

Monitoring Riparian Areas With a Camera

By Michael DeLasaux¹, Holly George², and Philip Mainwaring³

Riparian areas are next to streams, springs, rivers, ponds and lakes. Physical characteristics that influence riparian areas vary considerably and include slope, aspect, topography, soil, type of streambed material, water quality, elevation, size, and adjacent plant community as seen in (Figure 1).

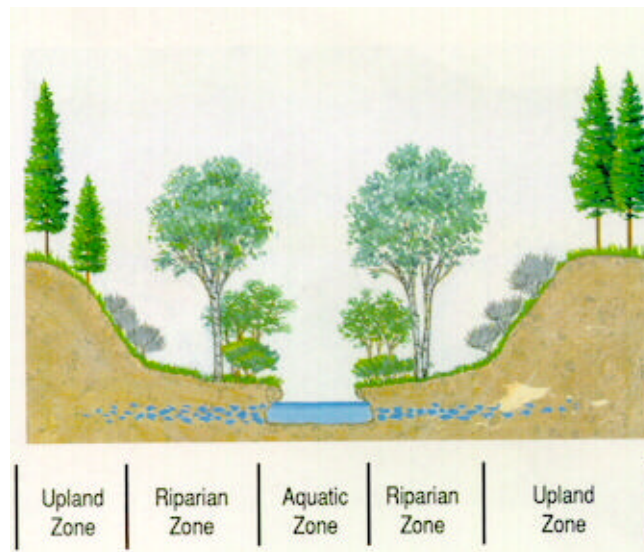


Figure 1

Riparian zones are identified by the presence of vegetation that requires large amounts of free or unbound water.

Source: BLM, Colorado State Office, 1990

You probably have overall management goals that include livestock production objectives. What about your riparian areas? **Management objectives for a healthy riparian area may include:**

- High water table and maintenance of water storage capacity,
- High forage production,
- Shade for cool water,
- Habitat for desirable fish,
- Wildlife habitat diversity,
- Presence of vegetation and roots to protect and stabilize banks,

¹ County Director and Natural Resources Advisor, Plumas-Sierra Counties, UCCE, 208 Fairgrounds Rd. Quincy, CA 95971

² Natural Resources and Livestock Farm Advisor, Plumas-Sierra Counties, UCCE, 208 Fairgrounds Rd. Quincy, CA 95971

³ Natural Resource Farm Advisor Intern, Plumas-Sierra Counties, UCCE, 208 Fairgrounds Rd. Quincy, CA 95971

- Late summer stream flows.

Management objectives can help you define what to monitor. For example, by recording the amount of bare soil along a stream bank each season, you may determine the trend of the bank towards stability or degradation. If the amount of bare banks is increasing, then your management practices should be changed to fulfill the objective of protected banks and stable banks.

Riparian Area Inventory

The first step in monitoring riparian areas is to determine the location, amount and the type of riparian areas in your management area. Riparian inventory is important when determining where to monitor. For an example of a riparian inventory short form see *Appendix III*.

Where to Monitor

Select areas that represent the different riparian areas on your property. These areas should be useful for demonstrating trends. Include riparian areas where management is having an impact, either positive or negative. You should also include riparian areas that are in some way degraded or highly susceptible to degradation. These areas may have little bank vegetation, resulting in bank instability, little shade, warmer water, lower water table, poor fish habitat, etc. At least one monitoring site should be established for each different riparian area. The transect for data collection is linear or parallel to the stream course.

Riparian Photo Monitoring Components

Riparian monitoring has two components;

- 1) Landscape photo
- 2) Site description with data collection.

Photo points are used to record change over time. The pictures on the following page are examples of the power of photographs to illustrate change over time. They also indicate the direction that change is occurring.

(see following page)



Photo Pt. 2 Fitzhugh Creek,
Summer 1976



Photo Pt. 2 Fitzhugh Creek,
Summer 1987

The second riparian monitoring component describes the site and its physical and biological characteristics, such as vegetative cover and bank condition.

Ideally, photographic monitoring is used together with site description and data collection. Monitoring that is based solely on photography might not provide sufficient information to evaluate objectives.

Photo Monitoring

It is convenient to use the same riparian monitoring areas for photographic monitoring and for collecting information on physical and biological characteristics. However, photographs should be taken before the sampling so the vegetation is not trampled. Also, photos should be taken at approximately the same time of year for comparison. Each monitoring area should have a number and location description unique to the management area. (See *Appendix IV - Photo Monitoring Site Record*).

