OWEB Photo Point Monitoring Guidance

(Revised April 2021)

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Cover photo: John Day River by Greg Ciannella

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Purpose

The intent of this document is to provide OWEB grantees guidance, instruction, and tools to fulfil photo point monitoring requirements associated with OWEB grant agreements. Throughout this document, you will learn when photo points are required, how to provide these to OWEB, and tips and considerations to accurately reflect your OWEB investment over time through photographs. This document does not offer specific methods or protocols for documenting photo points, as those may vary for each organization and in consideration of the type of restoration project to be monitored with photo points.

Introduction

The Oregon Watershed Enhancement Board (OWEB) requires photo point monitoring of each OWEB restoration project. Pre- and post-implementation photos, as well as photos documenting restoration actions, help document that the project has been implemented as proposed and to "tell the story" of a restoration project. Photo point monitoring can be a useful and inexpensive tool for qualitatively documenting events and changes at a restoration site over time. This type of monitoring allows for comparisons among photographs of a restoration project to determine whether changes have occurred. Well-documented photo points can also be used to support conclusions reached through other, more rigorous monitoring techniques.

In the course of developing project photo points, many grantees are beginning to add drone photography in addition to or, in some cases, for all of their photo point monitoring images. Many of the concepts used for developing good photo point monitoring for ground-based photo points can be also be factored in when doing drone-based photos. Drone-based photos will normally be a landscape photo point; however, in some cases they may also be used for opportunistic photos. For instance, showing high-water effects on a floodplain reconnection project or landscape changes after a wildfire.

For all references in this document, drone-based photos are defined as **still images** – no videos are currently being accepted as OWEB photo points. For more detail on using drones to meet OWEB's photo point requirements, please refer to the, "Things to Consider when using Drones for Photo Point Monitoring" section of this document. For information relating to OWEB paying for drone equipment or their use, please refer to the "OWEB's Guidance on Budgeting and Grants" document available on the OWEB website.

The Basics of Photo Point 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. Establishing photos points must be made prior to the restoration actions are implemented. Be sure to establish sites that will show how restoration actions change over time from right after the project is completed and over longer periods of time (5 to 10 years). Ask yourself: will these viewpoints still be viewable and show change from pre- to post-project?

Feature photos document changes resulting from a specific habitat restoration activity such as the placement of beaver dam analogs, large woody debris (LWD), riparian planting or fencing, or spring developments in the uplands. For example, photos can be taken across a fence line or in either direction along the fence to show contrast between different land management activities (Figure 1a). Changes in a stream can be shown through views upstream, downstream, and/or across the stream (Figure 1b). Drone-based photos can also be a useful tool for capturing a landscape view of larger scale restoration projects, when appropriate. OWEB has established guidance on factors to consider in determining whether a restoration project might be suitable to monitor with drone-based photos. See appendix D for this information. Further, a combination of photos from multiple perspectives may provide the best illustration of the conditions at the site.

Figure 1a. Pre-project photo showing project site with degraded riparian zone.

Photo credit: Wallowa SWCD

Figure 1b. Same location five years later showing increase in both riparian shrub and grass establishment.

Photo credit: Wallowa SWCD

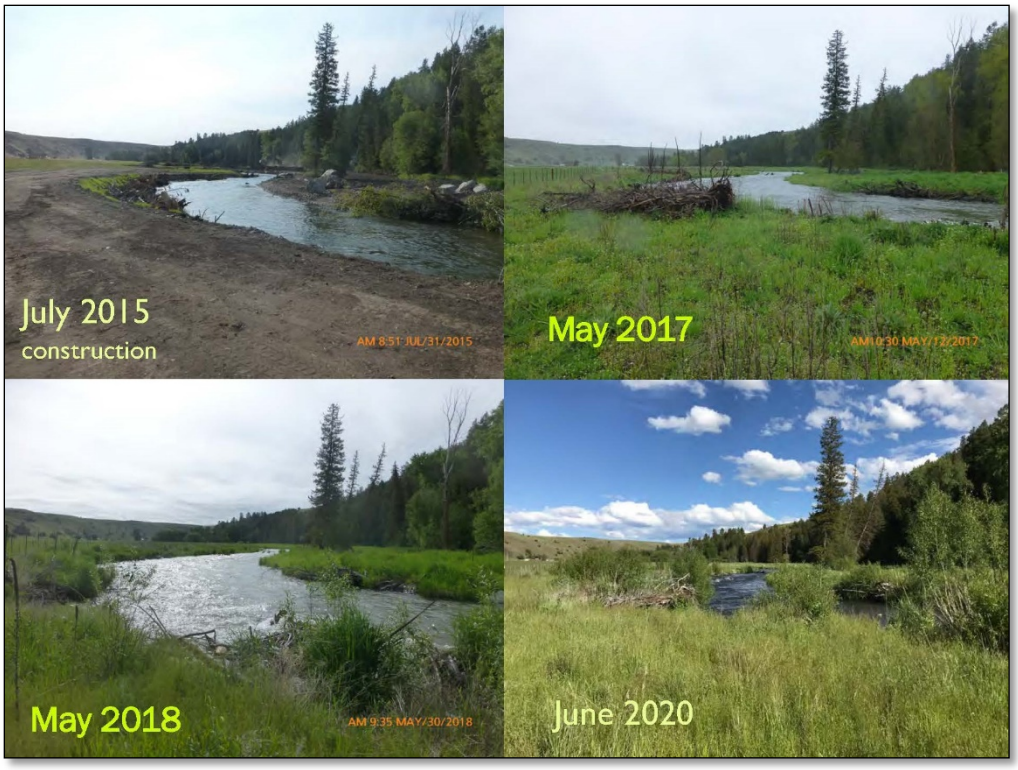


Figure 2. Sequence of photo points on a bank and channel project.

Photo credit: Grand Ronde Model Watershed

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 be taken from a nearby hill (Figure 3a & b), showing from a distance the same section of the landscape.

Figure 3a.

Figure 3b.

Photo credit: Tim DeBoodt, Camp Creek Paired Watershed Study

A landscape photo can also be taken using a drone to provide an drone-based still photo (Figure 4a & b), showing from a distance the same section of the landscape where the **feature photo** (Figure 4c) was taken and thus providing context for the **feature photo.**

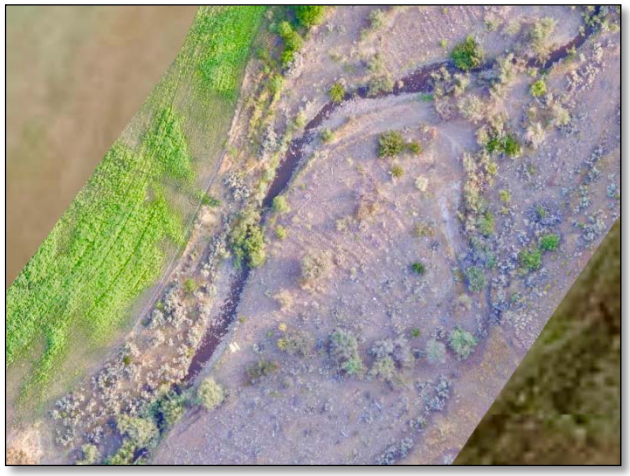


Figure 4a.

Figure 4b.

