

Southeast Coast Network

National Park Service
Inventory & Monitoring Program



Standard Operating Procedure (SOP) #1.1.5

Photopoint Collection

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Summary

Photopoints are an excellent technique to qualitatively document and visually describe the general condition and structural characteristics of a point of interest. The following Standard Operating Procedure (SOP) describes the procedure for the photo-documentation of sampling locations or sites as part of the terrestrial (i.e., vegetation, amphibian, and landbird communities) and salt marsh protocols, and the vegetation mapping accuracy assessment process.

Revision Log

Previous Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #
1.1.5	12/1/2014	M. Byrne	Added vertical (canopy) photo to terrestrial component	Added value	1.1.5

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Equipment

- Compass
- Camera
- Camera data-storage card
- Waterproof/resistant camera case/bag
- Camera battery, battery charger, and backup battery
- Photopoint pole (pre-measured 140-cm PVC pipe)
- Tripod/monopod with level
- Datasheets
- Pens/pencils
- Microsoft ICE and/or Google Picasa

Fieldwork Setup

- Ensure camera DOES NOT automatically assign a time and date stamp to each photo. This information is typically embedded in the image header.
- Set the camera to take photos at the highest resolution possible; the images can be saved at lower resolution later as necessary.
- Ensure the camera's internal clock and calendar are accurate.
- Ensure all camera settings (e.g., auto-focus, aperture, flash) are set in accordance with the needs of the purpose of the photo-collection activity.
- Program camera to name files in accordance with the guidance in the following "File Naming" section, or as closely as possible to ease the process outlined in the following "Photo Management" section.
- Pre-mount camera to a quick-release tripod plate (if preferred).

Terrestrial Photopoint Procedure

- Setup and extend tripod/monopod to 140 cm in height; use PVC pipe to confirm height. The height approximates eye-level and is a height that field personnel of all heights can manage (Figure 1).
- Center the tripod/monopod over the point that represents the site (i.e., the sampling location center point).
- Attach quick-release plate to base of camera, if not done during equipment setup.
- Attach camera to tripod/monopod base.
- Level the camera from side-to-side and from front-to-back with a bubble level.
- Record time, date, location (including GPS coordinates if necessary), observer, and starting frame/photo number on datasheet.
- Allow camera to auto-focus and automatically set the exposure. Do not zoom in on the frame and ensure the camera is zoomed out completely.
- The first of six pictures should be of the datasheet or other identifier (e.g., the GPS unit, a piece of paper identifying the sampling location and location).
- One picture is collected in each the cardinal directions, determined with a compass, starting with 0/360° (north), and proceeding in a clockwise direction taking one picture in each cardinal direction.
- The final picture is taken vertically (i.e., straight above) to characterize the canopy at the center of the sampling location. Ensure the camera is perpendicular with the ground and level.
- If vegetation is on the camera such that it impedes the auto-focus, move only that individual leaf or branch. The observer should use their best judgment in these situations such that the location or direction is accurately depicted. For example, do not omit a direction because of very dense vegetation that crowds the field of view as this is important to represent.
- Break equipment down and pack up.
- Image data should be copied from camera to field laptop at the end of each day, or as soon as possible to avoid accidental data loss.
- Charge camera battery.
- After photos are collected, the general procedures for handling the photos are to:

- Ensure the photos are documented on their corresponding datasheet.
- Copy photos from the data-storage card on the camera to the pre-established directory structure for photos.
- View and delete all errant photos, duplicates, or those out of focus. Do not, however, delete a picture from a specific cardinal direction if it is the only existing picture for that direction (i.e., an out of focus picture is better than no picture).
- Rename the photos in accordance with the guidelines detailed below.
- If necessary or desire, merge copies of select photos into a panorama; however if this is a goal it should be determined *a priori* because this warrants collecting pictures at all cardinal and intermediate directions (i.e., a total of eight pictures).
- Archive photos in accordance with the guidelines detailed below.

