Quick Guide to Photo Point Monitoring

Summary
Photo point monitoring consists of repeat photography of an area of interest over a period of time; it is an easy, yet effective, method of monitoring vegetation and ecosystem change. This document provides a quick reference to the field procedures; more detailed discussion of methodology, analysis techniques, and other applications of photo point monitoring, refer to the USDA Photo Point Monitoring Handbook (Hall 2002).

1. Define Monitoring Objectives
Photo documentation may be established for a variety of reasons, and different objectives will generally require different techniques. To obtain relevant and accurate information, the objective for monitoring must be carefully considered and defined before establishing photo points. Refer to Appendix A for general guidance.

Determine Photo Type:

I. Feature photo point method documents visual changes occurring at a fixed point through time. Generally, this method is used to document change resulting from a restoration activity (fig.1); where photos are taken before, during, and immediately after construction. Generally, the photos are periodically replicated thereafter to demonstrate the long-term effectiveness of the restoration.

Figure 1. Example of feature photos of a stream/riparian restoration project.

II. Landscape photos can capture changes undertaken at a broader scale such as forest stand treatment or floodplain restoration. These photos are often taken from a ridge, hill top or aerially during a low flight.

III. Opportunistic photos are not taken from a permanently marked location and are not intended to be formally repeated. They provide valuable information when taken during construction activities, or when used to document damages to a site that may require follow-up actions (such as high water events, fire, etc.); or as part of a vegetation/soil monitoring protocol to visually document a sample point.

Identify what/when to photo. Within selected monitoring areas, identify elements in the landscape that are most critical to document in order to achieve the project objectives. Ensure that enough photo points are established to adequately document changes that are expected to occur. Ensure that the timing of the photos is appropriate to achieve the objectives.

Equipment List
- Camera with back-up battery & adequate memory space/film
- GPS (w/ compass)
- Clip board/pens
- Marker Board or other record sheets
- Hammer/Stakes (if new establishment)
- Photo Point Map (if replicating)
- Prior Photos (if replicating)

ESTABLISHING FIXED PHOTO POINTS IN THE FIELD

To determine the location of a fixed photo point, consider the following:

- *Will changes be visible on the photo?*
- *Will the photo capture the "area of interest"?*
- *Can this location be reached conveniently and consistently?*
- *Will the location of the photo point need to change over time?*

Carefully record the location of each fixed photo point.

- Mark each photo point location in the field with a stake or other identifying marker that will hold up to site conditions for the duration of the monitoring effort.
  - Typical markers are a t-post, wood survey stake sprayed florescent, or capped rebar.
  - For permanent points (such as conservation easement monitoring), a recommended marker is a survey grade stake with florescent cap pounded in to expose two to three inches above ground. Some caps can be imprinted with text (point ID) for no additional cost.
  - If it meets the objectives; use an already established feature as the photo point marker (e.g. fence brace/gate, on top of a water control structure/culvert, at the toe of a stream vane, etc.).
  - Consider potential conflicts with livestock (rubbing on posts), or damage to vehicle/farm equipment.
  - Avoid using plastic flagging or tape.
  - Consider placing a second stake or post in the center of the photo area, 5-10 meters from the photo point; to serve as a marker for where to place a cover pole (gives scale to the photo). See Figure 2.

- Record GPS coordinates for each photo point location. Download the waypoints to a point shapefile. Label the GPS points using double digits (01, 02, 03…). Save the shapefile in the Toolkit customer folder, with an easily identifiable name such as "CRP_PhotoPoints".

- Record detailed directions for locating and taking the photo points. The next person taking the photo may be unfamiliar with the site; provide them with enough information to easily find the location. These details can be documented in field notes, in the table of the photo point shapefile (print report for file, see Appendix B for an example), on the photo point map, or any other format that works for this purpose.
  - Consider using a marker board to place in the corner of the photo, which states point number, date, and direction of the photo. See figure 2.
  - It helps to label each photo with the point number and general direction it was taken (01-NW).

- Develop a Photo Point Map. Mark the location and number of each photo point on an aerial map.
  - Use an appropriate map scale and small point symbol; to provide an exact point location, that if necessary, a user could take out into the field to find the photo point marker. An example is provided in Appendix B.

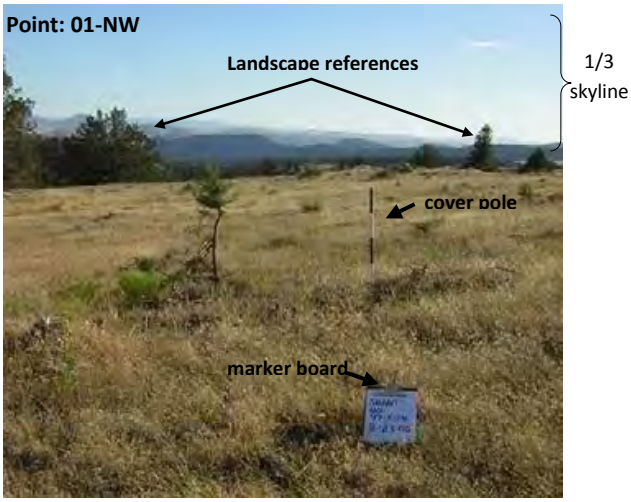


Figure 2. Photo with cover pole and marker board.

Technique of Taking Photos

It is best to take photos early in the morning, late in the afternoon, or on slightly overcast days when the sun is less intense. This eliminates dark shadows and harsh glare in the photos. Avoid taking photos when visibility is poor (due to low light, fog, or heavy rain) or when snow on the ground obscures the habitat changes. Take photos with the sun at your back.

1. Choose camera settings that give the greatest depth of field (every element from foreground to background is in sharp focus). Digital cameras generally provide this requirement in the "Landscape" setting. Document the type of camera (digital vs. 35mm etc.) and settings used.
2. Fill out a marker board (dry erase or similar) with point number, date, and direction of the photo; and place it in an upright position so that it appears in either corner of the photo's foreground. The text should be large enough to be readable in the photograph.
    - Else, keep a side record of the data that corresponds to each photo.
3. Hold the camera at eye level (~5'). Try to include one-third skyline in the photo to help establish the scale of the area being photographed, and to provide reference points for future replication (Figure 2).
    - If replicating a photo point, ensure that the image viewed is the same as in the original photo. Look for references such as rocks, trees, mountains, and fencelines.
    - If establishing a new photo point, ensure that reference points are included to assist future efforts.

Photo Management

- Save the images in a consistent, designated location; that is labeled in an easily identifiable folder (e.g. Projects/Tar Ranch/PhotoPoints/2013). Photos will need to be easily found for future efforts.
    - It may be necessary to compress the images, to reduce the file size. (1024x768 is appropriate)
- Print the Photos in a format that will provide: 1] project name, 2] photo date, 3] and an image name for each photo (e.g. 01-NW).
    - An NRCS approved program that provides this format is CADMEDIA Master. If not installed, you may request this program from ITS staff. See Appendix C.
    - Attach the photo point map, and the recorded directions (if separate).
- Photo points will be compared and analyzed to show habitat trends and conditions, and to assist in making management decisions.

Appendix A. Basic Recommendations for Planning Photo Point Monitoring

Riparian Habitat Improvement Projects

Restoration Action	Photo Type	What/When to Photograph
Livestock fencing	Feature	Pre-project photos should capture representative streambank profiles prior to fencing. Post-project photos should show fencing, and changes in vegetation and streambank erosion.
Riparian planting	Feature	Pre-project photos should capture future planting location before site preparation. After planting, take photos showing changes in vegetation structure.
Non-native plant management	Landscape	Pre-project, photograph area to be treated. Make sure to capture enough in the photos so that you will be able to detect changes in the vegetation in the post-project photos.

Wetland Habitat Improvement Projects

Restoration Action	**Photo Type**	**What to Photograph**
Non-native plant management	Landscape	Photograph area to be treated. Make sure to capture enough in the photos so that you will be able to detect changes in the post-project photos.
Planting	Feature	Pre-project photos should capture the future planting location before site preparation. After planting, take photos that show changes in the vegetation structure.
Reestablishment of wetland hydrology	Landscape	Photograph area where hydrology will be restored. Make sure to take post-project photos during the appropriate season so changes will be visible.

Upland Habitat Improvement Projects

Restoration Action	Photo Type	What to Photograph
Juniper management	Landscape	Pre-project photos should capture areas where juniper treatment will occur. Include ground so that vegetation reestablishment and reduction of sediment loss can be captured in post-project photos.
Non-native plant management	Landscape	Pre-project, photograph area to be treated. Make sure to capture enough in the pre-project photos so that you will be able to detect changes in the post- project photos.
Grazing management	Landscape	Photograph area prior to change in use and implementation of grazing management, and photograph again in following years.

