphylos - forb)
Site: steep south-facing slopes; parent materials and textures variable
Vegetation: rose, buffaloberry, juniper; kinnickinick, forbs, sage, grass

C3B-P (Colluvium: pine)
Site: early to mid seral stands on various slopes and aspects
Vegetation: dense lodgepole pine; sparse ground cover: lowbush cranberry, kinnickinnick, twinflower, freckled lichen, Cladonia lichen

C3C-BA (Colluvium: balsam poplar - aspen)
Site: sparsely vegetated unstable colluvial slopes as found along the Liard River
Vegetation: trembling aspen, balsam poplar; forbs form a very sparse ground cover

C3C-SwSb (Colluvium: white spruce - black spruce)
Site: moderately steep west-facing slopes; soils are sandy and range from well drained to imperfectly drained and are likely Regosols or Brunisols
Vegetation: white spruce, black spruce; sparse rose; northern comandra, one sided wintergreen, lowbush cranberry, twinflower; stepmoss, redstemmed moss, knight's plume

C4B-SbP (Colluvium: black spruce – pine)
Site: similar to M4C-SbP; occurs on moderately to rapidly drained slopes of various aspect; soils are likely Eutric and Dystric Brunisols, or Regosols
Vegetation: black spruce, lodgepole pine; alder, labrador tea, willow; bunchberry, northern comandra, grass; red bearberry, kinnickinnick, lowbush cranberry, crowberry; feather moss

C4C-FSw (Colluvium: fir - white spruce)
Site: mixed coniferous ecosystems on mid slopes over 800 m in elevation; site and soils are similar to M4C-FSw
Vegetation: subalpine fir, lodgepole pine, white spruce, Alaska birch; alder, Labrador tea, willow; bunchberry, one sided wintergreen; step moss, knight's plume, red-stemmed moss

C4C-Sh-L (Colluvium: shrub regeneration)
Site: sites have been clearcut
Vegetation: regeneration variable and patchy; aspen, balsam poplar, Alaska birch, white spruce; mixed shrubs, forbs, lichen, mosses

C4C-WSw (Colluvium: Alaska birch - white spruce)
Site: commonly found in mid to lower slope positions; soils usually well drained Orthic Eutric and Dystric Brunisols
Vegetation: Alaska birch, white spruce, lodgepole pine, black spruce, aspen; willow, alder, labrador tea, rose, arctic raspberry, highbush cranberry; bunchberry, stoloniferous mitrewort, tall bluebell; lowbush cranberry, twinflower

EOLIAN TYPES

E3B-PSbLi (Eolian: pine - black spruce – lichen)
Site: rapid- to well drained, sandy eolian soils, likely Brunisols
Vegetation: black spruce, lodgepole pine; Labrador tea, rose, northern comandra, grass; kinnickinnick, lowbush cranberry; stepmoss, usually >20% lichen

E4B-SbP (Eolian: black spruce – pine)
Site: well to poorly drained, sandy eolian soils, likely Brunisols or Gleysols
Vegetation: black spruce, lodgepole pine; Labrador tea, alder, willow; northern comandra, horsetail; lowbush cranberry; stepmoss, freckled lichen

FLUVIAL TYPES

F5D-A (Fluvial: aspen)
Site: moderately well to imperfectly drained floodplain sites; soils likely Brunisols or Regosols
Vegetation: aspen, white spruce, willow, buffaloberry, rose, high bush cranberry, horsetail, twinflower, lowbush cranberry, moss

F5D-Al (Fluvial: alder)
Site: swamps occuring on the banks of larger rivers subject to periodic flooding
Vegetation: mountain alder, willow, red osier dogwood, rose; bunchberry, horsetail

F5D-B (Fluvial: balsam poplar)
Site: level to gently sloping plains and terraces; soils are variable in texture and generally classified as Orthic or Gleyed Regosols
Vegetation: sparse to dense cover of balsam poplar commonly with some white spruce; rose, red osier dogwood, highbush cranberry; sparse groundcover including horsetail, pussytoes, strawberry, northern bedstraw, black-tipped groundsel; kinnickinnick, twinflower

F5D-FSw (Fluvial: fir - white spruce)
Site: rich ecosystems often located along small drainages where the channel has frequently shifted across the slope or valley; soils variable in texture and range from Humic Regosols to Gleyed, Melanic Brunisols to Terric, Mesic, Organic Cryosols
Vegetation: subalpine fir, lodgepole pine, white spruce, black spruce; alder, highbush cranberry, rose, wild red currant, horsetail, lycopodium, bunchberry, arctic sweet coltsfoot, stoloniferous mitrewort, tall bluebell, one sided wintergreen, twinflower

F5D-Gr-C (Fluvial: cultivated)
Site: cultivated fluvial soils
Vegetation: planted graminoid vegetation

F5D-NV (Fluvial: non-vegetated)
Site: mainly non-vegetated gravel/sand bars
Vegetation: non-vegetated.

F5D-NV-D (Fluvial: non-vegetated - developed)
Site: anthropogenic areas stripped of vegetation for borrow pits, parking, staging areas, future development, etc.
Vegetation: non-vegetated

F5D-SbSw (Fluvial: black spruce - white spruce)
Site: typically valley floor or toe slope position; soil texture varies from sand to loam; soils are likely well to poorly drained Regosols or Gleysols
Vegetation: black spruce, white spruce, larch; Labrador tea, rose, alder, willow, highbush cranberry; horsetail, bunchberry, grass, northern comandra; feather mosses

F5D-Sh-L (Fluvial: shrub regenerated)
Site: clearcut areas; skid roads, log piles and wood chip piles common
Vegetation: shrub strata regeneration may be variable and patchy; aspen, balsam poplar, Alaska birch, numerous shrubs, forbs, lichens and mosses

F5D-SwB (Fluvial: white spruce - balsam poplar)
Site: early to late seral ecosystems found along creeks and major rivers; subject to periodic flooding; clay loam to sandy soils are generally well to imperfectly drained Cumulic Regosols, other Regosols or Brunisols
Vegetation: white spruce, balsam poplar, highbush cranberry, rose, alder, willow, buffaloberry, raspberry; horsetail, grass; bunchberry, northern comantra, stoloniferous mitrewort, tall bluebell, twinflower, lowbush cranberry; feather mosses

F5D-SwFm (Fluvial: white spruce – feather moss)
Site: classic white spruce-feather moss ecosystem generally found on level fluvial sites; silt loam to sandy soils are typically well to imperfectly drained Orthic or Gleyed Regosols or Brunisols
Vegetation: white spruce, balsam poplar; rose, highbush cranberry, alder, willow, raspberry; horsetail, grass; bunchberry, wild sarsparilla, arnica, northern comandra; twinflower, lowbush cranberry; feather mosses

F6C-Wi:Ws (Fluvial: willow - swamp wetland)
Site: willow shrub dominated swamp ecosystem, typically found along creeks; soils are sandy and loamy, likely imperfect to very poorly drained Regosols and Gleysols
Vegetation: willow, shrub birch , sweet gale; horsetail; sedge, grass, mosses

F6D-SwL (Fluvial: white spruce – larch)
Site: level or gently sloping areas along creeks; soils are poor to very poorly drained, and high in nutrients; shallow organic layers accumulate on the surface; soils are likely Gleysols
Vegetation: larch, white spruce, black spruce, Labrador tea, willow, lowbush cranberry, twinflower, red bearberry, horsetail, step moss, red-stemmed moss, knight's plume

F6E-Cc (Fluvial: bluejoint grass)
Site: graminoid ecosystem occuring in the floodplain zone, usually in abandoned or inactive channels
Vegetation: bluejoint grass; other species may or may not be present; willow, currant, raspberry, highbush cranberry; water sedge, beaked sedge, sedge, spike rush manna grass, horsetail, moss

F8D-CaCu:Wm (Fluvial: water sedge - beaked sedge - marsh wetland)
Site: herb-dominated marsh; this ecosystem may be a zone within a larger marsh adjacent to the wetter equisetum zone
Vegetation: water sedge, beaked sedge, horsetail, cinquefoil, various mosses

F8D-Eq:Wm (Fluvial: equisetum - marsh wetland)
Site: equisetum-dominated marsh subject to high water fluctuation in back channels or along banks of the Liard River
Vegetation: horsetails, sedges, forbs

GLACIOFLUVIAL TYPES

G3B-ASw (Glaciofluvial: aspen - white spruce)
Site: typically south- or west-facing, gentle to moderate slopes; well to rapidly drained soils, likely Dystric or Eutric Brunisols
Vegetation: aspen, white spruce, Alaska birch; alder, rose, highbush cranberry, buffaloberry, red osier dogwood, raspberry; bunchberry, fireweed, pyrola; stepmoss, twinflower, kinnickinnick, lowbush cranberry

G3B-NV-D (Glaciofluvial: non-vegetated)
Site: anthropogenic areas stripped of vegetation for borrow pits, parking, staging areas, and future development
Vegetation: non-vegetated

G3B-P (Glaciofluvial: pine)
Site: seral ecosystem commonly occuring after fire
Vegetation: dense lodgepole pine, some black spruce; Labrador tea; sparse ground cover: crowberry, lowbush cranberry; moss, lichen

G3B-PASw (Glaciofluvial: pine - aspen - white spruce)
Site: mid- to late-seral mixed forest ecosystem, found on level to moderately steep, often west- or east-facing slopes; the rapidly drained, generally sandy soils are generally classified as Eutric Brunisols
Vegetation: lodgepole pine, aspen, white spruce, black spruce; Labrador tea, alder; northern comandra, bunchberry, fireweed; lowbush cranberry, kinnickinnick, twinflower; feather mosses

G3B-PSbLi (Glaciofluvial: pine - black spruce – lichen)
Site: generally level plains; well to rapidly drained, sandy soils are generally Orthic or Eluviated Eutric Brunisols
Vegetation: lodgepole pine, black spruce, white spruce; Labrador tea; northern comandra, lodgepole pine; kinnickinnick, lowbush cranberry, twinflower; lichen cover usually
>25%; redstemmed moss, stepmoss

G3B-SbFm (Glaciofluvial: black spruce – feather moss)
Site: climax ecosystem is typical of moderate to steeper slopes; soils are well drained Brunisols
Vegetation: black spruce; alder, Labrador tea; bunchberry; lowbush cranberry, twinflower; stepmoss, redstemmed moss; lichen

G3B-SbP (Glaciofluvial: black spruce – pine)
Site: level to gentle slopes of upland areas; the well drained sandy and loamy soils are generally classified as Eluviated or Orthic Eutric and Dystric Brunisols
Vegetation: black spruce, lodgepole pine, (white spruce); alder, Labrador tea, rose; northern comandra; lowbush cranberry, twinflower, crowberry; feather mosses

G4C-Sh-L (Glaciofluvial: shrub regenerated)
Site: clearcut
Vegetation: shrub strata, regeneration may be variable and patchy; aspen, balsam poplar, Alaska birch, numerous shrubs, forbs, lichens and mosses

G4C-SwSb (Glaciofluvial: white spruce - black spruce)
Site: level sites to steep slopes commonly facing south and west; moderately well drained soils are often classified as Dystric Brunisols or Humo Ferric Podzols
Vegetation: white spruce, black spruce, lodgepole pine; Labrador tea, alder, highbush cranberry; northern comandra; twinflower, lowbush cranberry; feather mosses, freckled lichen

G5B-SbFm (Glaciofluvial: black spruce – feather moss)
Site: level sites and cool northerly slopes; soils are usually moderately well to imperfectly drained and are likely classified as Gleyed or Orthic Brunisols
Vegetation: black spruce; Labrador tea, shrub birch, alder; bunchberry, horsetail; lowbush cranberry; stepmoss, redstemmed moss, knight's plume; lichen

LACUSTRINE TYPES

L4C-NV-D (Lacustrine: non-vegetated)
Site: anthropogenic areas stripped of vegetation for borrow pits, parking, staging areas, and future development
Vegetation: non-vegetated

L5D-Gr-C (Lacustrine: cultivated)
Site: cultivated lacustrine soils
Vegetation: planted graminoid vegetation

L5E-SwSb (Lacustrine: white spruce - black spruce)
Site: occurs where former lakes have drained; silty, calcareous soils may be frozen and subject to thermokarst; soils may be classified as Turbic Cryosols
Vegetation: black spruce, white spruce; low cover of shrubs: Salix sp. alder, shrub birch; lowbush cranberry; feather mosses, freckled lichen

L6C-Sb (Lacustrine: black spruce)
Site: level sites; loam or silty, fine sand soils are generally poor to very poorly drained and are likely classified as Gleysols, Gleyed Brunisols or Regosols
Vegetation: black spruce, some white spruce, larch; Labrador tea, shrub birch, horsetail, bunchberry, sedge, mosses, frecked, lichen

L6C-Wi:Ws (Lacustrine: willow - swamp wetland)
Site: associated with drained basins; fine textured soils are imperfect to poorly drained and are likely classified as Gleyed Regosols
Vegetation: willow, shrub birch, Labrador tea, leatherleaf, red osier dogwood; sedge, grass, moss

L6E-Cc (Lacustrine: bluejoint grass)
Site: former lake basins; fine textured soils are imperfect to poorly drained and are typically Gleyed Regosols
Vegetation: bluejoint grass; other species may include willow, red osier dogwood; other grasses, sedges, buckbean; mosses

L8D-CaCu:Wm (Lacustrine: water sedge - beaked sedge - marsh wetland)
Site: margins of lakes or ponds or in former lake basins; poor to very poorly drained, fine textured soils are likely Gleysols
Vegetation: sedges, grasses, horsetail, aquatic plants, moss

Table 4. (Continued).

MORAINAL TYPES

M2B-PASw (Morainal: pine-aspen - white spruce)
Site: mixed forest ecosystem on warmer aspects at low to high elevation; commonly occurs on slopes where openings in the forest allow establishment of deciduous trees, possibly associated with disturbance such as fire or logging; soils are Orthic Dystric and Eutric Brunisols with sandy loam to silty clay textures
Vegetation: lodgepole pine, aspen, spruce, Labrador tea, alder, buffaloberry, rose, bunchberry, northern comandra, strawberry, kinnickinnick, twinflower, lowbush cranberry; moss, Cladonia sp.

M2B-PLi (Morainal: pine – lichen)
Site: rapid to moderately well drained plains and gentle slopes; usually late seral to mature forests
Vegetation: lodgepole pine; some shrubs: alder, buffaloberry, rose may be present; kinnickinnick, lowbush cranberry; redstemmed moss, stepmoss; lichens

M3B-NV-D (Morainal: non-vegetated)
Site: anthropogenic areas stripped of vegetation for borrow pits, parking, staging areas, future development
Vegetation: non-vegetated

M3B-P (Morainal: pine)
Site: well to rapidly drained soils may be Eutric or Dystric Brunisols; young seral stage, post-fire, dense lodgepole pine usually less than 90 years old
Vegetation: lodgepole pine, some aspen; sparse ground cover: feather mosses, ground shrubs, Cladonia sp. and Peltigera apthosa

M3B-PSbLi (Morainal: pine - black spruce – lichen)
Site: well to rapidly drained, level to moderately steep slopes; soils are Brunisols and Luvisols; late seral to mature forests
Vegetation: black spruce, lodgepole pine, Labrador tea, shrub birch; lowbush cranberry, kinnickinnick, crowberry, bunchberry; feather mosses, groundcover is usually >30% lichen

M4B-PFm (Morainal: pine – feather moss)
Site: moderate to rapidly drained, level to moderate slopes with variable aspects; Orthic and Eluviated Eutric and Dystric Brunisol and Humo-Ferric Podzol soils
Vegetation: lodgepole pine; alder, Labrador tea, shrub birch, tall blueberry; lowbush cranberry, bunchberry, northern comandra; step moss, red-stemmed moss, knight's plume

M4B-SbP (Morainal: black spruce – pine)
Site: this ecosystem is common and widely distributed, occupying moderate to rapidly drained, level to moderately steep slopes with variable aspects; Orthic and Eluviated Eutric and Dystric Brunisol and Humo-Ferric Podzol soils
Vegetation: black spruce, lodgepole pine, alder, Labrador tea, shrub birch, tall blueberry, lowbush cranberry, bunchberry, northern comandra; step moss, red-stemmed moss, knight's plume

M4C-ASw (Morainal: aspen - white spruce)
Site: typically level to moderate slopes with warmer aspects; possibly some history of disturbance such as selective logging; most soils are Eutric or Melanic Brunisols
Vegetation: mixed forest dominated by aspen, white spruce, some lodgepole pine; alder, willow, rose, highbush cranberry and groundshrubs – twinflower, kinnickinnick, lowbush cranberry and northern comandra

M4C-FSw (Morainal: fir - white spruce)
Site: mixed coniferous ecosystems found on mid slopes over 800 m in elevation
Vegetation: subalpine fir, lodgepole pine, white spruce, Alaska birch; shrubs may include alder, Labrador tea, willow; bunchberry, one sided wintergreen; step moss, knight's plume, red-stemmed moss

M4C-Sh-L (Morainal: shrub regenerated)
Site: clearcut areas; skid roads, log piles and wood chip piles are common
Vegetation: regeneration may be variable and patchy; aspen, balsam poplar, birch, shrubs, forbs, lichens, mosses

M4C-SwSb (Morainal: white spruce - black spruce)
Site: mesic sites on level to moderate slopes with various aspects; soils are classified as Brunisols, and have mixed textures
Vegetation: white spruce, with black spruce and or lodgepole pine; with shrub understory of alder, Labrador tea, buffaloberry, rose; feather mosses, freckled lichen

M4C-SwSbP (Morainal: white spruce - black spruce – pine)
Site: moderate to well drained ecosystems found on mid slopes; soils may be Orthic or Eluviated Dystric or Eutric Brunisols and Grey Luvisols
Vegetation: white spruce, black spruce, lodgepole pine, alder, Labrador tea, lowbush cranberry, twinflower, bunchberry, one-sided wintergreen

M4C-SwSbPA (Morainal: white spruce - black spruce - pine – aspen)
Site: upper and mid slope positions up to 30% steep; also level or crest positions; soils are generally well drained Eluviated Dystric or Eutric Brunisols
Vegetation: white spruce, back spruce, lodgepole pine, aspen; alder, Labrador tea, lowbush cranberry, bunchberry may be present; mosses

M4C-WSw (Morainal: Alaska birch - white spruce)
Site: mixed forest ecosystems found in occasional patches on cool, east and west slopes, and on slope crests including eskers
Vegetation: Alaska birch, aspen, lodgepole pine, black spruce, white spruce; alder, highbush cranberry; northern comandra, twinflower, lowbush cranberry; red-stemmed moss, stepmoss, knight's plume

M5B-SbFm (Morainal: black spruce – feather moss)
Site: this type is common, but does not cover extensive areas; imperfect to poorly drained in lower or toe slope positions; may be associated with permafrost
Vegetation: black spruce, Labrador tea, willow, horsetail; lowbush cranberry; red-stemmed moss, step moss, freckled lichen

M6D-SwL (Morainal: white spruce – larch)
Site: generally gently sloping lower slope or toe slope positions; imperfectly drained to poorly drained soils, influenced by subsurface seepage, are generally classified as Gleyed Regosols or Humic Gleysols
Vegetation: larch, white spruce, black spruce, Labrador tea, willow; lowbush cranberry, twinflower, red bearberry, horsetail; step moss, red-stemmed moss, knight's plume

ORGANIC TYPES

O6C-SbFm:Ws (Organic: black spruce – feather moss - swamp wetland)
Site: lower slope or toe slope positions; imperfect to poorly drained soils, influenced by subsurface seepage, are generally Terric Mesisols, though some are Mesic Organic Cryosols with permafrost on cooler sites
Vegetation: moderate to low cover of black spruce, Labrador tea, willow, lowbush cranberry, step moss, red-stemmed moss, green reindeer lichen

O6D-Gr-C (Organic: cultivated)
Site: cultivated organic soils
Vegetation: planted graminoid vegetation

O7B-BtCx:Wb (Organic: shrub birch - sedge - bog wetland)
Site: poor to very poorly drained bogs with shallow to moderately deep peat; generally unfrozen
Vegetation: shrub birch, Labrador tea; water sedge or shore sedge, Sphagnum moss

O7B-Cl:Wf (Organic: shore sedge - fen wetland)
Site: this nutrient-poor fen ecosystem often occurs in a larger wetland complex associated with bogs
Vegetation: willow, sedge, scheuchzeria, buckbean, mosses

O7B-SbSp:Wb (Organic: black spruce - Sphagnum - bog wetland)
Site: bog islands in, or surrounding, larger wetland complexes; generally imperfect to very poorly drained; soils are typically Fibric Organic Cryosol or Terric Mesic Organic Cryosols, commonly frozen close to the surface
Vegetation: black spruce, Labrador tea, shrub birch, horsetail, lowbush cranberry, cloudberry, Sphagnum, red-stemmed moss, golden fuzzy fen moss, reindeer lichen

O7C-WiCx:Wf (Organic: willow - sedge - fen wetland)
Site: poorly drained fen wetlands; soils are likely Typic Fibrisols or Mesisols
Vegetation: willow, sedge, Scheuchzeria, Sphagnum, mosses

O7D-LSb:Wf (Organic: larch - black spruce - fen wetland)
Site: occurs in drainage channels and larger wetlands; associated with poor to very poorly drained Terric or Typic Mesisol and Fibrisol soils
Vegetation: sparse cover of larch and black spruce; Labrador tea, shrub birch, water sedge; mosses may include: golden fuzzy fen moss, glow moss, Sphagnum

O8D-CaCu:Wf (Organic: water sedge - beaked sedge - fen wetland)
Site: common fen wetland ecosystem, usually flooded annually
Vegetation: usually low species diversity; water sedge, beaked sedge, locally Equisetum fluviatile, aquatic emergents; mosses

OTHER TYPES

Rb (Rock: basalt)
Site: basalt bedrock outcrops (commonly columnar), or talus blocks
Vegetation: non-vegetated

W9-:Ww (shallow open water)
Site: lakes and ponds, such as beaver ponds, too small to be outlined on the 1:50 000-scale topographic base map
Vegetation: non-vegetated

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Any revisions or additional geological information known to the user would be welcomed by the Yukon Geological Survey.

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A digital PDF (Portable Document File) file of this map may be downloaded free of charge from the Yukon Geological Survey website: http://www.geology.gov.yk.ca.

SYMBOL LEGEND

building	field observation site (site number (04WLXXX))
campground	observation of frozen ground
airstrip	C14 radiocarbon dated wood sample (years)
seaplane base	stratigraphic section site
tank	gravel pit
tower	kettle hole
lake	landslide headwall and track
stream	sand dunes
topographical contour	streamlined landform (drumlins, flutings, grooves)
trail	terrain boundary (defined, approximate)
highway, paved	meltwater channel
main road, loose surface	scarp
secondary road (paved, loose surface)	esker
street (paved, loose surface)	tension crack

Yukon Geological Survey
Energy, Mines and Resources
Government of Yukon

Open File 2005-8

Biophysical Map of Watson Lake Area (NTS 105A/2), Yukon (1:50 000 scale)

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