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## **Standard Operating Procedure #9: Photopoint Monitoring, Version SCPN\_WATER\_QUALITY\_SOP09\_20160901**

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## Standard Operating Procedure #9: Photopoint Monitoring

| Version SCPN_Water_Quality_SOP09_20160901 |               |                       |                |             |
|-------------------------------------------|---------------|-----------------------|----------------|-------------|
| Revision History Log                      |               |                       |                |             |
| Previous version number                   | Revision date | Section and paragraph | Change(s) made | Approved by |
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Only changes in this specific SOP will be logged here. Record the previous version number and date of revision; identify sections and paragraphs where changes were made, who approved the revision, and the new version number. More detailed descriptions of the changes made and the reason for the changes is provided at the end of this SOP.

This Standard Operating Procedure (SOP) describes procedures for photopoint monitoring of water quality monitoring sites in SCPN parks.

### Equipment

Please see Appendix F for a list of the equipment needed for photo monitoring.

### 1 Photopoints

Photopoints will be established at one or more locations at each SCPN water quality monitoring site. These photopoints will be revisited on a regular basis to document changes occurring over time, therefore it is important that their locations be described in detail so that they can be relocated in the future.

#### 1.1 Establishing photopoints

The following instructions will guide you in selecting an appropriate photopoint location.

- Select a location that will allow the site's features and condition to be tracked over time.
  - It should provide good visibility of permanent, distinctive features in the area and must be easy to locate again, even by first time visitors (Figure 9-1).
  - It should offer unobstructed views of the identifying features
  - Areas that may not be suitable in future years due to vegetation growth, erosion, etc should be avoided.
- Note the site code, and name for each site where photopoints are established on the *Photopoint Datasheet* (see Figure 9-5 at the end of this protocol)..
- Assign each photopoint a unique identification (e.g. PP1, PP2...). Establish enough photopoint locations to adequately capture images of the entire site. At most monitoring sites several photopoints will be necessary, but in some



Figure 9-1. Photopoint 1 View A at Tsale Spring. The photopoint is on the end of the rock where the clipboard is placed. Notice the boulders as well as the cliff wall in the background which provide multiple permanent features to aid in locating the photopoint on future visits.

cases only one will be adequate.

- If needed take multiple photos at each photopoint (e.g. PP1A, PP1B...). Take as many photos from each photopoint as necessary to capture views of as much of the site as possible.
- Use a compass to determine the bearing of each photo in degrees. If known, set the appropriate declination on the compass and record bearing and the

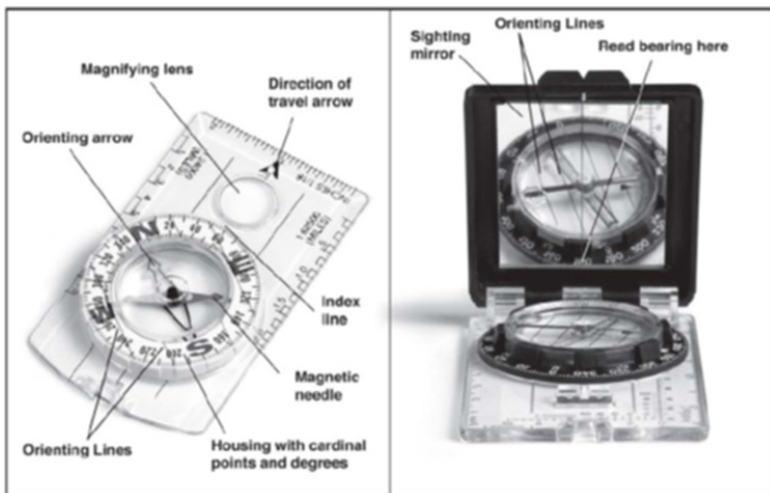


Figure 9-2. Use a compass to determine the bearing of each photo in degrees.

declination on the *Photopoint Datasheet*. (Figure 9-2 shows the parts of a compass). If the declination is not known, set the compass to magnetic north and note this on the datasheet.

To determine the bearing

- Keeping the compass level, hold with extended arms at eye level and line up the target with the sighting notch. Use the sighting mirror, tilted 50-70° to help get an accurate reading.
- Rotate compass housing so the magnetic needle is aligned with the orienting arrow. i.e., “Put Red Fred in the Shed!”
- The bearing can now be read at the index line on the compass or sighting mirror.
- Use a handheld GPS unit to identify coordinates for each photopoint. Be familiar and comfortable with your GPS unit before you go out! Learn how to set the coordinate system and collect a waypoint.

Follow these GPS tips:

- If possible, select a data collection point with an unobstructed view of the sky.
- To ensure the repeatability of the data, record coordinates using the averaging feature found on most GPS units, and record on the *Photopoint Datasheet*. The GPS unit should be on and in a stable fixed position for at least 10 minutes before recording data for a point.

The coordinate system SCPN uses is UTM (Universal Transverse Mercator), datum: NAD83. The UTM system reports positions in meters ‘easting’ and ‘northing’. The GPS unit should automatically know which Zone you are in. SCPN parks are in Zones 12 and 13.

- Write a brief description of each photopoint on the *Photopoint Datasheet*. Provide as many details as possible

about key site characteristics that are of a permanent nature (e.g. rocks, large trees). This is especially important if you cannot collect coordinates with a GPS unit – note any major features, compass bearings, and distances that may help you mark the point location on the site map.

- Mark the name (e.g. PP1) and location of each photopoint on the site map.

