Repeat Photography Monitoring Made Easy

G. Allen Rasmussen and Kathy Voth

Utah State University Extension

United States Environmental Protection Agency

March 2001 **NR504**

Photo Monitoring Made Easy

How often have you said or heard, "This area looks so much better than it was back...." The problem occurs when other people are not sure they can believe what they hear. They may still see problems and wonder to themselves how truly interested managers are in solving them. In addition, for those who have not been around to see improvements, the slow rate at which nature changes can make it seem that managers are doing nothing.

So what can you do? You've heard it for years - MONITOR! Rather than making your life more difficult, good monitoring can actually simplify it. Since most of us remember only the very best and very worst, our memories often fail us when it comes to gradual changes over longer periods of time. With the data collected and stored, you no longer have to rely on your memory. Your data are also more useful than your memory in describing what you saw, and is more readily accessible to interested public or managers who may follow you. Your data can provide you with concrete proof of successes and help you identify management strategies that did or did not work. Aldo Leopold once said "If you learn to read the land, I have no fear what you will do to the land." Your monitoring data can demonstrate how you read the land, reducing others' fear of what you might do.

Professional land managers have used monitoring as the basis for making decisions as varied as livestock movement to wildlife harvest rates and for determinations of water quality and ecosystem health. The Society for Range Management has defined monitoring as the orderly collection, analysis and interpretation of data to evaluate progress toward stated goals (1989). The amount of time and expertise this implies scares many people away. However, it is really not that complicated. At the most basic level monitoring is defined as "to watch, observe or check on for a specific purpose" (Webster 1983). All you are required to do is to look, to pay attention to what is happening and to record your observations in some way.

There are many monitoring techniques. Here we will discuss one of the simplest, cheapest and quickest methods -- Repeat Photography. By following the easy steps outlined here, you will collect data and record your interpretations over time to provide proof of change and management efforts. We will cover how to correctly take a photo, how to file it to ensure you can find it and know what it means, and how to record observations and interpretations of the monitoring site.

Step 1: Get the Equipment

Equipment Needed.

Your equipment must include:

1) Camera
2) Film
3) Photo Board
4) Reference pole
5) Evaluation forms
6) Notebook

Camera: There are numerous cameras on the market and any will work. The instamatic cameras are easy to use and very cheap in the short run. If you use a more advanced 35-mm camera, most now have an option to put the date right on the picture. The same is true for the newer digital cameras. If you have a computer system, digital photos may prove to be the least expensive over time.

Film: Use color print film. Typically 100 or 200 speed film works best in outdoor, sunny settings.

Photo Board: Placing as much information in the picture as possible eases record keeping in the future. Your photo board will appear in every picture you take so that you can be sure the photo includes the date and location of the monitoring site. Your photo board can be an inexpensive white board, or a clipboard with a plastic sheet, or even just a sheet of blank paper. All will allow you to write the appropriate information, take the picture and then move on to the next site.

Reference Pole: Your reference pole gives a sense of scale in your photograph. It allows you and others to see changes in the vegetation height and structure over time. Your reference pole should be 1 meter long. A piece of PVC pipe works well. Paint the bottom half red. Duct tape wrapped in the middle makes a good dividing line. The two colors are an important part of making it easy to estimate vegetation height. Some people also attach a stake to the bottom of the pole so it is easier to stick into the ground.

Evaluation Forms: This form is the place you will put your printed photo and your evaluations of the site from your visit. A form with printed questions or observation requests can jog your memory to ensure you collect the same information every time.

Notebook: With one place to store your photos and your evaluation sheets, you'll have quicker access to your information in the future. Using a notebook also makes it easier to carry photos from the past year into the field with you so you can be sure you're repeating photos at the same locations every time. A three ring binder works well. We suggest attaching your photos to your evaluation sheets (see the last page for an example).

Step 2: Choose a Location

Your photo monitoring will be most useful if you select "Key Areas" to monitor. A key area is representative of the area you are managing and acts as an indicator of changes that may be taking place. The greater the variety in your terrain, the larger the number of key areas you will need to properly represent the area being monitored. Keep these guidelines in mind when selecting your photo monitoring location:

1. Choose a spot you will have time to visit and monitor.

Pick areas that are high priority for your operation and add others over time.

2. Be sure that the area is representative of a larger area.

Choosing areas where livestock congregate (watering points or fence lines) or where livestock never graze will give you important comparisons. However, these areas may not adequately represent the larger area and how your management affects it over time.

3. Select enough key areas to adequately represent the area you manage.

An advantage of having more than one key area is that it ensures small local events, such as fires or floods, do not misrepresent conditions in the larger area.

4. Comparison photo stations in grazed and ungrazed areas can help you evaluate the effects of grazing.

Be sure that the sites are similar in soils, topography and precipitation.

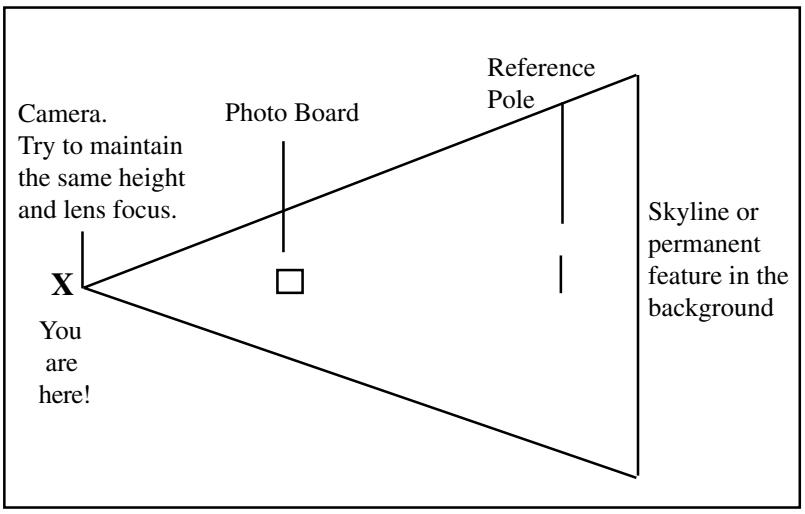
If you would like more information on how to pick key areas, see Bureau of Land Management, 1996, Sampling Vegetation Attributes, Interagency Technical Reference BLM/RS/ST-96/002.

Step 3: Take the Picture

The type of camera, film and lens are not as important as how you take the picture. Every picture you take should include the following, in order of importance:

1) Landmark
2) Photo Board
3) Reference Pole

Figures 1 - 3 show examples of monitoring photographs that range from useful to not useful.



Setting up the Picture

Landmark: A distinctive, permanent landmark is critical if you or others after you are going to find the photo point in the future. Repeating your photo at the same site on an ongoing basis allows you to use the photo to analyze and demonstrate what your management has done. By going to the same point every year, you also cannot be accused of simply picking points to your advantage.

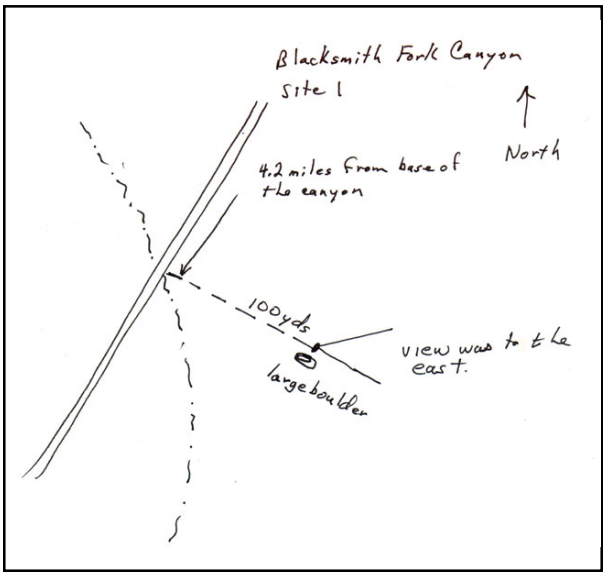
As you look through your camera's viewfinder check to be sure the frame includes a skyline. It can be particularly difficult to include a skyline when you are photographing a riparian area. Are there rock outcrops, mountain slopes, or other geologic features that will remain the same over long periods of time? Adjust your site until you are sure that your photo will include a landmark that you can find again and again. This will also help others to know they are looking at the same site.

Photo Board: After writing the date and the location of the monitoring site on your photo board, place it in the foreground of your picture. Check through your viewfinder again. Is the board legible? Be sure the sun's glare will not prevent you from reading the information on the board once the photo has been printed. With the photo board visible, check to see that your landmarks are also still in the frame.

Reference Pole: To make it easier to interpret the picture in the future, the reference pole should be placed the same distance from the point of origin every time. Because your photo board is in the photo's foreground, it can easily be used as the point of origin. Fifty feet from the point of origin is most commonly used to locate the reference pole. In many areas, such as a riparian area, willows can fill in over time making the pole difficult to see, so it might have to be moved forward over time. If the pole is moved, be sure to note this as part of your site observations.

With the reference pole in place, look through your viewfinder one more time. If you can see your landmark, the words on your photo board and the reference pole you're ready to shoot.

Step 4: Record Your Site Evaluation



Site Map Example

Take out your evaluation forms and write down your interpretation. It does not need to be a long academic write up; just a few words about what you see happening.

For example:

"Sagebrush seedlings are starting to show. I should start thinking about reburning this area in the next 5 years or so!"

"Grasses are becoming more dominant. I will try to adjust season of use to an early part of year to get the sedges back."

"Sagebrush has increased and grass cover is declining. I am seeing lots of bare ground and worry about future erosion."

To help you remember each location, include a map to the site on your first evaluation form. See the last page for an example of an evaluation form you can use. In some cases you might want to install a post or pin at the site to help you be sure you take the photo from the same point each time.

Step 5: Store the Picture and Data

The finishing steps include getting your photos developed and placing them in your notebook along with the evaluation sheets. This is the simplest method, though some people actually use computer systems to store data and photos. Please don't use the storage method used by most folks in a hurry, the standard "it's in the cab of my truck somewhere" filing system shown here.

Typical filing system used by many managers

Step 6: Repeat the Process

Once you've set up your key areas and have taken your first photos and recorded your observations and evaluations, don't stop. Do this every year. Take photos at about the same time of year. After all, what can you really tell about a site if one photo was taken in the spring and the next year's was taken in the fall? Try to use the same camera lens, film type and shutter speed each time.

General Recommendations

To make the most of your repeat photography monitoring, be sure it includes the following:

1. A good photo with:
    - Skyline or permanent features for easy relocation
    - Reference pole placed the same distance from the origin point
    - Photo board with date and location written on it

2. Written notes concerning the use and events on the site.

3. Your interpretation of the management effects on the site.

4. A storage system for your photos and notes.

5. Repetition of the process over time.

Dry Valley 1940, Bureau of Land Management photo

1998, Earl Hindley photo

Use of Historic Photos

Old family albums, historic records at the courthouse, and even the library are additional sources for photos you can use to tell a story about your the management of your area. Look for old photos that have some identifiable feature, maybe from a family picnic, or a round-up. By finding that location today, and putting yourself in the same location as the original photographer, you can take a picture that will show conditions today. The examples shown here are from "A Photographic History of Vegetation and stream Channel Changes in San Juan County, Utah" by Hindley, Bowns et al.

Figure 1. Four examples of photographs that have everything needed for monitoring changes. They each have the date, location, a reference pole, and some type of permanent feature that can be recognized. Note how the background skyline makes it easier to find these sites in the future.

Figure 2. These photographs are less useful. All have the date, location and reference pole which make them very useful for monitoring. However, because there is no permanent feature or a distinguishable skyline, it will be difficult, or impossible to relocate them.

Figure 3. These photographs are the least useful for monitoring. They are nice landscape pictures but do not contain the date, location or a reference pole. These are very difficult to use for monitoring, and then only by the person who took the original photo. To make them more usable, they should be attached to a sheet with the date and location. A map of how to find the site would be valuable as well.

Evaluation Sheet

Date:

Location:

Map to the site ___

What happened in last year? (grazing, type of animal, wildlife, burn, management action etc.)

What are management impacts since the previous photo?

Utah State University Extension is an affirmative action/equal employment opportunity employer and educational organization. We offer our programs to persons regardless of race, color, national origin, sex, religion, age or disability.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert L. Gilliland, Vice-President and Director, Cooperative Extension Service, Utah State University, Logan, Utah.