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Protocol status: In development
We are still developing and optimizing this protocol

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PROTOCOL integer ID:
30756

Tree Mapping for Leaf Collection (Megantic Only) V.1

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Vellend Cabo

ABSTRACT

Here, we describe the standardized protocol used by the [Canadian Airborne Biodiversity Observatory](#) (CABO) in preparation of the collection of trees during the leaf spectra effort at Parc national du Mont-Mégantic. It represents what the leaf spectra crew asked the veg crew to do prior to their arrival at the Megantic site, in order to save time, as the veg crew has easier access to this site and is familiar with it.

ATTACHMENTS

[CABO_species_list_per_site_2019.xlsx](#)

MATERIALS

Equipment		
Hammer and nails		NAME
-		BRAND
-		SKU

Equipment		
Numbered Aluminium Tree Tags		NAME
-		BRAND
-		SKU

Equipment		
S41		NAME
Cellphone		TYPE
CAT		BRAND
-		SKU
https://www.catphones.com/en-us/cat-s41-smartphone/		LINK

BEFORE START INSTRUCTIONS

SITE SPECIFIC INFORMATION

Parc national du Mont-Mégantic

- Project: "2019-Crofts-PhD-UdeS".
- Site: "MtMeg-1".
- Address: For plots in the Mont-Saint-Joseph area, park at 4491 Chemin de la Montagne, Val-Racine, QC G0Y 1E1. For plots in the Franceville area, park in the Franceville parking lot.
- Project Leaders: Anna Crofts and Mark Vellend.
- Local crew for 2019: Anna Crofts, Sabine St-Jean, Guillaume Tougas, Charlotte Taillefer, Florence Normand-Boisseau and Juliette Frappier-Lecomte.
- Park contacts: Camille-Antoine Ouimet, Head of Conservation, Maintenance and Infrastructures (ouimet.camilleantoine@sepaq.com) and Mélina Dubois-Verret, Partnership Consultant (duboisverret.melina@sepaq.com).
- Notice: The park patrol officers need to be notified via email on the same day or before of details about the upcoming tree surveys (where, when, how many people; see the attached "Sample_notice_park_rangers.txt" file under the "Abstract" tab of this protocol). A research permit has to be carried by each team during the surveys.
- Number of plots: 30 in 2019.
- Site gradients of interest: species composition, elevation, slope orientation, and logging history.
- Conservation value: high, but trampling is only a problem in the wet areas.
- Magnetic declination: about -15° 21' (West).

/!\ Magnetic declination changes with time, and has to be verified shortly before fieldwork on <http://www.magnetic-declination.com/>

- Plant ID resources:

- Arbres et plantes forestières du Québec et des Maritimes, Michel Leboeuf, Éditions Michel Quintin, 2016.

Tree Selection and Scouting

- 1 During site reconnaissance (walking between plots), pay attention to: 1) individuals of rare tree species (see attached Species List per Site and [step 11 of the Canopy Trees Survey Protocol - Forests of Southern Québec](#)), and 2) trees that meet the Leaf Spectra selection criteria.

Note

Leaf Spectra Selection Criteria:

- Leaves exposed to direct sunlight for at least 6 hrs a day.
- Tree height that allows for leaf collection (target leaves located at ____ m at most).
- Within 30 mins, ideally 15 mins, from parking spots for the Leaf Spectra van.
- If possible, sample individuals of the same species across the park (i.e., in both sectors and across the altitudinal gradient).
- Goal: 10 individual trees per species, for the common species; and 5 individual trees per species, for rare species (see attached Species List).

Details to know to assist the Leaf Spectra Crew during leaf collection:

- The Leaf Spectra van, once settled, won't move for the rest of the day.
- Once harvested from the tree, the leaves must remain attached to the branch during transportation to the Leaf Spectra van.
- If leaf collection occurs before aerial imagery, do not collect leaves inside the plots.

Record Creation and Tree Marking

- 2 From the *Fulcrum* main menu, go to the Plants app to create and save individuals.

Equipment

S41

NAME

Cellphone

TYPE

CAT

BRAND

-

SKU

<https://www.catphones.com/en-us/cat-s41-smartphone/>

LINK

CABO CABO

Q Type to filter your apps - 13 total

Exports Imports

Active

Sort by Last Activity

Plots

Small areas of well-defined shape/size, within which environmental conditions are relatively homogenous. Example: forest inventory plots.

Last activity 19 minutes ago

139 records

Bulk Leaf Samples

Bulk samples of fresh leaves for spectral and trait measurements.

Last activity about 21 hours ago

940 records

Plants

Individual plants that are georeferenced, identified, measured, and/or sampled.

Last activity about 21 hours ago

1,160 records

Vegetation Surveys: Herbs and Shrubs

Surveys of low-lying herbaceous and/or woody vegetation.

106 records

19 minutes ago

Sabine St-Jean submitted 1 record in Plots.

0 created 1 updated 0 deleted

28 minutes ago

Sabine St-Jean submitted 1 record in Plots.

1 created 0 updated 0 deleted

21 hours ago

Paul Hacker submitted 9 records in Bulk Leaf Samples.

0 created 9 updated 0 deleted

21 hours ago

Paul Hacker submitted 9 records in Plants.

0 created 9 updated 0 deleted

21 hours ago

Paul Hacker submitted 1 record in Bulk Leaf Samples.

0 created 1 updated 0 deleted

21 hours ago

Paul Hacker submitted 9 records in Plants.

0 created 9 updated 0 deleted

Fulcrum
 CABO CABO
?
⚙️

Plants

Individual plants that are georeferenced, identified, measured, and/or sampled.

Last activity about 21 hours ago

1160
records

29
contributors

Records
View/Edit Data

Importer
Import Data

Exporter
Export Data

Activity

Paul Hacker submitted 9 records 20 hours ago	0 created 9 updated 0 deleted
Paul Hacker submitted 9 records 20 hours ago	0 created 9 updated 0 deleted
Paul Hacker submitted 1 record 5 days ago	1 created 0 updated 0 deleted
Paul Hacker submitted 3 records 5 days ago	3 created 0 updated 0 deleted
Paul Hacker submitted 1 record 5 days ago	1 created 0 updated 0 deleted

3 Create a new record.

Fulcrum
 Plants
 ⚙️

🔍
🔴
|||
1002 records

📄
📁
📊
+
⚙️

Download Data

4 Under Plants → Metadata → Project, select the appropriate project name (see Site Specific Info).

Plants *(editing)*

44678725, 147, Larix laricina (Du Roi) K. Koch

Metadata

Created (device)	22/07/2019 à 14:46:22 4 months ago by Anna Crofts
Updated (device)	01/11/2019 à 22:37:56 3 weeks ago by Anna Crofts
Created (web)	22/07/2019 à 18:05:25 4 months ago by Anna Crofts
Updated (web)	01/11/2019 à 22:43:58 3 weeks ago by Anna Crofts
Duration	1 minute, 23 seconds (Total Time) 14 seconds (Most Recent Update) 1 minute, 2 seconds (First Creation)
Source	Fulcrum Android 2.33.5 / Android 8.0.0 / BullittGroupLimited S41
Location	45.474250, -71.200653 Change
Created Location	45.474202, -71.200667 (3m accuracy, 5.4m from the record)
Updated Location	45.386962, -71.912398 (3m accuracy, 56399.2m from the record)
Record Status	Pending Verification
Project	2019-Crofts-PhD-UdeS

- 5 Under Plants → Site and Plot, select the appropriate Site and leave the Plot field blank (see Site Specific Information).

Plants *(editing)*

44678725, 147, Larix laricina (Du Roi) K. Koch

Site and Plot

Site	* MtMeg-1		
Plot	Select		

Site Plot Information

Site ID	MtMeg-1
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- 6 Permanently tag the tree using aluminium tree tags numbered 1-200 –place tag on the far side of tree, so it cannot be seen from the trail. Under Plants → Plant, answer 'Yes' to Plant Tagged?, record the tag number next to Tag ID, and answer 'aluminium tag' to Tag Type. Add any other relevant info next to Plant Remarks.

