Apr 03, 2020

Post Processing: Abundance and Distribution of Species in Open Vegetation Plots

DOI

dx.doi.org/10.17504/protocols.io.9mrh456

Sabine St-Jean¹

¹Université de Sherbrooke

Canadian Airborne Biodiversity Observatory Tech. support email: jocelyne.ayotte@umontreal.ca



Sabine St-Jean

Université de Sherbrooke



DOI: dx.doi.org/10.17504/protocols.io.9mrh456

External link: http://caboscience.org

Protocol Citation: Sabine St-Jean 2020. Post Processing: Abundance and Distribution of Species in Open Vegetation Plots. **protocols.io**.<u>https://dx.doi.org/10.17504/protocols.io.9mrh456</u>

License: This is an open access protocol distributed under the terms of the <u>Creative Commons Attribution License</u>, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

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

Created: November 22, 2019

Last Modified: April 03, 2020

Protocol Integer ID: 30097

Keywords: open vegetation, virtual point frames, SamplePoint, DJI drone,



Abstract

Here we describe the standardised protocol used by the <u>Canadian Airborne Biodiversity Observatory</u> (CABO) to obtain an estimation of the abundance and distribution of plant species surveyed in the open vegetation plots in sites where small drone pictures are taken using the DJI Mavic Air, being Mer Bleue Bog (Ontario) and Parc national des Îles-de-Boucherville (Québec) in 2019. The *SamplePoint* program is used to process the small drone pictures, where a virtual point frame grid is overlapped to the subplot pictures. The grid is made of 100 crosshairs, representing one crosshair every 10 cm. Every crosshair is then associated to a ground cover. This process results in an Excel spreadsheet where we can extract a percent cover for each species (measure of abundance), and see for each of the 100 crosshairs per subplot what percent cover is present (measure of distribution).

Attachments



Photo Annotations

- 1 If the different species are difficult to tell apart visually, annotate the drone pictures.
- 1.1 From *Fulcrum*, download on your computer the small drone pictures from the 9 subplots of a given plot by following Vegetation Surveys: Herbs and Shrubs → Cover Estimates: Subplots → Subplots → Record [# from 1 to 9] → Vegetation Photos: Subplot → Download → Original.

۲	Vegetation Surveys: Herbs and Shrubs	Ø	\bigcirc
	1 record, July 19, 2019	8	≡
⊙	Species List		Í
۲	Plant Taxa	12 Items	
List - Spi - Spi - Po - Ma - Ka - Rh - Lai - Va - Eri - Va - Ch - Va	of scientific names available: hagnum magellanicum Brid. hagnum papillosum Lindb. lytrichum strictum Menzies ex Brid. nianthemum canadense Desfontaines lmia angustifolia Linnaeus ododendron groenlandicum (Oeder) Kron & Judd rix Iaricina (Du Roi) K. Koch ccinium oxycoccos Linnaeus iophorum vaginatum Linnaeus ccinium myrtilloides Michaux amaedaphne calyculata (Linnaeus) Moench ccinium angustifolium Aiton		
⊙	Cover Estimates: Subplot		
۲	Subplots	9 Items	

۲	Vegetation Surveys: Herbs and Shrubs	0
	1 record, July 19, 2019 / Subplots (9 Items)	8
1 re	cord	View 💙
1 re	cord	View 💙
1 re	cord	View 💙
1 re	cord	View >
1 re	cord	View >
1 re	cord	View >
1 re	cord	View >
1 re	cord	View >
1 re	cord	View 💙

۲	Subplots	Ľ	\bigcirc
	1 record		8
Crea	ated Location	45.409077, -75.516663 (3m accuracy, 1.8m from the record)	^
Upd	ated Location	45.397892, -75.698123 (15m accuracy, 14226.0m from the record)	
Sub	plot *	44083370-44100544, 1	0
۲	Cover Estimates	9 Items	
Tota	l Canopy Cover (%): Subplot		0
Bare	e Ground Cover (%): Subplot		0
Leaf	Litter Cover (%): Subplot		0
Tota	l Cover (%): Subplot		0
Veg	etation Photos: Subplot		,



1.2 Open the 9 pictures in a single PowerPoint file, with each slide corresponding to one subplot.

En	registrem	ent aut	omatique
Fichi	er Acc	cueil	Inserti
	n X □ [≞ - ≪	N dia	ouvelle positive *
Presse	-papiers	5	Dia
		^	
2			
3			
4			
5			
6			
7			
8			
9			

1.3 Use the species list from $Fulcrum \rightarrow$ Vegetation Surveys: Herbs and Shrubs \rightarrow Subplot Record \rightarrow Cover Estimates to locate each plant species, paying attention to the Canopy Remarks (abundance and distribution).

۲	Vegetation Surveys: Herbs and Shrubs	Ø	\odot
	1 record, July 19, 2019	1	≡
۲	Species List		^
۲	Plant Taxa	12 Items	
List - Spi - Spi - Poi - Ma - Ka - Ch - Ch - Va - Ch	of scientific names available: hagnum magellanicum Brid. hagnum papillosum Lindb. lytrichum strictum Menzies ex Brid. aianthemum canadense Desfontaines lmia angustifolia Linnaeus ododendron groenlandicum (Oeder) Kron & Judd rix Iaricina (Du Roi) K. Koch ccinium oxycoccos Linnaeus iophorum vaginatum Linnaeus ccinium myrtilloides Michaux amaedaphne calyculata (Linnaeus) Moench		
- Va	ccinium angustifolium Aiton		
\$	Subplots	9 Items	

۲	Ve	egetation Surveys: Herbs and Shrubs	Ø	\oslash
	<	1 record, July 19, 2019 / Subplots (9 Items)		
1 re	cord		Vie	w >
1 re	cord		Vie	•w >
1 re	cord		Vie	w >
1 re	cord		Vie	w >
1 re	cord		Vie	w >
1 re	cord		Vie	w >
1 re	cord		Vie	w >
1 re	cord		Vie	w >
1 re	cord		Vie	w >

۲	Subplots	Ø	
	1 record		B a
Sub	plot	• 44083370-44100544, 1	0
۲	Cover Estimates	91tems	
Tota	l Canopy Cover (%): Subplot		0
Bare	e Ground Cover (%): Subplot		0
Leaf	Litter Cover (%): Subplot		0
Tota	l Cover (%): Subplot		0
Veg	etation Photos: Subplot		

۲	Subplots							
	1 record / Cover Estimates (9 Items)	1						
Sph	agnum magellanicum Brid.	View >						
Sphagnum papillosum Lindb.								
Poly	View >							
Mai	anthemum canadense Desfontaines	View 💙						
Erio	pphorum vaginatum Linnaeus	View 💙						
Kalı	mia angustifolia Linnaeus	View >						
Vac	cinium oxycoccos Linnaeus	View 📏						
Vac	cinium angustifolium Aiton	View 💙						
Cha	maedaphne calyculata (Linnaeus) Moench	View >						

۲	Cover Estimates		Ø	\bigcirc
	Maianthemum canadense Desfontaines			8
۲	Metadata			
Crea	ted (device)	19/07/2019 à 11:57:13 3 weeks ago		
Upd	ated (device)	19/07/2019 à 12:02:19 3 weeks ago		
Duration		35 seconds (Total Time) 16 seconds (Most Recent Update) 19 seconds (First Creation)		
Loca	ition	45.409164, -75.516638		
Crea	ated Location	45.409166, -75.516638 (3m accuracy, 0.2m from the record)		
Upd	ated Location	45.409157, -75.516622 (3m accuracy, 1.5m from the record)		
۲	Taxon Cover			
Scie	ntific Name •	Maianthemum canadense Desfontaines		0
Can	opy Cover (%)			0
Cov	er Remarks	Bordure N milieu de l'est Milieu du NO		0

NOTES ON COVER REMARKS:

Each subplot is divided in areas identified with direction acronyms (S = south, N = north, O or W = west, E = east, C = center). If relevant, they also have a note on the number of individuals for a given species.

1.4 For all of the species or specimens that are difficult to identify at first sight, in PowerPoint, in a white font, note the intials of the species (generally, format is first letter of genra + first letter of species) on top of its occurences.



1.5 Save all PowerPoint slides (1 slide = 1 subplot) in .tif to your computer and name them in the format PlotNo.SubplotNo.