### 1.2 Taking photographs

- Ensure that the camera is set to the proper settings needed to capture photographs of appropriate quality (See Appendix G: Taking Effective Photos).
- Take a photo of the photopoint with a person or an object at the point. This is the point where the photographer will stand while taking all subsequent view photos for this photopoint. It is denoted by an “A” in the view column of the datasheet (PP1A would be a photo of a person standing at or an object placed on the first photopoint at Chaco Wash) and will help relocate the photopoint in the future.
- You can take several views (at different bearings) from the same photopoint. Label each of these views using letters (B,C,D...). Be sure to include the areas and features to be monitored over time. Also include in the photo easily identifiable permanent features that can be easily relocated on future visits and enable the duplication of photographs.

Whenever possible, try to include features that are unlikely to be impacted by vegetation growth, fire, or flood events. Ridgelines, canyon walls, or large boulders well out of the channel are likely to be visible for long periods of time. Trees or large boulders in the stream may be less permanent but often are the only features available in narrow canyons or dense riparian areas. When using these features as reference points make sure to include a variety of the most recognizable ones in each photo. This will make

it more likely that at least one feature can be identified during future visits in order to repeat the same view (Figure 9-3 shows monitored and permanent features).

- Use the camera’s view screen to review each photo that you take to ensure that proper focus and exposure has been achieved (See Appendix H: Taking Photos and Using a Camera).

### 1.3 Revisiting photopoints

- When you revisit a site, bring the original site visit photos, the most recent set of photos, site maps, and datasheets to aid in finding established photopoints and in recreating the view photos. Also use GPS coordinates to help you locate the photopoints.
- If the photopoint is difficult to locate, note this on the datasheet and, if necessary, refine the instructions for locating the photopoint.
- Stand at the photopoint, referring to view A in original site visit photos, or most recent set of photos to locate the photopoint.
- Use the compass bearing (make sure the



Figure 9-3. Photopoint 1 View B at Tsaille Spring. This view captures water levels and vegetation downstream from the spring. The surrounding boulders and background cliff provide permanent aids for framing on future visits.

compass is set to the same declination as recorded on previous visit sheets) and previous view photos to determine proper framing needed to repeat each view photo from this photopoint.

- Ensure that the camera is set to the proper settings needed to capture photographs of appropriate quality (See Appendix G: Taking Photos and Using a Camera).
- Carefully aim the camera to match framing and perspective of previous view photo. Line up with features such as ridgelines, rocks, and trees in previous view photos to ensure photos match as precisely as possible. Due to differences in cameras and photographers, this may require moving the camera up, down, closer or further away. In some cases (usually due to vegetation growth) the position of the camera may need to be shifted off of the actual photopoint or branches moved in order to properly capture the area being monitored. Figure 9-4 is a sample photo of monitored features and permanent features.
- If the view from the photopoint no longer provides an adequate view of the water quality site, you may need to estab-



Figure 9-4. Photopoint 1 View B at Wild Cherry Ledge Spring. This view captures water levels and vegetation. The rocks and ledges provide framing references but the tree on the right of the frame could grow to partially block these features in the future.

lish a new photopoint.

- Use the camera's view screen to review each photo taken to ensure proper focus and exposure have been achieved.

#### 1.4 Completing the photopoint datasheet

Be sure to fill out the *Photopoint Datasheet* (Figure 9-5) completely.

- Site code. Record the site code (e.g., BANDCAP01).
- Site name. Record the site name (e.g., Capulin Creek at Base Camp Gaging Station).
- Date. Record the date in the format YYYYMMDD (e.g., 20080117).
- Write down the camera make, model, and ID number.
- Photographer. Record the initials of crew member serving as the photographer.
- Compass setting. Record the bearing of each photopoint view, indicating magnetic north or declination (write declination degrees if appropriate)
- Start time. Use military format, e.g., 1300 or 0845. Note time zone (e.g. MST or MDT).
- End time. Use military format, e.g., 1300 or 0845.
- PhotoPoint ID (PP1 for Photopoint 1, PP2 for Photopoint 2, ..., or misc)
- Views. View A should always be of the photopoint. Other views (B,C,D...) should be of important site features. Use enough views from each photopoint to adequately capture the site.
- File number. File name/number that the camera creates for each photo (e.g. IMG\_1234.jpg).
- Description. Any notes that will aid in finding photopoints and framing view photos (e.g. upstream, right bank, PP1 on top of rock).

## **2 Storing photopoint image files.**

Photopoint files are uploaded from the camera to the SCPN common drive and filed according to park and year.

Metadata for each photo are entered into a Thumbs plus database and include park, site name, stream name, date and description of location.

|                                                                                                                                                 |                                    |                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------|
| <b>Site code:</b>                                                                                                                               | <b>Site name:</b>                  | <b>Date (yyyymmdd):</b>                                                                |
| <b>Photographer:</b>                                                                                                                            | <b>Camera make, model, and ID:</b> |                                                                                        |
| <b>Compass Setting</b> (indicate by circling setting and writing degrees if appropriate)<br>_____ Degrees declination      _____ Magnetic North |                                    | <b>Start time:</b> _____ <b>MST or MDT</b><br><b>End time:</b> _____ <b>MST or MDT</b> |

[illegible]

Figure 9-5. Water Quality Photopoint Monitoring Datasheet

### 3 Revision history

Provide the following information for each revision made to SOP #9

*New version:*

SCPN\_WATER\_QUALITY\_SOP09\_YYYYMMDD

Date:

Author:

Sections affected:

Changes & reasons: