

Southern Kettle Moraine Private Lands Oak Savanna Restoration Monitoring



(Photo-monitoring protocol described here has been adapted from the National Park Service, and the US Forest Service http://www.fs.fed.us/eng/rsac/invasivespecies/documents/Photopoint_monitoring.pdf, and Oregon Watershed Enhancement Board http://oregon.gov/OWEB/docs/pubs/PhotoPoint_Monitoring_Doc_July2007.pdf)

PHOTO POINT MONITORING

Monitoring is an important component of restoration. Monitoring provides feedback in your restoration efforts, including providing importance guidance towards adapting your management if needed. It is important to understand how each of your management activities works towards a management objective, and that your monitoring efforts relate to and provide an evaluation of your management activities and objectives.

Photographic monitoring (photo-monitoring) is an easy and inexpensive, yet effective technique used to track changes over time. The basic photo-monitoring process involves taking repeat photographs of the exact same point- a **photo-point**. A photo-point is an established location that acts as a point of reference over time. With appropriate site marking and documentation, photos can be precisely replicated by different people many years apart. Pre- and post-implementation photos, as well as photos documenting restoration actions, help to “tell the story” of the restoration project.

THE BASICS OF PHOTO MONITORING

The following types of photos can be used for monitoring restoration projects: **feature**, **landscape**, and **opportunistic** photos. Each of these is described in detail below with examples.

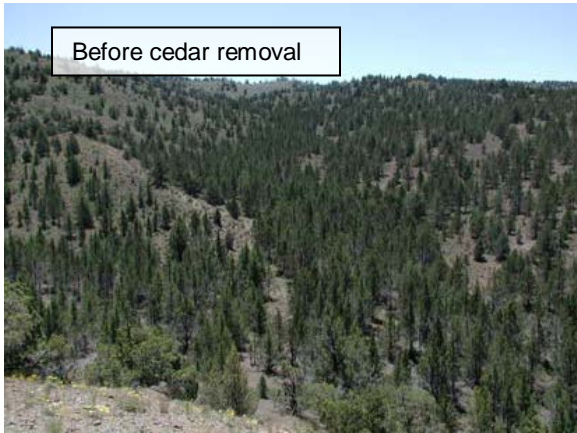
Feature photos document changes resulting from a specific habitat restoration activity such as the removal of trees and brush from a fenceline or prescribed burn on a prairie. For example, photos can be taken across a fenceline or in either direction along the line to show contrast between different land management activities. A combination of photos from multiple perspectives often provides the best illustration of the conditions at the site.

Feature photo examples



Landscape photos can capture restoration activities undertaken at a broader scale such as forest stand treatment or valley bottom stream restoration. These photos provide an overview of the area where restoration actions are implemented. A landscape photo can also be taken from a nearby hill, showing from a distance the same section of the landscape where the **feature photo** was taken and thus providing context for the **feature photo**.

Feature photo examples



Opportunistic photos are not taken from a permanently marked location and are not intended to be formally repeated. However, they do provide valuable information about a restoration action, particularly when taken during restoration- i.e. people conducting a prescribed burn, a work party removing invasives, etc.

Opportunistic photo example



GENERAL GUIDELINES FOR PHOTO MONITORING

For any type of project, consider five basic questions to help set up the appropriate photo points (Hall 2001, Borman 1995, Nader and others 1995):

Why monitor

What are your objectives or reasons for monitoring? The answers can determine whether the project was implemented correctly and whether the restoration action effectively met the project objectives. Identify the expectations for visual monitoring before you make a commitment of time and effort.

Where to monitor

Selection of photo point locations depends on local topography, accessibility, site specific restoration work, availability of reference points in the landscape, and the specific objectives of monitoring. A project map is helpful in choosing the appropriate photo point locations.

What to monitor

The sampling setup should reflect the objectives of monitoring. Focus on visible changes.

When to monitor

The answers to the previous three questions determine which photo interval (seasonal, annual, or biennial) is appropriate. It is critical to take photos at approximately the same time of year when making statements about changes from one year to the next.

How to monitor

The choice of detailed feature photos or broader landscape photos depends on the answers to the previous four questions. Determine the best way to emphasize the visual changes occurring through time as a result of the project.

CHOOSING PHOTO POINT SITES

To choose the locations of the permanent photo points, consider the following site characteristics:

- *Will changes be visible at the desired scale?*
- *Is there adequate light to take the photo?*
- *Will the photo capture the “area of influence?” This includes not only the work area but also areas likely to show the effects of that work (Gerstein and Kocher 2005).*
- *Will the location of the permanent photo point marker need to change? For instance, will land use change or vegetation growth change so that the site can no longer be accessed.*
- *Can this location be reached conveniently and consistently?*

SETTING UP PERMANENT PHOTO POINTS

Equipment needed- (Prepare all equipment before going to the project site)

- Maps- detailed topo, aerial, hand drawn or whatever is accessible to you and can show detailed photo point locations
- Photo identification labels
- Data sheets: Photo Point Monitoring Record, Photo Point Site Description and Location
- Clipboard
- Compass or GPS
- Camera- film, disc, and camera tripod or whatever ever your camera needs
- Stakes (2 for each photo point), 3 to 4 feet high
- Hammer or post driver
- Measuring tape

1. Create a map of the project area that you are going to be monitoring. This can include a hand drawn map, an air photo, a USGS quad map or a topo map.
2. After choosing the locations of your permanent photo points, carefully record information about the locations. (See Appendix A for an example). Do not assume that the person who set up the photo points will be available to take photos in the future. It is important that your photo points provide a visual record of your progress towards your management goals.
3. Mark the location of each photo point on maps. Include arrows showing the directions in which to point the camera. Also locate a **witness site**. A witness site is (preferably) an immovable object in the monitoring area that can be easily identified when returning to the area. It serves as a reference to quickly locate the monitoring area and also as a reference point from which the camera and photo points can be located. Measure the distance and direction from the witness site to the photo points. It is helpful to attach a permanent identification tag to the witness site with the distance and direction to the photo and/or camera points inscribed on the tag. **The idea is to capture the EXACT same vantage point every time!**
4. Mark the exact location of the permanent point on the ground with a marker (fence post, re-bar, aluminum tube, etc). Use a material that will still allow you to mow or conduct prescribed fires through the area without difficulty.
5. Record GPS coordinates and assign identification numbers for each permanent photo point location.
6. If possible, place a second stake or post in the center of the photo area, perhaps 5-10 meters (15-30 feet) from the photo point. This stake will be used to capture scale, so you will also need to note details about the stake- height from ground, etc.

TAKING BASELINE PHOTOS

Take prior to management activity! Record information on recording sheet (Appendix B)

1. 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, for example) or when snow on the ground obscures the habitat changes. Take photos with the sun at your back. Choose a camera that best suites your needs, but consider one that can provide a depth of field.
2. Document the type of camera and/or lens you use and whether you hold the camera vertically or horizontally.
3. Fill out a photo identification label (Appendix C) and place it on a clipboard in an upright position so that it appears in either corner of the photo's foreground. Make sure the photo label is in the field of view before taking the photo.
4. Hold the camera at eye level. Try to include some skyline in the photo to help establish the scale of the area being photographed.
5. Measure the height of the camera and the compass direction of the photo. Also measure the distance from the camera to the reference stake if using this method.

TAKING SUBSEQUENT PHOTOS

Photos points are used to track changes. Photos are a tool that can be used to document this. By comparing pre- and post-management photographs, you can assess whether management is progressing in the desired direction. It is important to always align your restoration and monitoring objectives prior to initiating a photo point monitoring schedule, to ensure that all your objectives are being met.

Consider what time of year allows you to demonstrate the focus of your monitoring and management. If you decide to change the season, begin taking monitoring photos in the appropriate season of the first year and maintain the new schedule for the remainder of the monitoring period.

Thorough documentation of photo point locations at the time of initial setup makes them easy to find upon returning to the project site to take repeat photos. Before returning to the field, copy all photo point information, including maps, data sheets, and previous photos. Take this material on each visit to the project site. The maps and directions on the data sheets will help you locate the permanent photo point sites. The previous photos can frame the new photos. Match the framing closely so that the new photos will be as similar to the earlier photos as possible. With a digital camera, it is useful to view the previous photo on the LCD screen to help frame the new photo.

STORING AND RECORDING YOUR PHOTO POINT INFORMATION

This information is important for grant and personal record keeping. Please keep it in a format that is easy to review and share, such as a .jpeg file, and in an organized system. This may consist of CDs or DVDs containing labeled digital photographs, electronic maps, directions, a site locator field book, site descriptions, other descriptive data, prints, and/or a series of expandable folders (one for each monitoring area) containing hard copies of this information.