		MedleseAnnotations - Enregistré dans ce PC	27
©	Enreaistrer so	us	
Accuel			
D Neuveeu	L Récent	Documents > Emploi > CABO > Sample	Point > MerBleue
	Recovered	MeBleveAnnotations Exempt TEE (2.10)	• Stresiter
EP Own	reserves	Autors options	
Informations	CneDrive - Personnel fielte@gmail.com		
	Autres emplacements	Nom T	Date de modification
Loregistrer	Ce PC	blue4_19-08-08	2019-08-19 11-45 AM
Enregistrer sous	-in-		
Imprimer	Ajouter un emplacement	Microsoft PowerPoint	×
Partager	Parcourir	Quelles diapositives voulez-vous exporter ?	
Exporter		Toutes les diapositives Celle-ci uniquement Annu	her
Fermer			
Compte			
Votre avis			
Options			

1.6 Crop all photos so that their shape is a tight square around the PVC pipes delimiting the subplot.

Example for subplot 1:



1.7 Save the cropped photos back to:

1) their original *Fulcrum* subplot record, under Vegetation Surveys: Herbs and Shrubs \rightarrow Subplots \rightarrow Record [# from 1 to 9] \rightarrow Vegetation Photos: Subplot,

۲	Subplots (editing)		0)
opt	1 record			^
Sub	plot •	44083370-44100544, 1	0	
۲	Cover Estimates	9 Items		
Tota	al Canopy Cover (%): Subplot		0	
Bar	e Ground Cover (%): Subplot	\$	0	
Lea	f Litter Cover (%): Subplot		0	
Tota	al Cover (%): Subplot	i.	0	
Veg	etation Photos: Subplot	Select File		



or 2) to a Google Photos folder, with all photos labelled with PlotNo.SubplotNo, shared with the Veg Crew Leader.



Virtual Point Framing

2 Classify 100 non-random crosshairs per subplot using the *SamplePoint* program, in order to obtain species distribution and abundance to the closest percent.

Note

Save everything related to *SamplePoint* (photos to classify (see 1.7), databases (see 2.2) and buttons (see 2.8) that will be created) in the same computer directory.

2.1 Indicate in the Veg_Crew_overview Google Doc on what plot(s) you will be working on that day, by writing the date and your initial next to the plot number.



2.2 Create a Database in *SamplePoint*, under Options \rightarrow Database Wizard - Create DB.

Note																		
We ar	e us	ing o	one	dat	abas	se p	er p	lot,	and	on	ly la	ter o	com	bini	ng a	all t	he databases into one.	
SamplePoint																	- ø ×	
Options Help NO	TE: Rotate I	mage First,	then adjus	it image p	arametersi													
Change Crossha	eir Color	>								Ne	xtimage	Begin	Commer	4		_		
Create Statistics	Files																	
Custom Buttons		,																
Database Widard	1 - Create Di																	
GoTo Image																		
Launch SPTrack	er																	
Preload the Next	t image	>																
Select DataBase																		
Select Grid Size		>																
SnapZoom		>																
<< Cont																		
C (2) (2)																		
· Classify																		
tran_																		
KEY																		
Zoom																		
RST																		
point of																	_	
Zoom B Refre	and a	Grass	Forb	Shrub	Cactus	Litter	Soil	Rock	Unknow	Invasiv	bin10	btn11	btn12	bin13	bts14	btn15	1	
Point Bac	*	btn1G	btn17	bin18	bin19	bin20	bin21	btn22	btn23	btn24	btn25	btn26	btn27	btn28	bin29	btn30	i i	

2.3 Name the database with an acronym for the site and the plot number.

No	ote																			
Bo Me	ucherv er Bleu	ville: e: MI	BOL 3#	J#																
📕 SamplePe	int																	-	σ	×
Options H	Create and Por	te Image First,	then adjus	it image p	arameters!					Ne	xt Image	Begin	Commen			_				
Rotate		(Brought																		
Darken		DataBase	Name																	
Lighton																				
R		Create	Populate aBase	·																
>> Cont	NOTE: If you	get an error s	un negative	un kading	-															
<< Cont	reduce the m	umber of film	to less that	200	one															
Classify			-		_															
Tran																				
KEY																				
₽ Block Zoom																				
RST																				
point																				Exit
Zoom (3	Refresh	Grass	Forb	Shrub	Cachus	Litter	Soil	Rock	Unknow	Invasiv	Min 10	bin11	bin12	bin13	bin14	bin15	I			
	Back	btn16	bin17	btn18	bin19	bts20	bbs21	bts22	btn23	btn24	bbs25	bts26	bbs27	bin28	bbn29	bts30				

2.4 Populate the database by selecting all 9 annotated .tiff or .tif pictures of this plot.

Note

Select All files from the menu in order to have access to the .tiff and .tif files.

👩 Sample	Point					- 0	\times
Options	Help NOTE: Rotate Image First, then adjust ima	ge parameters!					
C DataB	C.C	~	[NextImage Begin Co	omment		
	Create and Populate the DataBase	~					
Rotate							
	BOUP1						
Darken	DataBase Name						
Lighten							
R	Create/Populate						
_	DataBase						
>> Cont							
	NOTE: If you get an error message when los	ading files.					
<< Cont	reduce the number of files to less than 200!						
		Done					
 Classify 							
Tran							
KEY							
- Block							
Zoom							
RST							
							_
point							Exit
Zoom le							
Point 0	Refresh Grass Forb Shr	rub Cactus Litter	Soil Rock Unknow Inva	siv btn10 btn11 b	tn12 btn13 btn14 btn1		
Point	Back btn16 btn17 btn	18 btn19 btn20 b	tn21 btn22 btn23 btn2	4 btn25 btn26 b	tn27 btn28 btn29 btn30		



2.5 Select Done and OK to complete.

Options	nplePoint ns Help_NOTE: Rotate Image First, then adjust image parameters!	- a ×
C DataB-	HaBer C. A. Luce Begin Comment	
Rotate	BOUP1	
Darken	ken DataBase Name	
Lighten	ton	
R	Crente/Populate DataBase	
>> Cont	set	
<< Cont	reduce the number of files to less than 200 Successful Creation of new DataBasel	
Classify	The DataBase was created as: C:Users/Sabnet/Decuments/Emploi/CABO/SamplePoint/Boucherville/B	
C Train	n OUPLALS OUPLALS Click 'Options/SelectDataBase' to access this DataBase.	
		1
KEY	Y	L)
Black		
Zoom	om	
RST	57	
point		
Point	B Grams Forb Shrub Cactua Litter Soil Rock Unknow/ Invaniv btn11 btn12 btn12 Back btn16 btn17 btn18 btn20 btn21 btn23 btn24 btn26 btn26 btn27 btn26 btn27 btn26 btn27 btn26 btn26 btn26 btn27 btn26 btn26 btn27 btn26 btn26 btn26 btn27 btn26 btn26 btn26 btn26 btn26 btn26 btn26 btn26 btn26 btn26	i bin 14 bin 15

2.6 Follow Options \rightarrow Select DataBase, and select the file that you want to fill, then OK to open your database in *SamplePoint*.

Note

Warning: if you select a database that has already been used, you will overwrite your data. Therefore we are using one separate database per plot.

SamplePoint		- a ×
Options Help NOTE Rot	is Image First, then adjust image parameters!	
Change Crosshair Color	> NextImage Begin Comment	
Create Statistics Files		
Custom Buttons		
Database Wizard - Creat	08	
Dual Monitor		
GoTo Image		
Launch SPTracker		
Preload the Next Image		
Select DataBase		
Select Grid Size	>	
SnapZoom		
and and		
eccont		
© Classily		
C Train		
RET		
U Block		
Zoom		
RST		
_		
port		
Zoom 3 man	In the local walk of the deal walk with the second se	
Point	Grass Forb Strute Coctus Litter Seit Fock Deknow Invasiv Ma10 Ma11 Ma12 Ma13 Ma14 Ma15	
Back	bin16 bin17 bin18 bin19 bin20 bin21 bin22 bin23 bin24 bin25 bin25 bin26 bin27 bin28 bin29 bin30	

a SamplePoint						- 0
ptions Help NOTE: Rotate	Image First, then adjust image	parameters	Harthman	Basia Comment		
Con mage			Nextimage	begin Comment		
lotate						
_	Cuvrir			×		
larken		100 - CreateRaint - Reacher St	a B Bacharder des	- Rember its 0		
	(*	LADU > samplePoint > boucherville	V O Nechercher dan	s: boucherville p		
ighten	Organiser • Nouvea	au dossier		🗉 • 🔲 📀 📗		
al	Général ^	Nom	Modifié le	Type		
<u> </u>	 OneDrive 	R BOU TOT	2019-08-19 4-40 PM	Feuille de calcul		
Cont	Chechne	R BOUT	2019-08-19 4-45 PM	Feuille de calcul		
	Ce PC	BT 80014	2019-08-19 4:25 PM	Feuille de calcul		
Cant	E Bureau	8 BOUP1	2019-08-20 10:26	Feuille de calcul		
com	Documents	8 BOUPLOT17	2019-08-19 2:08 PM	Feuille de calcul		
	images	ET \$208	2019-08-14 4:02 PM	Feuille de calcul		
lassify	Musique	TEST1	2019-08-14 5:47 PM	Feuille de calcul		
irain	Objets 3D					
	Téléchargement					
	Vidées					
	Dirave local (C)					
ΈY	- Doque local (ci)					
	- Plant			· · · ·		
	Non	n du fichier : BOUP1	 Excel Spreadsh 	eets (*.xls,*XLS) 🗸		
Block Zoom			Ouvrir	Annuler		
nerl						
Kal						
point						
Refresh	Grass Forb Shrub	Cactua Litter Soil Ro	ck Unknow Invasiv btn10	btn11 btn12 btn1	3 btn14 btn15	
Internet						

🖉 Sam	plePoint																			 0	\times
Options	Help NOTE	Rotate Im	age First,	then adju	st image p	arameters						_		-							
Dat	ibase i Cur	Image									Neo	ct Image	Begin	Commer	it						
Rotal	-																				
Darke	<u>-</u>																				
Lighte	-																				
R																					
>> Cor	<u>-</u>																				
<< Cor	-							-							×						
Class	ily .								There are 9	images to a	view. If th	is is less th	an excert	ed check t							
C Train	-							d	iatabase fo	ormat or rec	create the o	iatabase.									
								L						OK							
KEY	_																				
- Bloc																					
Zee	•																				
RST																					
point																					E
Zeom	Refresh		Grass	Forb	Shrub	Cactus	Litter	Soil	Rock	Unknow	Invasiv	btn10	bin11	btn12	bin13	bin14	btn15				
Point	Back		btn16	btn17	btn18	btn19	btn20	btn21	btn22	btn23	btn24	btn25	btn26	btn27	btn28	btn29	btn30				

2.7 Create, upload or edit a *SamplePoint* button file for classifying the plot.

For every plot, using the plot species list in *Fulcrum*, under Vegetation Surveys: Herbs and Shrubs \rightarrow [Appropriate plot] \rightarrow Species List, all the species* must appear as a button in *SamplePoint*.

Note

SamplePoint allows for a maximum of 30 classification buttons.

- *: If there are more than 30 species in your list, add a button named Other that you will edit appropriately afterwards in the plot Excel Database. Make notes of the species of these Other-classified points in each subplot where they occur.
- Always include one button named Unknown, used for when you are not sure of the plant ID (for ex.: because of shade).
- If necessary, add buttons named Ground or Water.
- If necessary, add a button named Dry for cases where a plant is unidentifiable because only a dry stem remains.

⊗	Vegetation Surveys: Herbs and Shrubs	
	1 record, July 9, 2019	State 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1
⊙	Species List	
۲	Plant Taxa	20 Items
List - Ph. - Sol - Ru. - Co. - Vic - Sol - Tar - Pla - Eur - Po. - Ca. - Fra - Equ - Ca. - Sol - Ca. - Sol - Ga. - Ga. - Ga. - Ga. - Ga. - Co. - Co. - Vic - Sol - Tar - Pla - Co. - Sol - Tar - Pla - Co. - Co. - Sol - Tar - Pla - Co. - Co. - Co. - Sol - Tar - Pla - Co. - Co. - Co. - Co. - Sol - Tar - Pla - Co. -	of scientific names available: iragmites australis (Cavanilles) Trinius ex Steudel lidago gigantea Aiton ibus idaeus Linnaeus irrus sericea Linnaeus irrus sericea Linnaeus inchus arvensis Linnaeus raxacum officinale F.H. Wiggers antago major Linnaeus ithamia graminifolia (Linnaeus) Nuttall ira alsodes A. Gray ira pratensis Linnaeus irex intumescens Rudge axinus pennsylvanica Marshall uuisetum variegatum Schleicher ex F. Weber & D. Mohr tis riparia Michaux ilamagrostis canadensis (Michaux) Palisot de Beauvois lidago altissima Linnaeus intum aleppicum Jacquin ctium lappa Linnaeus Irsum arvense (Linnaeus) Scopoli	
⊙	Cover Estimates: Subplot	

2.8 Create a new set of buttons in *SamplePoint* by following Options \rightarrow Custom Buttons \rightarrow Create Custom Button Files.



2.9 Fill in the button names (4 letters, see buttons_explanations joined file) and descriptions (latin or common name; no single quotation marks) for every ground cover that will be used (ex.: species, bare ground, water, unknown, or other).

Sample/toint		- 0 X -									
North Custom Buttons		×									
Description (optional)	Short	Cat. Note: You need the 1.47 or greater database to create shorkutal Description (optional) ShortCat									
Button 1		Button 16 NOTE: Tocreate a									
Betton 2		Button 17 enter the button labels									
		fields as shown. A									
Betton 3		Button 15 Diank field will result in an invisible button.									
Button 4	Г	Button 19 Save the definition									
Batton 5	-	intosfile. Aftera									
Denor S		Dutton 20 Outsouts has been									
Betton 6		Button 21 Custom Button File to									
Button 7	-	Bettra 22 Ioad the definition into									
		After the better in									
Button 8		Betton 23 Deded into the									
Betton 9		Button 24 A section 24 A sectio									
B. M		and statisticial analysis.									
Bellos 10		Betton 25									
Button 11		Button 26 Cood' Button can be									
Batton 12	-	existing set of ballons.									
		Gutton 27 They still need to be saved when done.									
Button 13		Button 28 0 Note that the ShortCol									
Button 14		Batton 29 characters must be									
		appagence.g. A 2 or a 2.									
Dutton 15	F	Button 30									
NOTE: a description can contain any character DCEPT the ', travat also be less than 256 characters.											
Cancel Existing	Save	NOTE: Y, y, N, and n are NOT allowed as ShortCatal									
Back PLMA POAL POPR RUID GEAL VICH SO	AL 50	ONCHE SOGE AREA VIRIP ANSY TAXOF PHLA unknow									

		Description (optional)	Shork	Note: You	need the 1.43	or greater database to create sho	Description (optional)	ShortCat	
dion 1	LYSA	Littvun salcara		Button 16	PLMA	Plantago major Plantain majeu	0		NOTE: To create a custom button file.
Atton 2	ASCSY	Asclepias syriaca Asclepiade commune		Button 17	POAL	Pos alsodes Pliturin des bo	iguets 0		enter the button is in the correspond
tton 3	CALCA	Calamagrotis canadensis Calamagrotide du Canade	5 E	Button 18	POPR	Poa pratensis Pätum des pr	• 0		blank field will rep in an invisible buff
atton 4	CARL	Carex L	ΞE	Button 19	FUID	Pubus daeus Frantoiser ro	• 0		Save the definition
atton 5	CORSE	Comus sercea Comouller/hat-rouge	Π	Button 20	GEAL	Geum aleppicum	0		database has bee loaded, use the m
atton 6	FRPE	Francia perveyhanca		Button 21	MCR	Vicie cracca Vesce jargeau	0		item to select a Custom Button Fil
utton 7	EQVA	Equestum varlegatum Phile panachée		Button 22	SOAL	Soldago altreama Verge dor hau	• 0		the database.
atton 8	EUGR	Euthamia graninifolia Vierge dor à feuilles de graninile	Π	Button 23	SONCH	Sonchus arvensis Lateron des d	hanpa D		After the button is loaded into the
etton 9	GATR	Salun Milun	5 🗆	Button 24	SOGI	Soldago pgartea Verge dor géa	• 0		used for classifica and statistical
atton 10	ONSE	Onoclea senabilis	5 🗆	Button 25	ARLA	Arctium lappe	0		analysis.
ution 11	CIRAR	Orsun avense	5 F	Button 26	WRIP	Vitis riparta Vigne des riva	pes 0		'Load' Button can used to edit an
utton 12	APOAN	Apogrum andreaemfolum	5 🗆	Button 27	ANSY	Anthrisous sylvestris	0		existing set of but They still need to
utton 13	PHAU	Progetes autralis Cavaniles) Tinus ex Strudel subsp. Autralis Roseau consun	Π	Button 28	TAXOF	Taravacum officinale Peo	nik oficinal 0		Note that the Shore
atton 14	əgigig	Agrodis ggantea Agrodide blanche	<u> </u>	Button 29	PHA	Phalans anndhacea	0		characters must b alphabetic e.g. A
utton 15	FRM	Fageta vignaria		Button 30	unknow	unknown	0		
					NOTE	description can contain any ch	sractor EXCEPT the ', It must also be less than	255 characters.	

4 letter names in caps lock can be seen more clearly and thus are more convenient.

2.10 If a set of buttons already exists for the site, use it as a base to create this new set by clicking on Load Existing. Make the required edits by renaming the appropriate button names and descriptions.

Note

The original button file will remain intact if the new one is given a new name.

SamplePoint Junior Custom Puttons		- 0 X									
Description (optional)	Short	nCut Note: You need the 1.47 or greater database to create shoricutal Description (ontional) ShortCut									
Button 1		Button 16 NOTE: To create a									
Button 2		Button 17 enter the button labels in the corresponding									
Button 3		Button 18 fields as shown. A blank field will result									
Button 4		Button 19									
Button 5		Button 20									
Button 6		Button 21 loaded, use the menu item to select a									
Button 7		Custom Button File to Ioad the definition into									
		Button 22 After the button is									
Button 8		Button 23 O loaded into the database, it will be									
Button 9		Button 24 used for classification and statisticial									
Button 10		Button 25 Also and that the									
Button 11		Button 26 Uad' Button can be used to edit an									
Button 12		Button 27 existing set of buttons. They still need to be									
Button 13		Button 28 O Note that the ShortOat									
Button 14		Button 29									
Button 15		Button 30									
		N N N N N N N N N N N N N N N N N N N									
Concel Load Sava NOTE: a description can contain any character EXCEPT Me ¹ . It must also be less than 256 characters.											
Existing	Guve	NOTE: Y, y, N, and n are NOT allowed as ShortCuts!									

SamplePoi	nt									- 0 X		
🖳 Define Cu	stom Button	5								×		
		Description (optional)	ShortC	ut Note: You	need the 1.47	7 or greater database	to create shortcuts!	Description (optional)	ShortCut			
Button 1	LYSA	Lythrum salicaria		Button 16	PLMA	Plantago major	Plantain majeur			NOTE: To create a custom button file.		
Button 2	ASCSY	Asclepias syriaca Asclépiade commune		Button 17	POAL	Poa alsodes	Pâturin des bosquets			enter the button labels in the corresponding fields as shown. A		
Button 3	CALCA	Calamagrostis canadensis Calamagrostide du Canada		Button 18	POPR	Poa pratensis	Pâturin des prés			blank field will result in an invisible button.		
Button 4	CARL	Carex L		Button 19	RUID	Rubus idaeus	Framboisier rouge			Save the definition into a file. After a		
Button 5	CORSE	Comus sericea Comouiller hart-rouge		Button 20	GEAL	Geum aleppicum		1		database has been loaded, use the menu		
Button 6	FRPE	Fraxinus pennsylvanica		Button 21	VICR	Vicia cracca	Vesce jargeau	:		Custom Button File to load the definition into		
Button 7	EQVA	Equisetum variegatum Prêle panachée		Button 22	SOAL	Solidago altissima	Verge dor haute	1		the database. After the button is		
Button 8	EUGR	Euthamia graminfolia Verge dor à feuilles de graminée		Button 23	SONCH	Sonchus arvensis	Laiteron des champs	1		loaded into the database, it will be		
Button 9	GATR	Galum trfidum		Button 24	SOGI	Solidago gigantea	Verge dor géante			used for classification and statisticial		
Button 10	ONSE	Onoclea sensibilis		Button 25	ARLA	Arctium lappa				Also note that the		
Button 11	CIRAR	Cirsium arvense		Button 26	VIRIP	Vitis riparia	Vigne des rivages			'Load' Button can be used to edit an existing set of buttons		
Button 12	APOAN	Apocynum androsaemifolium		Button 27	ANSY	Anthriscus sylvestris	1			They still need to be saved when done.		
Button 13	PHAU	Phragmites australis (Cavanilles) Trinius ex Steudel subsp. Australis Roseau commun		Button 28	TAXOF	Taraxacum officinal	e Pissenit officinal			Note that the ShortCut		
Button 14	agrgig	Agrostis gigantea Agrostide blanche		Button 29	PHLA	Phalaris arundinace	a			alphabetic e.g. A-Z or a-z.		
Button 15	FRVI	Fragaria virginiana		Button 30	unknow	unknown		(
	Cancel Load Existing Save NOTE: a description can contain any character EXCEPT the'. It must also be less than 255 characters. NOTE: Y, y, N, and n are NOT allowed as StortCute!											

M SamplePo	int								- 0 X				
🛃 Define Cu	ustom Butto	ns							×				
		Description (optional)	Short	Note: You	need the 1,47	or greater database to create shortcuts!	Description (optional)	ShortCut					
Button 1	CAIN	Carex intumescens		Button 16	PLMA	Plantago major Plantain majeur			NOTE: To create a custom button file,				
Button 2	ASCSY	Asclepias syriaca Asclépiade commune		Button 17	POAL	Poa alsodes Pâturin des bosquets	0		enter the button labels in the corresponding fields as shown A				
Button 3	CALCA	Calamagrostis canadensis Calamagrostide du Canada		Button 18	POPR	Poa pratensis Pâturin des prés	\sim		blank field will result in an invisible button.				
Button 4	CARL	Carex L		Button 19	RUID	Rubus idaeus Framboisier rouge	0		Save the definition into a file. After a				
Button 5	CORSE	Comus sericea Comouller hart-rouge		Button 20	GEAL	Geum aleppicum	0		database has been loaded, use the menu				
Button 6	FRPE	Fraxinus pennsylvanica		Button 21	VICR	Vicia cracca Vesce jargeau	0		Custom Button File to load the definition into				
Button 7	EQVA	Equisetum variegatum Prêle panachée		Button 22	SOAL	Solidago altissima Verge dor haute	0		the database.				
Button 8	EUGR	Euthamia graminfolia Verge dor à feuilles de graminée		Button 23	SONCH	Sonchus arvensis Laiteron des champs	0		loaded into the database, it will be				
Button 9	GATR	Galium trfidum		Button 24	SOGI	Solidago gigantea Verge dor géante	0		used for classification and statisticial				
Button 10	agrgig	Agrostis gigantea Agrostide blanche		Button 25	ARLA	Arctium lappa	0		Also note that the				
Button 11	CIRAR	Cirsium arvense		Button 26	VIRIP	Vitis riparia Vigne des rivages	0		"Load" Button can be used to edit an existing set of buttons				
Button 12	APOAN	Apocynum androsaemifolium		Button 27	ANSY	Anthriscus sylvestris	0		They still need to be saved when done.				
Button 13	PHAU	Phragmites australis (Cavanilles) Trinius ex Steudel subsp. Australis Roseau commun		Button 28	TAXOF	Taraxacum officinale Pissenit officinal	0		Note that the ShortCut				
Button 14	ground	ground		Button 29	PHLA	Phalaris arundinacea	0		alphabetic e.g. A-Z or a-z.				
Button 15	dry	dayl O		Button 30	unknow	unknown	0						
	Lond NOTE: a description can contain any character EXCEPT the'. It must also be less than 255 characters. Existing Save NOTE: Y, y, N, and n are NOT allowed as ShortCutal Back 1 PDMA1 PDMA1 PDMA1												

2.11 Save and name this new custom button file.

construction of the second sec			×	A7 or greater backage to create short day Description (optional	d) ShortCut	
->	v & Rechercher dans	:Boucherville J	PLMA	Partago najor Partan najeur		NOTE: To create a custom button file.
rganiser = Nouveau dossier		10 × 4	POAL	Poe alsodes Páturin des bosqueta		enter the button lai in the corresponde
E Images # A Nom	Modifié le	Туря	^ POPR	Paa prateriais Páturin des prés		blank field will res
SamplePoint #	2019-06-28 11-10	Fichier 8TN				in an invisible buth
Bouchenille bou2.8th	2019-08-28 1/22 PM	Fichier 8TN	RUID	Rubus daeus Rramboisier rouge		Save the definition
Bouchenville boul.Btn	2019-08-28 2:55 PM	Fichier BTN	GEAL	Deurs alessinum		database has bee
Boucherville boul.8th	2019-08-14 5:36 PM	Fichier 8TN	in the second			loaded, use the m
Medieut bouilith	2019-08-16 3-05 PM	Fichier 8TN	VICR	Voa oracca Vesce jargeau		Custom Button Fi
bou10.8tn	2019-08-19 4:44 PM	Fichier 8TN	Con al	Enter a second sec		load the definition
OneDrive BOU11.8te	2019-08-21 3:56 PM	Fichier 8TN	SOAL	Doldago allissma Verge dor haute		the database.
CaPC boul2.8tm	2019-08-22 10:58	Fichier BTN	SONC	Sonchus anveneis Lateron des champs		After the button is londed into the
Bureau Douris.Btn	2019-06-22 12:09	Fichier 8TN				database, it will b
Decuments	2019-06-22 2:34 PM	Fichier IITN	* SOGI	Solidago pipartina Verge dor pliarite		used for classific and statisticial
			-	The first sectors		analysis.
Nom du fichier: boul			- NILA	Proton lappa		Also note that the
Type: Custom Button Files (*.8tn,*8TN)			VIRIP	Vite spara Vigne des rivages		"Lond" Button car
						used to edit an existing set of bu
Masquer les dossiers	Envegistrer	Annuler	ANSY	Anthracus sylvestre		They still need to
IS PHALI Progrates autouts Covarilles) Timus or Strudel subsp	Autula Roseau ~	Button	28 TAXO	Taraxacun ofionale Preerit ofional		Saved when done
commun	×.				<u>x</u>	Note that the Sho characters must
an 14 ground provid	0	Betton	29 PHLA	Phalans arundinacea		alphabetic e.g. A
an 15 day day	A	Button	30 Junkno	Leterone .		
int in the second se	Ψ.		Janacio		× •	
		1				

2.12 In *SamplePoint*, follow Options \rightarrow Custom Buttons \rightarrow Load Custom Button File to select and load the buttons that you will be using to classify the photos from your database.

Note

The Button File selected needs to remain untouched for the whole database.



SamplePoint

 Ouvrir ← → < ↑	Boucherville C Rechercher dans : Boucherville P C Rechercher dans : Boucherville P C Rechercher dans : Boucherville P C C Recherville P C Rechercher dans : Boucherville P C C Rechercher dans : Boucherville P C C Recherville P C Recher
 ← → · ↑ • · CABO > SamplePoint Organiser ▼ Nouveau dossier ♥ Téléchargem * ↑ Nom ֎ Documents * • bou1.8tn ■ Images * • bou2.8tn 	Boucherville C Rechercher dans : Boucherville P BEE Modifié le Type 2019-08-28 11:10 Fichier BTN 2019-08-28 1:22 PM Fichier BTN 2019-08-28 1:22 PM Fichier BTN P
Organiser ▼ Nouveau dossier ↓ Téléchargem: * ^ ≧ Documents * bou1.8tn E Images * bou2.8tn	Modifié le Type 2019-08-28 11:10 Fichier BTN 2019-08-28 1:22 PM Fichier BTN
↓ Téléchargem x ∧ Norn ☐ Documents x ☐ bou1.8tn ☐ Images x ☐ bou2.8tn	Modifié le Type 2019-08-28 11:10 Fichier BTN 2019-08-28 1:22 PM Fichier BTN 2019-08-28 1:22 PM Fichier BTN
😭 Documents 🖈 📄 bou1.8tn 📰 Images 🖈 📄 bou2.8tn	2019-08-28 11:10 Fichier BTN 2019-08-28 1:22 PM Fichier BTN
📰 Images 🖈 🗋 bou2.8tn	2019-08-28 1:22 PM Fichier BTN
	2010 00 20 2 5 DM
SamplePoint 🖈 📄 bou3.8tn	2019-08-28 2:55 PM Fichier BIN
Boucherville bou4.8tn	2019-08-29 11:58 Fichier BTN
Boucherville bou8.8tn	2019-08-14 5:36 PM Fichier BTN
Boucherville	2019-08-16 3:05 PM Fichier BTN
MerBleue	2019-08-19 4:44 PM Fichier BTN
BOU11.Btn	2019-08-21 3:56 PM Fichier BTN
 OneDrive bou12.8tn 	2019-08-22 10:58 Fichier BTN
bou13.Btn	2019-08-22 12:09 Fichier BTN
bou15.Btn	2019-08-22 2:34 PM Fichier BTN
bou16.8tn	2019-08-23 10:05 Fichier BTN ¥
Documents V C	3
Nom du fichier : bou4.8tn	✓ Custom Button Files (*.8tn,*BT ✓
	Ouvrir Annuler



2.13 Edit the picture as needed. The rotation has to be done once only, before classification. The rest can be done at any point and undone by clicking on R.

Note

Use the buttons on the left menu to Rotate*, Darken, Lighten, reset (R), increase contrast (>> Cont), or lower contrast (<< Cont) of the picture. Key indicates the Subplot number. Leave Block Zoom ticked. Only untick it if your computer performances are slow.

*: Use the subplot number (title of the picture) and compare the picture in *SamplePoint* to its copy in *Fulcrum*** to know what rotation is needed. **: Especially useful for subplot no. 5.



2.14 Under Options \rightarrow Select Grid Size, select 10×10 = 100. This means that we are using a 10×10 grid of points (100 crosshairs) to classify each subplot.

SamplePoint									
Options Help NOTE: Rotate Image First	t, the	n adjust image parameters!							
Change Crosshair Color >	1				Next Image	Begin	Comment		
Create Statistics Files								 	
Custom Buttons >									
Database Wizard - Create DB									
Dual Monitor >									
GoTo Image									
Launch SPTracker									
Preload the Next Image >									
Select DataBase									
Select Grid Size >		5X5 = 25							
SnapZoom >		6x6 = 36							
we will		7x7 = 49							
<< Cont		8X8 = 64							
		9x9 = 81							
Classify	~	10X10 = 100							
CTrain		12X12 = 144							
		15X15 = 225							
		Random Points							
	_								

2.15 Click on Begin to start classifying. The 100 crosshairs are now regularly placed on the image, and one crosshair at a time (the red one) will be activated. To classify it, click on one of the 30 buttons of the lower menu.

Note

The meaning of each button is indicated in the joined buttons_explanations Excel file. The Zoom can be adjusted by rotating the wheel of a wheel mouse. The Point field indicates the point (#/100) you are currently classifying. The Back button is used to correct a previous crosshair classification.





2.16 To classify each crosshair, help yourself by opening (ideally on a different monitor) the *Fulcrum* Vegetation Survey: Herbs and Shrubs of that specific plot. Before starting to work on each subplot, open in two different tabs 1) the species list for the subplot and 2) the Original picture (not annotated) of that subplot.

Note

Compare the *Fulcrum* species list to the annotated picture on *SamplePoint* to locate where the different species are. Use the zoom in the Original picture, as well and the Lighten, Darken, and contrast options in *SamplePoint* to help identify less obvious plants.

۲	Subplots	Ø	\oslash
	I record / Cover Estimates (7 Items)		1
Ascle	epias syriaca Linnaeus	Vie	w >
Phal	aris arundinacea Linnaeus	Vie	w >
Vicia	e cracca Linnaeus	Vie	w >
Salix	interior Rowlee	Vie	w >
Equi	setum variegatum Schleicher ex F. Weber & D. Mohr	Vie	w >
Poa	pratensis Linnaeus	Vie	w >
Poa	alsodes A. Gray	Vie	w >



2.17 When the 100 points of an image have been classified, click on Next Image, then Begin to start again for the next image (= key = subplot).

Note

You can stop working on a plot at any time (at the end of a plot, at the end of a subplot, or through a subplot) by clicking on the Exit button in the lower right corner of the screen. Make a note of the point where you stopped.

To start back where you left, click Next image on the top menu until you reach the desired image. Then, enter the number of the point in the point field in the left menu and hit RST (restart).









Data Combining

3 Combine all the databases into one. Keep the originals as a backup.

📙 🛃 📑 = Boucher	rville											
Fichier Accueil Pa	artage Affichage											
Épingler à Copier Colle Accès rapide	Couper Copier le chemin d'acci er Coller le raccourci	ès Déplacer Cop vers ▼ ver	Dier Suppi	rimer Renommer	Nouvea dossier	Nouvel é T Accès raj u	lément * pide	Propriétés	Ouvrir ▼ Modifier Historique	Sélection Aucun Inverser la	ner tout a sélection	
Pres	se-papiers		Organise	r		Nouveau		Ouvr	ir	Sélectio	nner	
← → ~ ↑ <mark> </mark> ›	Ce PC > Documents > En	nploi > CABO >	SamplePo	int → Boucherv	ille							~ Ç
📌 Accès rapide	SamplePointHelp	bou3.Btn	6 .7	E 11.5	a 19.3	22.1	24.8	27.6	1.4	7.2	12.9	■ 16.7
Bureau 🖈	BOD_IOI	bou4.Btn	B.0 B	11.0	19.4	22.2	24.9	27.7	N 1.5	N 7.3	N 13.1	■ 16.8
📕 Téléchargem 🖈	BOOL	bou8.Btn	6.9	II./	I9.5	22.3	25.1	27.8	1.0	M 7.4	13.2	10.9
	BOU2	bou9.6th	9.1	m 11.8	I 19.0	E 22.4	E 25.2	27.9	M 1.7	N 7.5	13.5	17.1 (a) 17.2
		BOUID.Bth	···· 9.2	I 14 1	19.7	E 22.J	E 25.4	20.1	1.0	N 7.0	12.4	17.2
images 🖈		boul2 Ptn		14.1	19.0	22.0	20.4	20.2	a 1.5	■ 7.7	■ 13.5 □ 12.6	17.3
SamplePoint 🖈	BOUR	bou12.btn	···· 0.4	■ 14.3	· 15.5	···· 22.0	m 25.6	20.5	2.1	1 70	13.0	■ 17.5
Boucherville		bou15.btn	···· 9.5	14.3	····· 20.1	22.0	···· 25.0	20.4	2.2	1 9 1	12.9	17.5
Boucherville	BOU10	bou16 Btn	···· 9.0	m 14.5	20.2	22.5	■ 25.8	20.5	2.5	a 8.2	13.0	17.0
Boucherville	BOU11	bou17 Btn		14.5	20.5	23.2	E 25.9	28.7	25	a 83	15.5	17.8
MerBleue	BOU12	bou18 Btn		a 14.7	20.5	23.3	2 26 1	28.8	2.5	84	15.2	179
_	BOU13	BOU19.Btn	III 10.1	a 14.8	20.6	23.4	26.2	28.9	2.7	8.5	15.3	boucherville
OneDrive	BOU14	bou20.Btn	10.2	m 14.9	20.7	23.5	26.3	2015	2.8	8.6	15.4	- boacherine
Ce PC	BOU15	BOU21.Btn	10.3	a 18.1	20.8	23.6	a 26.4	29.2	2.9	8.7	15.5	
Bureau	BOU16	12.2	a 10.4	a 18.2	20.9	23.7	a 26.5	29.3	5.1	8.8	15.6	
Documents	BOU17	17.1	a 10.5	a 18.3	a 21.1	23.8	a 26.6	29.4	5.2	8.9	15.7	
i bocuments	BOU18	17.2	a 10.6	a 18.4	a 21.2	23.9	a 26.7	29.5	5.3	12.1	15.8	
images	BOU19	17.3	a 10.7	a 18.5	21.3	24.1	a 26.8	29.6	5.4	12.2	15.9	
Musique	BOU20	6.1	a 10.8	a 18.6	21.4	24.2	a 26.9	29.7	5.5	12.3	16.1	
📜 Objets 3D	BOU21	6.2	10.9 📧	8 18.7	21.5	24.3	a 27.1	29.8	5.6	12.4	16.2	
🕂 Téléchargement	BOU22	6.3	a 11.1	a 18.8	a 21.6	24.4	a 27.2	29.9	5.7	🖬 12.5	16.3	
Vidéos	BOU23	6.4	a 11.2	a 18.9	a 21.7	24.5	a 27.3	🖬 1.1	5.8	🖬 12.6	🖬 16.4	
🏪 Disque local (C:)	bou1.Btn	6.5	a 11.3	a 19.1	a 21.8	24.6	a 27.4	1.2	🖬 5.9	🖬 12.7	🖬 16.5	
n 288 élément(s) 22 éléi	bou2.Btn ments sélectionnés 2.99 Mo	a 6.6	📧 11.4	a 19.2	a 21.9	24.7	a 27.5	🖬 1.3	🖬 7.1	🖬 12.8	🖬 16.6	

Enregistrem	ent automatique 🦲) 🖪 १-९	- -			BOU_TOT - N	fode de compatibilité	- Excel	Ч		Sabine St	Jean 🗈	- 0	×
Fichier Acc	uell Insertion	Mise en page	Formules	Données	Révision	Affichage	Aide 🔎 Rech	ercher des outil	s adaptés			🕆 Partager	Commentaire	es
Coller 🖉	Arial G I S -	• 12 • A* A* ↓ Δ* • ▲ • lice Γ ₂	≡ ≡ ≡ ∛ ≡ ≡ ≡ ≡ ∎	▶・ お 王王国・ sent ©	Standard \$ - % 000 Nombre	* ***	Mise en forme Mettr conditionnelle * de Sty	e sous forme Styl tableau * cell ries	les de ules * E For	érer • ∑ oprimer • trat • ellules	Trier et Rechercher filtrer * sélectionne Édition	r et r *		^
A1	• I 🗠 🗸	f _* key												*
A		В		С		D	E	F	G	H	- I	J	K	-
1 key	image		Commer	nt		GridSize	Point1	Point2	Point3	Point4	Point5	Point6	Point7	
2 1	5.1.tiff					100	SOGI, 154, 172,	SOGI, 120,	1(FRPE, 16	2, 1 FRPE, 13	32, 1 FRPE, 111,	1 FRPE, 155	, 1 SOGI, 118,	,1
3 2	5.2.tiff					100	SOGI, 32, 37, 16	5 FRPE, 132,	1 CARL, 42	44 EQVA, 9	0, 94 CALCA, 41,	CALCA, 5	4, 4 POAL, 129	۶,
4 3	5.3.tiff					100	APOAN, 136, 1	5 GEAL, 37, 3	3 CALCA, 2	6, 2 CALCA,	123, CALCA, 112	2, CALCA, 9), 1CALCA, 11	15
5 4	5.4.tiff					100	APOAN, 255, 25	5 UNKW, 55,	5(CALCA, 8	5, ESOGI, 99	, 11(UNKW, 58, 5	5 CALCA, 9	2, 1CALCA, 38	в,
6 5	5.5.tiff					100	PLMA, 73, 82, 6	2 EUGR, 129,	1FRPE, 91	10 SOGI, 10	1, 1; SOGI, 88, 1	CALCA, 8	4, ESOGI, 103,	,1
7 6	5.6.tiff					100	POAL, 132, 139	, EUGR, 167,	1SOGI, 112	2, 13 SOGI, 87	, 117 SOGI, 52, 74	4, FRVI, 73, 9	1, FRVI, 45, 4	41
8 7	5.7.tiff					100	SOGI, 142, 168,	(SOGI, 110,	1: CALCA, 1	35, SOGI, 12	2, 14 CALCA, 88,	1CALCA, 1	53, CALCA, 88	8,
9 8	5.8.tiff					100	FRPE, 129, 156	, POAL, 100,	1 SOGI, 158	8, 1{ SOGI, 17	5, 2(EQVA, 104,	1EQVA, 87,	95 EQVA, 55,	8
10 9	5.9.tiff					100	CALCA, 90, 100	CALCA, 57	CALCA, 8	0, ECALCA,	58, EASCSY, 143	, CALCA, 5	1, 5 SOGI, 93, 1	12
11														-
12														
13														
14														
10														
10														
10														-
10														
20														
21														
22														
22													_	
< • •	BOU1 BOU	2 BOU3 BOU	4 BOU5	BOU6 BOU7	BOU8	BOU9 B	OU10 BOU11	BOU12 BOU	J13 BOU14	BOU15 E	BOU16 BOU17	BOU18 BO	U19 🕂 🗄	
												─ -	+	100%

4 In Excel, create another version of the existing species per dot per subplot table, that doesn't contain the RGB values. To do so, copy the name of the image column and the

point numbers row. Then, for a given point * subplot cell, write the formula =LEFT(E3,4). This new table must contain 900 cells (100 points * 9 subplots).

E3 being the name of the original cell, and 4 being the amount of characters kept, starting from the left.

	Enreg	jistrement a	utomatique		5.6	- -			
Fic	hier	Accueil	Insertio	on Misele	n page	Formu	les Dor	nnées	Révision
C	oller	× •	G I <u>S</u> →	- 12 ₩ - <u>&</u>	A^ A` ~ <u>A</u> ~		= »? • = = =	ab c₽	Nombre \$ ~ %
Pres	se-pa	piers 🖬		Police	G.	A	lignement	- Gi	No
S	омм	IE 👻	: ×	✓ f _x	=GAUCH	E(E3,4)			
ы	A		в	С		D	E	F	G
	A key	image	в	C Comment		D GridSize	E Point1	F Point2	G Point3
1	A key 1	image 1.1.tiff	в	C Comment		D GridSize 100	E Point1 UNKW, 193, 194	F Point2 PHLA, 99, 9:	G Point3 PHLA, 89, 7:
1 2 3	A key 1 2	image 1.1.tiff 1.2.tiff	B	C Comment		D GridSize 100 100	E Point1 UNKW, 193, 194 SAIN, 147, 146, 1	F Point2 PHLA, 99, 93 UNKW, 25, 3	G Point3 PHLA, 89, 7: ASSY, 166, 1:
1 2 3 4	A key 1 2 3	image 1.1.tiff 1.2.tiff 1.3.tiff	B	C Comment		D GridSize 100 100	E Point1 UNKW. 193. 194 SAIN. 147. 146. SAIN. 182, 192, 1	F Point2 PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57	G Point3 PHLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49
1 2 3 4 5	A 1 2 3 4	image 1.1.tiff 1.2.tiff 1.3.tiff 1.4.tiff 1.5.tiff	B	C Comment		D GridSize 100 100 100 100	E Point1 UNKW, 193, 194 SAIN, 147, 146, 1 SAIN, 182, 192, 1 SAIN, 135, 150, 3 SAIN, 135, 150, 3	F PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57 SAIN, 40, 54	G PhLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49 SAIN, 21, 38, SAIN, 21, 38,
1 2 3 4 5 6 7	A 1 2 3 4 5 6	image 1.1.tiff 1.2.tiff 1.3.tiff 1.4.tiff 1.5.tiff 1.5.tiff	B	C Comment		D GridSize 100 100 100 100 100	E Point1 UNKV. 193. 194 SAIN. 147. 146. 1 SAIN. 182. 192. 1 SAIN. 135. 150. 1 SAIN. 141. 153. 4 SAIN. 67. 75. 2	F PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57 SAIN, 40, 54 SAIN, 82, 98 SAIN, 79, 87	G Point3 PHLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49 SAIN, 21, 38, SAIN, 138, 11, 38, SAIN, 80, 87
1 2 3 4 5 6 7 8	A 1 2 3 4 5 6 7	image 11.tiff 1.2.tiff 1.3.tiff 1.4.tiff 1.5.tiff 1.6.tiff 1.6.tiff 1.7.tiff	B	C Comment		D GridSize 100 100 100 100 100 100	E Point1 UNKV. 193, 194 SAIN, 147, 146, SAIN, 142, 192, 1 SAIN, 135, 150, 1 SAIN, 135, 150, 1 SAIN, 141, 153, 4 SAIN, 67, 75, 20	F PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57 SAIN, 40, 54 SAIN, 82, 98 SAIN, 79, 87 POPB 142	G Point3 PHLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49 SAIN, 21, 38, SAIN, 138, 14 SAIN, 80, 87 VICE 79, 91
1 2 3 4 5 6 7 8 9	A 1 2 3 4 5 6 7 8	image 1.1.tiff 1.2.tiff 1.3.tiff 1.4.tiff 1.5.tiff 1.6.tiff 1.7.tiff 1.8.tiff	B	C Comment		D GridSize 100 100 100 100 100 100 100 100	E Point1 UNKV. 193, 194 SAIN, 147, 146, 1 SAIN, 182, 192, 1 SAIN, 135, 150, 1 SAIN, 135, 150, 1 SAIN, 141, 153, 4 SAIN, 67, 75, 22 POPR, 90, 87, 1 ASSY, 45, 65, 1	F PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57 SAIN, 40, 54 SAIN, 82, 98 SAIN, 79, 87 POPR, 142, ' POPR, 142, '	G PhLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49 SAIN, 21, 38, SAIN, 21, 38, SAIN, 38, 87 VICR, 79, 91, SAIN, 129, 14
1 2 3 4 5 6 7 8 9 10	A 1 2 3 4 5 6 7 8 9	image 1.1.tiff 1.2.tiff 1.3.tiff 1.4.tiff 1.4.tiff 1.6.tiff 1.6.tiff 1.7.tiff 1.8.tiff 1.9.tiff 1.9.tiff	B	C Comment		D GridSize 100 100 100 100 100 100 100 100	E Point1 UNKV. 193, 194 SAIN, 147, 146. SAIN, 182, 192, 1 SAIN, 135, 150, 3 SAIN, 135, 150, 3 SAIN, 67, 75, 2 POPR, 90, 87, 4 ASSY, 45, 65, 1 UNKV, 30, 36, 1	F PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57 SAIN, 40, 54 SAIN, 82, 98 SAIN, 79, 87 POPP, 142, 7 SAIN, 76, 94 UNKW, 33, 5	G Point3 PHLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49 SAIN, 21, 38, SAIN, 138, 14 SAIN, 80, 87 VICR, 79, 91, SAIN, 129, 14 EUGR, 58, 71
1 2 3 4 5 6 7 8 9 10 11	A 1 2 3 4 5 6 7 8 9	image 1.1.tiff 1.2.tiff 1.3.tiff 1.4.tiff 1.5.tiff 1.6.tiff 1.7.tiff 1.8.tiff 1.8.tiff	B	Comment		D GridSize 100 100 100 100 100 100 100 10	E Point1 UNKW. 193. 194 SAIN. 147. 146. SAIN. 182. 192. SAIN. 182. 192. SAIN. 181. 153. 4 SAIN. 67. 75. 2: POPR. 90. 87. 3 ASSY, 45. 65. 1 UNKW, 30. 36. 1	F PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57 SAIN, 49, 57 SAIN, 40, 54 SAIN, 82, 98 SAIN, 79, 87 POPP, 142, 4 SAIN, 76, 94 UNKW, 33, 5	G Point3 PHLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49 SAIN, 21, 38, SAIN, 138, 14 SAIN, 80, 87 VICR, 79, 91, SAIN, 129, 14 EUGR, 58, 71
1 2 3 4 5 6 7 8 9 10 11 11 12	A 1 2 3 4 5 6 7 8 9	image 11.tiff 1.2.tiff 1.3.tiff 1.4.tiff 1.5.tiff 1.6.tiff 1.7.tiff 1.8.tiff 1.9.tiff	B	Comment		D GridSize 100 100 100 100 100 100 100 100 100 10	E Point1 UNKW 193.194 SAIN.147.146. SAIN.182,192, SAIN.135,150,3 SAIN.135,150,3 SAIN.135,150,3 SAIN.135,150,3 SAIN.135,150,3 SAIN.141,153,4 SAIN.67,75,23 POPR, 90,87,1 ASSY,45,65,1 UNKW	F Point2 PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57 SAIN, 49, 57 SAIN, 49, 57 SAIN, 40, 54 SAIN, 82, 98 SAIN, 79, 97 DOPR, 142, 1 SAIN, 76, 94 UNKW, 33, 5 PHLA	G Point3 PHLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49 SAIN, 21, 38, SAIN, 138, 14 SAIN, 80, 87 VICR, 79, 91, SAIN, 129, 14 EUGR, 58, 71 PHLA
1 2 3 4 5 6 7 8 9 10 11 11 12 13	A 1 2 3 4 5 6 7 8 9	image 11.tiff 1.2.tiff 1.3.tiff 1.4.tiff 1.5.tiff 1.6.tiff 1.7.tiff 1.8.tiff 1.9.tiff	B	COmment		D GridSize 100 100 100 100 100 100 100 100 100 11.tiff 1.2.tiff	E Point1 UNKW, 193, 194 SAIN, 187, 193, 194 SAIN, 182, 192, SAIN, 185, 150, 1 SAIN, 185, 150, 1 SAIN, 187, 193, 193, 193, 193, 193, 193, 193, 193	F Point2 PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57 SAIN, 40, 54 SAIN, 82, 98 SAIN, 79, 87 POPR, 142, 1 SAIN, 76, 94 UNKW, 33, 5 PHLA UNKW	G Point3 PHLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49 SAIN, 21, 38, SAIN, 138, 14 SAIN, 80, 87 VICR, 79, 91, SAIN, 129, 14 EUGR, 58, 71 PHLA ASSY
1 2 3 4 5 6 7 8 9 10 11 12 13 14 5	A 1 2 3 4 5 6 7 8 9	image 1.1.tiff 1.2.tiff 1.3.tiff 1.4.tiff 1.5.tiff 1.6.tiff 1.7.tiff 1.8.tiff 1.9.tiff	B	COmment		D GridSize 100 100 100 100 100 100 100 100 100 11.tiff 1.2.tiff 1.3.tiff	E Point1 UNKV. 193. 194 SAIN. 147. 146. SAIN. 182, 193. SAIN. 135, 150, 1 SAIN, 135, 150, 1 SAIN, 135, 150, 1 SAIN, 135, 150, 1 SAIN, 135, 150, 1 UNKV, 30, 36, 1 UNKV 4) SAIN	F Point2 PHLA, 99, 9: UNKW, 25, 3 SAIN, 49, 57 SAIN, 49, 54 SAIN, 82, 98 SAIN, 79, 87 POPR, 142, ' SAIN, 76, 94 UNKW, 33, 5 PHLA UNKW SAIN	G Point3 PHLA, 89, 7: ASSY, 166, 1: SAIN, 47, 49 SAIN, 21, 38, SAIN, 138, 14 SAIN, 80, 87 VICR, 79, 91, SAIN, 129, 14 EUGR, 58, 71 PHLA ASSY SAIN

- 5 In Excel, create a final table to calculate the percent cover (abundance) of each species in each subplot.
 - The subplot numbers are now used as the top row, and the species button names as the left column.

• In each new cell, write the formula =COUNTIF(E\$12:CZ\$12, C23) where E\$12:CZ\$12 is the list of the 100 buttons for the given subplot, and C23 is the name Excel is searching for.

Enreg	gistrement auton	natique (\bigcirc	¶ ۲.6	- -				BOU_TO	T_25oct ·	• Mode de c
Fichier	Accueil	Insertio	n Mis	e en page	Formu	les Dor	nées	Révision	Affic	nage	Aide ,
Ĺ			× 12	▼ A [^] A [×]	$\equiv \equiv$	≡ ≫	ab. c€	Nombre		-	
Coller T	G	I <u>S</u> -		<u> A</u> -	$\equiv \equiv$	←= →=		\$ - %	5 000 €0 ,00	00, 0 ->0	Mise en forr conditionnel
Presse-pa	apiers 🖬	F	Police	G.	А	lignement	G	No	ombre	5	
SOMN	ΛE ▼ : B	×	✓ f _x	=NB.SI(E	\$12:CZ\$1	L2,C23)	F	G	н	I	J
9 8 10 9	1.8.tiff 1.9.tiff				100 100	ASSY, 45, 65, 14 UNKW, 30, 36, 1	SAIN, 76, 94 UNKW, 33, 5	SAIN, 129, 14 EUGR, 58, 7	SAIN, 85, 104 UNKW, 43, 5	SAIN, 102, 1 SAIN, 139, 1	12 SAIN, 207, 2 : 16 SAIN, 121, 14: :
12					11666	UNIZA			CAINI	LINES/	SAIN
12					12 tiff	SAIN		ASSY	SAIN	UNKW UNKW	UNKW 1
14					13 tiff	SAIN	SAIN	SAIN	SAIN	UNKW .	EUGB I
15					1.4.tiff	SAIN	SAIN	SAIN	UNKV	SAIN	SAIN
16					15.tiff	SAIN	SAIN	SAIN	POAL	SAIN	SAIN
17					1.6.tiff	SAIN	SAIN	SAIN	SAIN	PHLA	SAIN
18					1.7.tiff	POPR	POPR	VICR	POPR	POAL	PHLA
19					1.8.tiff	ASSY	SAIN	SAIN	SAIN	SAIN	SAIN :
20					1.9.tiff	UNKW	UNKV	EUGR	UNKW	SAIN	SAIN :
21					subplot1	subplot2	subplot3	subplot4	subplot5	subplot6	subplot7 :
22	Factor for unseen b	ut present s	APAN		0.0	0.0	0.0	0.0	0.0	0.	0.0
23	0.5		ASSY		CZ\$12,C23)	1.0	0.0	1.0	3.0	0.	0.0
24		1	CACA		0.0	0.0	0.0	0.0	0.0	0	0 00

• The value that will appear in the new cell is the relative abundance of the given species in the given subplot.

	Enreg	jistremen	it auton	natique	•		5.6	¹	
Fic	hier	Accu	eil	Insert	ion	Mise	en page	Formu	les
[X	Arial		Ŧ	12	A A	三三	= 🇞
C	oller	u⊒ * ∛	G	I <u>S</u>	•	- 🔗	- <u>A</u> -	≣≡	= =
Pres	sse-pa	piers 🗔			Police		G.	A	ligneme
D	23			×	~	$f_{\mathcal{K}}$	=NB.SI(E\$12:CZ\$1	L2,C23)
	А		в		1	С	:	D	E
9	8	1.8.tiff						100	ASSY, 45
10	9	1.9.tiff						100	UNKV, 30
11									
12								1.1.tiff	UNKV
13								1.2.tiff	SAIN
14								1.3.tiff	SAIN
15								1.4.tiff	SAIN
16								1.5.tiff	SAIN
17								1.6.tiff	SAIN
18								1.7.tiff	POPR
19								1.8.tiff	ASSY
20								1.9.tiff	UNKW
21								subplot1	subplot2
22		Factor for	unseen b	ut preser	it s APAN			0.0	
23		0.5			ASSY			3.0	
24					CACA			0.0	

 At the end of the table, add one row to calculate the sum of the relative abundances. The sum should be of 100.

Fichier Accueil Insertion Mise en page Formules	Donné
12 × A [*] A [*] = =	87 -
	<u>←</u> = ⇒=
Presse-papiers 😨 Police 🗟 Align	nement
SOMME ▼ : × ✓ <i>f</i> _x =SOMME(D22:D62)	
A B C D	E
27 ELRE 0.0 28 EQVA 2.0	0.0 5.0
29 EUGR 0.0	0.0
31 GATB 0.0	0.0
32 GEAL 0.0	0.5
33 IMCA 0.0	0.0
35 PHAU 0.0	0.0
36 PLMA 0.0	0.0
37 PUAL 0.5 28 POPR 0.5	2.0
39 BUID 0.0	0.0
40 SAIN 69.0	31.0
41 SOAL 0.0	0.0
43 SOGI 0.0	2.0
44 SORU 0.0	0.0
45 SYNA 0.0	0.0
47 VICB 10	0.0
48 VIRI 0.0	0.0
49 TRRE 0.0	0.0
51 UNKV 180	20.0
52 LYSA 0.0	0.0
53 PHLA 7.0	37.0
50 PHPB 0.0	0.0
57 QHMA 0.0	0.0
58 TRDU 0.0	0.0
59 PHPB 0.0	0.0
61 SAU 00	0.0
62 CARL 0.0	0.0
63 0 D22:D62	101.0
64 7 65	9

 Add one last row under the previous one, containing the number of species per subplot. The formula to enter is

=COUNTIF(D22:D62, ">0")

where the cells D22:D62 are the percent cover values across all species within the subplot, and >0 accounts for presence.

Enregistr	ement autom	natique 🤇		8 9		Ŧ
Fichier	Accueil	Insertion	M	ise en pa	ge Fo	ormules
		r c	- 11	- A^	A =	≡ = ≫
- 5	G	<u>7</u> .				= = ∈=
Presse-papie	rs 🖬	P	olice		GI	Alignemer
SOMME	*	×	✓ fs	=NE	B.SI(D22:0	056,">0")
A		В		С	D	E
27				ELRE	0.0	0.0
28				EUCR	0.0	0.0
30				FRVI	0.0	0.0
31				GATR	0.0	0.0
32				GEAL	0.0	0.0
33				IMCA	0.0	0.0
34				AGGI	84.0	87.0
35				PHAU	1.0	0.0
36				PLMA	0.5	1.0
37				POAL	0.0	0.0
30				DUID	0.0	0.0
40				SAIN	0.0	0.0
41				SOAL	0.0	0.0
42				SOAR	0.0	2.0
43				SOGI	1.0	0.0
44				SORU	0.0	0.0
45				SYNA	0.0	0.0
46				TAOF	0.0	1.0
4/				VICR	0.0	0.0
40					0.0	0.5
50				OTHR	0.0	0.0
51				UNKW	0.0	0.0
52				FRPE	3.0	2.0
53				CARL	0.0	0.0
54				BEPO	0.0	0.0
55				CACR	0.0	0.0
56				0	0.0	0.0
57				0	100.5	100.5
58					ר <u>ט</u> לי)	7

6 Species that occur within the *Fulcrum* subplot species list BUT that are not observed by the point frame are assigned an abundance value of 0.5% in the Excel spreadsheet to account for their presence.

Note

The last column (no. of species per subplot) of the table generated at step 5 is useful to compare your data to the *Fulcrum* records, when looking for absent species. Ground covers that are not species should be left out of the count.

Enregistreme	nt automatiqu		<u>।</u> २ - ९	l ≠ ∓
Fichier Accu	ieil Insert	tion Mise	en page	Formule
	Arial G I S	- 12	· A A ·	= = =
resse-papiers ⊡		Police	G	Aliç
F69	• : ×	✓ f _x		
- A	в		с	D
33		IMCA		0.0
34		AGGI		0.0
35		PHAU		0.0
36		PLMA		0.0
37		PORL		0.0
39		BUID		0.0
40		SAIN		69.0
41		SOAL		0.0
42		SOAR		0.0
43		SOGI		0.0
44		SURU		0.0
45		TADE		0.0
47		VICB		1.0
48		VIBI		0.0
49		TRRE		0.0
50		OTHR		0.0
51		UNKV		18.0
52		DLE A		0.0
55		PHPR		0.0
56		ASIN		0.0
57		QHMA		0.0
58		TRDU		0.0
59		PHPR		0.0
60		EUMA		0.0
61		SALL		0.0
62		CARL	0	100.0
64				50.0
OF.				<u> </u>

The Excel spreadsheet generated from *SamplePoint* only contains 5 species, while the orignal *Fulcrum* record contains 7 in the same subplot.

8 Subplots	2
Cover Estimates (7 Items)	8
Asclepias syriaca Linnaeus	View >
Phalaris arundinacea Linnaeus	View >
Vicia cracca Linnaeus	View >
Salix interior Rowlee	View >
Equisetum variegatum Schleicher ex F. Weber & D. Mohr	View >
Poa pratensis Linnaeus	View >
Poa alsodes A. Gray	View >

Enregistrement automatique 💽 🔋 り・ 🖓 - 🗧		
Fichier Ac	ccueil Insertion Mise en page	Formules
Coller 🗳	Arial \bullet 12 \bullet \bullet G I S \bullet \bullet \bullet	I I I I I I I I I I I I I I I I I I I
Presse-papiers	ra Police r	Align
D66	▼ : × ✓ fx	
A	в с	D
33	IMCA	0.0
34	AGGI	0.0
35	PHAU	0.0
36	PLMA	0.0
37	POAL	0.5
39	BUD	0.5
40	SAIN	69.0
41	SOAL	0.0
42	SOAR	0.0
43	SOGI	0.0
44	SORU	0.0
40	SYNA	0,0
47	VICE	10
48	VIBI	0.0
49	TRRE	0.0
50	OTHR	0.0
51	UNKW	18.0
52	LYSA	0.0
03 EE	PHLA	7.0
56	ASIN	0.0
57	QHMA	0.0
58	TROU	0.0
59	PHPR	0.0
60	EUMA	0.0
61	SALL	0.0
62	CAPL	0.0
63		0 101.0
01		

The species that were absent from the Excel spreadsheet generated from *SamplePoint* but present in the original *Fulcrum* record are given a value of abundance of 0.5% to account for their presence even though they were not targeted by the 100 crosshairs.