Standard Operating Procedure (SOP) #14

Managing Photographic Images (All Vegetation Vital Signs)

Version 3.0 (May 19, 2025)

Change History

New Version #	Revision Date	Author	Changes Made	Reason for Change	Previous Version #
2.0	5/24/2021	Kelly Kozar, Kim Weisenborn, Jacob Gross	Updated folder structure and instructions. Revised section on organizing images, and few other minor updates like SOP references and external links. Added new procedures for managing photos captured with ArcGIS Field Maps app, utilizing AGOL cloud storage, and photo processing with ArcGIS and R.	To reflect current folder setup and how to process the images. To update outdated SOP references and external links. To better document species identifications and utilize the suite of capabilities available with smart devices, ESRI apps, and AGOL.	1.0
2.01	3/14/2022	Kim Weisenborn	Updated content to refer to new PACN I&M SharePoint. Updated figures to reflect change.	PACN data is no longer stored on a networked server (I:\ drive) and is now stored on the PACN SharePoint site.	2.0
3.0	5/19/2025	Jacob Gross	Updates to processing images using R. Some user instructions moved from SOP into R script. Several changes to the order of steps to improve efficiency.	Improvements to R script and functions (within pacnvegetation R pacakage) occur frequently – easiest to make updates directly in the script and point SOP to that script- this also reduces confusion if SOP and script are out of sync.	2.01

Only changes in this specific SOP will be logged here. Version numbers increase incrementally by hundredths (e.g., version 1.01, version 1.02) for minor changes. Major revisions should be designated with the next whole number (e.g., version 2.0, 3.0, 4.0). Record the previous version number, date of revision, author of the revision, changes made, and reason for the change along with the new version number.

Purpose

This SOP describes how to download and process ArcGIS® Field Maps photographic images collected by project staff or volunteers while conducting both Focal Terrestrial Plant Communities (FTPC) and Established Invasive Plant Species (EIPS) monitoring.

The standards described herein pertain specifically to all digital photographs related to FTPC and EIPS Monitoring. In this SOP, digital photograph refers to any photo in electronic format regardless of acquisition by scanner or digital camera. Most photos acquired and used by I&M personnel should fit into one of the general categories.

1. *Library Photos*: These photos are final products that have been edited, documented, reviewed, and added to the photo archive in the Pacific Island Inventory and Monitoring Network (PACN) Monitoring Archive Library[1] in the PACN SharePoint (SPO) site[2]. These photos are representative, unique, and instructive and can be used for multiple purposes by a variety of staff.

2. *Data Photos*: Data photos are photos collected as data. Care should be taken to distinguish data photos from incidental or opportunistic photos taken by project staff. Data photos are those taken for at least one of the following reasons, to:

   - Document a particular feature or perspective for the purpose of site relocation
   - Capture site habitat characteristics and possibly to indicate gross structural changes over time
   - Document a species detection or unknown species that is also recorded in the data
   - Document crewmembers conducting monitoring (used in reports, etc.)

   Data photos may be linked to specific records within the database and are stored in a manner that permits the preservation of those database links. Other photos – e.g., of field crew members at work, or photos showing the morphology or behavior of certain species – may also be retained but are not necessarily linked with database records.

3. *Misc Photos*: Miscellaneous photos are photos taken during monitoring missions but that do not pertain directly to monitoring data. These photos may be useful for efforts and operational reviews. For example, photos taken while camping or traveling, helicopter operations, touring park locations outside of sampling frame, etc.

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[1] PACN Monitoring Archive Library, https://doimspp.sharepoint.com/sites/nps-PWR-PACNIM/monitoring_archive (last accessed 19 May 2025).
[2] PACN SharePoint (SPO) Site, https://doimspp.sharepoint.com/sites/nps-PWR-PACNIM (last accessed 19 May 2025).

Image Management Workflow

Effectively managing hundreds of photographic images requires a consistent method for downloading, naming, editing, and documenting. The general process for managing photos proceeds as follows:

1. File structure setup
2. Image acquisition
3. Syncing & Downloading files
4. Review and edit or delete the photos
5. Process Photos
    - Rename the image files according to convention
    - Move into appropriate folders for storage
6. Establish database links
7. Document the photos
8. Final storage

File Structure Setup

Prior to data collection for any given year, project staff will need to set up new folders under the "Images" folder in the FTPC Monitoring project workspace / EIPS Monitoring project workspace in SharePoint. Folder structures should be set up as follows (Figure SOP 14.1 and 14.2):

Images	FTPC "Images" / EIPS "Images"
[Year]	The appropriate year (e.g., 2021, 2022, etc.)
_attributes	Attributes of the photo that are populated in the field when the photo is taken.
[PARK]	Arrange files by 4-letter park code (e.g., HAVO, HALE, etc.)
Data	Organized and watermarked plot photos arranged by sampling location and date.
Misc	Non-ArcGIS Field Maps photos that may be pertinent to the monitoring season.
Originals	The most up-to-date copy of the AGOL file geodatabase (photos and attributes).
Plants	Contains additional folders for park/year master spreadsheet and individual sampling event folders containing watermarked plant photos.

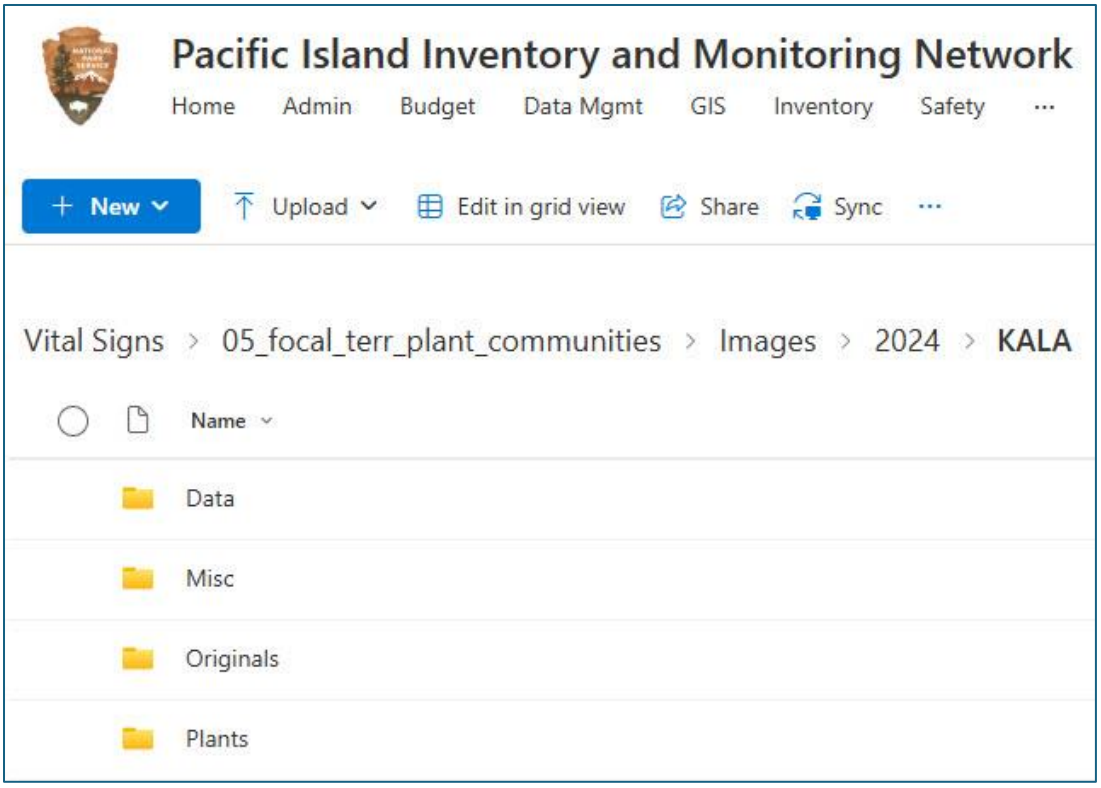

Figure SOP 14.1. Example of FTPC Images subfolder structure for a particular year and park in SharePoint.

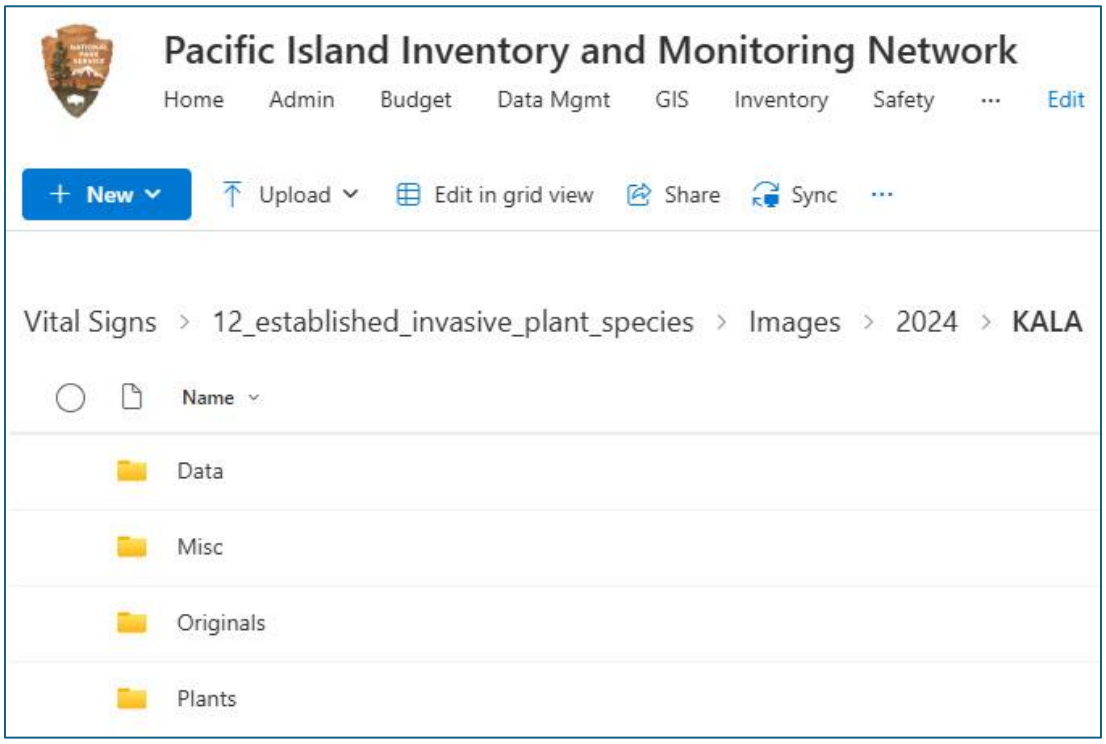

Figure SOP 14.2. Example of EIPS Images subfolder structure for a particular year and park in SharePoint.

This folder structure permits data images to be stored and managed separately from miscellaneous images collected during the project. It also provides separate space for storage of originals. For additional information about the project workspace, refer to SOP #12 Workspace Setup and Project Records Management.

Image Acquisition

FTPC and EIPS photos will be taken using the ESRI ArcGIS Field Maps App. For steps on collecting ArcGIS Field Maps photos see SOP #8 Using Field Maps for ArcGIS.

Three specific ArcGIS Online (AGOL) layers are used to distinguish the three types of vegetation monitoring photos collected in the field, which will be described in more throughout later sections of this SOP:

1. *FTPC Point Photos*: FTPC point photos are images that capture site habitat characteristics and gross structural changes in the plant community over time. They are taken at specific locations within a plot and are designed to be repeatable.

2. *EIPS Point Photos*: EIPS photos taken also capture habitat characteristics and gross structural changes and are taken at specific intervals along the invasive plant transects.

3. *FTPC & EIPS Plant Photos*: Photos of plant species with uncertain identification that need further investigation. These are documented with photos so follow-up identification can be conducted or show why identification was uncertain. Alternatively, plant photos can also document confidently identified species and used as a reference or as a learning tool for future crewmembers.

Syncing & Download Images

Syncing from field maps on smart device to AGOL

During field collection, ArcGIS Field Maps photos and corresponding attribute information are stored locally on the mobile device and must be uploaded (synced) to ArcGIS Online once back in a connected environment. See SOP #8 Using Field Maps for ArcGIS for steps to complete data synchronization/upload.

Download photos (Plant Photos + "FTPC/EIPS originals")

Biweekly downloads from AGOL to the PACN SharePoint vital signs folders should be performed in order to back-up the images and attributes stored on the AGOL cloud server. Having the photos in a SharePoint folder also provides an easier way to share/email plant photos than using AGOL/Field Maps to download each species photo individually. The R download (steps below) also provides an output spreadsheet to help with QA/QC verification and to track uploads to iNaturalist (for Plant Photos). **Note** that all steps require the use of the 'pacnvegetation' R package (most up-to-date version on github: jakegross808/pacn-veg-package: all pacn veg code)

Using pacnvegetation R package, open the R script found in the project folder pacn-veg-package/scripts/agol_fieldmaps_photo_download.R and follow the comment lines in the script (If the

comment lines differ from the example steps below, follow the script comment lines as the R script may be updated more frequently than the SOP).

Example script comment lines below (latest script may be slightly different)

1. Enter the temporary location on your computer where the photos and files will be downloaded to:

```
var_temp_dest <- "C:/Users/JJGross/Downloads/Check_Photos"
```

2. Enter the location on the SharePoint where the folders containing the photos will be downloaded to:

```
var_SharePoint_dest <- "https://doimspp.SharePoint.com/:f:/r/sites/nps-PWR-PACNIM/vital_signs/05_focal_terr_plant_communities/Images/2024/KALA/Plants/Plants_photos"
```

   a. SharePoint location examples:

      i. FTPC/Images/2024/KALA/Originals/FTPC/master_spreadsheet

      ii. FTPC/Images/2024/KALA/Plants/Plants_KALA_2024_Spreadsheet

3. If first time downloading photos for a particular layer in AGOL

   a. Enter and the AGOL rest service https:// link as a named object (and run the line):

```
FTPC_KALA_2024 <-
"https://services1.arcgis.com/fBc8EJBxQRMcHlei/arcgis/rest/services/KALA_2024_FTPC_Sampling_Points_Photos/FeatureServer/3"
```

   b. Then enter the object as the variable "var_photo_layers" and run that line.

```
var_photo_layers <- c("FTPC_KALA_2024")
```

   c. Run the code in the `## First Download -----` section.

      i. `# Test Run`

         1. Run code chunk to return a table that can be checked for accuracy.

      ii. `# First Full Download`

         1. Run code chunk to download all photo/points contained within the AGOL to the location folder specified above.

4. If this is second time (or more) downloading from AGOL layer, then:

   a. If not already specified, type in the folder location where the master spreadsheet is housed (and make sure only the one master spreadsheet file exists within the folder).

Currently it seems to work best by setting up a short-cut to the SharePoint folder and pointing to the short-cut:

master_spreadsheet_folder <- "C:/Users/JJGross/OneDrive - DOI/2024/KALA/Plants/Plants_KALA_2024_Spreadsheet"

b. Navigate to the `## 2nd-n Downloads` section of the R script.

c. `# 2nd Download Test Run` section.

   i. Run code chunk to return a table that can be checked for accuracy.

      1. **Note** that the entire table will be returned, and you will need to scroll to bottom of table to see newest photo records.

   ii. `# 2nd Download new Photos`

      1. Run code chunk to download all new photo/points contained within the AGOL, using the last photo date on the master spreadsheet as the cutoff (dates before this date will not be downloaded).

         a. Use output from test run of when most recent photo downloaded and enter that date into 'after_date_filter' argument.

            i. For example: after_date_filter = lubridate::mdy_hms("08/18/2024 18:00:00", tz = "HST")

            ii. The highlighted portion is all that needs updated, make sure to keep format the same (MM/DD/YYYY).

   iii. Drag folders from local folder location (var_temp_dest) to "Images" > Year folder > Park folder > "Plants" > "Plant_photos" folder in SharePoint (var_SharePoint_dest) (Figure SOP 14.3)

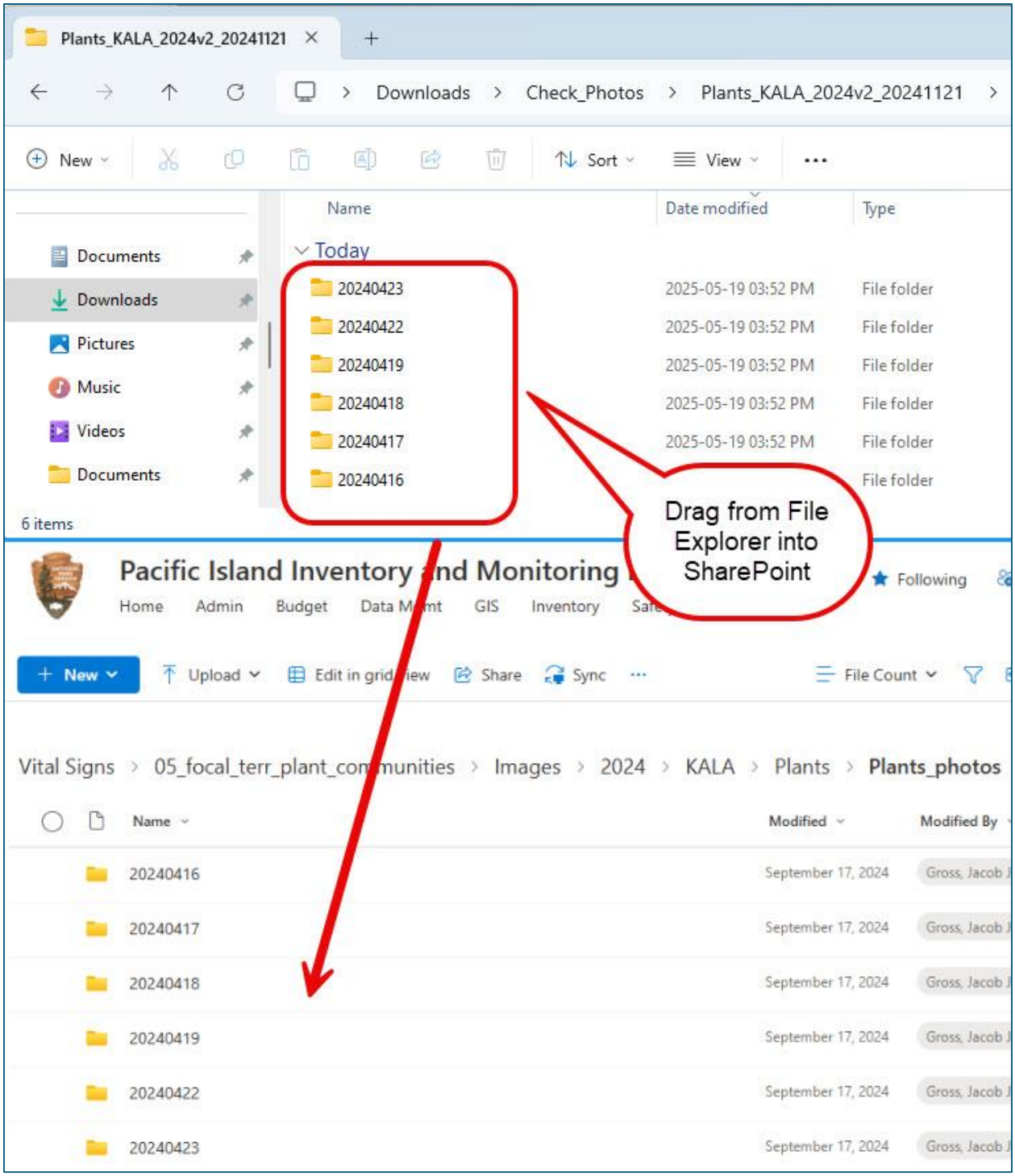

Figure SOP 14.3. Uploading photos from the user's local drive to SharePoint.

5. Download the master excel spreadsheet.
6. Open new csv spreadsheet created in the local folder (var_temp_dest)
    a. Copy the new rows since the last download (link column will not be populated)
    b. Paste the new rows into the downloaded master spreadsheet.
        i. Select the last value with a populated "link" column and drag it down to populate the new rows with links to the SharePoint.
    c. Rename master spreadsheet with last photo date in spreadsheet and upload to same 'master_spreadsheet_folder'
    d. Move old excel spreadsheet to 'old' folder located "…var_SharePoint_dest /old"

Note: If all phones were not synced before conducting the 'Downloading photos' step then the easiest approach is to delete all recent folders and recent master spreadsheet records and repeat the download process. This is much easier than trying to pinpoint and download just the photos that were not synced.

Download AGOL Layer (Plant Photos + "FTPC/EIPS originals")

In addition to photo downloads, a download of the AGOL layer can also be performed. However, bi-weekly backups of the AGOL layer are not necessary if the "Downloading photo" section above is conducted bi-weekly. A download of the AGOL layer needs to be conducted at the end of the season or at any point that protocol photos are processed (watermarked and organized).

To download the layer file from AGOL using ArcGIS Pro:

1. Open ArcGIS Pro
2. Make sure within ArcGIS Pro that you are signed into your NPS AGOL account.
3. Add data from the photo layers hosted on the PACN Vegetation Group on AGOL (Figure SOP 14.4). If you do not have access to this group, contact PACN Lead Vegetation Biological Science Technician, PACN Botanist, or the PACN GIS Specialist.

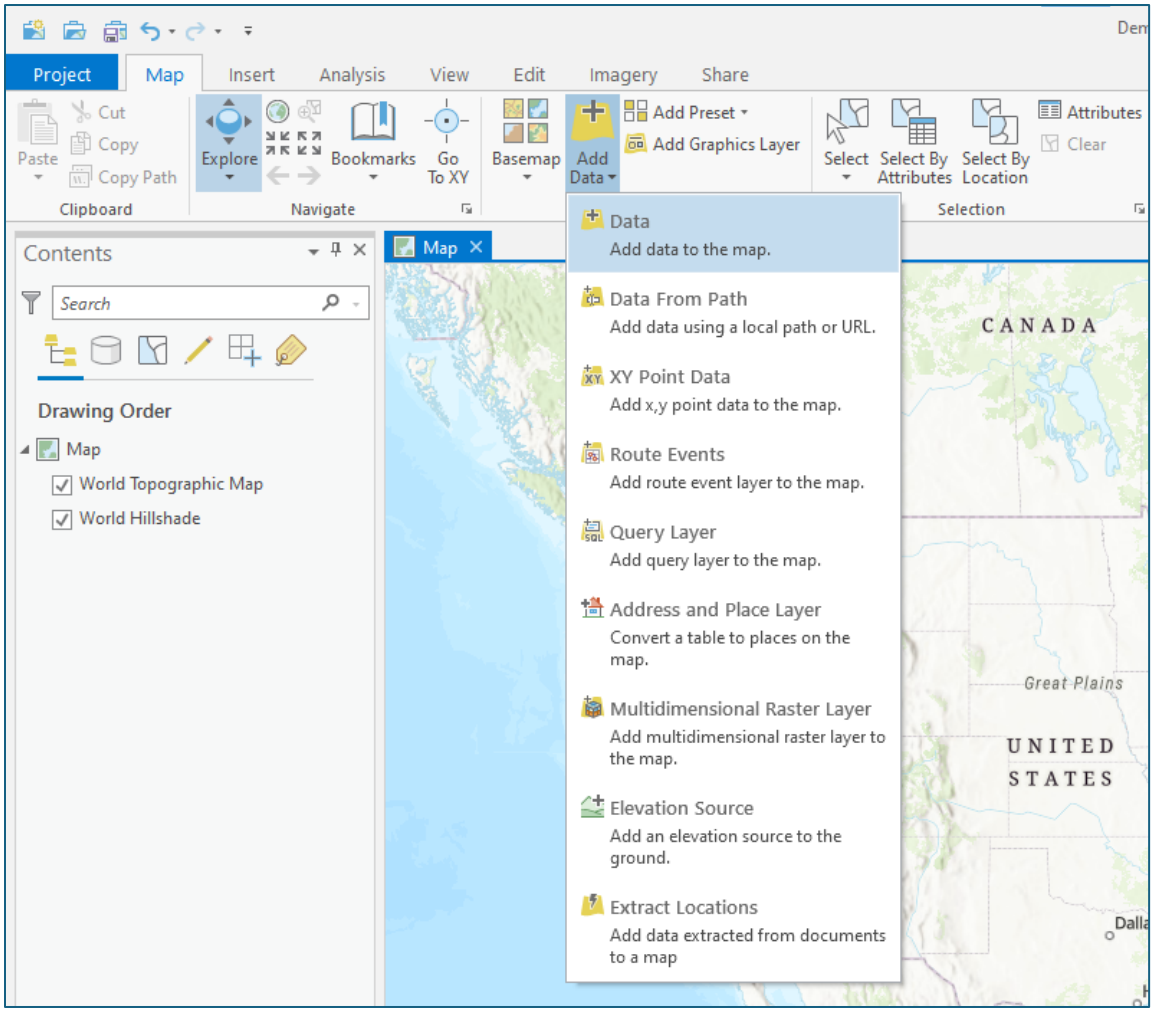

Figure SOP 14.4. Adding data from AGOL to ArcGIS Pro.

a. Navigate to PACN Vegetation Group (Figure SOP 14.5)

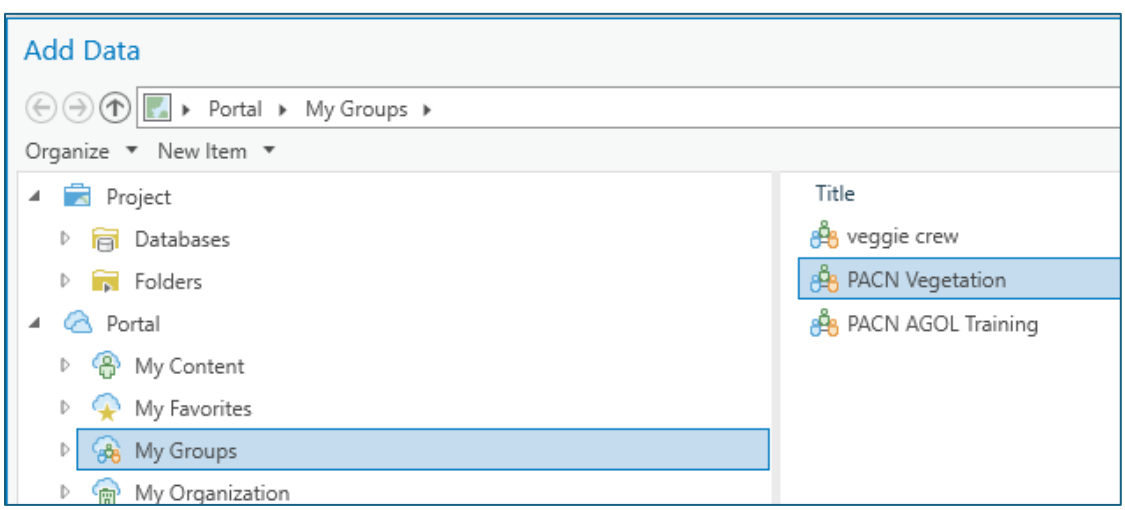

Figure SOP 14.5. Navigating to the PACN Vegetation Group in ArcGIS Pro.

b. Select the hosted feature layers with “Photos” and appropriate year and click OK (Figure SOP 14.6).

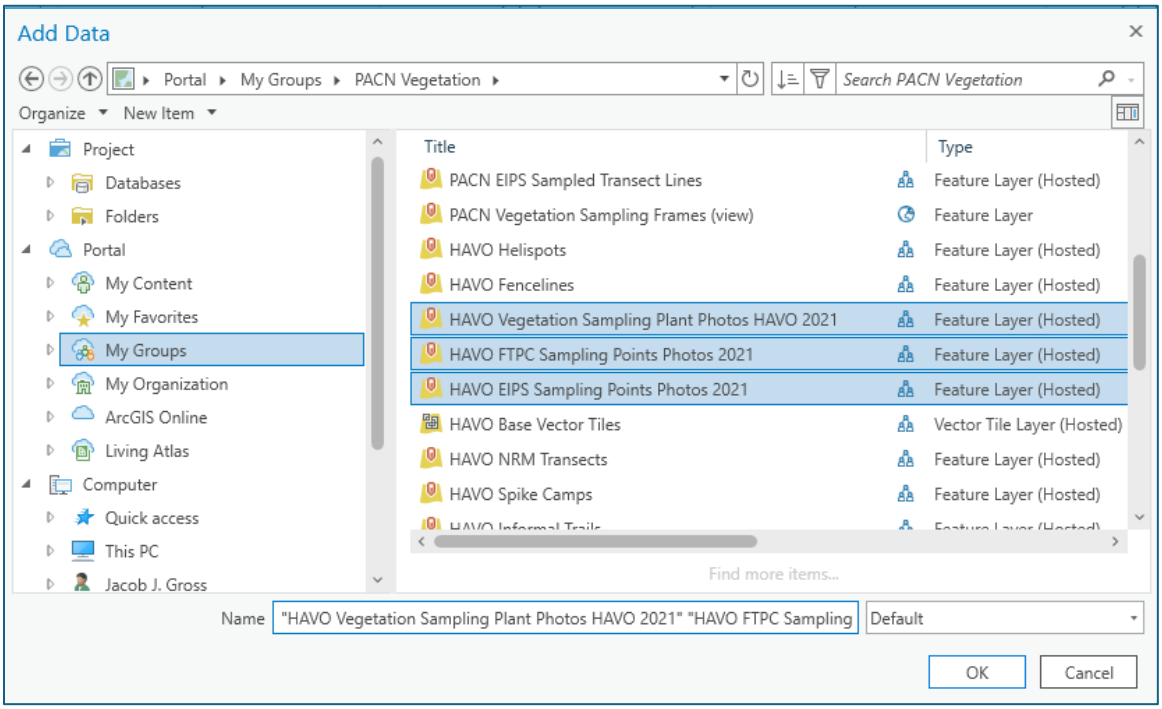

Figure SOP 14.6. Selecting the desired data from AGOL portal to be added to ArcGIS Pro.

4. Make sure the attribute table is showing all fields (Figure SOP 14.7):

   a. Right click on feature layer

   b. Select “Attribute Table”

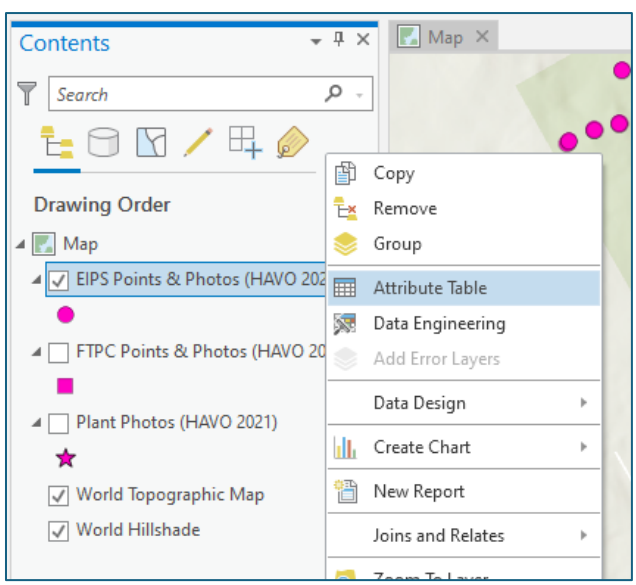

Figure SOP 14.7. Opening the attribute table.

c. Click on Attribute Menu and select "Show All Fields"—this ensures all attribute fields are exported with the point data (Figure SOP 14.8).

i. **Note**: You will only need to do this once if you save the ArcGIS Pro workspace and later use the same workspace to export the AGOL layers. If "Show all Fields" is light grey in color than all fields are already being displayed.

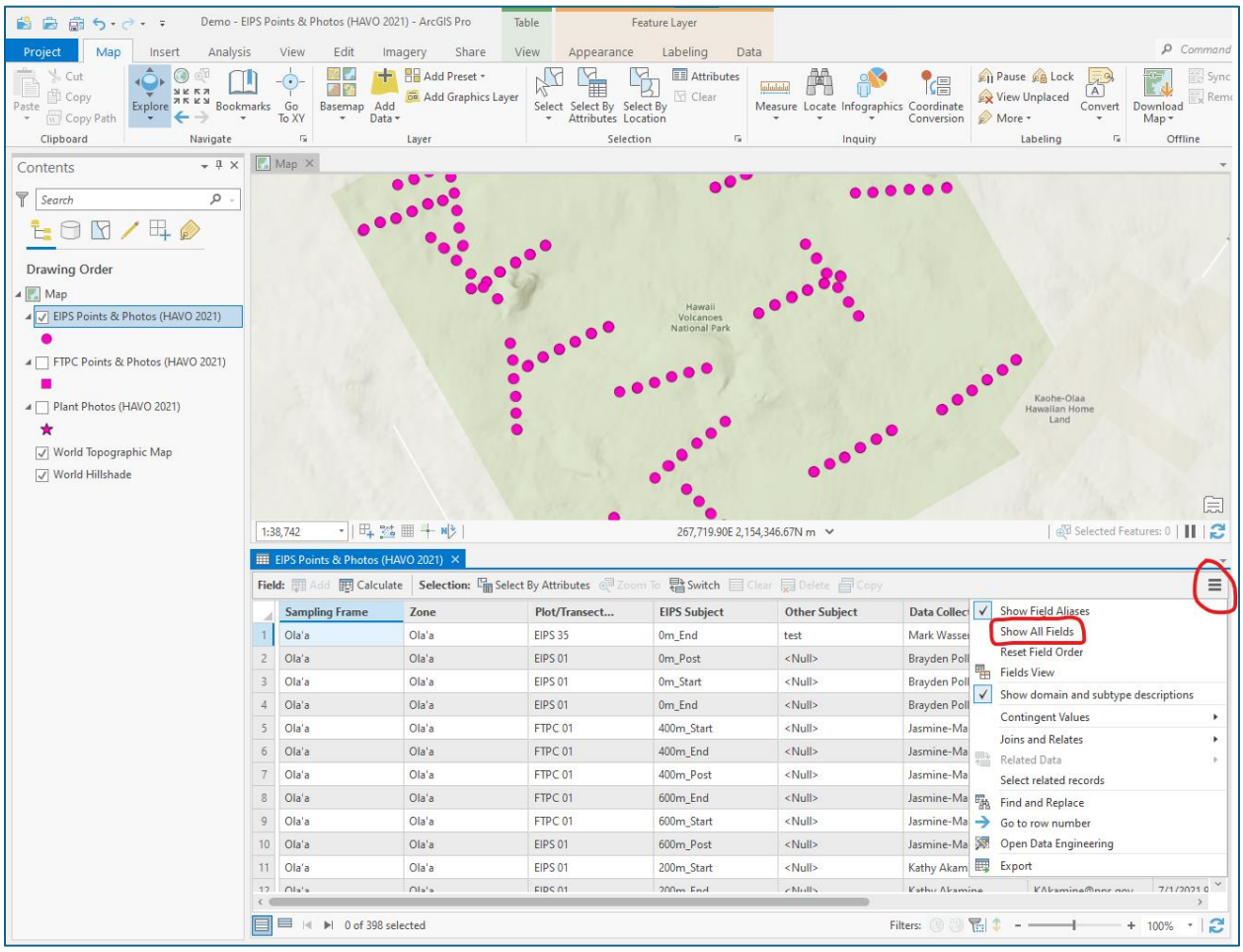

Figure SOP 14.8. Showing all fields on the attribute table.

5. Check the attribute table to ensure data values are correct. This step can also be done in AGOL using the steps listed in the FTPC user guide (Plot Images Section): focal_terr_plants_database_user_guide_sql_v2_02.docx

6. Export the feature layer

a. Prior to exporting, check that the number and locations of points in each layer file are correct. This can be done in the Map viewer in ArcGIS Pro.

b. IMPORTANT: Before starting export, make sure no features are selected within the layer file you intend to export. If features are selected, then only selected features will be exported instead of all features.

   i. To clear any selected features, click on the feature layer you intend to export in the Contents pane, then click the “Clear” button in the Map ribbon. If it is greyed out than no features are selected (Figure SOP 14.9).

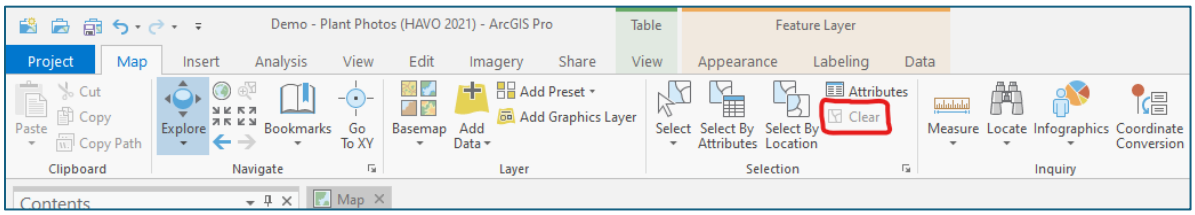

Figure SOP 14.9. Clearing all selected features prior to exporting the feature layer.

c. If no features are selected, then you can start the export by right-clicking on feature layer that you want to export (Figure SOP 14.10).

   i. Hover over “Data”.

   ii. Click on “Export Features”.

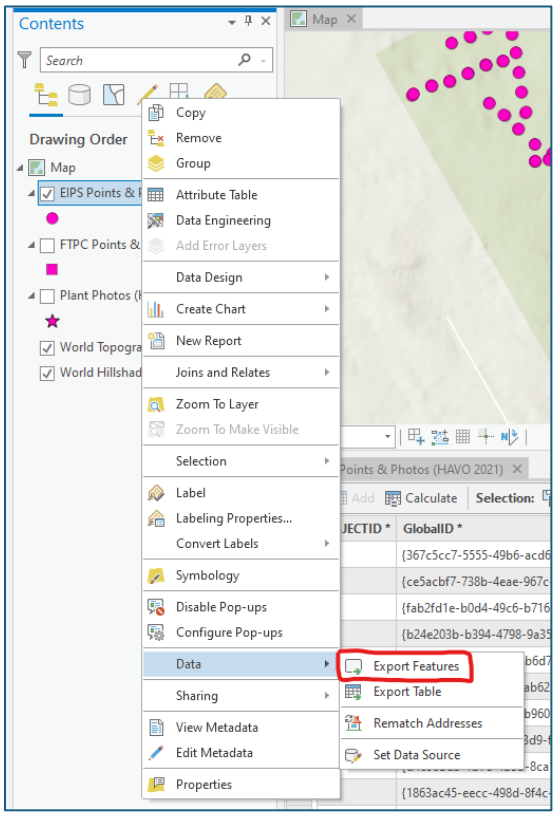

Figure SOP 14.10. Right-click on feature layer, Data, then select Export Features to begin exporting the feature layer.

iii. Save the feature class to local, a stand-alone file geodatabase (Figure SOP 14.11). The geodatabase will then be uploaded to the appropriate SharePoint folder.

1. Click on the folder image next to “Output Location”

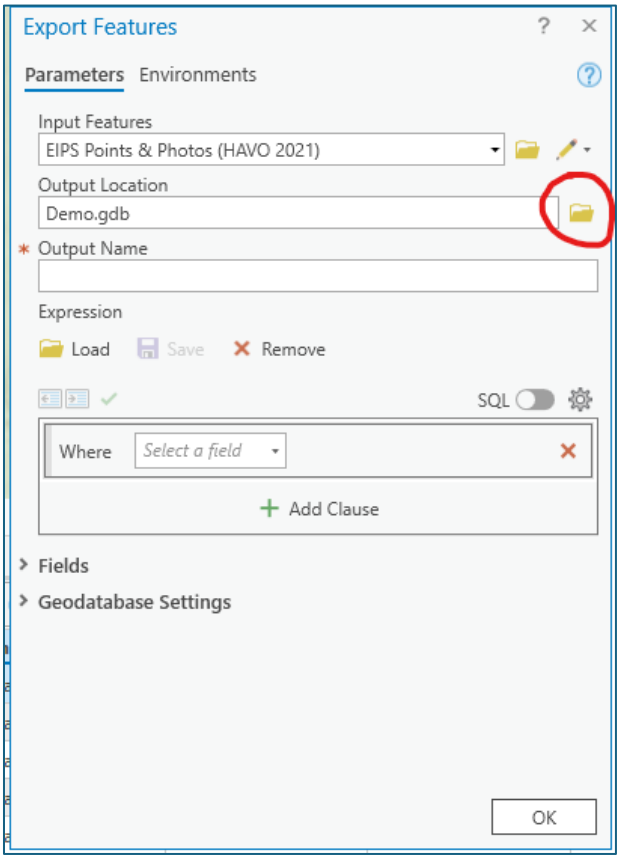

Figure SOP 14.11. Saving the feature later to a local geodatabase.

2. Navigate to an appropriate location on your local computer and create a folder (if needed) and a new geodatabase. Right-click in order to create either of these (Figure SOP 14.12, below).

3. In the example below, a new folder called “Temp_Geodatabase” was created within the Downloads folder on a local computer (it will be deleted after uploading to SharePoint).

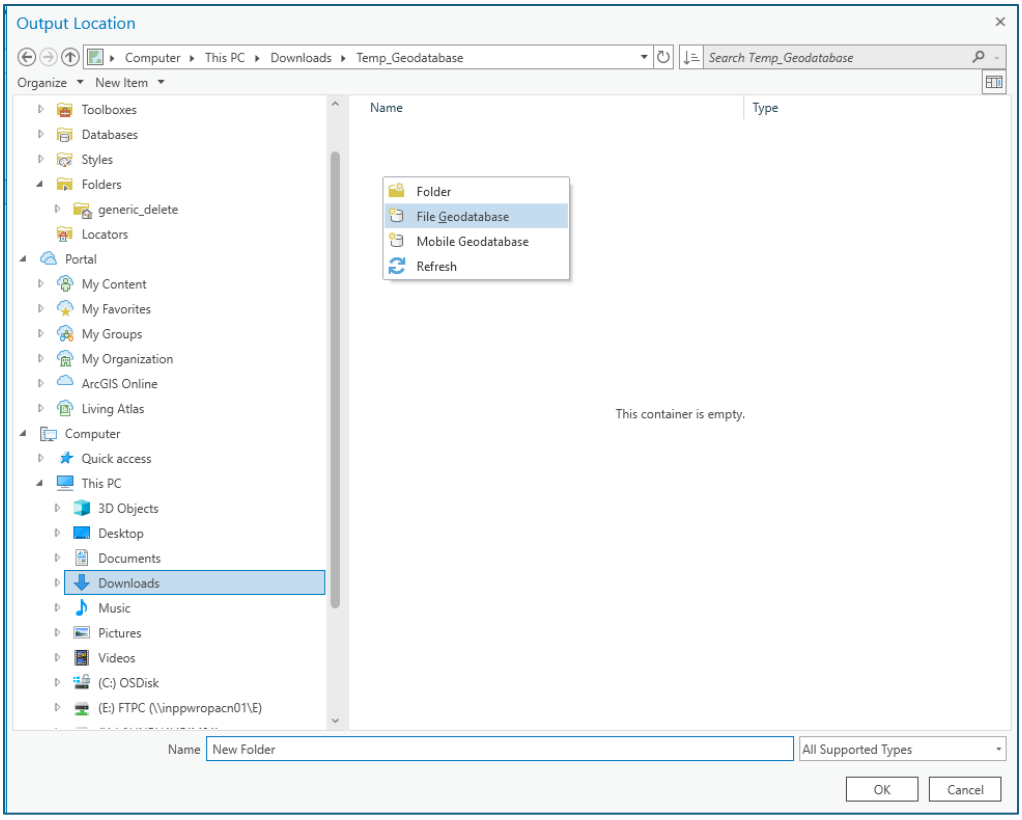

Figure SOP 14.12. First create a new temp folder (if needed), and then create a new File Geodatabase within the temp folder (Figure SOP 14.13, below).

4. Right click within the empty "Temp_Geodatabase" folder and click on "File Geodatabase" (Figure SOP 14.13, below).

5. Rename the empty file geodatabase using the following naming convention: protocol name or "Plants" if plant photos, write out sampling frame or multiple sampling frames if needed, and date (using year, month, day of the download in the file name) and click OK:

    a. Examples:

        i. Plants_Olaa_20220318.gdb

        ii. FTPC_Olaa_Nahuku_20220318.gdb

        iii. EIPS_Kahuku_Maunaloa_20220318.gdb

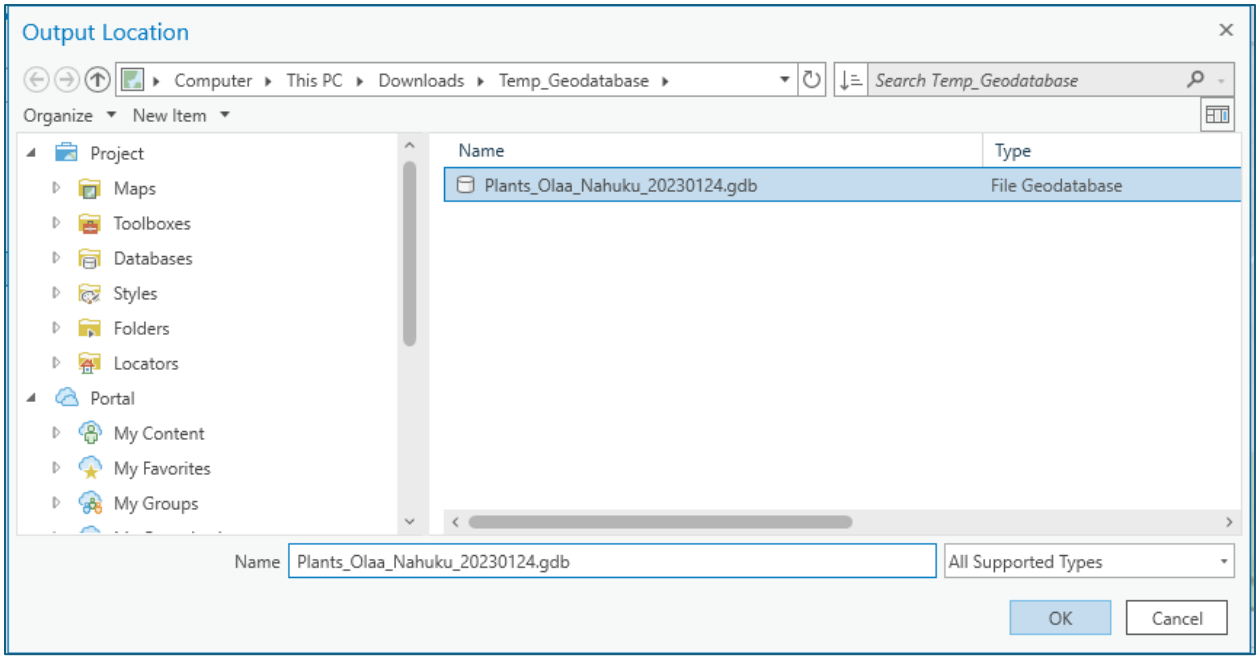

Figure SOP 14.13. New Geodatabase file created within the temp folder.

6. Click on box for "Output Name" and enter the same name used for the geodatabase (without the .gdb) (Figure SOP 14.14).
    a. Examples:
        i. Plants_Olaa_20220318
        ii. FTPC_Olaa_Nahuku_20220318
        iii. EIPS_Kahuku_Maunaloa_20220318

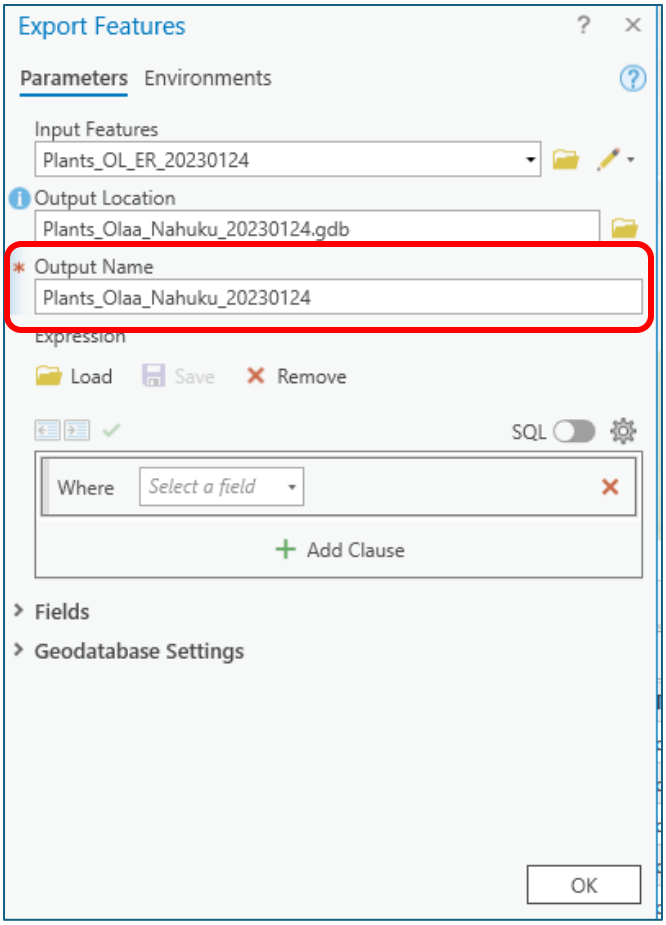

Figure SOP 14.14. Update Output Name to be the same as the Output Location (minus the ".gdb").

7. Click "OK" to start the export

iv. The follow progress message will display (Figure SOP 14.15)

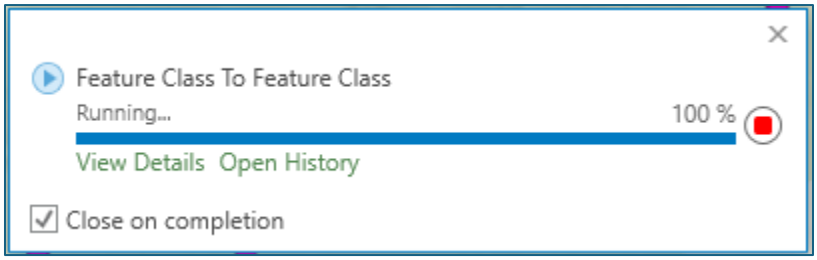

Figure SOP 14.15. Export progress meter.

1. Although it shows 100% within the first few seconds, the export is not complete if "Running..." is still displayed (Figure SOP 14.16, below).

2. To see more information about the status, click on view details. It will show when the export started. The “completed” line will be blank until the process is completed (Figure SOP 14.16).

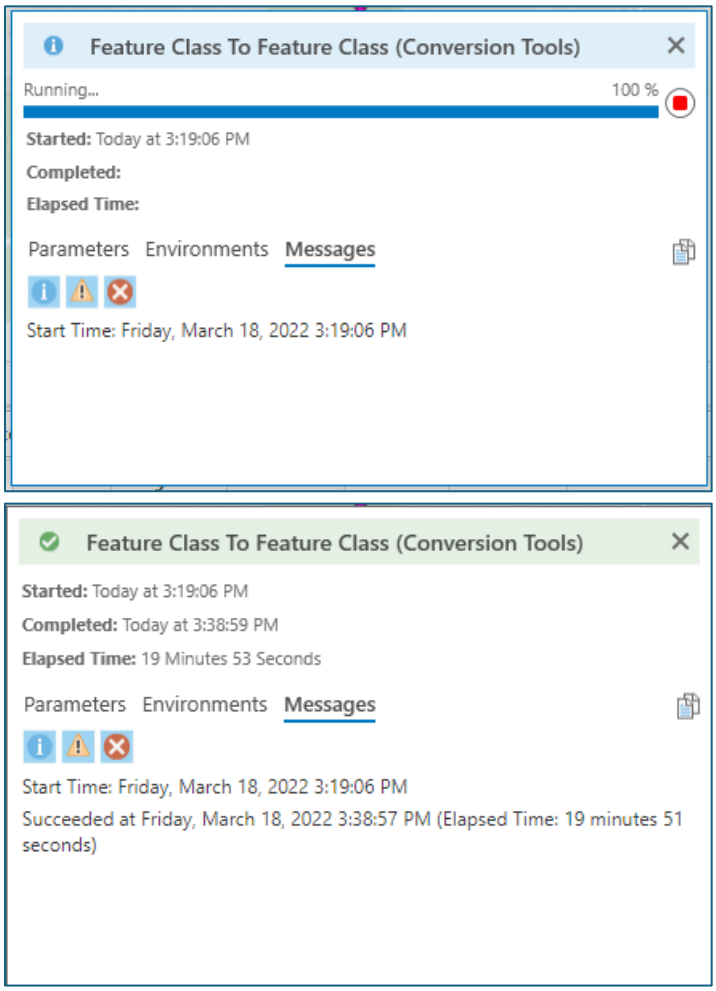

Figure SOP 14.16. Export status and details.

3. For reference, while teleworking from Hilo and connected to VPN, the FTPC layer file containing 553 points from ~40 plots took 17 minutes to complete. While the Plants layer file with 255 points took 20 minutes to complete (the plants layer file took longer because more photos are taken per point for plants).

4. Repeat steps for all layer files (i.e. FTPC, EIPS, and Plants).

v. When all geodatabases are ready, upload the FTPC, EIPS and Plants backups to the same folder on SharePoint:

1. Vital Signs > 05_focal_terr_plant_communities > Spatial_info > YEAR > PARK > GIS_Data > Data > AGOL_photo_backups

2. Once upload is complete, the local copy can be deleted from your computer. If this is the final copy, and you are processing photos – then do not delete the local copy and proceed with the next section.

Finalize Photos (Watermarking and Final Folder/File Structure)

Use the following steps to process ArcGIS Field Maps images, add watermarks to photos, organize the photos with the correct folder structure, and name the photos. It is easiest to perform this step when all photos for a sampling frame are complete. Photos can be processed before this time, however, the person performing the processing will then need to track which plots/transects have been completed and which still need processed.

1. Perform a final QA/QC check of the photo data in ArcGIS Pro or AGOL. If using ArcGIS Pro, load all current points into ArcGIS Pro using steps 1-5 in the "Downloading" Section or by opening a previously saved project that is connected to the Plant, EIPS, and FTPC AGOL photo layers.
    a. Check the attribute table for each point to ensure all fields are filled. For Plants layer, check that a final ID has been entered if the original ID was uncertain.
    b. Check that all points are accounted for in FTPC/EIPS layer (e.g. no plots/transects missing, no photo points missing within a plot or transect).
    c. Check spatial location of points to make sure they are reasonable accurate (e.g. no points with obviously inaccurate coordinates.)
2. Save the final .gdb download to the Vital Signs Spatial_info, AGOL_photo_backups folder:
    a. Vital Signs > 05_focal_terr_plant_communities > Spatial_info > YEAR > PARK > GIS_Data > Data > AGOL_photo_backups
    b. This insures that the spatial data backup is most up to date.
3. Also save the final .gdb download to the photos originals folder within the appropriate vital signs folder.
    a. **Note** that "Plants" gets saved to FTPC vital signs even though the plant photos layer contains both EIPS and FTPC plants.
        i. FTPC = Vital Signs > 05_focal_terr_plant_communities > Images > YEAR > PARK > Originals
        ii. Plants = Vital Signs > 05_focal_terr_plant_communities > Images > YEAR > PARK > Originals
        iii. EIPS = Vital Signs > 12_established_invasive_plant_species > Images > YEAR > PARK > Originals

4. Download the same final geodatabase to your local computer (if not already available).

5. Using pacnvegetation R package, open the R script found in the project folder pacn-veg-package/scripts/agol_fieldmaps_photo_finalize.R and follow the comment lines in the script.

    a. **Note** that all steps require the use of the 'pacnvegetation' R package (most up-to-date version on github: jakegross808/pacn-veg-package: all pacn veg code)
    b. Open the 'agol_fieldmaps_photo_finalize.R' script found in the 'scripts' folder under the root project folder.
    c. Follow the comment lines in the script (if the comment lines differ from the example steps below, follow the script comment lines as the R script is updated more frequently than the SOP).

        i. Example script comment lines below (latest script may be slightly different)

            1. In the R studio console run the following:

```
library(pacnvegetation)
```

            2. Then run the following (example arguments used):

```
process_photos(AGOL_Layer = "EIPS",

gdb_name = "EIPS_OL_ER_20220502.gdb",

gdb_location = "C:/Users/JJGross/OneDrive -
DOI/Documents/Photo_Processing/FTPC_EIPS_Photo_Processing",

gdb_layer = "EIPS_OL_ER_20220502",

return_table = FALSE))
```

            3. Where **AGOL_Layer** can be "EIPS" , "FTPC" , or "Plants"
            4. **gbd_name** is the geodatabase name saved locally
            5. **gdb_location** is the file path to the geodatabase
            6. **gdb_layer** layer is the layer file inside the geodatabase (and should be the same name as the geodatabase minus the ".gdb"
            7. **return_table** if TRUE the table used to label the photos, files, etc. is returned instead of processing the photos. This option can be used to check photo labeling, troubleshoot, etc. If FALSE (default), the photos are processed.
            8. Run the following in R command line to get more help with the function

```
?process_photos
```

            9. Photos will be saved inside the folder corresponding to the location where the R studio project was created.

10. Files will automatically be watermarked, renamed, and copied to the correct folder structure (Figure SOP 14.17 and 14.18 [below]).

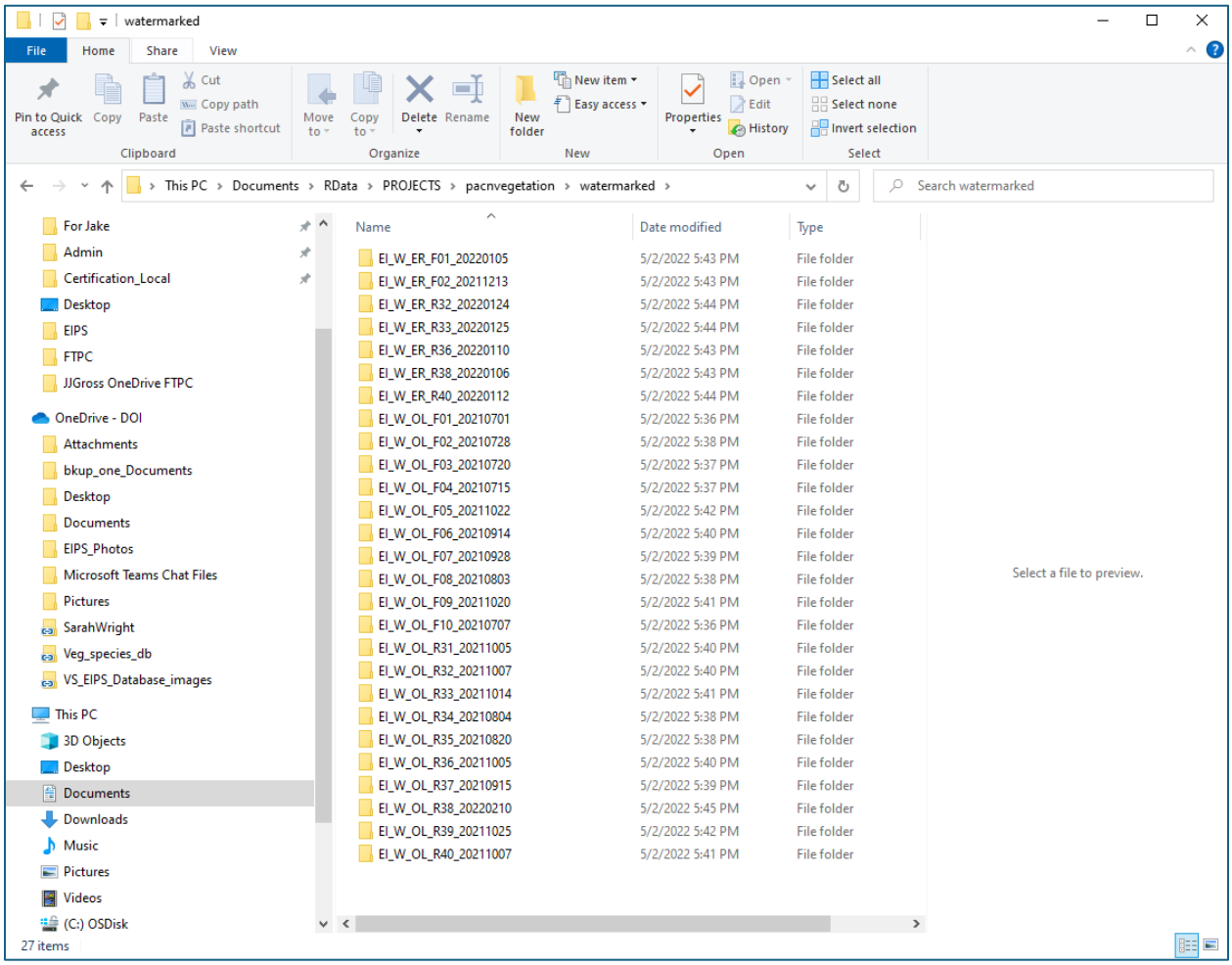

Figure SOP 14.17. Example of folder export for watermarked photos.

Name	Date	Type	Size
20210908_F02_CenterT1_CenterT2.jpg	9/8/2021 1:05 PM	JPG File	759 KB
20210908_F02_CenterT2_Canopy.jpg	9/8/2021 1:07 PM	JPG File	1,369 KB
20210908_F02_CenterT3_CenterT2.jpg	9/8/2021 1:11 PM	JPG File	817 KB
20210908_F02_EndT1_CenterT1.jpg	9/8/2021 1:36 PM	JPG File	799 KB
20210908_F02_EndT2_CenterT2.jpg	9/8/2021 1:38 PM	JPG File	1,349 KB
20210908_F02_EndT2_Post_001.jpg	9/8/2021 1:40 PM	JPG File	1,378 KB
20210908_F02_EndT2_Post_002.jpg	9/8/2021 1:39 PM	JPG File	1,228 KB
20210908_F02_EndT3_CenterT3.jpg	9/8/2021 1:31 PM	JPG File	857 KB
20210908_F02_Quadrant1.jpg	9/8/2021 1:10 PM	JPG File	1,331 KB
20210908_F02_Quadrant2.jpg	9/8/2021 1:12 PM	JPG File	1,351 KB
20210908_F02_Quadrant3.jpg	9/8/2021 1:12 PM	JPG File	1,289 KB
20210908_F02_Quadrant4.jpg	9/8/2021 1:13 PM	JPG File	1,315 KB
20210908_F02_StartT1_CenterT1.jpg	9/8/2021 12:47 PM	JPG File	824 KB
20210908_F02_StartT2_CenterT2.jpg	9/8/2021 12:48 PM	JPG File	1,365 KB
20210908_F02_StartT2_Post_001.jpg	9/8/2021 12:49 PM	JPG File	1,360 KB
20210908_F02_StartT2_Post_002.jpg	9/8/2021 12:50 PM	JPG File	1,320 KB
20210908_F02_StartT2_Post_003.jpg	9/8/2021 12:51 PM	JPG File	1,275 KB
20210908_F02_StartT3_ CenterT3.jpg	9/8/2021 12:35 PM	JPG File	853 KB

Figure SOP 14.18. Example of file export for watermarked photos.

6. Folders with watermarked photos will then need to be copied to the following SharePoint folders:

   a. EIPS

      i. https://doimspp.SharePoint.com/:f:/r/sites/nps-PWR-PACNIM/vital_signs/12_established_invasive_plant_species/Images/

         Note: remember to use appropriate folder structure: “YEAR” > “PARK” > “Data” > “Plant_Community”

      ii. https://doimspp.SharePoint.com/:f:/r/sites/nps-PWR-PACNIM/vital_signs/12_established_invasive_plant_species/Data/Database/VS_EIPS_Database_images/

         Note: remember to use appropriate folder structure: “YEAR” > “PARK” > “Plant_Community”

   b. FTPC

      i. https://doimspp.SharePoint.com/:f:/r/sites/nps-PWR-PACNIM/vital_signs/05_focal_terr_plant_communities/Images

         Note: remember to use appropriate folder structure: “YEAR” > “PARK” > “Data” > “Plant_Community”

ii. A:\Files\FTPC\Database_Images\<YEAR>\<PARK>\<Plant_Community>

7. The .csv spreadsheet that provides links the photos to the image path and the Event_ID for linking the plot/transect to the photo should be saved to the same folder as the final watermarked photos.

Folder & File Naming Standards

In all cases, folder & file names should follow these guidelines:

- No spaces or special characters in the folder name
- Use the underscore ("_") character to separate words in folder names
- Try to limit length of names whenever possible
- Dates within folder names should be formatted as YYYYMMDD for better sorting

Within the "Data" and "Originals" folders, plot folders should be created for each sampling event in which sampling is being conducted for the field season. Individual plot folders should be named to distinguish between protocol, sampling frame, plot type and number, and date that the plot was sampled. If a sampling event is multiple days long, use the first date of the sampling event in the folder naming structure.

Field Maps images will be renamed using the "process_images_YYYYMMDD.R" script and will adhere to the file naming conventions below.

<u>Folder Naming Conventions</u> (Table SOP 14.1):

[Protocol]_[Sampling_Frame]_[Plot_Type+Plot_Number]_[Date]

FTPC Example: 'FT_OL_F10_20210517'
EIPS Example: 'EI_KU_R38_20110604'

Sampling Frame	Abbreviation
ʻŌlaʻa	OL
Nāhuku /East Rift	ER
Mauna Loa	ML
Kahuku	KU
Kaloko-Honokōhau	KH
Kīpahulu District	KD
Haleakalā	HA
Puʻu Aliʻi	PA
Kalawao	KA
Hoʻolehua	HO
Tutuila	TU
Taʻū	TA
Guam	GU
Muchot	MU

Table SOP 14.1. Folder naming convention guide.

File Naming Conventions (Table SOP 14.2 and 14.3):

Plot/Transect Photos: [Date]_[Plot_Type+Plot_Number]_[Subject]_[### if multiples]

FTPC Example: 20210517_R52_StartT1_CenterT1_002.jpg
EIPS Example: 20190606_F01_0mEnd.jpg

FTPC Subject
StartT1_CenterT1
StartT2_CenterT2
StartT3_ CenterT3
StartT2_Post
CenterT1_CenterT2
CenterT2_Canopy
CenterT3_CenterT2
EndT1_CenterT1
EndT2_CenterT2
EndT3_CenterT3
EndT2_Post
Quadrant1
Quadrant2
Quadrant3
Quadrant4
Staff_Photo
Photo_Record
Other

Table SOP 14.2. File naming guide for FTPC photos.

EIPS Subject
0m_End
0m_Start
0m_Post
…
1000m_End
1000m_Start
1000m_Post
Staff
Other
Photorec

Table SOP 14.3. File naming guide for EIPS photos.

Plant Photos: [YYYYMMDD]_[XXhXXmXXs]_[Species Code]_[### if multiples]

Example: “20210226_21h01m49s_EREVAL_006.jpg”

Establish Database Links

Images for the FTPC and EIPS Monitoring protocol can be directly linked to the data in their respective databases. During data entry and processing, the database application will provide the functionality required to establish a link between each database record and the appropriate image file(s). To establish the link, the database prompts the user to indicate the root project workspace directory path, the specific image folder within the project workspace, and the specific file name. This way, the entire workspace may be later moved to a different directory (i.e., the PACN Monitoring Archive Library for FTPC & EIPS) and the links will still be valid after changing only the root path. Refer to the FTPC SOP #14 Workspace Setup and Project Records Management / EIPS SOP #12 Workspace Setup and Project Records Management, and FTPC SOP #17 Data Entry and Verification / EIPS SOP #15 Data Entry and Verification for additional details on setting up the database images structure and establishing these links.

Note: It is important that the files keep the same name and location once these database links have been established. Users should not rename or reorganize the directory structure for linked image files without first consulting with the PACN Data Manager.

The procedures for linking images to the FTPC Monitoring Database can be found in Focal Terrestrial Plant Communities Monitoring Database User Guide, located in the FTPC Database Documentation in SharePoint.

The procedures for linking images to the EIPS Monitoring Database can be found in Established Invasive Plant Species Monitoring Database User Guide, located in the EIPS Database Documentation in SharePoint.

Final Storage

At the end of the season, and once the year's data are certified, data images for the year will be moved to the PACN Monitoring Archive Library for FTPC & EIPS in SharePoint for archival. Before data is certified all data images should be checked for completeness and linked to the database. Since the project images are on the network server, simply inform the PACN Data Manager that the images are ready to be archived. These files will be loaded into the PACN Monitoring Archive Library for FTPC & EIPS in SharePoint, and the database links to data images will be updated accordingly.