Photo credit: Ecological Research LLC, Bear Creek BDA project

Figure 4c. Feature photo linked with corresponding drone-based photo by red star, as noted on page 6.

Photo credit: Wheeler SWCD, Bear Creek BDA project

Opportunistic photos are not taken from a permanently marked location and are not intended to be formally repeated nor required for OWEB grants. However, they do provide valuable information about a restoration action, particularly when taken during construction activities. Examples of good subjects for opportunistic photos include a site during construction (Figure 6a) and the condition of a site after a significant event such as high water (Figure 6b).

Opportunistic photos can capture relevant episodic events such as construction, floods, fire, and drought, anything that helps tell the project's story or provides visuals on events that have impacted the project.

Figure 5a. Opportunistic photo documenting the installation of a culvert.

Photo credit: Scappoose Watershed Council

Figure 5b. Opportunistic photo showing floodplain reconnection during high flows.

Photo credit: North Fork John Day Watershed Council

General Guidelines for All Types of Monitoring Photos

For any type of project, consider these five basic questions in establishing appropriate photo points:

1. **Why monitor?**

   What were your objectives or reasons for the restoration project? The answers to this question can help you set up appropriate photo points to clearly show whether the project was implemented correctly and whether the restoration action effectively met the project objectives.

2. **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. Using project maps can be helpful in establishing the appropriate photo point locations, as well as documenting locations for the future repeat photos. Photos should be collected to show implementation of all project elements (i.e., fencing, planting or structures) and include locations at each site. Will you be able to locate the photo point(s) in subsequent years? Will you be able to access all photo point locations in the subsequent years, and at the same time of year? Will your photo points include landmarks that can be used as a reference over time?

3. **What to monitor?**

   The photo points you establish should reflect the restoration objectives proposed in the grant application. Focus on the expected visible changes and include photos of all different project elements.

4. **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. Pre-project photos are due at the time of first payment request, and your OWEB grant agreement will specify when reports are due. Plan to take your monitoring photos at the same time as the pre-project photos, when the season is appropriate, and when access is available. Think about what time of year best reflects the objectives of the project – consider vegetation green-up, flood stage, fish movement, etc. Also, consider access – are there times of the year the site will not be accessible? Avoid taking pre- and post-projects during the winter when vegetation is dormant, and snow may obscure restoration project elements.

5. **How to monitor?**

   The choice of detailed feature photos, broader landscape or a combination of both type of photos depends on the answers to the previous questions. Determine the best way to emphasize visual changes occurring through time as a result of the project as you plan your photo point locations.

OWEB Photo Point Monitoring Requirements

Restoration

Photo-points are required to be submitted to OWEB at three key milestones; before the project is implemented (pre-project), at project completion and in the years following completion (post-implementation). Be sure to plan ahead - if satisfactory photo points are not submitted by the due dates in the grant agreement it may result in unnecessary delays to receive funds or have reports approved in a timely manner. The OWEB Grant Agreement details when photo points are to be submitted to OWEB. Refer to your grant agreement for specific details in exhibit B, C & D.

First Payment: Pre-project Photo Points

OWEB will not release any funds for a project site until the grantee has submitted to the Board's Project Manager pre-project photos at photo points established to track visual change(s) resulting from the restoration project. The grantee should carefully consider photo point locations to ensure photos clearly show the same sites and perspective in future photos to meet reporting requirements in the Project Completion Report (PCR) and Post-Implementation Status Reports (PISR) and demonstrate that completed restoration meets the scope of work described in the grant application.

First Payment: Map of Pre-project Photo Points

OWEB will not release any funds for a project site until the grantee has submitted to the Board's Project Manager a map that shows where the photo points have been established. Baseline criteria for the map include 8 ½ x 11 size and .pdf format. Minimum background layers include recent aerial imagery, project boundary, streams, and roads/highways. See Figure 6 for an example of a suitable map showing where the photos points have been established.

Project Completion Photos

Grantees are required to submit photo points with the Project Completion Report. The first page of the Grant Agreement indicates the Project Completion Date. Project Completion Reports are due 60 days after the Project Completion Date. Exhibit C of the Grant Agreement outlines the requirements of the project completion report, including photo points. Specifically, Exhibit C requires that the color photographs of the project areas before and after the project was completed that were taken at the same photo points that were established when the pre-project photos were submitted with the first payment request.

Post-Implementation Photos

Grantees are required to submit post-implementation photo points with post-implementation status reports (PISR). The first page of the Grant Agreements indicates when PISRs are due. Exhibit D of the Grant Agreement outlines the photo point requirements in PISR. Specifically, photos should document all project elements (i.e., fencing, planting, or structures). Color photographs should be taken from the same perspective at the same time of year, showing conditions before and after project completion.

For more information on important features to include in your photo points map and how to submit these photos, please see the section titled "Submitting Photos and Photo Point Map to OWEB". Grantees are encouraged to contact their OWEB Project Manager if they have questions about establishing photo points before the project is initiated.

Small Grants

Photo point monitoring for Small Grants should follow general guidance above.

Pre-project photos and a map are required at time of Small Grant Program application submission.

Before and after photo point monitoring is required for both Project Completion and Year-Two Status reporting for all Small Grant projects. 2-6 color photos with captions showing project site 2 years after completion are required when the Year-Two Status Report is submitted.

Figure 6. Small Grant Photo Points

Photo credit: Benton SWCD

Refer to your Small Grant agreement for specific details and how to submit the Year-Two Status report.

Land Acquisition

Baseline photos are an integral component of Baseline Inventory Documentation, a report that is required for all OWEB land acquisition grants. Baseline photos must document the built and natural features of the easement area.

Follow general photo point guidance pertaining to the time of year, repeatability, labeling, GPS coordinates, and description.

For more detailed information and baseline requirements, refer to the latest "Baseline Inventory Documentation Guidance", available on the land acquisition grants page of the OWEB website.

Weed Grants

Photo point monitoring for Weed Grants should follow general OWEB guidance. Pre-project photos and a map are required at time of Weed Grant Program application submission. Before and after photo point monitoring is required at Project Completion for all Weed Grant projects.

Figure 7. Knotweed Photo - before

Photo credit: Tillamook SWCD

Refer to your Weed Grant agreement for specific details on project reporting.

Drone-based Photo Point Monitoring

For all references in this document, aerial photos are defined as **drone-based photos.** Videos are not currently being accepted as OWEB photo points.

In the course of developing project photo points, some grantees are beginning to add drone-based photography in addition to or, in some cases with OWEB prior approval, for all of their photo point monitoring images. Many of the concepts used for developing good ground-based photo points can be considered when doing drone-based photos. Drone-based photos will normally be used as a landscape type; however, in some cases they may also be used for opportunistic photos – for instance showing high water impacts on a floodplain reconnection project or changes after a wildfire.

Process to decide whether to use only drone-based photos to meet OWEB photo point requirements:

1) If you plan on using only drone-based photos for OWEB photo points, you first need to contact your OWEB project manager for approval prior to submitting pre-project photo points and associated map.
2) The grant agreement will include specific conditions related to the drone-based photos.
3) Be aware that once you confirm the use of only drone-based photos for photo points, all future photo points will also have to be taken using a drone and repeated from the original photo viewpoint.
4) If your organization loses its ability to take drone-based photos, you will need to find others means for obtaining them; for example, via contractors or partners.

Determining whether drone-based photos will show change and if objectives are being met:

1) What were the project objectives and are they best represented by ground-based or drone-based photos; or a combination of both?
2) Is the project landscape scale, or does it feature elements that will be lost at elevation?
3) Can you fly the drone at the time of year that best shows change?
4) Are there limitations or constraints to consider in flying the drone on the project site and what drone-based photos can be collected (airports, urban areas, landowner constraints, canopy cover, etc.)?
5) Make sure your landowner agreements include clauses relating to using drones - both on private and public land. See the current guidance in the Budgeting and Grants document on our website to revisit OWEB's drone budget policy.
6) Will each photo be able to be minimized so they are no larger than 8 mb in size? (8 mb is the maximum file size for any single image that can be uploaded to OWEB's online project completion report.
7) Does the resolution at 8 mb show enough detail to meet OWEB's photo point reporting requirements? (Please contact your OWEB project manager to discuss if needed).

8) Does your organization have the ability to process and analyze drone-based photos with existing resources in the grant agreement or otherwise, or will that be an additional cost?

9) Does your organization have the capacity to keep drone-based imagery and metadata so future flights can be clearly replicated through the last Post Implementation Status Report (PISR)?

Before You Head Out

Prepare all equipment you will need before going to the project site. To choose the locations of the permanent photo points, consider the following site characteristics:

1) Consider the scale of the project. Will changes resulting from the project be visible at the collection of photo points you plan to establish?

2) Consider the time of day and the weather. Is there adequate light to take the photo? Will shadows impair the photo detail?

3) What is the best season to show change and how the original project objectives are continuing to be met?

4) What is the best time of year for site access?

5) Re-read the grant application submitted to OWEB to remind you of the stated goals and objectives.

6) Take photos of all the various elements of the project and project locations for each landowner site (for example, juniper cut, cross fencing, spring developments).

7) Was there a scope of work change approved from the original application? If so, make sure you go out, prior to project implementation, and take pre-project photo points at the new sites or new project elements.

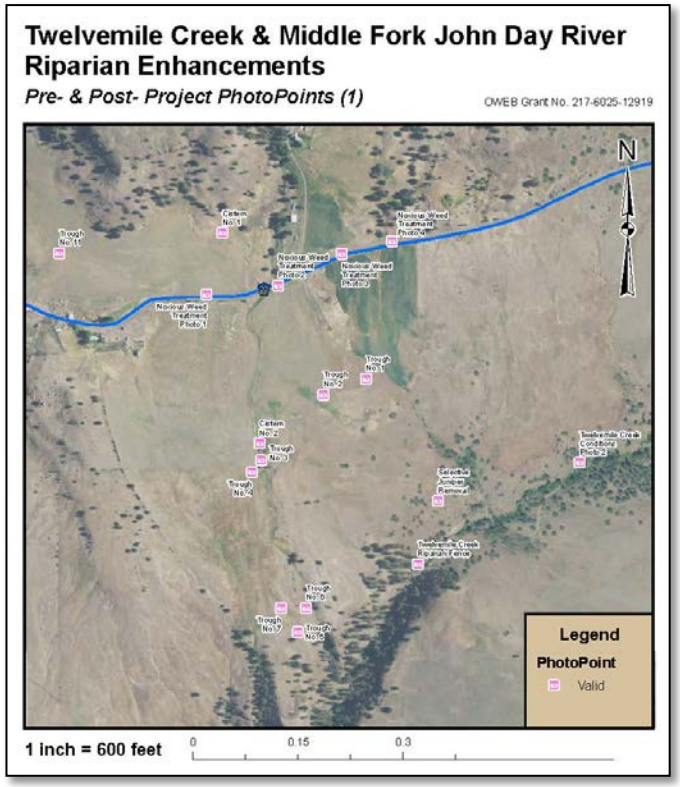


Figure 8. Photo point map example

8) Map the pre-project photo points, including any GPS locations, so staff will be able to locate and replicate photos of the original or any new sites in the future.

9) Make sure you will be able to replicate the photos, whether they are ground-based or drone-based photos. OWEB will expect the same format and type of photos at project completion and Post Implementation Status Reports that you've submitted as pre-project photos.

Once You Are in the Field

1) GPS the locations and mark if possible, with stakes or other markers. However, permanent stakes are not always feasible nor safe to use, so record in your field notes any landmarks to help identify the site. Be sure you don't rely on features that may not be there when you come back. For instance, a better method would be to use skylines, rocky bluffs, roads, rock outcrops, etc. rather than a log, tree or shrub.
2) Think again about the scale of the project and how best to illustrate change.
3) Consider the topography and aspect and how it relates to the best time of day or season for photos.
4) Will the next person taking photos be able to locate and replicate the shot?
5) Avoid pre-project locations that may prevent you from repeating the photo (too close to the stream, etc.)
6) In some cases, incorporating a one-meter board may be useful to provide scale to the project elements. One-meter boards measure one meter in ten decimeter increments, showing change in photos taken over time, especially useful showing changes in forage or range conditions.
7) A photo identification label can also be useful to record photo information. Make sure you use a thick Sharpie© to write on the photo label so that the label is readable.
8) If you are using drones, utilize software to document and replicate the path, angle, elevation and other critical aspects of the drone flight and photography.

Figure 9. Example of one-meter board and photo ID placard.

When You Get Back to the Office

It is important to clearly label photos immediately after returning from the field. A standardized procedure to adequately label all photos needs to include the project name, grant number [e.g. 218-4567-12698], date, time, and photo point number that is also referenced in your photo point map. Digital photos, including drone-based photos, should be saved using the same labeling procedures. Be sure future staff within your organization will be able to easily find each photo along with the related metadata, in order to satisfactorily replicate the photo. If you map using map software such as ArcMap or Google Earth, you need to be sure to include the same detailed information within the mapping metadata.

It is important to think about the long-term storage of these photos for your organization. Consider backing these photos up to ensure you can access them if a computer crashes and loses the images. Common approaches to backing up photos and metadata includes cloud storage and external hard drives. Be sure to make copies of these photos at a regular interval to avoid losing your work.

Repeating Your Photo Points in the Future

1) Revisit guidance provided in sections "Before You Head Out" and "Once You are in the Field", before leaving the office.
2) Ensure that it is the same time of year as prior photos for consistency.
3) Take a copy of the prior photos to ensure the photo points are adequately repeated.
4) Take the original field notes to guide you to the site using GPS and landmarks.
5) Provide the same types of photos you originally established in pre-project photos (i.e., ground-based, landscape from the ground, or drone-based).

Submitting Photos and Photo Point Map to OWEB

OWEB requires that pre-project photo points and an identifying map are submitted with each grant's first fund request. The best way to submit your photos to OWEB is to create a .pdf of your pre-project photo points with no more than two pictures per page (see appendix C for example). Ensure that each photo label is unique and correlates accurately to the label on the accompanying photo point map.

Accompanying your .pdf set of pre-project photo point photos, grantees are required to submit a map identifying where each photo point is located. The map should be in .pdf format, sized 8 ½ x 11, and include at minimum the following base layers: recent drone-based imagery, project boundary, streams, and roads/highways (see appendix C for example). Additionally, include any labels, features, and/or symbology that provide added context.

To submit photo point photos and the map send your OWEB project manager an email with .pdf file(s) attached. Make sure the email subject line lists the grant number and the .pdf's attached (one for photos, one for map or one combined). OWEB's email capacity is 20mb.

When the project is coming to a close, grantees will be required to capture post-project photos from the original photo point locations. When compiling your project completion report in OGMS, you will need to upload both the original pre-project photo and post project photo. Grantees are also allowed, in lieu of using the pre- and post-photo upload feature, to upload a .pdf that includes both pre and post-photos (one set per page). As an option if the grantee has too many photos for the pre and post upload function, they can upload a pdf that includes supplemental pre- and post-photos (one set per page).

Lastly, photo points are also required when submitting Post-Implementation Status Reports (PISR) to your project OWEB project manager. These are submitted via email, and each photo point should be labeled according to: 1.) pre project, 2.) post project, and 3.) current condition photo. These photos should be featured on the same page to offer clear comparison of photo points over time (see appendix D for example). Be sure to provide descriptive captions identifying project elements related to all photos.

Helpful Hints

1) First and foremost, always remember to take pre-project photo points before restoration occurs. There's no going back in time.

2) Prior to starting work on an OWEB report, be sure to review the OWEB grant agreement for details on reporting requirements, including instructions for photo point monitoring. This may help avoid the need to visit the site more than once in order to meet the reporting requirements.

3) Choose photo point locations that are easily repeatable and include photos from these same locations in every report. A lack of consistency across photo point locations over time reduces, or in some cases eliminates, their usefulness.

4) The seasonality and time of day in taking photo points is important. For instance, if pre-project photos occur in spring/summer and show a riparian area with extensive invasive weed growth, and post-project photos show a riparian area with invasives removed and but native plants are in a dormant state, then the post-project photos aren't going to reflect the full extent of the accomplishments of the completed restoration work.

   One common mistake to avoid is waiting until a report is due in the fall/winter to take photo points. OWEB encourages grantees to take photos at the optimal time of year and day to reflect changes in site conditions as a result of restoration, even if the photos are taken months before the report is due.

5) It's best to review earlier photo points prior to taking new photos in order to frame the photos in a way that includes visual landmarks from the earlier photos (e.g., large trees, rocks, canyon or cliff, etc.). It can be disorienting in reviewing photo points if before/after photos are in approximately the same location but either improperly frame or exclude visual landmarks from one set of photo points to the next.

6) Drones and drone-based photos are fun and exciting to use, but they aren't necessarily the best tool for collecting photo points in all cases. Be mindful of the project elements supported with OWEB grants funds and how best to depict those in photo points.

   For instance, instream habitat structures or site conditions under dense canopy cover are generally better suited for ground-based photo points. On the other hand, if you're trying to illustrate change at the landscape scale, then drone-based photos may be a better option (e.g. juniper thinning, floodplain inundation). In some cases, a combination of both ground and drone-based photos may be the best fit to illustrate the changes from your project.

7) Opportunistic photos can offer important insights contributing to telling the story of a restoration project. However, opportunistic photos should be used in addition to, and not instead of, established photo points.

8) There is a point at which you can have too many photo points. Be thoughtful and judicious about selecting photo point locations that offer the best perspective on illustrating change at the site over time and are best suited for telling the story of the restoration project and result. An overabundance of photo points can be time consuming to collect over repeated photo point monitoring periods and unwieldy to

store and update over multiple reporting periods. In other words, more is not necessarily better. Conversely, providing too few photos may not adequately portray the OWEB investment.

9) A classic common mistake is either not labeling or mislabeling photos in OWEB reports. Every photo and every photo point set should clearly indicate at a minimum the date and location # as it corresponds to the photo point map. Don't make your readers guess which photos are intended to match.

10) Many OWEB restoration grants require post-implementation status reports (PISR) that might be due several years after a project is completed. Thus, from pre-project photos to the last PISR, required OWEB photos points may span roughly 5-10 years. Be strategic about where and how you store photo points to ensure a seamless transition in grant management and reporting duties in the case of shifting responsibilities or staff turnover at your organization in the future.

Lastly, if you have questions or would like clarity on OWEB reporting requirements as you set out to complete photo points at any stage of a project, don't hesitate to contact your OWEB project manager. It's always beneficial to communicate directly rather than to operate on assumptions.

Closing

Photo point monitoring is an effective tool for measuring qualitative visual change resulting from restoration projects. Properly establishing and marking permanent photo points requires time and effort but keeping detailed records and following protocol with each photo point monitoring site visit will make subsequent visits easier.

For more information or help with photo point monitoring, please contact your OWEB Project Manager. The OWEB Staff Directory is available on OWEB's website.

Figure 10. Photo point before and after culvert to bridge project

Photo credit: Coos Watershed Association

Appendices

Appendix A.

Equipment List

1) Paper Maps (topo/aerials)
2) Tablet (charged)
3) GPS (charged)
4) Camera (charged)
5) Clipboard
6) Data Sheets
7) Markers, pens, pencils
8) Field markers (meter board, measuring tape, rebar, tapes, stakes, hand sledge, etc)
9) Camera tripod (optional)
10) Drone (charged) and associated gear
11) Extra batteries (drone, GPS, camera)

Appendix B.

Examples for Specific Types of Photo Point Monitoring

Riparian Habitat Improvement Projects		
Restoration Action	**Type**	**What to Photograph**
Livestock fencing	Feature	Pre-project photos should capture representative streambank profiles prior to fencing. Post-project photos should show fencing, 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.

Upland Habitat Improvement Projects		
Restoration Action	**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.

Road Projects		
Restoration Action	**Type**	**What to Photograph**
Road decommissioning	Landscape	Pre- and post-project photos should capture the area of road to be decommissioned and the surrounding area to be restored.
Road reconstruction	Landscape	Pre- and post-project photos should capture the area of road to be upgraded and the surrounding damaged habitat.

Water Management Projects		
Restoration Action	**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. Include specifics such as flow measuring devices, and fish screens.
Instream flow protection	Feature	Photograph stream reach before project implementation. Take monitoring photos at weirs or other specific points.

Wetland Habitat Projects		
Restoration Action	**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.

Instream Habitat Projects		
Restoration Action	**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.
BDAs or grade control structures	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.

Fish Passage Improvement Projects		
Restoration Action	**Type**	**What to Photograph**
Installation of fish passage structure	Feature	Pre-project, photograph area where structure will be installed. After implementation, photograph the functioning structure.
Culvert removal/ replacement	Feature	Take pre- and post-project photos directly upstream and downstream of culvert showing either existing impassable culvert or location of new culvert. Take more photos from either bank looking down on structure.
Stream crossing removal	Feature	Take pre- and post-project photos showing the crossing to be removed from upstream, downstream, and above.
Push-up dam removal	Feature	Pre-project, photograph the structure blocking fish passage and the available habitat above the barrier. Post-project, take photos showing that the area now passes fish.

Appendix C.

Examples of Pre Project Photos and Map

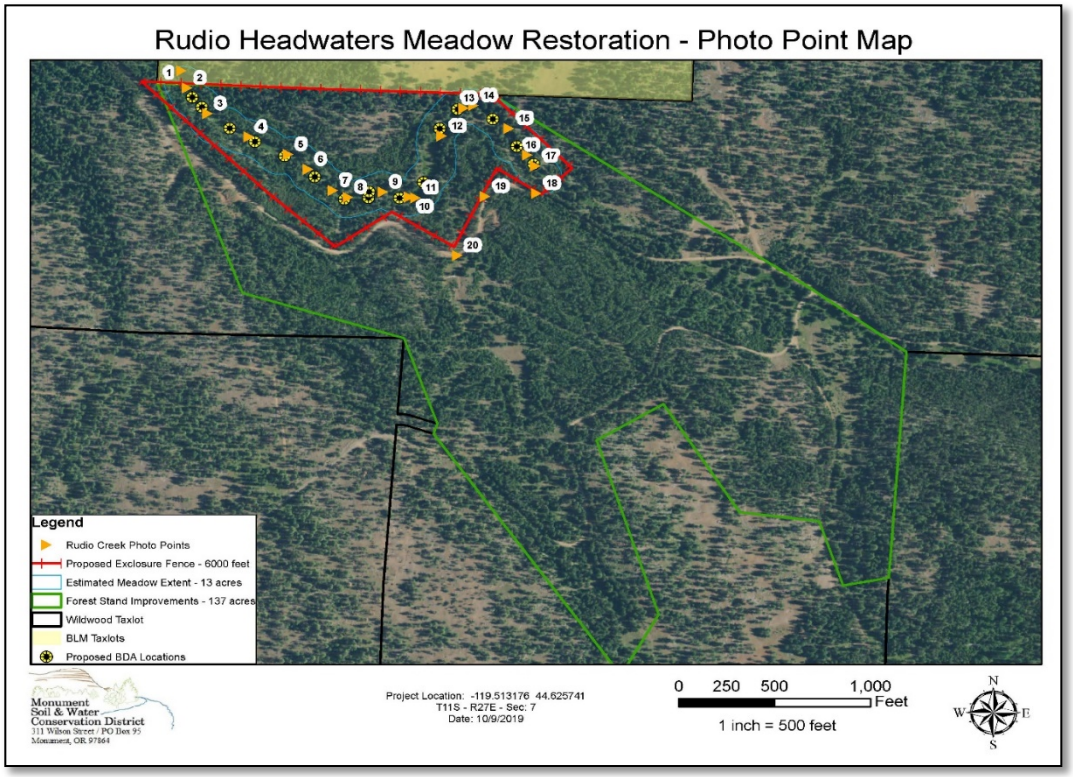
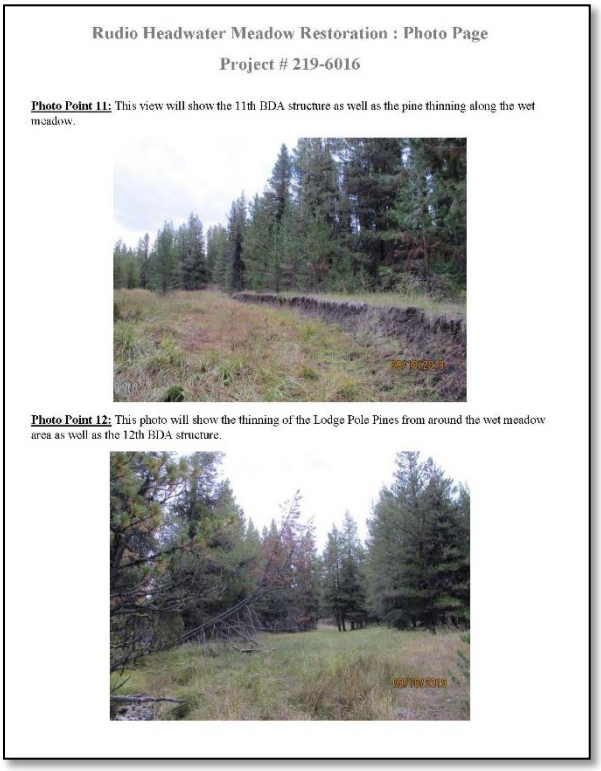


Figure 11. Example of Photo point map and photos

Photo credit: Monument SWCD

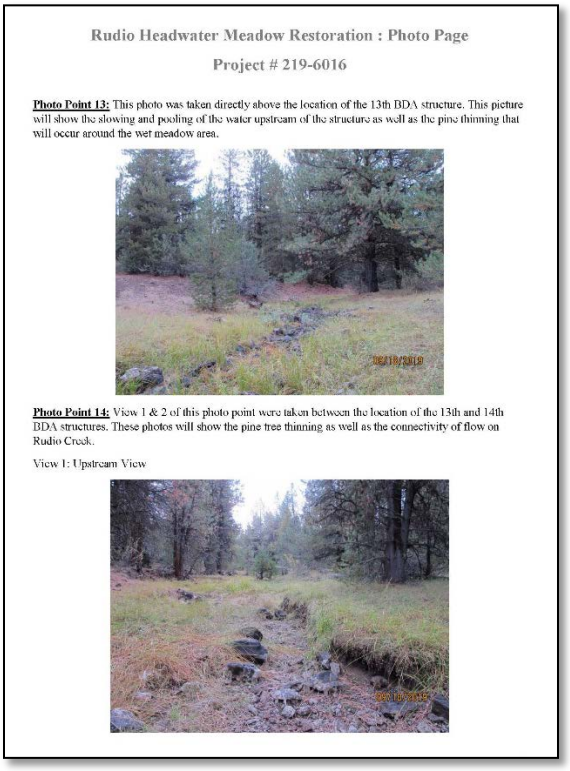


Rudio Headwater Meadow Restoration : Photo Page

Project # 219-6016

Photo Point 11: This view will show the 11th BDA structure as well as the pine thinning along the wet meadow.

Photo Point 12: This photo will show the thinning of the Lodge Pole Pines from around the wet meadow area as well as the 12th BDA structure.



Rudio Headwater Meadow Restoration : Photo Page

Project # 219-6016

Photo Point 13: This photo was taken directly above the location of the 13th BDA structure. This picture will show the slowing and pooling of the water upstream of the structure as well as the pine thinning that will occur around the wet meadow area.

Photo Point 14: View 1 & 2 of this photo point were taken between the location of the 13th and 14th BDA structures. These photos will show the pine tree thinning as well as the connectivity of flow on Rudio Creek.

