

*Sampling Protocol for Peatland Monitoring as Part of the Poplar River First Nation
(PRFN) Adaptation Project*

June 2018



1. GENERAL OVERVIEW

Beginning in 2018 and as part of Crown-Indigenous Relations and Northern Affairs Canada's First Nation Adapt Program, Poplar River First Nation (PRFN) and its partner North/South Consultants Inc. (NSC) have developed a sampling protocol for monitoring representative peatlands adjacent to the community and within the traditional territory of PRFN. The objective of this sampling protocol is to inform PRFN staff involved in the project on the collection of peatland data related to peat cores and soil profile moisture.

2. SAMPLING SITES

Samples of peatland (fen and bog) cores will be collected at or as close to predetermined sampling sites. Peat core sampling sites in 2018 were selected from a total of 38 within the PRFN Traditional Territory. Sites may have to be relocated in the general vicinity of the preselected sites if organic soils are not found at the provided coordinates (UTMs).

3. SAMPLING TIMES

Sampling for peat profile soil moisture will be conducted mid-summer (July and August).

4. SAMPLING METHODS

Sampling methods are based loosely on previous methodologies used (Malley 2007), and will include extracting peat cores at the preselected sites using a Peat Sampler (Eijkelkamp), taking soil moisture readings of the cores using SM150T soil moisture sensor (Delta T Devices Ltd.), and documenting the core characteristics and depth to water table and mineral soils.

4.1 SAMPLING SEQUENCE

At each of the peat core sampling sites, the field crew will be responsible for taking three core samples in the nearby area measuring *in situ* peat core soil moisture at 0.5 meter depth increments, in addition to photographing and documenting the core using the equipment described below.

4.2 PEAT CORE SAMPLING EQUIPMENT

The sampling kit will include the following:

- Garmin handheld GPS;
- Ruggedized point and shoot camera;
- Peat Sampler kit (Eijkelkamp);
- SM150T soil moisture sensor (Delta T Devices Ltd.);
- Field data entry sheets (write in the rain);
- Tape measure;
- Field thermometer.

4.3 SAMPLING INSTRUCTIONS

At each site, peat core samples will be collected three times within 5 metres of each other using the peat sampler. While one person is assembling the sampling gear the other person should be documenting the site/sample characteristics, using the GPS and camera.

The following steps should be followed to collect samples:

1. Arrive at site using handheld GPS navigation.
2. Assess site and begin filling out site information on Peatland Monitoring Sample Sheet (Page 5 and 6).
 - a. Site/Sample Name
 - b. Coordinates from GPS
 - c. Date/time and relative weather conditions
 - d. Circle Dominant Vegetation (Trees (e.g. tamarack, black spruce), Shrubs, grasses/sedge, moss).
 - e. Photo record, description, and photo number in each direction (North, East, South, West).
 - f. Small sketch of site location, or make notes on laminated map (Example show site distance relative to shoreline etc.)
3. Surface Sample:
 - a. Hold down waypoint button on GPS over top of selected sampling site (this will create a new site, name it or leave auto number e.g. 001, record the name on the data sheet)
 - b. Take photo of spot on ground where the Peat Sampler will be used to take core, record photo number.
 - c. Insert SM150T probe Soil Moisture Sensor into the ground vertically and take reading from Soil Moisture Meter, add soil moisture reading output (e.g. 23%) from logger to data sheet; repeat two more times. Add any notes or comments.
4. First Core Sample (0–50cm)
 - a. Position Peat Sampler over sample spot vertically, holding on to handle.
 - b. Insert Peat Sampler without rotating to top of sampler (50 cm depth).
 - c. Once at depth give auger half turn clockwise, gouge will make a half circle, pivoting on the blade's hinges. Complete remaining half circle in clockwise direction.
 - d. Lift auger vertically to the surface (straight back and bent knees to prevent injury)
 - e. Lay the sampler flat on the ground with the blade on top of the gouge.
 - f. Turning the blade a half circle in a horizontal position will clean the gouge, presenting a hardly disturbed sample laid out on the blade.
 - g. Assess core sample, take a picture and record the photo number on the data sheet. Record depth to standing water in core hole if applicable, record depth to mineral soil if applicable. Indicate (circle) relative texture of organic soil. Indicate (circle) mineral soil type if applicable.
 - h. take three soil moisture readings in the top 1/3 (0-17 cm), middle third (17-34cm), and bottom third (34 – 50 cm) of the core sample, using the tape measure as a guide. Recording three readings for each depth in the profile on the data sheet.

