

Protocols for Establishing Photo Points at Mining Reclamation Sites

The goal of establishing photo points at newly reclaimed mine sites is to document events and changes over time for the various resources. Although photos by themselves may provide enough justification to make management decisions, e.g., if they illustrate no revegetation, erosion, raw and eroding streambanks, unstable stream channels, etc. (Figure 1), their main objective is to provide visual support for more rigorous and quantitative monitoring efforts that will be used to determine if reclamation efforts have successfully achieved the minimum standards. Photo points should be strategically placed to monitor the required Performance Standards found in 43 CFR 3809.420, which in general include, 1) measures to control erosion, landslides, and water runoff, 2) revegetation of disturbed areas, 3) rehabilitation of fish habitat which is essentially a stable channel and streambanks with riparian vegetation and/or anchored rocks/logs, and instream habitat complexity similar to predisturbed natural conditions, 4) rehabilitation of wildlife habitat, and 5) site stability to maintain water quality. To accomplish this, photo points should be established adjacent to the stream and in upland areas as applicable. Photo points should be established at all newly reclaimed mine sites in an effort to better understand the timeframes for recovery and to help determine if current management practices are meeting the Performance Standards. Another very useful benefit of establishing photo points and monitoring them on an annual basis is to provide new mining staff (high turnover rate) with a clear understanding of the reclamation history at our mine sites that have pending reclamation.

Streamside Photo Points

- A minimum of 6 photo points will be established above the bankfull elevation, which in newly constructed stream channels will likely be the annual high water mark. Use best judgment to avoid placing markers in areas prone to future erosion. Of the 6 photo points, 3 will be established on each side of the stream near the bottom, middle, and upper end of the reclaimed stream reach. See figure 3.
- Take 4 photos at each streamside photo point marker (upstream, facing across the stream towards the opposite marker, downstream, and 180° away from the stream). See figure 3.
- Streamside photo point markers provide a good place to establish cross sections for monitoring channel stability.
- Streamside photo points should be monitored annually given the challenge of reclaiming stream channels and streambanks to a stable condition. Problem areas identified may initiate the need for corrective action.

Upland Photo Points

- Veg and Wildlife specialists fill in this section with protocols for monitoring upland vegetation.

Establishing Photo points

- Pound a 3 foot length of 5/8" rebar into the ground where it is not likely to be destroyed or moved and can be found with relative ease. The marker should probably be a minimum of 12" above ground level for visibility.
- Wrap brightly colored flagging (generous amounts) around the top of the marker.
- Name the marker (#1, #2, etc.) and scribe the name onto a Metal tag. Wire the metal tag to the marker post for future reference.

- Record GPS coordinates at each marker location.
- Sketch a map of the area which includes the general position of all the photo point markers.
- If deploying a time-lapse camera, wire a fence post to one of the rebar stakes and mount the camera to the fence post.

Collecting Photos

- If possible take photos during the same month
- Take pictures with the camera in the horizontal position and don't zoom in
- If possible choose a time of day when the sun will be at your back
- Use a compass to find magnetic North and then record the bearing (degrees) for the direction that you take each photo. This will ensure that photos are taken consistently in the same direction over time.
- Fill out site information (site ID # that you scribed onto the metal tag, stream name, operator, date, compass bearing, gps coordinates, etc.) onto the dry erase board. Now have your partner stand 10 meters back from the marker post while holding the white board and a graduated measuring rod. Next, stand back from the marker post (about 10 feet) just far enough so that the marker post can be seen in the bottom center of the photo and take the photo. This provides reference for future photos. The measuring rod would provide reference to the height of future vegetation. See Figure 2 (marker board, rod, and partner was not used). If you don't have a partner, use a HD clamp to hold the dry-erase board to the rebar marker.
- When re-visiting photo points, have a copy of the previous year's photos with you to ensure you capture the same view.

Opportunistic Photos

- Are not taken from a permanently marked location and are not intended to be formally repeated. However, they may provide valuable information and if necessary you may want to establish a new photo point marker for future monitoring at the point of interest.

Tools Needed

3 foot lengths of 5/8" rebar (semi-permanent photo point marker)

5' fence (if you're going to deploy time-lapse camera)

Big hammer

Flagging

Wire

Pliers

Metal Tag for site ID

White board and dry erase pen to record site info

HD clamp

Camera

GPS unit

Compass

Notebook and pen for note taking

Measuring Rod (for height reference)

Veg plot square? (used at veg plots and/or at all photo point markers to monitor veg?)

Once Data has been collected

- It's imperative that data collected at photo points (mainly photos themselves) be placed into an electronic folder within the appropriate folder for that mine operation.
- Create a sub-folder for each individual photo point location and place the appropriate photos there.
- As soon as possible, all photos must be "renamed" with appropriate descriptions and organized in such a manner that it's very clear when and where each photo was taken including orientation (upstream, downstream, compass bearing, etc.) and at what photo point it was taken. Don't assume that you will be the one re-visiting the photo points. Poorly labeled photos are of little use.
- An annual report for each site should be created with a brief discussion and all of the photos collected for that year should be in the report. Doing so will make it easier to compare photos from year to year.

EXAMPLE



Figure 1. Photos captured at this photo point provided enough justification by themselves, even though quantitative cross section measurements were also taken, to make management decisions. The operator was asked to recontour the eroding streambank.



Figure 2. These photos were taken from the same photo point marker. Note that taking the photo with the rebar marker in the very bottom and center of the photo provides reference. These photos capture the channel, streambank, and riparian and upland vegetation over a 4 year period. The information on the white board in the 2015 photo can easily be read when zoomed in to 300% and if the 2015 photo was viewed in full size zooming in would not be necessary.



Figure 3. Establish a minimum of 6 photo points along the stream to monitor change over time. Four photos should be taken (downstream, across, upstream, 180° away from stream) annually from each photo point.

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