



Apr 08, 2020

Small Drone Photos - Open Vegetation Protocol

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In Development

dx.doi.org/10.17504/protocols.io.9zch72w

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ABSTRACT

Here we describe the standardised protocol used by the [Canadian Airborne Biodiversity Observatory](#) (CABO) to take small drone pictures of the plots and subplots in open vegetation surveys. In 2019, such pictures were taken at the Mer Bleue Bog (Ontario) and Parc national des îles-de-Boucherville (Québec) sites. These pictures are to be classified later (see [the Post Processing protocol](#)) to obtain the abundance and distribution of plant species through every subplot.

EXTERNAL LINK

<http://caboscience.org/>

MATERIALS TEXT

 Mavic Air
Drone
DJI - [!\[\]\(a1fb5325ee1c7b346d6307698998af79_img.jpg\)](#)

 CAT S41 Field cellphone - [!\[\]\(32d08c9e37b3f56f0f9dd1a4b89fde76_img.jpg\)](#)

 Go 4
App
DJI -
The application used to connect your cellphone to the drone controller. Your cellphone then becomes the screen interface to control the drone.


DJI GO 4 
Spark, P4 Series, Mavic and Z2
DJI
DJI Photo & Video
★★★★★ Inc. Unmanned
Free



Wood pannel for take-off and landing

-

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SAFETY WARNINGS

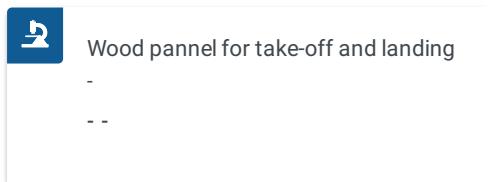
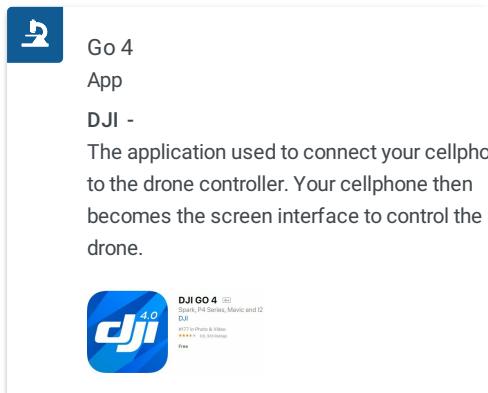
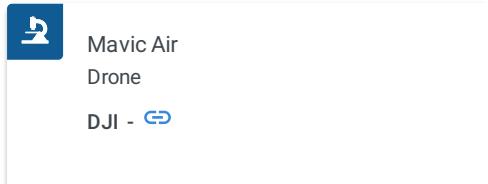
Carry with you your Transport Canada permit as well as the required insurance documentation.

BEFORE STARTING

Ensure all batteries are charged.

Picture-Taking

- 1 Fly the small drone to take photos of the plots and subplots.



- 1.1 Turn on the drone and the controller. Connect the controller to your phone and open the DJI Go 4 App. Press Go Fly. Adjust the settings to Speed = 1:1000 and Iso = 400. If it is very sunny, set the Iso to a lower value; if darker, to a higher value. Activate the Grid option to view lines of the center of the image.



DJI MAVIC 2 ▾



Learn more about your local regulations and policies before takeoff.



- 1.2 Take off.

 Before taking each picture, make sure:

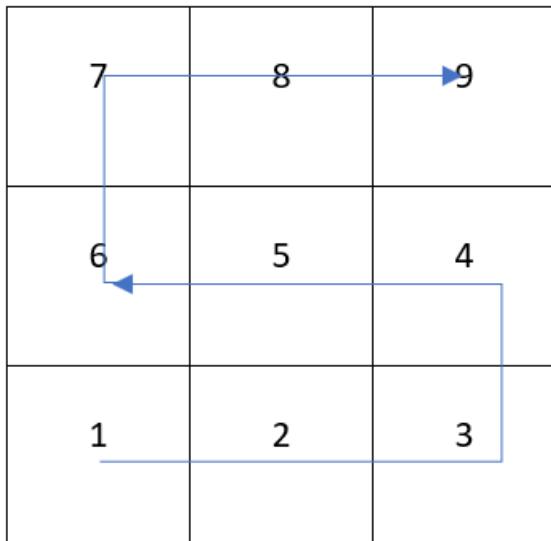
- the camera is at a 90° angle (facing down completely),
- the plot or subplot is centered and its sides are visible,
- and the drone is still.

- 1.3 Take a photo of the whole plot, with the southwest corner of the grid being in the lower-left corner of the picture.



Fly at a sufficient height to see the whole plot.

1.4 Take the photos of each subplot, in the same order as the subplots numbers.



Fly at a sufficient height to see the whole subplot. The ideal height of the drone should be set so that the sides of the subplot can be seen in the image, and otherwise as close to the vegetation as possible without wind created by the drone causing movement of the vegetation (which blurs the image).

1.5 Land the drone on the platform.

- 1.6 From the DJI Go 4 App → Editor → Album → Photo, download all of the original pictures to your cellphone. Turn off the drone and the controller and put them back in their case until the next flight.



Photo Import

- 2 Import the photos.



- 2.1 From your cellphone Photo App → DJI album, move the 10 pictures from the plot (1 for the plot and 9 for the subplots) to a new album titled with the plot name.

Photos 11 h 53
Personnes Lieux Thèmes

PHOTOS SUR L'APPAREIL



DJI Album

CACHE_IMAGE

DJI_SPALSH

ALBUMS

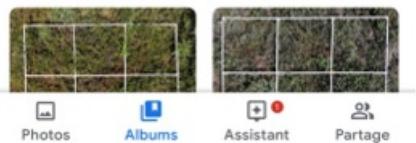


Nouvel album



Tree6

13 éléments



Photos

Albums

Assistant

Partage

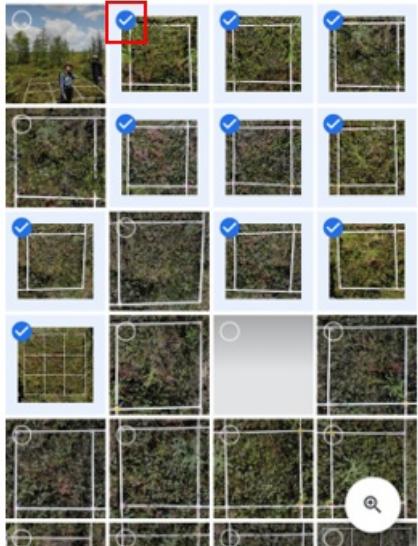
Photos 11 h 52

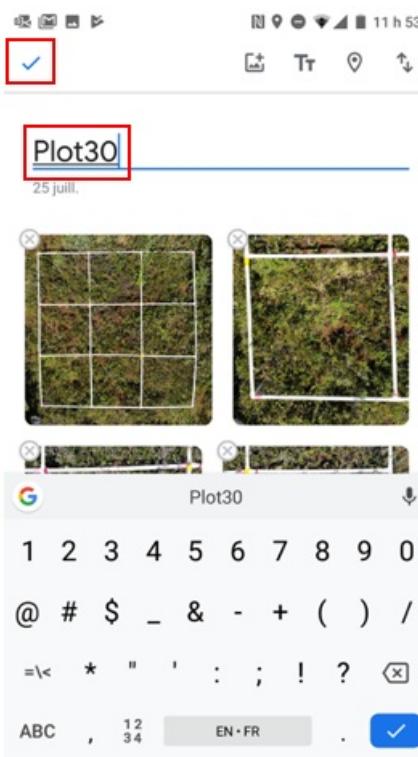
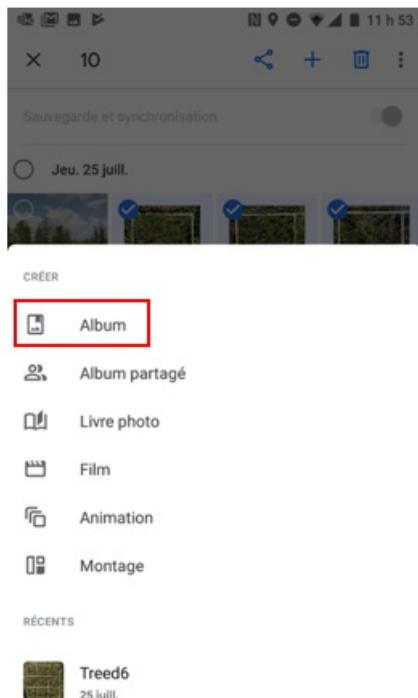
X 10

< + : :

Sauvegarde et synchronisation

Jeu. 25 juill.





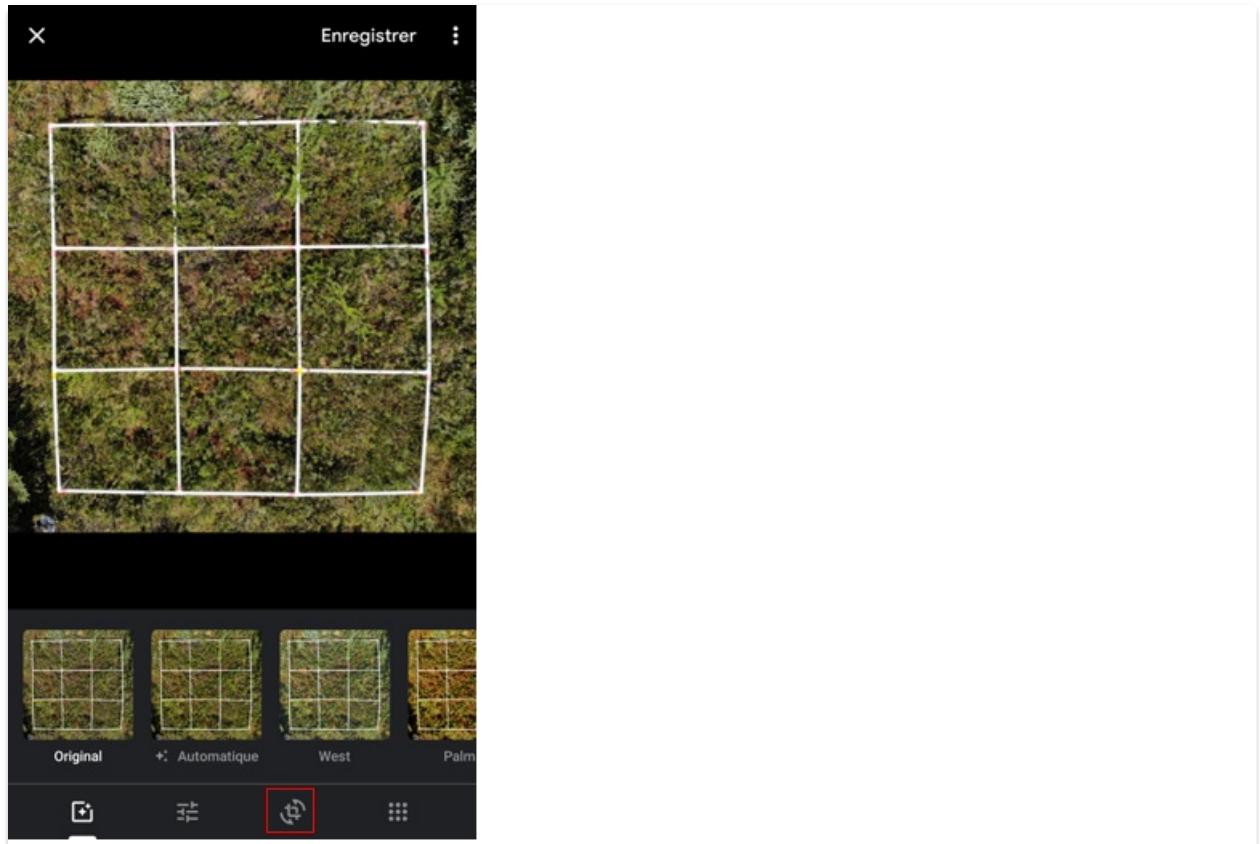
2.2 Crop each picture to limit the area outside the plot or subplots' perimeter. The edges of the PVC pipes forming the plot or

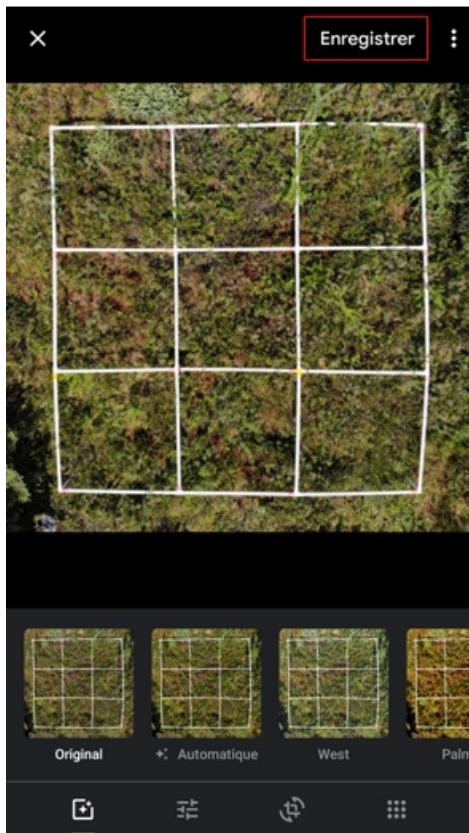
subplot of interest should remain visible.



Once the photos of a given plot have been put in a specific album (step 2.1), steps 2.2 to 2.4 can be done later (i.e., outside the field) to maximize efficiency on the field.







2.3 Upload the picture of the plot to *Fulcrum*, under Vegetation Surveys: Herbs and Shrubs → Survey Event → Vegetation Photos:

Vegetation Surveys: Herbs and Shrubs	
✖	1 record, July 16, 2019
🕒	Sampling Plot
Plot	* 44077962, TreeD1, MBP_veg_crew
Survey Within a Subplot?	* Yes
🕒 Survey Event	
Surveyed By	* Charlotte Taillefer, Guillaume Tougas, Sabine St-Jean
Date Surveyed	* July 16, 2019
Event Remarks	(empty)
Audio Remarks	(empty)
Vegetation Photos: Plot	

Plot.

- 2.4 Upload the picture of the subplots to Vegetation Surveys: Herbs and Shrubs → Cover Estimates: Subplot → Subplots → Record item [1 to 9] → Vegetation Photos: Subplot.

Vegetation Surveys: Herbs and Shrubs

1 record, July 16, 2019

Species List

- *Rhododendron groenlandicum* (Oeder) Kron & Judd
- *Chamaedaphne calyculata* (Linnaeus) Moench
- *Kalmia angustifolia* Linnaeus
- *Aronia melanocarpa* (Michaux) Elliott
- *Vaccinium myrtilloides* Michaux
- *Sphagnum magellanicum* Brid.
- *Sphagnum fallax* H. Klinggr.
- *Polytrichum strictum* Menzies ex Brid.
- *Sphagnum papillosum* Lindb.
- *Vaccinium corymbosum* Linnaeus

Cover Estimates: Subplot

Subplots

10 Items

9 Items

Vegetation Surveys: Herbs and Shrubs

1 record, July 16, 2019 / Subplots (9 Items)

1 record	View >
1 record	View >

Subplots

1 record

Created Location 45.397880, -75.698075 (11m accuracy, 14023.4m from the record)

Updated Location 45.397880, -75.698075 (11m accuracy, 14023.4m from the record)

Subplot * 4407962-44097938, Treed1_1

Cover Estimates 3 Items

- Total Canopy Cover (%): Subplot
- Bare Ground Cover (%): Subplot
- Leaf Litter Cover (%): Subplot
- Total Cover (%): Subplot

Vegetation Photos: Subplot




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