View 1: Upstream View

And more examples of photo point map and photo points…

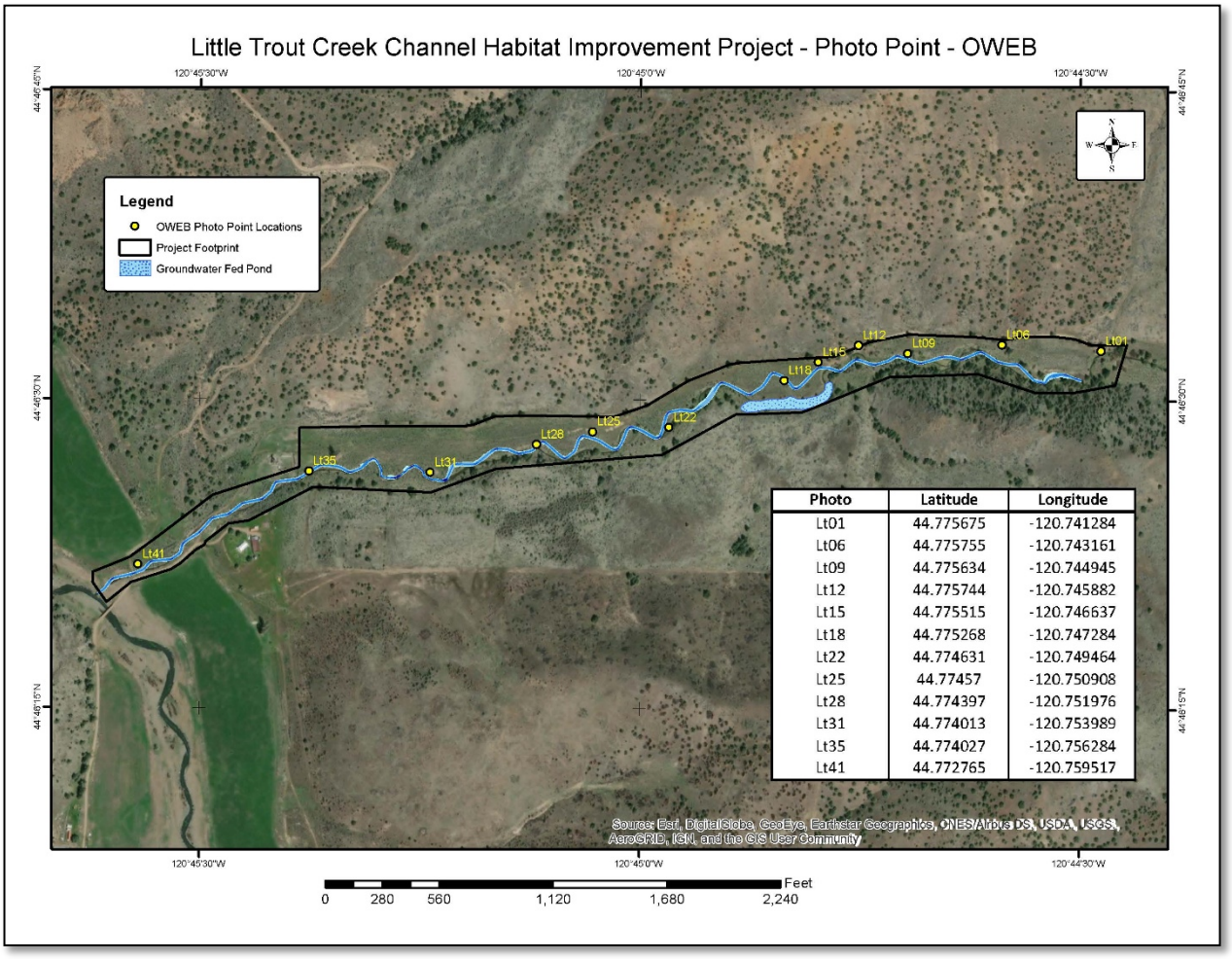


Photo	Latitude	Longitude
Lt01	44.775675	-120.741284
Lt06	44.775755	-120.743161
Lt09	44.775634	-120.744945
Lt12	44.775744	-120.745882
Lt15	44.775515	-120.746637
Lt18	44.775268	-120.747284
Lt22	44.774631	-120.749464
Lt25	44.77457	-120.750908
Lt28	44.774397	-120.751976
Lt31	44.774013	-120.753989
Lt35	44.774027	-120.756284
Lt41	44.772765	-120.759517

Figure 12. Example of photo point map and associated photos

Photo credit: Jefferson SWCD

LT-09

LT-06 Circle noting distinct landmark as reference

Appendix D.

Examples of Photo Points

Photoset 6b. Pre-project (Oct 2013) and post-project photos of outlet of the Trib 219 culvert on the WeyCo 5000 Road. The perched, undersized culver was replaced with an open-bottom box culvert.

Figure 13. Examples of a PISR photo point report.

Photo credit: Rogue River WC

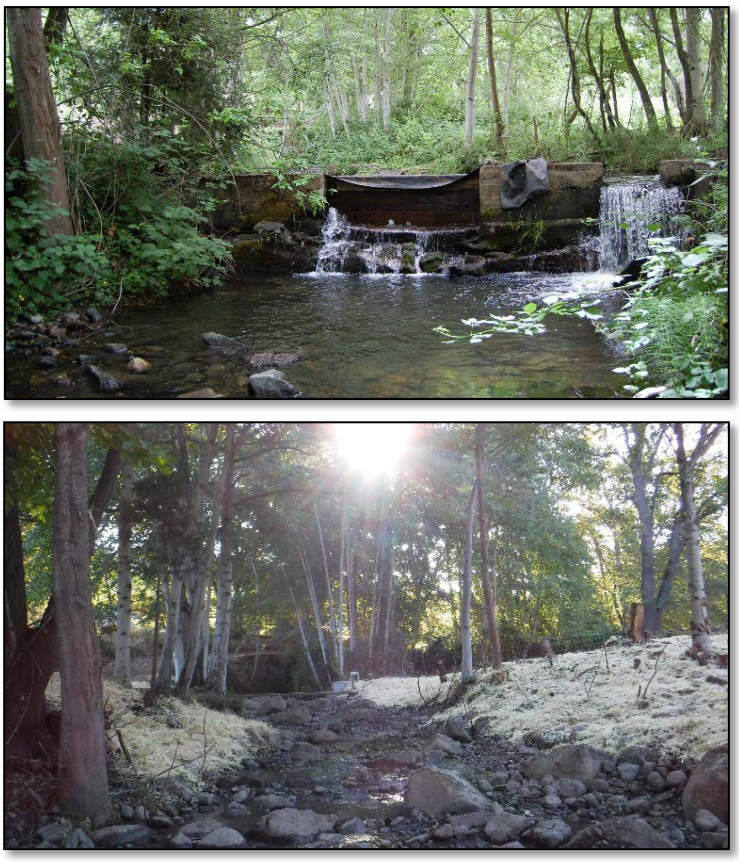


Figure 14. Examples of before and after photo points of a diversion removal project.

Photo credit: Rogue River WC

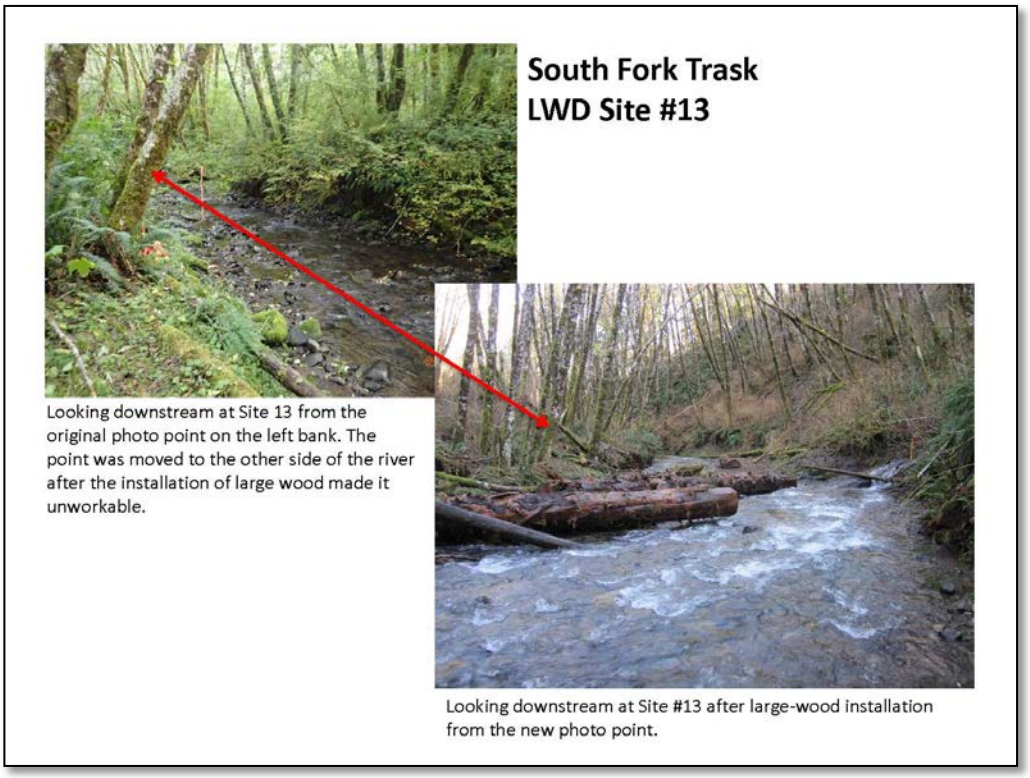


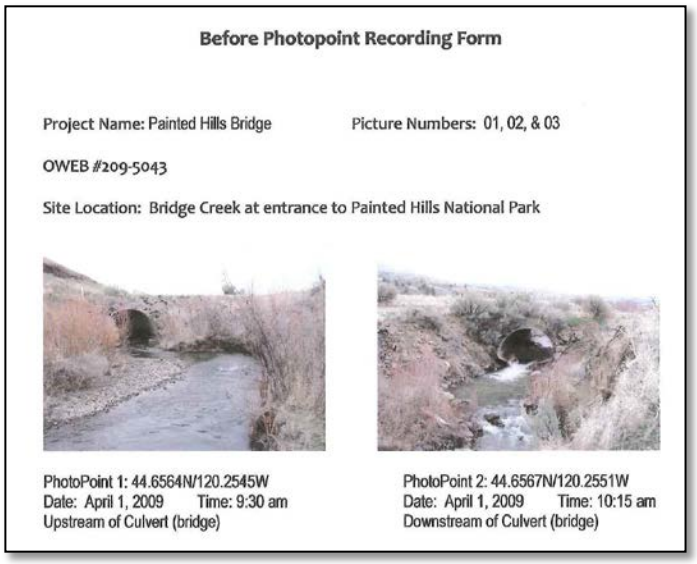
Figure 15. Example of before and after photo points with modification in location noted.

Photo credit: Tillamook Bay WC

Figure 16. Examples of before and after photo points of an instream large wood project

Photo credit: McKenzie Watershed Alliance

…and even more examples of photo points in reports



Before Photopoint Recording Form

Project Name: Painted Hills Bridge Picture Numbers: 01, 02, & 03

OWEB #209-5043

Site Location: Bridge Creek at entrance to Painted Hills National Park

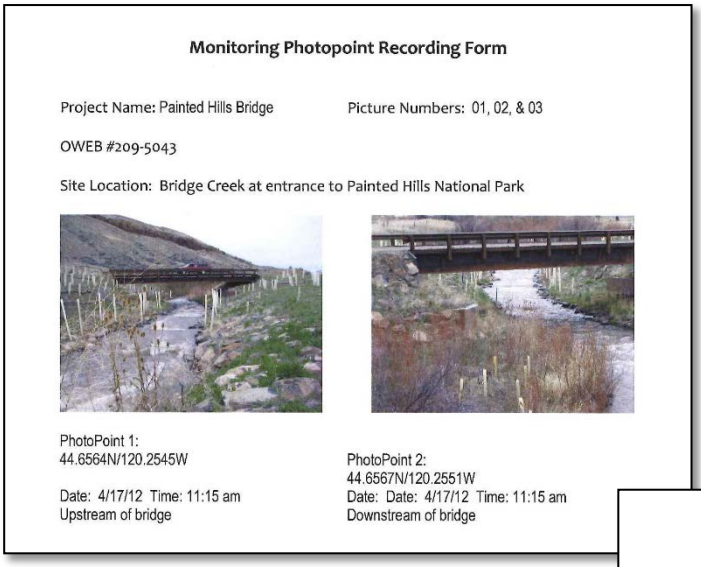
PhotoPoint 1: 44.6564N/120.2545W
Date: April 1, 2009 Time: 9:30 am
Upstream of Culvert (bridge)

PhotoPoint 2: 44.6567N/120.2551W
Date: April 1, 2009 Time: 10:15 am
Downstream of Culvert (bridge)

Figure 17. Examples of photo point page format for completion report, and at PISR #1 and #2 reports.

Photo credit:
Wheeler SWCD

Submitted with Completion Report



Monitoring Photopoint Recording Form

Project Name: Painted Hills Bridge Picture Numbers: 01, 02, & 03

OWEB #209-5043

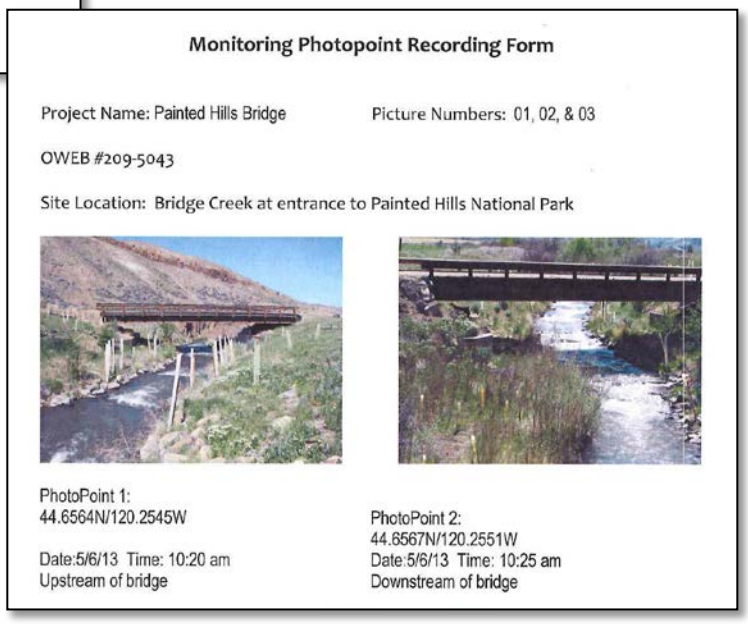
Site Location: Bridge Creek at entrance to Painted Hills National Park

PhotoPoint 1:
44.6564N/120.2545W

Date: 4/17/12 Time: 11:15 am
Upstream of bridge

PhotoPoint 2:
44.6567N/120.2551W
Date: Date: 4/17/12 Time: 11:15 am
Downstream of bridge