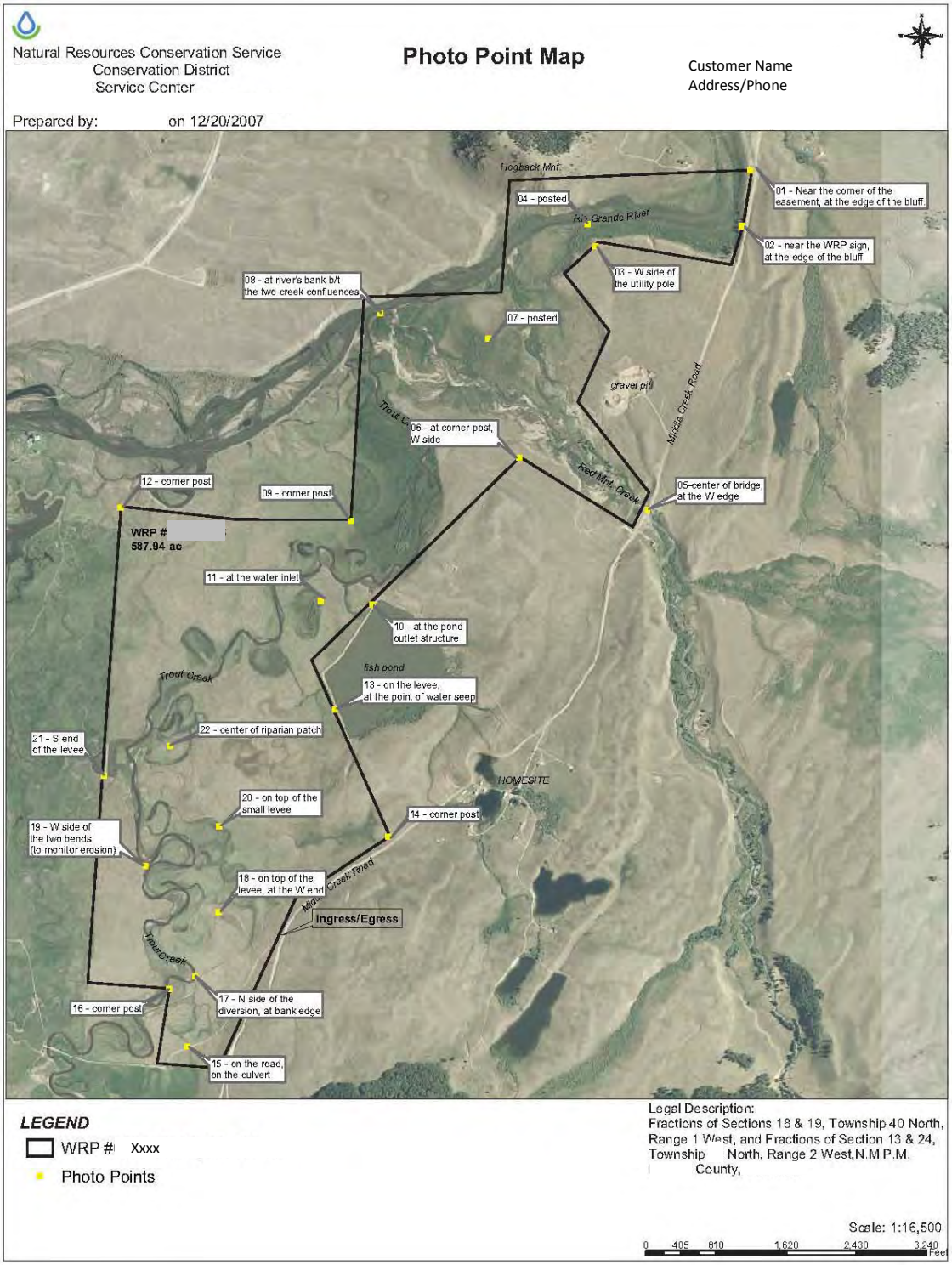
Water Management Projects

Restoration Action	Photo Type	What to Photograph
Irrigation system improvement	Feature	Pre-project, photograph old structures and intended location of new structures. Post-project, take photos showing restoration and demonstrating that structures are still operational.
Instream flow protection	Feature	Photograph stream reach before project implementation. Take monitoring photos at weirs or other specific points.

Instream Habitat Improvement Projects

Restoration Action	**Photo Type**	**What to Photograph**
Bank stabilization	Feature	Take pre- and post-project photos from the opposite bank and from mid-channel, looking across stream to future treatment location.
Boulder/LWD placement	Feature	Take pre- and post-project photos from mid-channel looking upstream and downstream from each structure location. Take more photos from either bank looking down on structure.
Weirs/grade control	Feature	Take pre- and post-project photos from mid-channel looking upstream and downstream from each structure location. Take more photos from either bank looking down on structure.

Appendix B.



Example of a photo point location record built into the point shapefile.

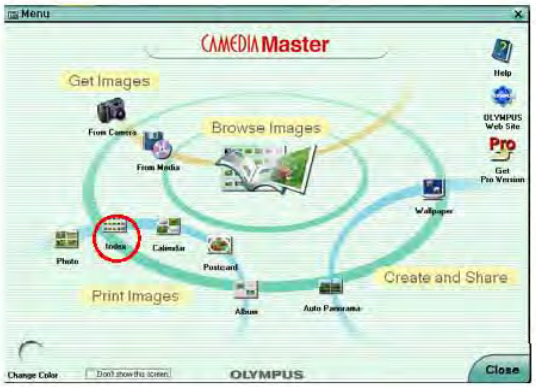
Attributes of PhotoPoint

Shape *	PointID	ProjectNam	Date_	Observer	Location
Point	01	Tuff Ranch	8/1/2012	C. Pettie	At the NW corner brace of pasture A.
Point	02	Tuff Ranch	8/1/2012	C. Pettie	On the access road, on top the culvert (N side).
Point	03	Tuff Ranch	8/1/2012	C. Pettie	Marked in the field with a t-post.

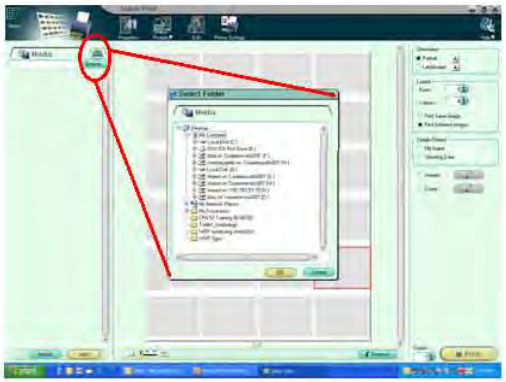
CAMEDIA Master

Quick guide to use CAMEDIA Master to print photos which show the photo name and date taken; the pictures can be sized and headers/footers added.

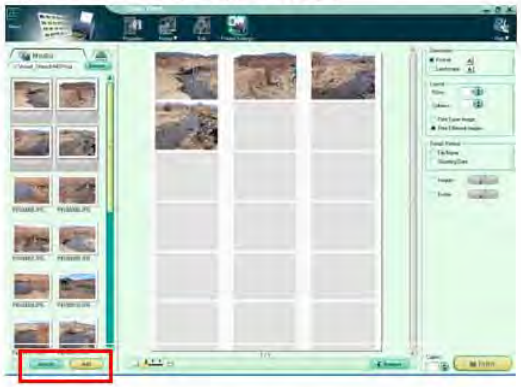
1] From the welcome screen, select “Index”.



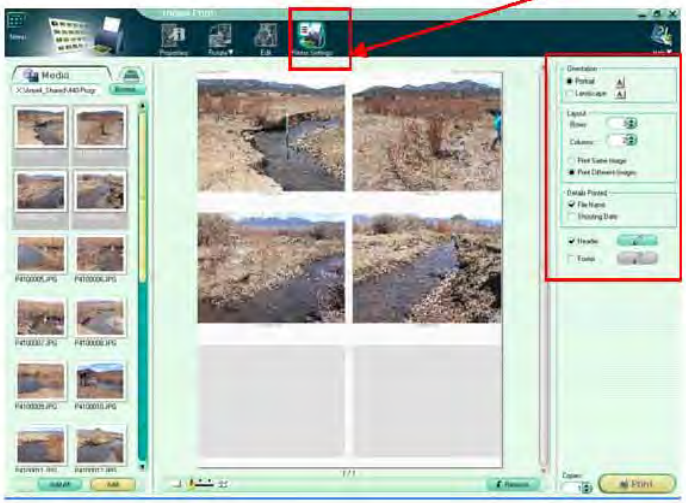
2] Click on “Browse” to locate the photos.



3] Click “Add all Photos” or select the photo to add and click “Add”.



4] Alter to landscape or portrait orientation. Then size the photos by selecting how ma pictures per row and column. Check the box by “ ne Name” and/or “Shooting Date”. Add a header or footer s needed.



5] Click “Printer Settings”. Select “Adobe PDF ” as your printer.

6] Click “Print”. Select the location to be saved, and the file name. After it’s printed to the .pdf format, open the document and print to the printer.