Integrated Water Quality and Aquatic Communities Protocol – Wadeable Streams

Standard Operating Procedure (SOP) #16: Photo Points and Photo Management

Draft Version 1.0

Revision History Log:

Previous Version	Revision Date	Author	Changes Made	Reason for Change	New Version

This SOP includes instructions for the digital photography associated with sampling activities. Photographic documentation of the sampling reach, sampling activities, and collected organisms is an important component of data collection. Photos may provide information on the variation of stream characteristics between sampling events that may not be obvious elsewhere within the tabular dataset. It is paramount to know the content of each photograph taken in the field so that this information can be transferred to the computer database along with the photos themselves. It is important to maintain a standard order in which photos are taken using datasheets. Always attempt to make each photo as clear, focused, and informative as possible. *Check each photo after it has been taken to ensure its quality.* Erase substandard photos from the camera's memory and recapture a better image when applicable.

"Photo points" can refer to permanently marked points that are repeated at regular intervals. In this protocol, we use the term photo points for a standardized set of photos to document the conditions of the reach. However, *no permanent markers are utilized*. Instead, follow-up surveys will include printouts of previous year's photo points so that the photographer can repeat the photo as closely as possible. It is not the intent of the photo points to be used in quantitative analyses, but rather to track gross change over time, as it occurs.

Prior to taking any photographs, it is important to make certain the date on the camera is set properly (SOP #1: Preparations, Equipment, and Safety). Photographs retain many of the attributes associated with the camera, including the camera model and the date the picture was taken. This date is compared to the date entered into the metadata form as a way to ensure the correct images is being described. If the camera date is not properly set, it may cause some data validation issues.

Initial Photo Points

Photos should be taken of all cross-section transects throughout the sampling reach and additionally around the X-Point. The order in which photos are taken is important to ensure that

photo metadata is entered correctly into the computer after returning to housing. All transect photos should have the transect flag visible in the photo. Give this consideration when placing flags during reach layout (SOP #6: Site Arrival and Sample Reach Layout).

1. Always start photographing transects beginning with Transect A (the furthest downstream transect) and then moving upstream. The photo taken at Transect A should be taken looking upstream from a position that is outside of the sample reach at a distance of four times the mean wetted width (the inter-transect distance). For example, if the mean wetted width is 3 meters, take the photo 12 meters below Transect A. This is equivalent to a "phantom" transect below Transect A.
2. The photos taken of the subsequent transects should be taken from the prior transect (e.g., photo of Transect B taken from Transect A looking upstream, photo of Transect C taken from Transect B looking upstream, and so forth). Surrounding vegetation, large distances between transects at large sample reaches, and stream meanders may obscure the photographic view of a transect flag. In this case, alter the position from whence the photo is being taken so that you are as close to the prior transect as possible while still able to see the transect flag for the transect being photographed.
3. After all transect photos have been taken, return to the X-Point of the stream and take one photo each facing downstream from the X-Point, facing upstream from the X-Point, facing the left bank from the right bank near the X-Point, and finally facing the right bank from the left bank near the X-Point in this specific order (a useful pneumonic device for remembering this order is "D.U.L.R." or "duller," which stands for **D**ownstream, **U**pstream, **L**eft bank, **R**ight bank).
4. These photos comprise the minimum required photos at each stream reach. Record the following photo metadata on the datasheet (Appendix F).

Subsequent Photo Points

Site revisits in following years should follow the steps and orders of the initial site photos, but the photographer should have printouts of previous years to assist in recreating the subsequent photos in matching previous years as much as possible.

Additional/Incidental Photos

1. Photos should be taken of any feature within the stream reach that seems out of the ordinary. These may include, but are not limited to, human influences and unique stream features such as large logjams, waterfalls, or subterranean flows. If you question yourself as to whether or not something is unusual enough to warrant a picture, take one. There is no downside to additional photos, other than the time to record appropriate metadata.
2. Take voucher photos of any organism that is unidentifiable (or is questionable) in the field. These photos will be used to identify these organisms at a later time. Focus upon photographing the distinguishing features of the organisms such as mouth parts, fins, body shape, coloration, tree bark, leaf structure, etc. Ensure that these images are clear and interpretable. Make certain to photograph all sides, including the underbelly, of the unidentified species. Ensure that the description matches the species designation used on the vertebrate collection data form (example: Unknown species #1, Site 07L). Be sure to include specific site information with the description to distinguish unknown species from each other at multiple sites.
3. Take photos to document field crew activities during sampling and site set up. Human interest, methodological, and aesthetic photos are encouraged but not required for all sampling sites.

4. In the case that the images are of extraordinary findings (e.g., River otters, Martens, Fishers, Bigfoot, etc.), the crew should also make an effort to record the coordinates using a GPS device, especially if the sighting and photo occurred away from the sampling site (e.g., on the hike in or out).

Photo Metadata

The Klamath Network Data Plan (Mohren 2007) specifies the required metadata for photo management. The required metadata that must be recorded for every photograph taken while working on this project are:

1. Use the photo log (Appendix F) to **record all following fields**. Do not use notebooks or rely on memory! In addition, they can be entered into the database while in the field.
2. Photo name - the file name assigned by the camera (e.g., RIMG0001). Do not include the extension in the file name.
3. Date photo taken - should be in the format mm/dd/yyyy. Note that this is different from other protocol procedures (yyyymmdd) but is in this format to comply with photo metadata standards.
4. Name of photographer - full name should be given (i.e., not just initials or E. Dinger).
5. Location - include the name of the stream that is being sampled.
6. Description of photo - should be as detailed, clear, and concise as possible. When entering into the database, caption descriptions are acceptable but keep grammar correct. The goal is that the description could be used as a caption in a report.

a. Acceptable examples:
   i. Emerald Creek, looking upstream towards Transect B
   ii. Joe Crewman holding an unknown tadpole at Emerald Creek
   iii. Black bear seen on trail while hiking to Emerald Creek

b. **UNACCEPTABLE** examples
   i. Emerald creek, B
   ii. Tadpole?
   iii. Bear on trail

7. For transect photos, the use of ditto marks to record descriptions is acceptable when using the forms. However, in the database you can copy and paste when necessary. See example below:

Photo file name	Photographer	Date	Location	Description
RIM0098	Joe Crewperson	10/18/2009	Emerald Creek, REDW	Looking upstream at Transect A
RIM0099	"	"	"	" B
RIM0100	"	"	"	" C
RIM0101	"	"	"	" D
RIM0102	"	"	"	" E
RIM0103	Sarah Crewperson	"	"	Unidentified Salmonid, dorsal view

Downloading Photos and File Management

The digital photos taken for the day should be copied at the end of each day (SOP #17: Post-site Tasks). Using Windows Explorer, the photos from the camera (connected to the computer using the camera's download cable) should be copied (using the shift-left click function to highlight the

photos, followed by a right click and selecting "copy") and pasted to the appropriate folder. The destination folder (Stream Monitoring/Images/Backup) should then be opened and a new folder should be created with the date you copied the images. The photos then should be pasted within the date folder (e.g., 20100725 for 25 July 2010). Keep in mind, photographs from previous days will be on the camera and care should be taken to only back up photographs from that day's surveys. **A double check that the correct files were copied into the correct destination should follow.** The camera can then be disconnected using the "Safely Remove Hardware" function of Microsoft Windows. After photos have been downloaded, enter all metadata for each photo (as described in the previous section of this SOP) into the Photo_Log Microsoft Excel spreadsheet, located within the Photos_Backup folder. As information is entered in the spreadsheet from the field photo metadata sheet, simultaneously use an image viewer to confirm that the image matches the metadata. Save the photo log in the Photos_Backup folder and not in the dated image folder.

Deliver Image Files for Final Storage

It is the Project Lead's responsibility to compile all images into a common folder and to transfer processed images to the Data Manager (SOP #17: Data Transfer, Storage, and Archive). To transfer images, once compiled, place the images and the metadata into the stream project folder at: G:\Monitoring\Stream Monitoring\Stream_Images\Seaonal Data\2011 (where the year is the year the field sampling occurred). Complete the data certification form (SOP #17: Data Transfer, Storage, and Archive) and send an email to the Data Manager when these steps are complete. The Data Manager will place copies of the images in the Klamath Network Image Library. Metadata for the images will be loaded into the Klamath Network Image Database, which is linked to the photographs in the Klamath Network Image Library, making them available to all Network staff. Images and metadata will be backed up and archived following the methodologies outlined in the Klamath Network Data Management Plan (Mohren 2007). Mohren (2007) should be consulted for additional information on photo management.

Literature Cited

Mohren S. R. 2007. Data management plan, Klamath Inventory and Monitoring Network. Natural Resource Report NPS/KLMN/NRR—2007/012. National Park Service, Fort Collins, CO.