Coastal Photopoint Procedure

- Connect two 1-meter range poles to each other (using adapter).
- Attach compass and bubble level to range pole.
- Attach camera to range pole (using adapter).
- Place range pole in PVC used to mark site.
- Using bubble level and compass, level camera and take eight pictures, one in each of the cardinal and intermediate directions, starting with 0/360°. Before taking each picture, allow the camera to autofocus by pushing the button halfway down.
- Record photo numbers on data sheet.
- Break equipment down and pack up.
- Image data should be copied from camera to field laptop at the end of each day.
- Charge camera battery.
- Once the photos are collected, the general procedures for handling the photos are to:
 - Move photos from the data-storage card on the camera to the pre-established directory structure for photos.
 - Rename the photos in accordance with the guidelines detailed below.

- If necessary or desire, merge copies of select photos into a panorama; however if this is a goal it should be determined *a priori* because this warrants collecting pictures at all cardinal and intermediate directions (i.e., a total of eight pictures).
- Archive photos in accordance with the guidelines detailed below.

Vegetation Mapping Photopoint Procedure

- From the accuracy assessment (AA) point, setup and extend tripod/monopod to 140 cm in height; use PVC pipe to confirm height. The height approximates eye-level and is a height that field personnel of all heights can manage (Figure 1).
- Attach quick-release plate to base of camera, if not done during equipment setup.
- Attach camera to tripod or monopod base.
- Level the camera from side-to-side and from front-to-back with a bubble level.
- Record the AA Point Code on the form, which is derived from the park abbreviation, a unique identifier that represents the observation area size, and a three digit number (e.g., CAHA-025-001). Also record the full name of the park being sampled, the date, the GPS unit used (e.g., Garmin Rino), the estimated accuracy of the GPS unit at the time of navigation and the number of satellites, the projection and map datum, the Easting and Northing coordinates, and the initials of all field observers.
- The first picture should be of the datasheet or other identifier (e.g., the GPS unit, a piece of paper identifying the sampling location and location).
- Take at least one picture in each of the cardinal directions as determined with a compass, and one picture of the ground below the location. If vegetation exists vertically above the camera, then an additional vertical photo should be taken.
- Record the total number of photos collected at each location.



Figure 1. Example of the tripod setup and identification of the cardinal directions with a compass.

Panorama Procedure

While individual and directionally-consistent images generally provide an excellent visual and qualitative representation of a site, panoramas may be necessary for some presentation purposes or at management request. Because most SECN cameras do not have panorama capability, post-processing is necessary to create a panorama. The need for a panorama should be determined *a priori* because a panorama requires photos taken at cardinal and intermediate directions (i.e. eight photos total) to result in 360-degree horizontal coverage.

Only copies of the original photos are used for manipulative purposes. All files merged into a panorama are named/labeled with a consolidation of the original filenames. The picture number at the end of the filename is removed and “_360Merge” is added to the end of the filename. Only images taken during the same sampling event or site visit should be merged into a panorama.

Manual Merging

Two readily available/free software packages are used to merge photos into a panorama, Microsoft ICE and Google Picasa. Occasionally, Microsoft ICE does not recognize the overlap in pictures, and is unable to complete the panorama as desired. If the software is unable to merge the photos for this reason or any other, Google Picasa can create a panorama without blending the color using the following steps. If both Microsoft ICE and Google Picasa are unavailable or unable to create the panorama, Adobe Photoshop has capabilities that can be explored, although those are not described here. Google Picasa is our preferred software tool.

- Open Google Picasa.
- Click Create > Picture Collage.
- On the left hand side of the screen under the “Clips” tab, click “Get more...” (Figure 2).

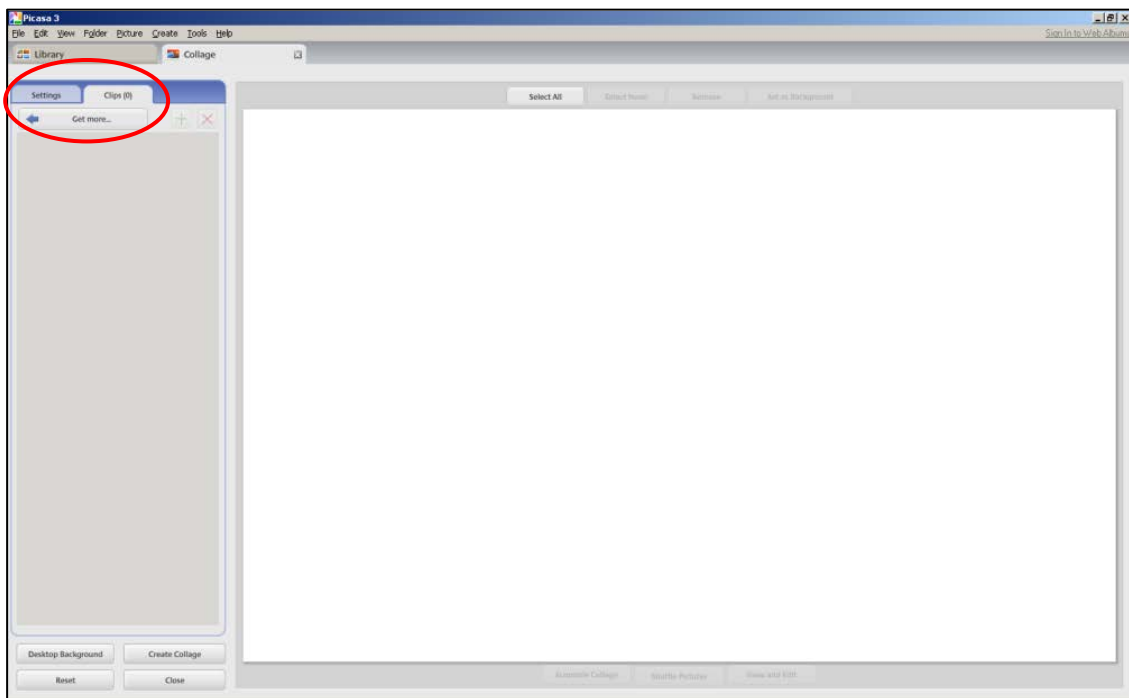


Figure 2. Window in Google Picasa. Red oval identifies the “Get More” Button.

- Locate and select Photos so they appear at the bottom of the screen.
- Click “Back to Collage”.
- Drag one picture at a time to the work space.
- Align each picture manually, resizing as necessary.

- Click “Create Collage” (Figure 3).
- Click File > Save As and rename file appropriately.

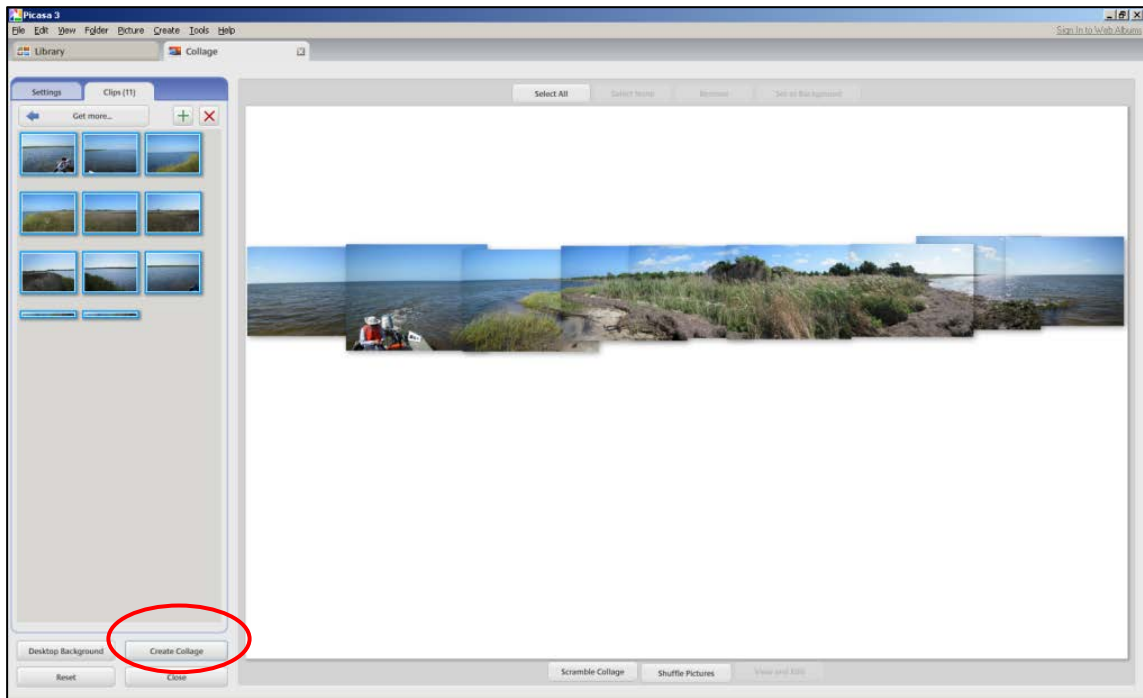


Figure 3. Window in Google Picasa. Red oval identifies the “Create Collage” Button

Data Management

File Naming

The file naming convention for all photos should follow Davie et al. (2006a) and Davie et al. (2006b) and updated in the SECN Digital Photo Management SOP (SECN 2013). In summary, the filename contains information about where the image was taken, the date, the camera used, the photographer, the field office conducting the photo work, the general subject matter category of the photo, and a unique identifier. Photo names should not use spaces or special characters. The filename is **PARKMMDDYYYYPHNOS###**, where:

PARK = Four character park code of where picture or file was taken or created.

MMDDYYYY = Date photo was taken or GPS file was created in month, day and year format. Must be 8 characters long.

PH = Photographer initials or GPS File creators initials (if unknown put XX). The complete photographer’s name will be provided in the photo metadata record.

N = Number for camera used to take the picture. This list is based upon the SECN property list, accessed 01/2014 (Table 1).

O = Office code that indicates which office the person taking the pictures is working from (numbers or letters can be added later should the need arise). 0 = SERO office, 1 = FOSU office, 2 = CUIS office, 3 = Athens office.

S – Subject code that indicates the general category the picture falls into. 1 = Flora, 2 = Fauna, 3 = Geophysical, 4 = Water, 5 = People/Meetings, 6 = Scenic, 7 = General.

= Three Digit Number: an incremental (sequential) number at the end of the file name to assist in creating a unique photo id (restart at 001 for each day).

File naming can occur by programming the camera to name the files accordingly, or do so when data are copied from the camera to the field laptop/office computer for backup and incorporation into the photo-management software. .

Files merged into a panorama should be named **PARKMMDDYYYYPHNOS_360Merge**.

Files can be batch-renamed in the photo-management software package the SECN uses, Extensis Portfolio.

Table 1. Southeast Coast Network cameras, as of 01/2014.

Camera Number	Brand/Model	NPS Property Number	Serial Number
0	Personal Camera / Unknown	NA	NA
1	Pentax Optio WP	NP5000100202	9329071
2	Nikon D100	NP5000080901	2069885
3	Olympus Stylus 790 SW	NP5000105396	D77521324
4	Nikon CoolPix S8100		30312564
5	Canon G11		0725500402
6	Canon Powershot D10	NP5000105857	8621203492
7	Pentax Optio W 60	NP5000105874	58695700159534
8	Canon Powershot D10		2828800651
9	Canon Powershot D10		2228801255
10	Canon Powershot D10		2828800662
11	Nikon D100	NP5000112311	2228801255
12	Vixia HFM500 (video)	NP5000119073	582522101609

File Organization

In order to maintain a unified structure for photos collected by SECN personnel, the file-storage and organizational structure identified by Davie et al. (2006b) consists of one main folder and five sub-folders:

\Images

- \Originals – raw, downloaded photos, including poor photos of unique subject matter
- \Edited – photos which have been processed (i.e., renamed and edited)
- \Working – photos still being processed
- \Data – photos taken as part of a project data collection protocol (e.g., photoplots)
- \Misc – miscellaneous or incidental photos which do not fit the above categories

Photo Organizing and Cataloging in Extensis Portfolio

Extensis Portfolio (EP) is used to organize and catalog photos. The following procedures are excerpted from (Davie et al. 2006b).

Steps to add photos to the EP database:

- Download the pictures to the aforementioned file structure on your hard drive/server.
- Review the photos. Delete blurry, unrecognizable, or bad photos and unnecessary duplicates.
- Open the EP 8 software program. Check the box to open an existing catalog, browse to the Images folder on the network drive and open the database file (e.g., SECN_CUISoffice_photos.fdb). It will likely take a few moments to load the entire database.
- Click on the 'Add' button or go to 'Catalog' and then 'Add Items'. Navigate to the photos you want to catalog and add, and select them.
- You can either move individual files or several files at a time. If you choose to move several files simultaneously, you can also batch-rename and batch-apply keywords and descriptions. The first 17 characters of the name you will apply to them must be identical, (i.e. they must have the same park, date, photographer, camera, office and category codes), but the last three digits remain unique.
- After you have selected the photos you wish to transfer together, click 'Open' and you will see the Cataloging Options window (Figure 4).
- To add keywords, move files, and rename them all in one step, check all three boxes for 'Assign Properties [Description, Keyword...] to Added Items', 'Copy or Move Files to a Location' and 'Rename Files'(Figure 4).

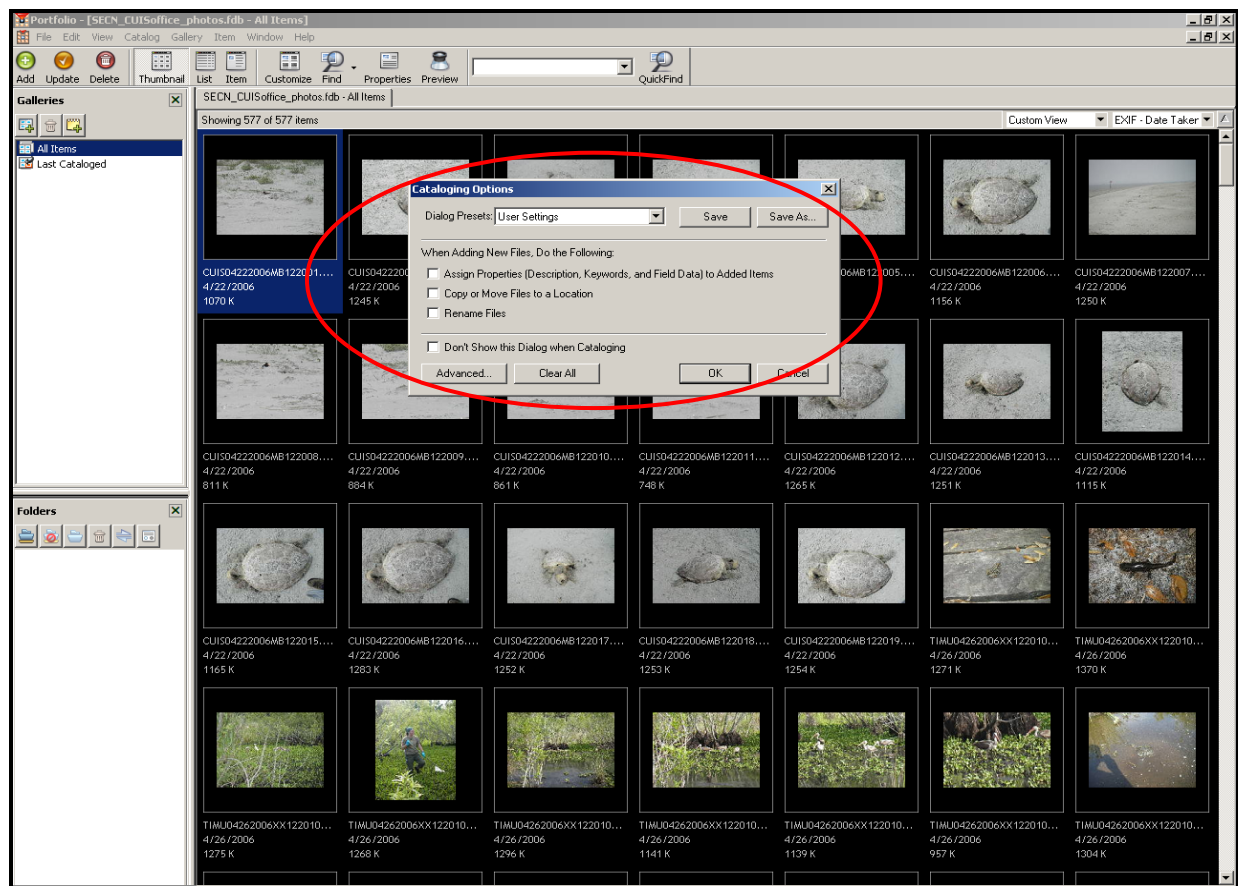


Figure 4. Window in Extensis Portfolio. Red oval indicates Cataloging Options window.

- The Cataloging Options expand as in Figure 5.

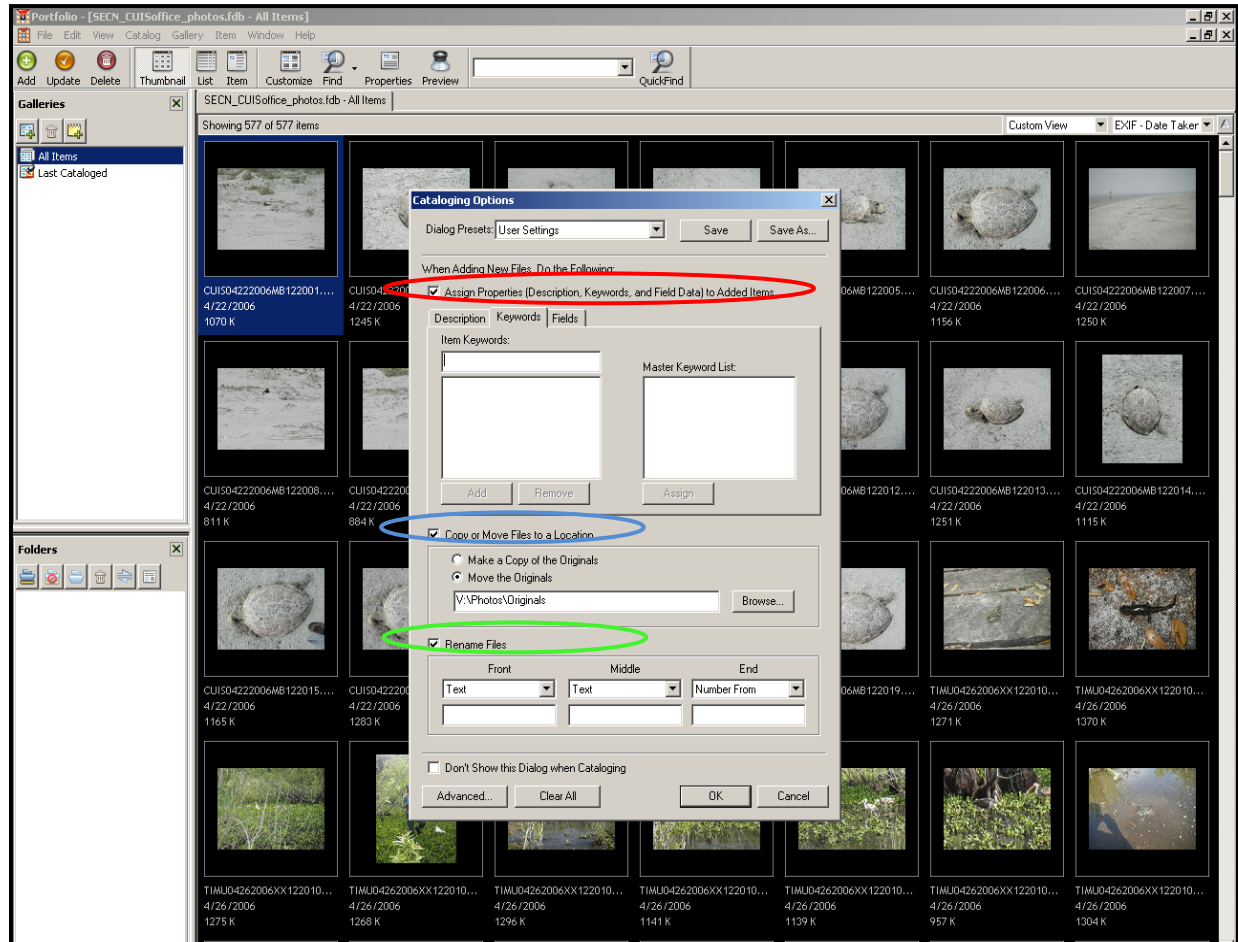


Figure 5. Window in Extensis Portfolio. Expanded Cataloging Options window. Red oval indicates Assign Properties options, blue oval indicates Copy or Move Files options, and green oval indicates Rename Files options.

- Under the ‘Assign Properties’ checkbox (red oval), select the ‘Keywords’ tab and include in as many keywords as apply to all the photos transferred in the batch. If a descriptive statement applies to all of the photos, this can be added under the Description tab.
- Under the ‘Copy or Move Files’ checkbox (blue oval), select ‘Move the Originals’ and use the Browse button to navigate to the location of the files.
- Under the ‘Rename Files’ checkbox (green oval), you will create the new name for all photos being moved so that they conform to the defined naming convention.
 - o Under the ‘Front’ and ‘Middle’ headings, use the drop-down menu to select ‘Text’ – use these spaces to enter the first 17 characters of the name. This part of the name will be identical for all the photos being moved in this batch (e.g., CUIS01012005MB127).

- o Under the 'End' heading select 'Number From' and enter 001 as the start number (or others as you see fit). You must have a three-digit start number here to maintain the same number of characters for all names.
- Click OK when done. The program will now move the photos and refresh the screen showing all photos cataloged in the program. This typically takes a couple minutes to process.
- Navigate to the most recent additions by scrolling to the bottom of the catalog screen, or clicking on the 'Last Cataloged' item on the upper left side column of the program (Figure 6; green oval) to see only the last photos that were added to the catalog. Select a photo and click on the 'Properties' button (Figure 6; red oval).

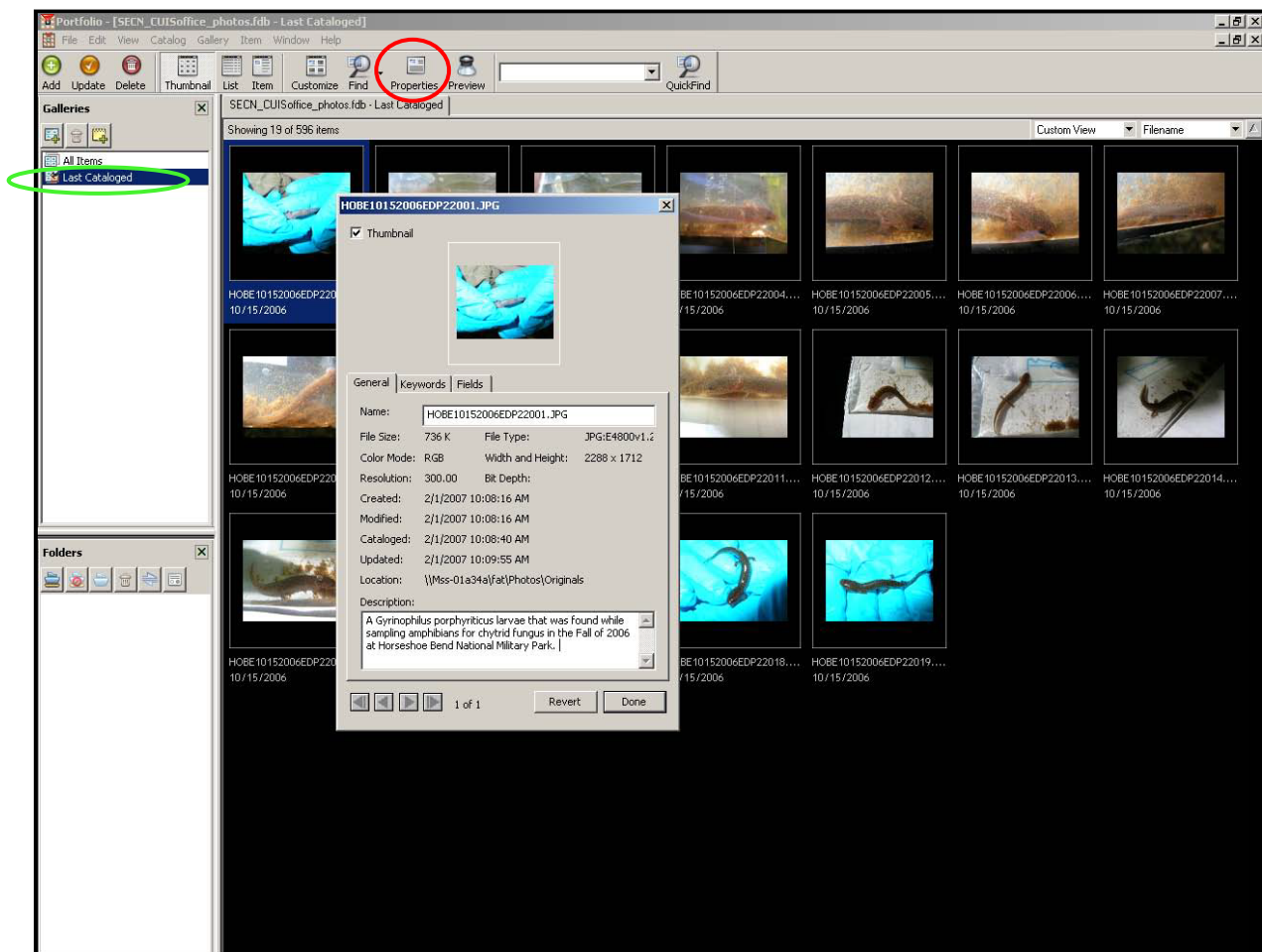


Figure 6. Window in Extensis Portfolio. Depicts process to view and edit photo properties. Green oval indicates the Last Cataloged, or most recently cataloged, photos. Red oval indicates the Properties function and associated options.

- Add all required metadata, add a more specific description if you can, review the keywords batch-applied and add those specific to the photo, and add anything else you deem as useful/necessary. Also check the correctness of all fields. If the date on a camera was incorrect, it can be edited here.

Metadata

At minimum, metadata for each picture should include the following:

- File name (usually inherent)
- File location (usually inherent)
- Storage Location of the original/hardcopy/negative
- Description
- Photographer, Contributors, or Archive Institution (all that apply)
- Collection Name, if applicable (historic and archives)
- Publisher
- Date Taken
- Format/Size/Source
- Type of Media of original
- Subject
- Keywords
- Park Code
- Place
- Any necessary credits
- Distribution Restrictions, such as copyright or sensitivity

If possible or available, include:

- Aperture
- Date Digitized
- Date Taken
- Exposure Bias
- Exposure Time
- F-Number
- Flash (yes, no)
- Focal Length
- ISO Speed
- Light source
- Metering Mode
- Shutter Speed

Optional information includes:

- Special instructions for how the photo was taken
- Subject distance

- Caption writer
- City, State, Country
- Equipment make
- Equipment model
- Object name

Metadata should be stored either in EP or a .txt file kept with the photos.

Photo Log Datasheet

All protocols with a photopoint component should include a data log on the datasheet. Although the direction of number of photos collected at each site is consistent and detailed in the procedures above, occasionally errors occur during image collection (e.g., person walks in front of camera, a finger strays in front of lens), deleting the image is not possible, and additional or repeat photos must be collected while at the sampling location. Datasheets are simple and should be similar to Table 2, which includes example entries.

Table 2. Example photo log/datasheet for photopoint collection.

Sampling Location / Site	Date	Start Time	# of Images	Comments
FOFR01	6/12/2009	0851	8	No problems
TIMU09	11/18/2010	1625	9	My thumb was in the shot
CHAT16	8/1/2010	1158	11	Hikers walked in front of camera several times in the East direction (i.e., third image in the sampling location series), and three East images were taken before an image without a hiker was obtained
OCMU15	7/22/2003	1345	6	Battery died, spare battery also bad, before plot was completed

If unacceptable photos can simply be deleted, such as in the thumb or hiker example above, this simplifies the process at each sampling location/site has only eight images collected.

Archiving

Because the SECN has several offices, all photos should be stored on a local server and sent to the SECN Data Manager on an annual basis. Contact Christina Wright for the current process of file transfer (christina_wright@nps.gov, 404-507-5821).

Literature Cited

- Davie, E., M. W. Byrne, T. Curtis, and D. Lagana. 2006a. SECN GIS and GPS Directory Structure and File Naming Conventions. National Park Service, Southeast Coast Network Inventory and Monitoring Network, Athens, GA, USA.
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- Southeast Coast Network (SECN). 2013. Digital photo management – acquisition to archiving (version 2.0). Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP-2.1.7. National Park Service, Athens, Georgia.