Equipment		
Hammer and nails		NAME
-		BRAND
-		SKU

Equipment		
Numbered Aluminium Tree Tags		NAME
-		BRAND
-		SKU

Plants *(editing)*

44678725, 147, Larix laricina (Du Roi) K. Koch

Plant

Plant ID	44678725	
Plant Tagged?	<input checked="" type="button" value="Yes"/> <input type="button" value="No"/>	
Tag ID	* 147	
Tag Type	* aluminium tag	
Tag Remarks	LL4 (on flagging)	
Plant Photos	<input type="button" value="Select File"/>	
Close-Up Photos	<input type="button" value="Select File"/>	
Plant Remarks	For leaf collection	

- Under Plants → Plant First Occurrence, indicate the names of the team members (one or more) who first observed the plant as well as the date of the first observation of the plant.

✕

Plants *(editing)*

✓

44678725, 147, Larix laricina (Du Roi) K. Koch

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Plant First Occurrence

⬆

First Observed By

*

Alizée Girard

Anna Crofts

Antoine Mathieu

Alexandra Massey

Charlotte Taillefer

Clément Robert-Bigras

Deep Inamdar

Etienne Laliberté

Florence Blanchard

Guillaume Tougas

Isabelle Gareau

Kathryn Elmer

Madeleine Trickey-Massé

Margaret Kalacksa

Maria Juliana Pardo Losada

Mark Vellend

Myriam Cloutier

Oliver Lucanus

Pablo Arroyo

Paul Hacker

Rime Néron

Rosalie Beauchamp-Rioux

Sabine St-Jean

Sabrina Demers-Thibeault

Xavier Guilbeault-Mayers

Other

⬆

?

Date First Observed

*

22 / 07 / 2019

✕

?

First Occurrence Remarks

⋮

?

- 8 Under Plants → Location, precisely georeference the tree location by clicking Update location with GPS on your field cellphone connected to the Trimble GPS – coordinates will automatically be imported to the Latitude, Longitude, Horizontal Accuracy and Altitude fields.

×

Plants *(editing)*

✓

44678725, 147, Larix laricina (Du Roi) K. Koch

⌚

Location

Latitude (degrees)

45.47425

i

Longitude (degrees)

-71.2006533

i

Horizontal Accuracy (m)

3

i

Altitude (m)

488.1

i

Vertical Accuracy (m)

i

Current GPS Information

Your GPS is not accessible. No Location Available

Update Location with GPS

Update Location with GPS

- 9 Under Plants → Taxon, select the name of the plant species from the VASCAN Taxon list.

×

Plants *(editing)*

✓

44678725, 147, Larix laricina (Du Roi) K. Koch

⌚

Taxon

Taxon Checklist

* VASCAN

i

VASCAN Taxon

* Larix laricina (Du Roi) K. Koch

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i

- 10 Under Plants → Taxonomic Identification, indicate the team members (one or more) the tree was Identified By, enter the Date Identified, and indicate the Identification Protocol.

Plants *(editing)*

44678725, 147, Larix laricina (Du Roi) K. Koch

Taxonomic Identification

Identified By

Alizée Girard

Anna Crofts

Antoine Mathieu

Alexandra Massey

Charlotte Taillefer

Clément Robert-Bigras

Deep Inamdar

Etienne Laliberté

Florence Blanchard

Guillaume Tougas

Isabelle Gareau

Kathryn Elmer

Madeleine Trickey-Massé

Margaret Kalacksa

Maria Juliana Pardo Losada

Mark Vellend

Myriam Cloutier

Oliver Lucanus

Pablo Arroyo

Paul Hacker

Rime Néron

Rosalie Beauchamp-Rioux

Sabine St-Jean

Sabrina Demers-Thibeault

Xavier Guilbeault-Mayers

Other

Date Identified

22 / 07 / 2019

Identification Protocol

botanical knowledge only

field guide, flora or other published source

comparison with herbarium specimen

Other

Identification Qualifier

Identification Remarks

Identification Audio Remarks

Select File

11 Save your record.

Plants *(editing)*

44678725, 147, Larix laricina (Du Roi) K. Koch

Taxon

Taxon Checklist

VASCAN

VASCAN Taxon

Larix laricina (Du Roi) K. Koch