5. Repeat Step 4 a to h for next 50cm (50 – 100m) sample. Add 1 meter extension if required. Enter data as required.
6. Repeat Step 4 a to h for next 50cm (100 – 150m) sample. Add 1 meter extension if required. Enter data as required.
7. Continue profile until mineral soil encountered.
8. Once complete take a photo of both sides of the sample sheet, in order to preserve a digital record.
9. Continue with second replicate on a new data sheet. Move 5 paces (5m) from the last core sample and repeat steps 3 – 8.
10. Continue with third and final replicated. Move 5 paces from the last core sample and repeat steps 3- 8.

5. REFERENCES

Malley, D.F. 2007. Putting Manitoba peatlands on the map. Informal progress report on Manitoba Climate Change Action Find Project. Sampling peatlands on the East side of Lake Winnipeg, Poplar River First Nation Traditional Lands. PDK Projects Inc. 13

PEAT CORE SAMPLING DATA SHEET (FRONT PAGE)

PRFN PEATLAND MONITORING SAMPLE SHEET

SITE:	SAMPLE (Replicate):	AIR TEMP:
SAMPLE UTM: EASTING:	NORTHING:	WAYPOINT NAME or#:
ALTITUDE:		SKY (circle): sun mostly sun partly cloud overcast
DATE:	TIME:	Precipitation (circle): during recent none/dry

SITE NOTES:

DESCRIPTION: (Bog, Fen, Marsh, Upland) Dominant Vegetation: (Tree, shrub, sedge, moss): Photo North Direction Description: Photo East Direction Description: Photo South Direction Description: Photo West Direction Description:	SITE SKETCH:
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SURFACE SAMPLE:				
Vegetation Description: Photo#:	1	2	3	Comments
SURFACE SOIL MOISTURE:	Reading 1	Reading 2	Reading 3	Comments
PROFILE 1 (0 to 50 cm depth)				
Profile Photo#:	<u>Organic</u> (circle) Fibric - roots Melicic -moderate Humic - fine	DEPTH TO MINERAL	Mineral (circle) clay or silt sand rock	DEPTH TO WATER TABLE (cm)
SOIL MOISTURE - Top 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Middle 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Bottom 17 cm	Reading 1	Reading 2	Reading 3	Comments
PROFILE 2 (50 to 100 cm depth)				
Profile Photo#:	<u>Organic</u> (circle) Fibric - roots Melicic -moderate Humic - fine	DEPTH TO MINERAL	Mineral (circle) clay or silt sand rock	DEPTH TO WATER TABLE (cm)
SOIL MOISTURE - Top 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Middle 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Bottom 17 cm	Reading 1	Reading 2	Reading 3	Comments

PEAT CORE SAMPLING DATA SHEET (BACK PAGE)

PRFN PEATLAND MONITORING SAMPLE SHEET

PROFILE 3 (100 to 160 cm depth)				
Profile Photo#:	Organic (circle) Fibric - roots. Metic - moderate Humic - fine	DEPTH TO Mineral	Mineral (circle) day or with sand rock	DEPTH TO WATER TABLE (cm)
SOIL MOISTURE - Top 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Middle 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Bottom 17 cm	Reading 1	Reading 2	Reading 3	Comments
PROFILE 4 (160 to 200 cm depth)				
Profile Photo#:	(circle) Fibric - roots. Metic - moderate Humic - fine	DEPTH TO Mineral	Mineral (circle) day or with sand rock	DEPTH TO WATER TABLE (cm)
SOIL MOISTURE - Top 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Middle 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Bottom 17 cm	Reading 1	Reading 2	Reading 3	Comments
PROFILE 5 (200 to 260 cm depth)				
Profile Photo#:	Organic (circle) Fibric - roots. Metic - moderate Humic - fine	DEPTH TO Mineral	Mineral circles day or with sand rock	DEPTH TO WATER TABLE (cm)
SOIL MOISTURE - Top 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Middle 17 cm	Reading 1	Reading 2	Reading 3	Comments
SOIL MOISTURE - Bottom 17 cm	Reading 1	Reading 2	Reading 3	Comments
ADDITIONAL NOTES				