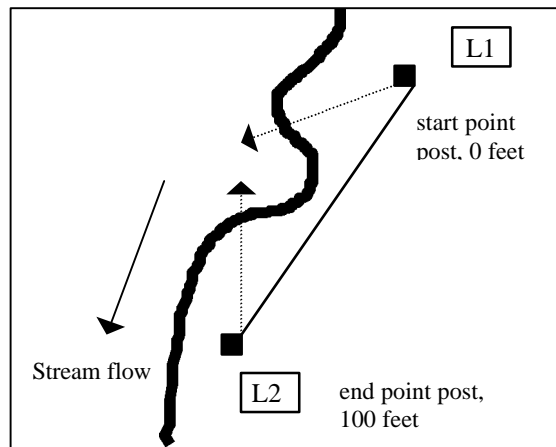
Monitoring Area Location and Size

The monitoring area (distance along stream course) should be long enough to give a representative view of the area. For example, a narrow creek that is only ten feet wide with dense vegetation may only need a monitoring area that is 50 feet long, while a one-hundred-foot-wide stream in an open meadow may need a 400-foot monitoring area to better represent the section. As a rule of thumb, your monitoring area length should be about four times the width of the channel at the banks' edges.

Two permanent markers (post, tree, etc.) are used to delineate the monitoring area, one at the beginning and one at the end on the same side of the stream (see Figure 2). These two markers are the principal photo points. One of the monitoring area markers should be referenced with a compass bearing and distance to a witness point such as a nearby large tree or utility pole to aid in future location of the monitoring area or if the marker post is removed. The compass bearing and distance between the two permanent landmarks should also be noted. The referenced landmark should be noted on a map or aerial photos as shown in Figure 2. This information should be included on the Photo Monitoring Site Record.

Figure 2

A stream channel that is only 10 feet wide may require as few as two photographs to adequately cover the area.



A diagram similar to Figure 2 should be drawn with a sketch of the stream channel, the photo points, the direction of stream flow, a reference or witness point, and any extra comments that would be helpful in locating the monitoring area.

It doesn't matter how you label the points within the monitoring area but be consistent. A suggested method is to denote the left side of the stream with an 'L' and the right side with an 'R' and the upstream marker as point 1. Left and Right Bank is determined by facing downstream. So you might have photo point labels 'L1' and 'L2' as shown in figure 2.

Photographing the Monitoring Area

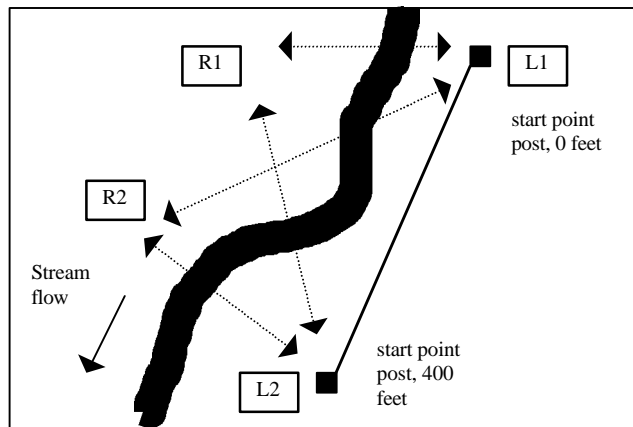
The photographs are intended to provide a representative view of the actual stream channel, bank and bank vegetation. Photos are taken in several directions upstream, downstream and across the stream. The camera may be oriented either vertically or horizontally as needed to obtain the best results in framing the most representative view of the stream channel.

At locations with heavy woody vegetation or the potential for a lot of growth, you may want to take photos from the center or edge of the stream. Views that are open and void of woody vegetation today may be blocked by dense vegetation in a few years.

Take as many photos as are necessary to document the conditions. As few as two photographs may be adequate for a riparian area that is ten feet wide, while as many as eight photographs may be necessary for a one-hundred foot wide riparian area (Figure 3). Terrain and riparian vegetation conditions and changes over time may cause some of the photo points to become impractical. For that reason, you may want to take additional pictures when you start.

Figure 3

A stream channel that is 100 feet wide may require as many as eight photographs to adequately cover the area.



When taking the photographs, use the monitoring area posts as photo stations. Get close enough to the stream channel so your photo gets as clear a view of the other bank as possible. Also, frame a readily identifiable permanent landmark in your photo so you can use it next year to get the same view. Indicate the direction of each photo on the sample area sketch.

A quick method for clearly identifying the photos is to have someone hold a small chalkboard at the edge of the photo that is labeled something like:

SAMPLE AREA: 3
FROM: R1
TO: L2
7-8-94
Pump Pasture

It is best to use the same film type and speed each year and, when possible, the same camera or lens size.

Equipment List

- 2 permanent markers (steel angle iron posts or rebar)
- camera and film
- felt tip pen, non-white photo description card (example in *Appendix II*)
- compass
- steel post
- hammer
- steel post driver

References for More Information

Oregon Watershed Improvement Coalition Brochure, 1994.

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