Labeling Photos

It is important to clearly label photos immediately after returning from the field. Label all photos with the project name, date, time, and photo point number (Appendix D). Use a fine Sharpie marker to write the information as legibly as possible on the back of the photo or on the mount of the slide. Digital photos should be saved with file names providing the same information.

DATA COLLECTION SHEET- INITIAL PHOTO POINT SET-UP

Complete this form prior to management activities. Take photos at initial set up.

Data collector:

Date:

Description of Project Area (include witness point information):

Restoration Objective:

Describe of Photo Point/s – Assign Identification #. Include GPS coordinates, or any other information that will help you to locate again, description of marker type, distance from witness point or reference stake, etc.

MAP

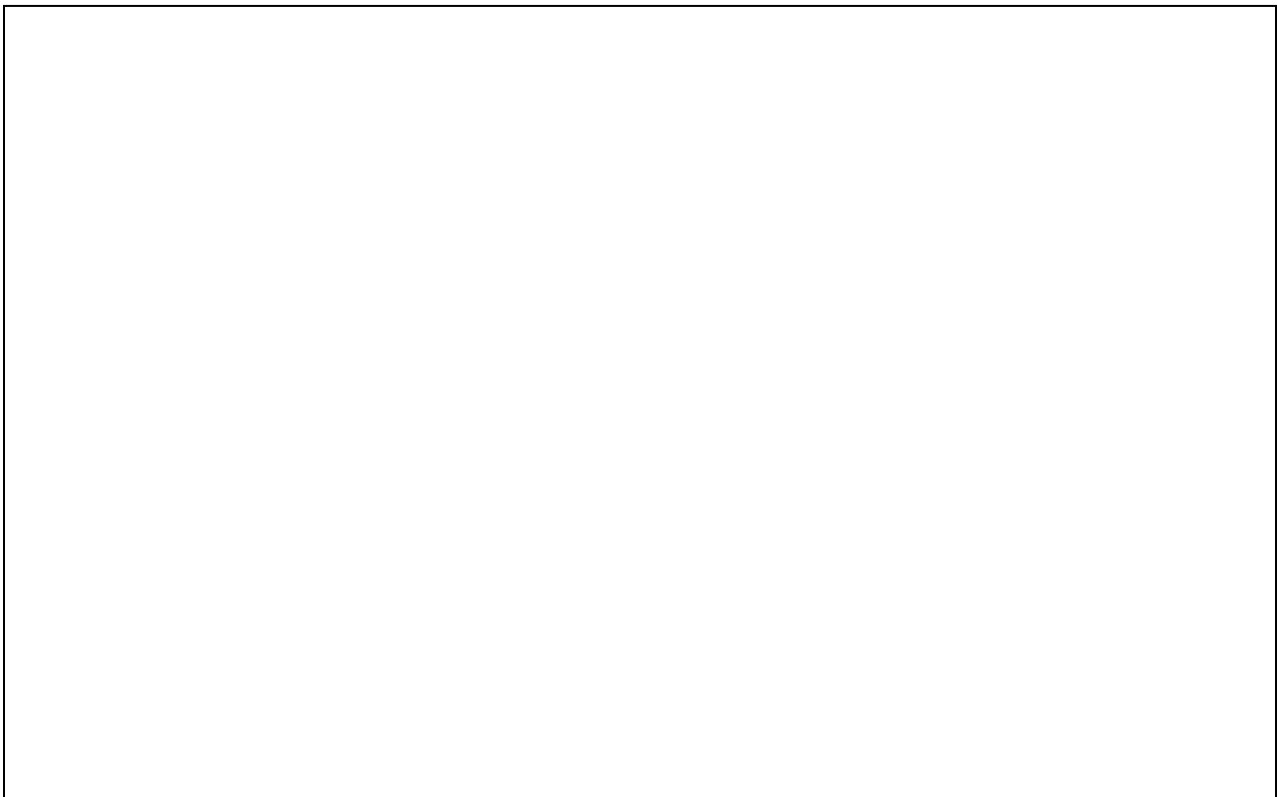


PHOTO MONITORING DATA COLLECTION FORM

(Copy this form as needed)

Date and time:

Data collector:

Description of weather:

Recent management activities of note:

Photograph Record

Photo Point #	Camera information (lens, film type, frame #)	Camera Height	Other Observations

DATE:

UNIT:

PHOTO PT #: