



Forest 2020

Preliminary Site

Assessment Field Guide



Forest 2020
*Plantation Demonstration
and Assessment Initiative*

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Objectives

To develop a relatively quick but thorough assessment system to delineate and document site conditions and suitability of potential lands for inclusion in the “Forest 2020 / Greencover” initiative to establish demonstrations of fast-growing plantations across the country.

Site Pre-Requisites

For a site to qualify under the new initiative, the subsequent plantation must:

- 1) qualify for carbon credits under Kyoto Protocol, and*
- 2) produce 8X the average yield for natural forests.*

Site Selection Targets

Site selection should target areas that were clearly in a non-forest land use prior to 1990 (e.g. agricultural lands, barren ground, etc) and that do not have significant tree cover.

Preliminary Site Assessment Procedures

The completion of the preliminary site assessment will summarize the background and site information for the overall site. This will include:

- 1) Landowner and Contact Information*
- 2) Site Location Information*
- 3) Overall Site Characteristics*
- 4) Site History*

Note: More detailed site assessments will be completed through the Measuring and Monitoring Assessments.

Using the tallysheet pictured in Figure 1, document the required information outlined in the remainder of this document. The protocols for each requirement of the site assessment are outlined in the following sections.

Preliminary Site Assessment

Conducted to evaluate the potential suitability of a site for use as a Forest 2020 demonstration site.



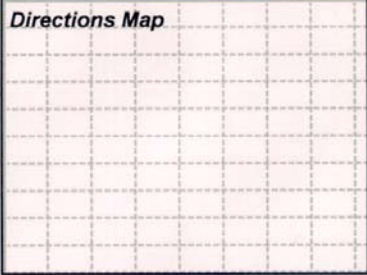
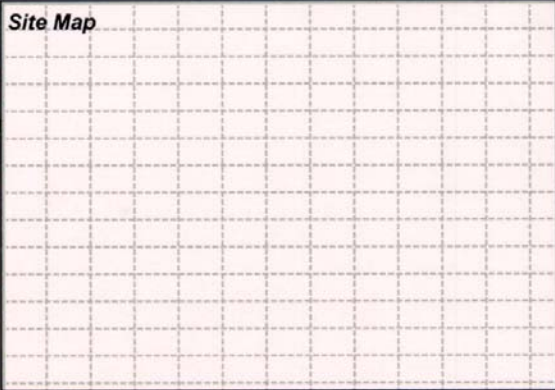
| | | | | | |
|---|--|---|---|--|----------------------|
|  | <h2 style="margin: 0;">Preliminary Site Evaluation Form</h2> |  | | | |
| Site ID # | Province | Landowner Name | Land Location | Assessment Date | Assessed By |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Contact Information | | | Contact Person <small>(If different than landowner)</small> | | |
| Landowner | | | Name | | |
| Address <input type="text"/> | | | <input type="text"/> | | |
| Town <input type="text"/> | | | Address <input type="text"/> | | |
| Province <input type="text"/> Postal Code <input type="text"/> | | | Town <input type="text"/> | | |
| Phone Number <input type="text"/> | | | Province <input type="text"/> Postal Code <input type="text"/> | | |
| Phone Number <input type="text"/> | | | Phone Number <input type="text"/> | | |
| Site Location Information | | | | Directions Map | |
| Closest Community <input type="text"/> | | | |  | |
| Directions From Closest Community <input type="text"/> | | | | | |
| Terrestrial Ecozone | CLI | Latitude | Longitude | | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | | |
| Plant Hardiness Zone | Elevation (m) | | <input type="text"/> | | |
| Site Information | | | |  | |
| Topography | Slope | Slope Position | Aspect | | |
| <input type="text"/> | <input type="text"/> % | <input type="text"/> | <input type="text"/> | | |
| Drainage | Stoniness | Moisture Regime | Site Length (m) | | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | | |
| Present Vegetation | Present Use | Site Width (m) | | | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | | | |
| Soil Texture 15cm | Soil Texture 30cm | Total Area (ha) | | | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | | | |
| pH | Salinity | Tillage Methodology | 2003 Vegetation Cover | | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | | |
| Site History | | | | | |
| Land Use Prior to 1990 | | History 1990-2003 | | | |
| <input type="text"/> | | <input type="text"/> | | | |
| Land Use Prior to 1950 | | | | | |
| <input type="text"/> | | | | | |
| Comments | | | | | |
| <input type="text"/> | | | | | |
| Developed by Tim Keddy and Derek Sidders, Northern Forestry Centre, Edmonton, Alberta (October 16, 2003) | | | | | |

Figure 1. Preliminary Assessment Tallysheet

Preliminary Site Assessment Procedures

Header Information

| | | | | | | |
|---|----------------------|---|----------------------|----------------------|---|--|
| Forest 2020 Plantation Demonstration and Assessment Initiative | | Preliminary Site Evaluation Form | | | Forest 2020 Plantation Demonstration and Assessment Initiative | |
| Site ID # | Province | Landowner Name | Land Location | Assessment Date | Assessed By | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | |

Site ID #

A user defined identifier for each site.

(Example: Region-Province=Number or NOFC-AB-01)

Province

Province in which the site is located.

Landowner Name

Name of landowner with whom the CFS/Landowner agreement will be established.

Land Location

Legal Land Description associated with the potential site delineated to the quarter section.

(Example: Section-Township-Range-Meridian or NW 19-73-12 W5)

Assessment Date

Date assessment is completed, recorded in the dd/mm/yyyy format.

Assessed By

Name of the person completing the assessment. If assessment is completed by a crew of 2 or more people, record the name of the crew chief.

Contact Information

| <i>Contact Information</i> | | <i>Contact Person</i> <i>(if different than landowner)</i> | |
|----------------------------|----------------------|---|----------------------|
| <i>Landowner</i> | | Name | <input type="text"/> |
| Address | <input type="text"/> | Address | <input type="text"/> |
| Town | <input type="text"/> | Town | <input type="text"/> |
| Province | <input type="text"/> | Province | <input type="text"/> |
| Postal Code | <input type="text"/> | Postal Code | <input type="text"/> |
| Phone Number | <input type="text"/> | Phone Number | <input type="text"/> |

Landowner Contact Information

Address, Town, Province, Postal Code

Record the mailing address for the landowner whose name has been recorded in the header.

Phone Number

Record the phone number for the landowner whose name has been recorded in the header in the (xxx) xxx-xxxx format.

Contact Person Information

Name

If the landowner is not the primary contact person for the site, record the name of the contact person.

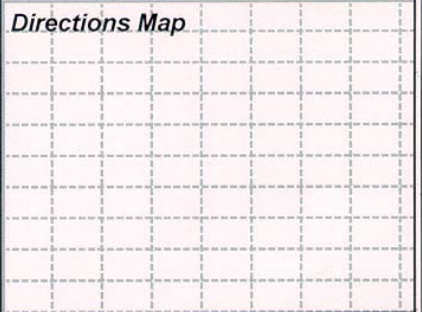
Address, Town, Province, Postal Code

Record the mailing address for the contact person identified above.

Phone Number

Record the phone number for the contact person identified above in the (xxx) xxx-xxxx format.

Site Location Information

| | | | | |
|-----------------------------------|----------------------|----------------------|----------------------|---|
| Site Location Information | | | | Directions Map  |
| Closest Community | | | <input type="text"/> | |
| Directions From Closest Community | <input type="text"/> | | | |
| Terrestrial Ecozone | CLI | Latitude | Longitude | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | |
| Plant Hardiness | Site Suitability | Elevation (m) | <input type="text"/> | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | |

Closest Community

Identify the closest community to the potential site.

Directions From Closest Community

Verbally describe driving directions from the closest community to the potential site. Include highway numbers, directions and distances in kilometers of the primary access to the site. Also include the direction from the primary access to the potential site.

Example: *From Edmonton, travel 14.6 km south on Hwy# 2. Site is adjacent to HWY # 2 on the east side.*

Directions Map

A visual description of the driving descriptions from the closest community to the potential site. Include highway numbers and distances in kilometers of the primary access to the site. Also include location of potential site and a North Arrow.

Terrestrial Ecozone

Identify the applicable ecozone from Figure 2.

CLI

Identify the applicable Canadian Land Inventory Classification from Table 1. A map to assist in the selection of the applicable CLI rating can be found at http://geogratis.cgdi.gc.ca/CLI/index_agriculture.html. If no classification exists for the area, enter N/A.

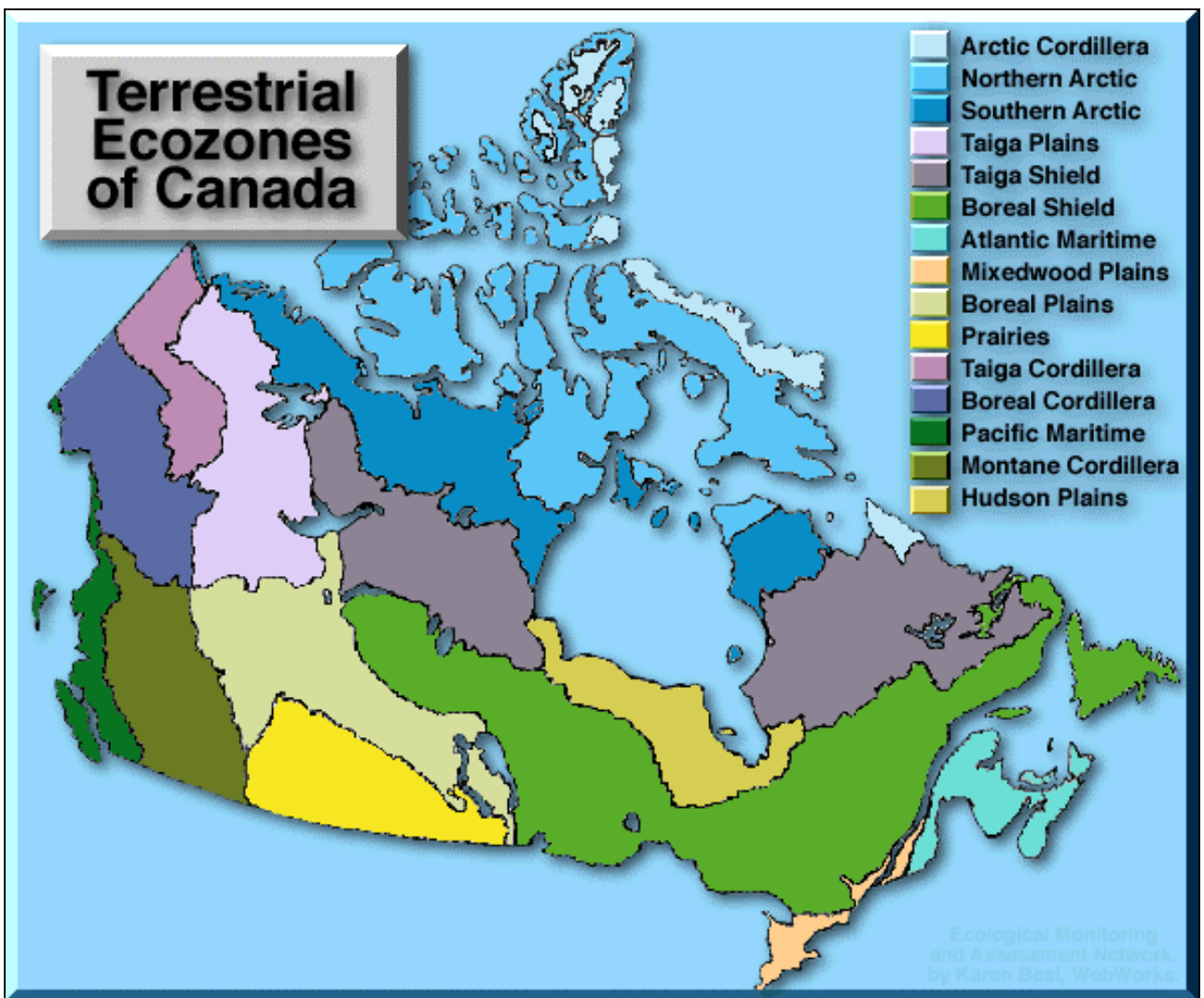


Figure 2. Terrestrial Ecozones of Canada

Table 1. Canadian Land Inventory Classes

| Class | Description |
|-------|--|
| 1 | No significant limitations |
| 2 | Moderate limitations, moderate conservation practices required |
| 3 | Moderately severe limitations, range of crops restricted or special conservation practices required. |
| 4 | Severe limitations |
| 5 | Forage crops improvement practices feasible |
| 6 | Forage crops improvement practices not feasible |
| 7 | No capability for arable culture or permanent pasture |
| 0 | Organic soils |
| W | Water area |
| F | Forest reserves |
| N | National parks |
| U | Urban area |
| P | Provincial parks |
| ? | Unmapped area |

Plant Hardiness Zone

Identify the applicable Plant Hardiness Zone from Figure 3. A map to assist in the selection of the applicable Plant Hardiness Zone information can be found at

