

# Photo Documentation Procedure for Measuring the Success of Restoration Projects and Best Management Practices



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## **Introduction:**

Photographs provide a qualitative, and potentially semi-quantitative, record of conditions in a watershed or on a water body. Photographs can be used to document general conditions on a reach of a stream during a stream walk, pollution events or other impacts, assess resource conditions over time, or can be used to document temporal progress for restoration efforts or other projects designed to benefit water quality. Photographic technology is available to anyone and it does not require a large degree of training or expensive equipment. Photos can be used in reports, presentations, or uploaded onto a computer website or GIS program. This approach is useful in providing a visual portrait of water resources to those who may never have the opportunity to actually visit a monitoring site.

## **Equipment:**

Use the same camera to the extent possible for each photo throughout the duration of the project. Either 35 mm color or digital color cameras are recommended, accompanied by a telephoto lens. If you must change cameras during the program, replace the original camera with a similar one comparable in terms of media (digital vs. 35 mm) and other characteristics. A complete equipment list is suggested as follows:

### Required:

- Camera
- Folder with copies of previous photos (do not carry original photos in the field)
- Topographic and/or road map
- Compass
- Timepiece
- Extra film or digital disk capacity (whichever is applicable)
- Extra batteries for camera (if applicable)
- Photo-log data sheets or, alternatively, a bound notebook dedicated to the project
- Dry-erase board, and markers (bring extra markers)

### Optional:

- GPS unit
- Ruler (for scale on close up views of streams and vegetation)
- Wooden stakes and flags or re-bar and flags for dedicating fixed photo points in the absence of available fixed landmarks

## Roles and Duties of Team:

The team should be comprised of two people, for restoration or other water quality improvement projects, as follows:

1. Primary Photographer responsible for selecting photo angles, targets and GPS operation.
2. One person responsible for taking field notes, recording photos and preparing dry erase board.

## Safety Concerns:

Persons involved in photo monitoring should **ALWAYS** put safety first. For safety reasons, always have at least two volunteers for the survey. Make sure that the area(s) you are surveying either are accessible to the public or that you have obtained permission from the landowner prior to the survey.

Some safety concerns that may be encountered during the survey include, but are not limited to:

- Inclement weather
- Flood conditions, fast flowing water, or very cold water
- Poisonous plants (e.g.: poison ivy)
- Dangerous insects and animals (e.g.: bees, ticks, livestock, etc.)
- Harmful or hazardous trash (e.g.: broken glass, hypodermic needles, human feces)

We recommend that the volunteer coordinator or restoration coordinator discuss the potential hazards with all volunteers prior to any fieldwork.

## General Instructions:

From the inception of any photo documentation project until it is completed, always take each photo from the same position (photo point), and at the same bearing and vertical angle at that photo point. Photo point positions should be thoroughly documented, including photographs taken of the photo point. Refer to copies of previous photos when arriving at the photo point. Try to maintain a level (horizontal) camera view unless the terrain is sloped. When photo points are first being selected, consider the type of project (salt marsh, wetland, or stream restoration, ambient or event monitoring, etc.) and refer to the guidance listed on *Suggestions for Photo Points*.

When taking photographs, try to include landscape features that are unlikely to change over several years (buildings, other structures, and landscape features such as peaks, rock outcrops, large trees, etc.) so that repeat photos will be easy to position. Lighting is, of course, a key ingredient so give consideration to the angle of light, cloud cover, background, shadows, and contrasts. Close view photographs taken from the north (i.e., facing south) will minimize shadows. Medium and long view photos are best shot with the sun at the photographer's back. Some artistic expression is encouraged as some photos may be used on websites and in slide shows (early morning and late evening shots may be useful for this purpose). Seasonal changes can be used to advantage as foliage, stream flow, cloud cover, and site access fluctuate. It is often important to include a ruler, person, farm animal, or automobile in photos to convey the scale of the image. Of particular concern is the angle from which the photo is taken. Oftentimes an overhead or elevated shot from a bridge, peak, etc. will be instrumental in conveying the full dimensions of the project. Of most importance overall, however, is being aware of the goal(s) of the project and capturing images that clearly demonstrate progress towards achieving those goal(s). Again, reference to *Suggestions for Photo Points*, may be helpful.

If possible, try to include a dry-erase board in the view, marked at a minimum with the location, subject, time and date of the photograph. Use large font and position the dry-erase board in the lower corner of each photograph. The dry erase board should be positioned at a distance from the photographer that does not obscure the subject matter of the photo point but allows for the text to be legible. If using a digital camera (recommended), experiment on the first photo point to determine the optimum combination of font size, distance to photographer and position of dry erase board in the photo. Use of the flash is *not recommended* with the dry erase board as it tends to reflect off the surface obscuring the text. A blank photo sign form is included in this document. Copies of this sign form can be used in the photos if a dry-erase board is not available. Copying this form onto yellow sheets for field use provides the necessary contrast for the text to be visible in the photographs.

### **Recording Information:**

Use a systematic method of recording information about each project, photo point, and photo. The following information should be entered on the photo-log forms (blank form included in this document) or in a dedicated notebook:

- Project or group name, and contract number (if applicable, e.g., for funded restoration projects)
- General location (stream, beach, city, etc.), and short narrative description of project's habitat type, goals, etc.
- Photographer and other team members
- Photo number
- Date
- Time (for each photograph)
- Photo point information, including:
  - Name or other unique identifier (abbreviated name and/or ID number)
  - Narrative description of location including proximity to and direction from notable landscape features like roads, fence lines, creeks, rock outcrops, large trees, buildings, previous photo points, etc. – sufficient for future photographers who have never visited the project to locate the photo point
  - Latitude, longitude, and altitude from map or GPS unit
- Magnetic compass bearing from the photo point to the subject
- Specific information about the subject of the photo
- Optional additional information: a true compass bearing (corrected for declination) from photo point to subject, time of sunrise and sunset (check newspaper or almanac), and cloud cover.

When monitoring the implementation of restoration, or Best Management Practices (BMP) projects, include or attach to the photo-log a narrative description of observable progress in achieving the goals of the project. Provide supplementary information along with the photo, such as noticeable changes in habitat, wildlife, and water quality and quantity.

Archive all photos, along with the associated photo-log information, in a protected environment.

## **The Photo Point: Establishing Position of Photographer:**

1. Bring a variety of methods for establishing position: maps, aerial photos, GPS, permanent markers and landmarks, etc. If the primary method fails (e.g., an inoperative GPS or lost marker post) have an alternate method available.
2. Select an existing structure or landmark (mailbox, telephone pole, benchmark, large rock, etc.), identify its latitude and longitude, and choose (and record for future use) the permanent position of the photographer relative to that landmark. If no such permanent landmark is convenient for establishing the photo point, the installation of grade stakes or rebar with flagging (with station ID on flagging) is recommended.
3. For restoration, and BMP projects, photograph the photo-points and carry copies of those photographs on subsequent field visits.

## **Determining the Compass Bearing:**

1. Select and record the true compass bearing of the photo center view. Include a prominent landmark in a set position within the view. If possible, have an assistant stand at a fixed distance from both the photographer and the center of the view, holding the dry-erase board for scale.
2. When performing ambient or event photo monitoring, and when a compass is not available, then refer to a map and record the approximate bearing as north, south, east or west.

## **Suggestions for Photo Points:**

1. When first beginning a monitoring program take representative long and/or medium view photos of stream reaches, segments of shoreline or other areas being monitored. Show the positions of these photos on a map or site sketch. Subjects to be photographed include a representative view of the stream or shore condition at the beginning and ending positions of the segment being monitored, storm drain outfalls, confluence of tributaries, structures (e.g., bridges, dams, culverts, etc.).
2. If possible, take a close view photograph of the substrate (streambed), algae, or submerged aquatic vegetation.
3. Take long view and medium view of streambed changes (thalweg, gravel, meanders, etc.)
4. Time series: Take photos immediately before and after construction, planting, or vegetation removal. Take medium and close views of structures, plantings, etc. Long term monitoring should allow for at least annual photography.
5. Event monitoring: this refers to any unusual or sporadic conditions encountered during a stream or shore walk, such as trash dumps, turbidity events, oil spills, etc. Photograph and record information on your photo-log. Report pollution events to the NH Department of Environmental Services (603-271-3503).
6. Optional: Use a tape set perpendicular across the stream channel at fixed points and include this tape in your photos. The tape will show the current depth of the stream relative to the tape.



PHOTO SIGN FORM: Print this form on yellow paper if a Dry-erase board is not available. Complete the following information in black marker for each photograph. Include in the photographic view so that it will be legible in the finished photo.

**Location:**

**Subject Description:**

**Date:**

**Time:**