Submitted with PISR#1



Monitoring Photopoint Recording Form

Project Name: Painted Hills Bridge Picture Numbers: 01, 02, & 03

OWEB #209-5043

Site Location: Bridge Creek at entrance to Painted Hills National Park

PhotoPoint 1:
44.6564N/120.2545W

Date:5/6/13 Time: 10:20 am
Upstream of bridge

PhotoPoint 2:
44.6567N/120.2551W
Date:5/6/13 Time: 10:25 am
Downstream of bridge

Submitted with PISR#2

Examples of drone-based photo points

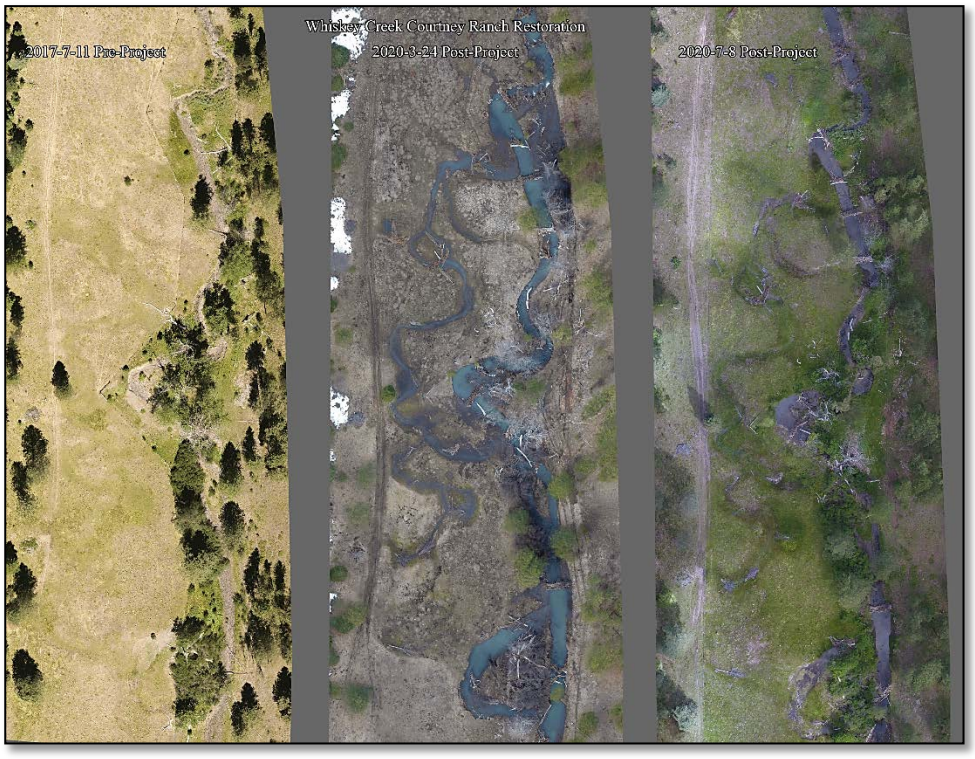


Figure 18. Example of sequenced drone photo points.

Photo credit: Grande Ronde Model Watershed

Figure 19. Example of before and after drone photo points.

Photo credit: McKenzie River Trust

Examples of weed grant photo points

Figure 20. Example of before and after weed grant photos.

Photo credit: Curry SWCD

Figure 21. Example of before and after weed grant photos.

Photo credit: Long Tom Watershed Council

Appendix E.

Grantee Guidance for using drone-based photo points

Things to consider when using Drones for Photo Point Monitoring

In the course of developing project photo points, some grantees are beginning to add drone photography in addition to or, in some cases, for all of their photo point monitoring images. Many of the concepts used for developing good photo point monitoring for ground-based photo points can be also be factored in when doing drone-based photos. Photo point monitoring types include feature, landscape or opportunistic photos. Drone-based photos will normally be used as a landscape type, however in some cases they also could be used for opportunistic photos – for instance showing high water impacts on a floodplain reconnection project or changes after a wildfire.
For all references in this document, drone-based photos are defined as **still photos** – no videos are being accepted as OWEB photo points.

Decision on whether to solely use Drone still photos for OWEB photo points:

1) If you are interested to only use drone still photos to meet OWEB photo point reporting requirements, you need to contact your OWEB project manager for prior approval.
    a. The grant agreement will include specific conditions related to the use of drone-based photos.
2) Be aware that once you go down this path, all future photo points will also have to be taken using a drone and repeated at the original photo locations.
3) If your organization loses its ability to take those drone-based photos, you will need to find another means for obtaining them, whether by contracting or using partner services.

Determining whether drone-based photos will show change and that objectives are still being met:

1) What were the project objectives and are they best represented by ground-based or drone-based photos; or a combination of both.
2) Is the project landscape scale, or does it feature components that will be lost at elevation?
3) Can you fly the drone at the time of year that best shows change?
4) Are there constraints to flying the drone on the project site (airports, urban areas, landowner constraints, canopy cover, etc.)
5) Will each photo be able to be minimized so they are no larger than 8 MB in size? Eight MB is the maximum file size that can be uploaded to OGMS.
6) Does the resolution at that size show enough detail to meet OWEB's photo point reporting requirements?
7) Does your organization have the ability to process and analyze photos with existing resources in the grant agreement or will that be an additional cost? Please note: OWEB cannot provide additional funds to your grant to cover these expenses, if needed.
8) Does your organization have the capacity to keep drone imagery and metadata so future flights can be clearly replicated through the last PISR?
9) Does your organization have a good photo labeling protocol?

It is important to always align your restoration and monitoring objectives prior to initiating any photo point monitoring schedule, to ensure all your objectives will be clearly shown in the photos.

Grantees have the option to meet OWEB photo point monitoring requirements with ground-based photos while also submitting drone-based photos. If you do use a combination of both ground-based and drone-based photos to show project changes, plan ahead to show the location of any ground-

based photos on your aerial photos. In other words, provide drone-based photos to show overarching change from an elevation; but your ground-based photos show individual project components that are lost in an aerial photo, such as a spring development, fish barrier removal, engineered wood structures or the health of understory vegetation on a forest treatment or juniper removal project.

Photo point guidelines for ground-based and drone-based photography

1) Have a conversation with your OWEB project manager about your photo point requirements.
2) Make a monitoring photo point plan based on the project objectives and expected changes
    a. What time of year is best to show these things? (riparian green up, flow increases, floodplain reconnection)
    b. Will you have access at that time of year?
        i. amenable to the landowner (hunting, working)
        ii. prohibitions due to weather
3) Make sure your landowner agreements include clauses relating to using drones - both on private and public land. See the current budget category definitions document to revisit OWEB's drone policy for helpful things to consider. https://www.oregon.gov/oweb/Documents/GoBIG.pdf
4) Be prepared before you go out into the field
    a. Take a map with locations noted and any past photo points for comparison as you take the new photos.
    b. Replicate the direction, time of day, time of year, specific landmarks, and in the case of drones, adding the ability to replicate elevation, aspect, project footprint
5) Once back in the office, review the photos, label and file according to a standardized labeling protocol. Be sure future staff within your organization will be able to easily find and then replicate the photo. Also consider how OWEB staff will be interpreting the photo points as they assess project progress and success based on the details described in the grant application. The photos must include all major project components and project locations for each landowner site.