<http://sis.agr.gc.ca/cansis/nsdb/climate/index.html>

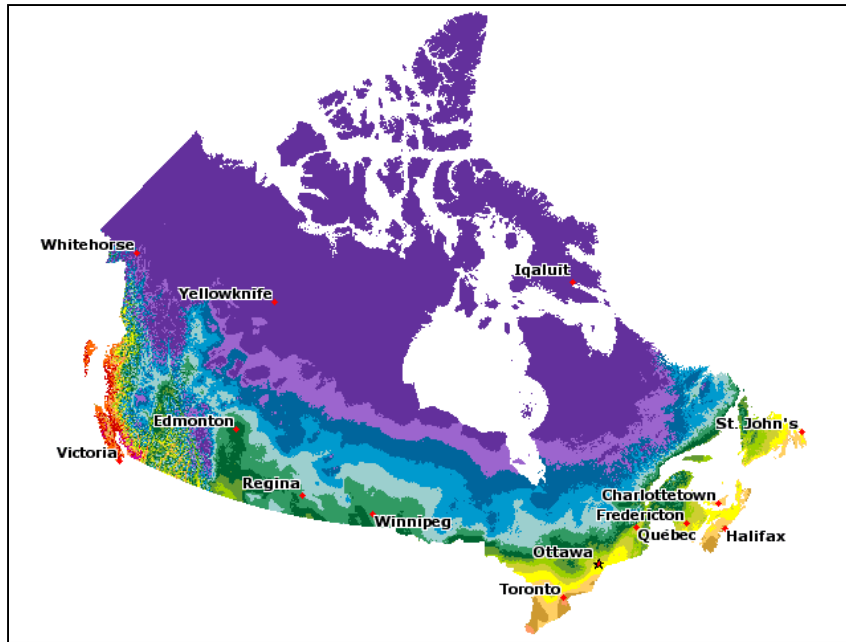


Figure 3. Plant Hardiness Zones of Canada

Site Suitability

Using the newly developed Site Suitability Index for hybrid poplar being developed under the Feasibility Assessment of Afforestation for Carbon Sequestration, record the applicable coding. As of the development of this field guide, the Site Suitability Index system is not operational.

Latitude and Longitude

Using a portable GPS, record the lat/long coordinates of the site. The reading should be taken at the center of the potential site. Ensure the receiver is set using NAD83 datum and the readings should be recorded in the **dd/mm/ss.s** format.

Elevation

Using a portable GPS, record the elevation of the site. The reading should be taken at the center of the potential site. Ensure the receiver is set using NAD83 datum and the readings should be recorded in meters.

Site Information

| Site Information | | | | Site Map |
|----------------------|------------------------|----------------------|-----------------------|----------|
| Topography | Slope | Slope Position | Aspect | |
| <input type="text"/> | <input type="text"/> % | <input type="text"/> | <input type="text"/> | |
| Drainage | Stoniness | Moisture Regime | Site Length (m) | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | |
| Present Vegetation | Present Use | Site Width (m) | | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | | |
| Soil Texture 15cm | Soil Texture 30cm | Total Area (ha) | | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | | |
| pH | Salinity | Tillage Methodology | 2003 Vegetation Cover | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | |

Topography

Record the applicable topography classification of the potential site based on the classification options outlined in Table 3.

Table 3. Topography Descriptions.

| Class | Description |
|-------------------------|--|
| Dissected | A dissected (or gullied) pattern providing external drainage for an area. |
| Hummocky (or irregular) | A very complex sequence of slopes extending from somewhat rounded concavities (or swales) of various sizes to irregular conical knolls (or knobs) and short discontinuous ridges; there is a general lack of concordance between knolls and swales. Slopes are generally 4-70%. Examples are hummocky moraines and hummocky fluvio-glacial landforms. |
| Inclined | A sloping, unidirectional surface with a generally constant slope unbroken by marked irregularity or gullies; a weakly developed dissected pattern provides external drainage for the local area. Slopes are 2-70%; the form of inclined slopes is not related to the initial mode of origin of the underlying material. |
| Knoll and kettle | A chaotic sequence of knolls and kettles (or sloughs), which occupies 15-20% of an area and has no external drainage. Slopes are generally >3%. Examples are morainal plains and hill lands. |
| Level | A flat or very gently sloping, unidirectional surface with a generally constant slope unbroken by marked elevations and depressions. Slopes are generally <2%. Examples are floodplains and lake plains. |
| Rolling | A very regular sequence of moderate slopes extending from rounded and, in some places, confined concave depressions to broad, rounded convexities producing a wavelike pattern of moderate relief. Slope gradients are generally >5% but may be less. This surface form is usually controlled by the underlying bedrock. |
| Ridged | A long, narrow elevation of the surface, usually sharp crested with steep sides; ridges may be parallel, subparallel, or intersecting. Examples are eskers, crevasse fillings, washboard moraines and some drumlins. |
| Steep | Erosional slopes of >70%, present on both consolidated and unconsolidated materials. An example is an escarpment. |
| Terraced | Scarp face and the horizontal or gently inclined surface (or tread) above it. An example is an alluvial terrace. |
| Undulating | A very regular sequence of gentle slopes that extends from rounded and, in some places, confined concavities to broad, rounded convexities producing a wavelike pattern of low local relief. Slope length is generally <0.8 km and the dominant gradient of slopes is usually 2-5%. The terrain lacks an external drainage pattern. Examples are some ground moraines and lacustrine material of varying textures. |

Slope

Record the slope gradient to the nearest percent. On uniform conditions, assess slope by averaging over a 100m distance.

Slope Position

Record the slope position from the following options; Crest, Upper slope, Middle slope, Lower slope, Toe, Depression, or Level.

Aspect

Record the direction that the site is facing by letter code (E, N, S, W, NE, NW, SE, SW) or record as “flat” if no aspect.

Drainage

Record the applicable drainage classification of the potential site based on the classification options outlined in Table 4.

Table 4. Drainage Descriptions.

| CLASS | DESCRIPTION |
|------------------------|--|
| Excessive | Water is removed from the soil very rapidly in relation to supply; excess water flows downward very rapidly if underlying material is pervious; subsurface flow may be very rapid during heavy rainfall provided the gradient is steep; source of water is precipitation. |
| Rapid | Water is removed from the soil rapidly in relation to supply; excess water flows downward if underlying material is pervious; subsurface flow may occur on steep gradients during heavy rainfall; source of water is precipitation. |
| Well | Water is removed from the soil readily but not rapidly; excess water flows downward into underlying pervious material or laterally as subsurface flow. These soils commonly retain optimum amounts of moisture for plant growth after rains or addition of irrigation water. |
| Moderately well | Water is removed from the soil somewhat slowly in relation to supply due to low perviousness, a shallow water table, lack of gradient, or a combination of these factors; precipitation is the dominant source of water in medium to fine textured soils; precipitation and significant additions by subsurface flow are necessary in coarse-textured soils. |
| Imperfect | Water is removed from the soil sufficiently slowly in relation to supply leaving the soil wet for a significant part of the growing season; excess water moves slowly downward if precipitation is the major supply; if subsurface water, groundwater, or both are the main source the flow rate may vary. |
| Poor | Water is removed so slowly in relation to supply that the soil remains wet for a comparatively large part of the time that the soil is not frozen; excess water is evident in the soil for much of the time; subsurface flow, groundwater flow, or both, in addition to precipitation, are the main sources of water; a perched water table may also be present. |
| Very Poor | Water is removed from the soil so slowly that the water table remains at or on the surface for a majority of the time the soil is not frozen; groundwater flow and subsurface flow are the major sources of water; precipitation is less important except where there is a perched water table. |
| | Non-applicable |

Stoniness

Record the overall stoniness of the potential site from the following options using the classifications outlined in Table 5.

Table 5. Stoniness Classifications.

| Code | Meaning | Percentage of surface covered | Distance (meters) between stones or boulders if their diameter is ... | | |
|------|-------------------|-------------------------------|---|---------|----------|
| | | | 25 cm | 60 cm | 120 cm |
| 0 | Nonstony | < 0.01 | > 25 | > 60 | > 120 |
| 1 | Slightly stony | 0.01 - 0.1 | 8-25 | 20 - 60 | 37 - 120 |
| 2 | Moderately stony | 0.1 - 3 | 1-8 | 3-20 | 6-37 |
| 3 | Very stony | 15-Mar | 0.5 - 1 | 1-3 | 2-6 |
| 4 | Exceedingly stony | 15 - 50 | 0.1 - 0.5 | 0.2 - 1 | 0.5 - 2 |
| 5 | Excessively stony | > 50 | < 0.1 | < 0.2 | < 0.5 |

Moisture Regime

Record the applicable moisture regime classification of the potential site based on the classification options outlined in Table 6.

Site Length

The maximum length of the potential site recorded in meters.

Site Width

The maximum width of the potential site recorded in meters.

Total Area

The total area of the potential site recorded in hectares. The area can be calculated from field measurements, aerial photography or satellite imagery.

Table 6. Moisture Regime Descriptions.

| Class | Description | Primary water source |
|--------------|--|--|
| Very xeric | Water removed extremely rapidly in relation to supply; soil is moist for a negligible time after precipitation | precipitation |
| Xeric | Water removed very rapidly in relation to supply; soil is moist for brief periods following precipitation | precipitation |
| Subxeric | Water removed rapidly in relation to supply; soil is moist for short periods following precipitation | precipitation |
| Submesic | Water removed readily in relation to supply; water available for moderately short periods following precipitation | precipitation |
| 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 |
| 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 |
| Hygric | Water removed slowly enough to keep soil wet for most of growing season; permanent seepage and mottling; gleyed colours common | seepage |
| 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 |
| Hydric | Water removed so slowly that water table is at or above soil surface all year; gleyed mineral or organic soils | permanent water table |

Site Map

A visual description of the outside boundaries of the potential site. Include primary access in relation to the potential site and a North Arrow.

Present Vegetation

Record the dominant vegetation growing on the potential site at the time of the assessment from the following options; cereal grains, vegetable crops, stubble, hay, sod, weeds or other (Specify).

Present Use

Record the present use of the potential site at the time of the assessment from the following options; cropland, improved pasture, grazing or abandoned farmland.

Tillage Methodology

Record the tillage methodology used on the potential site in recent history from the following options; conventional till, reduced till or no till.

2003 Vegetation Cover

Record the cover crop grown on the potential site during the 2003 growing season from the following options; cereal grains, vegetable crops, hay, sod, summerfallow or other (Specify).

Soil Texture 15cm

Record the soil texture at a depth of 15cm of the potential site based on the classification options outlined in Table 7 using the guides in Appendices I, II, and III. Collect a sample of the soil at 15cm for analysis of pH and Salinity

Table 7. Soil Texture Classifications.

| Soil Texture | | |
|----------------------|---------------------------|---------------------|
| Clay | Very Fine Sandy Clay Loam | Fine Sand |
| Heavy Clay | Loam | Gravelly Loamy Sand |
| Silty Clay | Sandy Clay Loam | Sand |
| Sandy Clay | Gravelly Sandy Loam | Loamy Sand |
| Clay Loam | Gravelly Loam | Loamy Fine Sand |
| Silty Loam | Sandy Loam | Leaf/Humic |
| Silty Clay Loam | Fine Sandy Loam | Organic |
| Silt | Very Fine Sandy Loam | Rock |
| Fine Sandy Clay Loam | Gravelly Sand | Unclassified |

Soil Texture 30cm

Record the soil texture at a depth of 30cm of the potential site based on the classification options outlined in Table 7 using the guides in Appendices I, II, and III.

pH and Salinity

Either through the use of field equipment or lab analysis, determine the pH and Salinity of the soil sample collected at a depth of 15cm.

Site History

| Site History | |
|------------------------|----------------------|
| Land Use Prior to 1990 | History 1990-2003 |
| <input type="text"/> | <input type="text"/> |
| Land Use Prior to 1950 | |
| <input type="text"/> | |

Land Use Prior to 1990

Record the use of the potential site prior to 1990 from the following options; cropland, improved pasture, grazing, abandoned farmland or forest.

Land Use Prior to 1950

Record the use of the potential site prior to 1950 from the following options; cropland, improved pasture, grazing, abandoned farmland, forest or unknown.

History 1990 - 2003

Complete a detailed history of the potential site from 1990 to 2003.

Comments

Comments

Developed by Tim Keddy and Derek Sidders, Northern Forestry Centre, Edmonton, Alberta

(October 16, 2003)

Comments

Record any other pertinent information needed to determine the suitability of the potential site for inclusion in the Forest 2020 initiative.

Glossary

Forest

For the purposes of the Kyoto Protocol, Canada is bound to the internationally agreed definition of Forest in the Marrakech Accords^[1], which specifies a range of minimum values for three parameters used to define forests: *“Forest” is a minimum area of land of [0.05-1.0] hectares with tree crown cover (or equivalent stocking level) of more than [10-30] per cent with trees with the potential to reach a minimum height of [2-5] metres at maturity in situ. A forest may consist either of closed forest formations where trees of various stories and undergrowth cover a high proportion of the ground or open forest.”*

The definition of forest also includes forests that are in a transitional state, where the tree cover is temporarily below the low end of the minimum range specified in the first part of the definition of forest:

“Young natural stands and all plantations which have yet to reach a crown density of [10-30] per cent or tree height of [2-5] metres are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to fore.

Afforestation

“Afforestation” is the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources.

Reforestation

“Reforestation” is the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. For the first commitment period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forest on 31 December 1989.

Cropland

Land being used to grow annual crops.

Improved Pasture

Land being used to grow hay. May be also used for pasture at certain times of the year..

Grazing

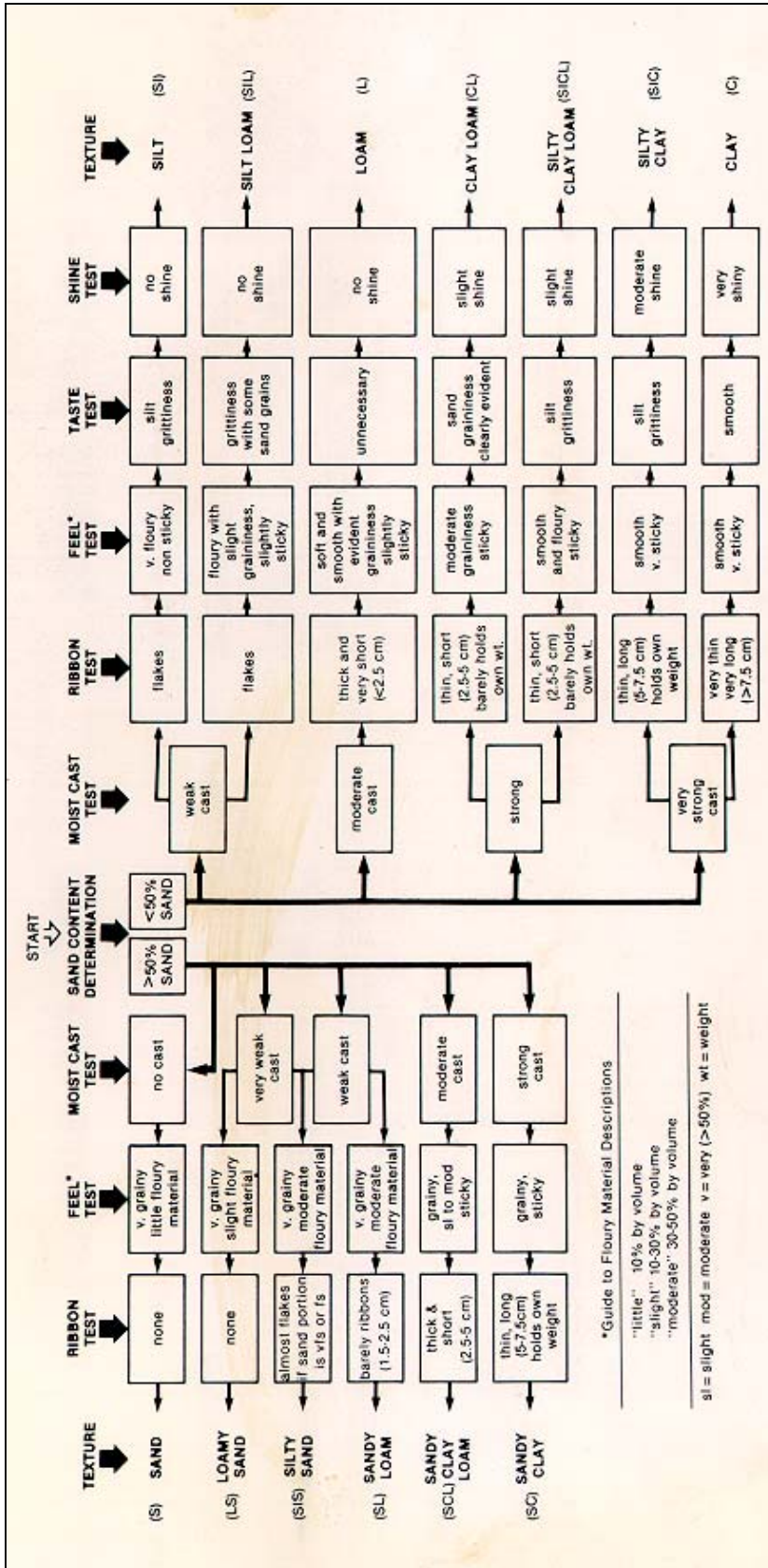
Land being used strictly for pasturing of animals.

[1] Report of the Conference of the Parties on its seventh session, held at Marrakesh from 29 October to 10 November 2001. Addendum. Part two: Action taken by the Conference of the Parties. Volume I. [FCCC/CP/2001/13/Add.1](http://www.unfccc.org/Docs/CP/2001/13/Add.1). Available on the UNFCCC website in French and English.

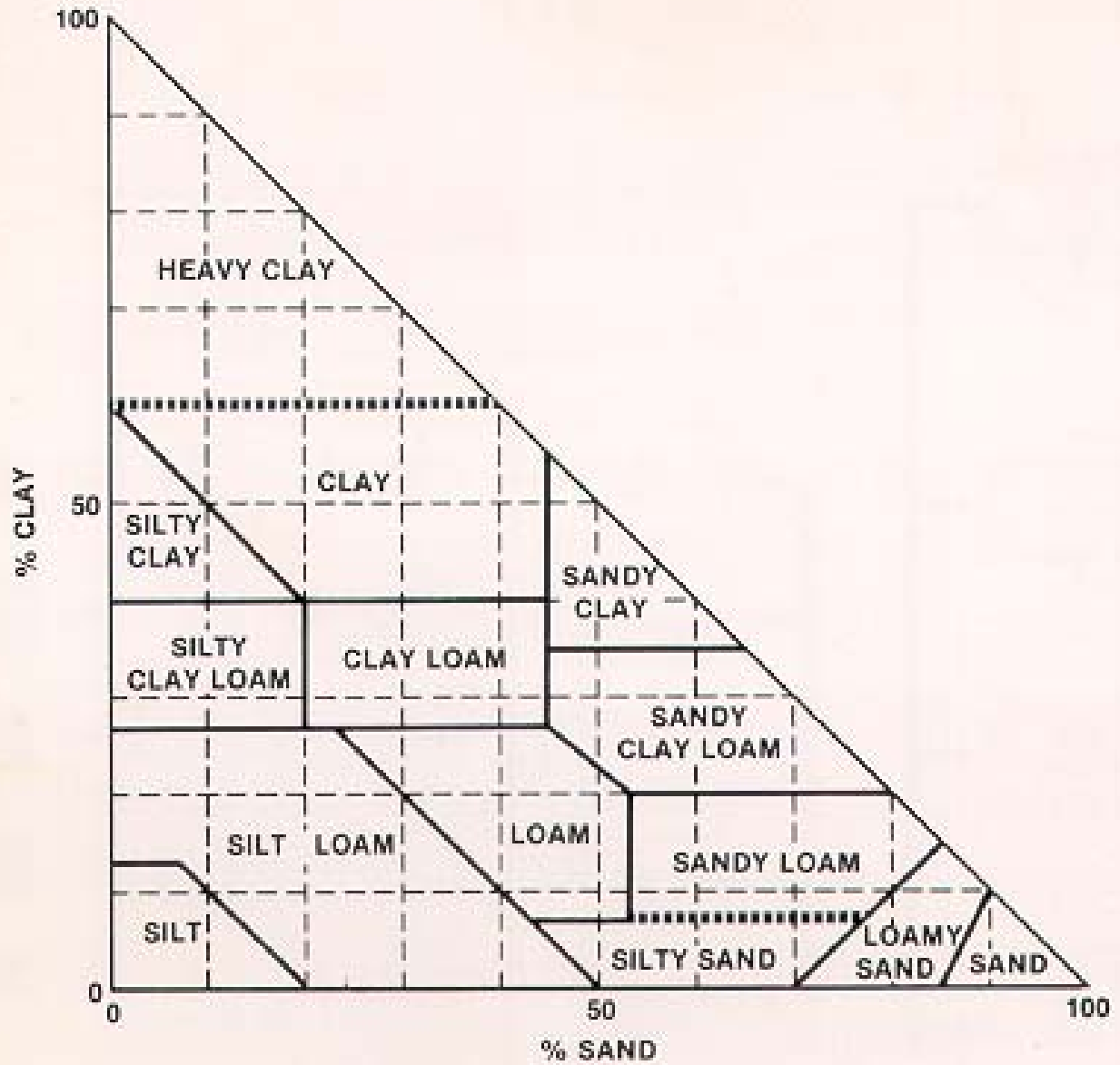
Appendix I

| TEXTURE CLASS | FEEL TEST | MOIST CAST TEST | RIBBON TEST | TASTE TEST | SHINE TEST |
|-----------------|--|------------------------------------|---|---------------------------------------|------------------|
| SAND | grainy with little floury material | no cast | none | unnecessary | unnecessary |
| LOAMY SAND | grainy with slight amount of floury material | very weak cast no handling | none | unnecessary | unnecessary |
| SILTY SAND | grainy with moderate amount of floury material | weak cast, no handling | almost flakes if sand portion is v/s or f/s | unnecessary | unnecessary |
| SANDY LOAM | grainy with moderate amount of floury material | weak cast, allows careful handling | barely ribbons (1.5-2.5 cm) | unnecessary | unnecessary |
| LOAM | fairly soft and smooth with evident graininess | good cast, readily handled | thick and very short (<2.5 cm) | unnecessary | unnecessary |
| SILT LOAM | floury with slight graininess | weak cast, allows careful handling | flakes, rather than ribbons | silt grittiness, some sand graininess | unnecessary |
| SILT | very floury | weak cast, allows careful handling | flakes, rather than ribbons | silt grittiness | unnecessary |
| SANDY CLAY LOAM | very substantial graininess | moderate cast | short and thick (2.5-5 cm) | sand graininess clearly evident | slightly shiny |
| CLAY LOAM | moderate graininess | strong cast | fairly thin, breaks readily, barely supports own weight | sand graininess clearly evident | slightly shiny |
| SILTY CLAY LOAM | smooth and floury | strong cast | fairly thin, breaks readily, barely supports own weight | silt grittiness | slightly shiny |
| SANDY CLAY | substantial graininess | strong cast | thin, fairly long (5-7.5 cm) holds own weight | sand graininess clearly evident | moderately shiny |
| SILTY CLAY | smooth | very strong cast | thin, fairly long (5-7.5 cm) holds own weight | silt grittiness | moderately shiny |
| CLAY | smooth | very strong cast | very thin, very long (<7.5 cm) | smooth | very shiny |

Appendix II



Appendix III



texture triangle