ALPINE WATERSHED GROUP

Alpine Watershed Group

Protecting the Headwaters of the California Alps

January 2, 2026

Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Blvd
South Lake Tahoe, CA 96150

Attn: Liz van Diepen

Re: Hope Valley Restoration and Aquatic Habitat Enhancement Project General 401 Water Quality Certification WDID# 6A022004007 Annual Monitoring Report

Dear Ms. van Diepen,

I am submitting documentation for the sixth year of Hope Valley Restoration and Aquatic Habitat Enhancement Project monitoring requirements as noted in the General 401 Water Quality Certification WDID# 6A022004007. Documentation includes the following data: water quality, photo points, percent vegetation coverage, adaptive management, and California Rapid Assessment Method. An adaptive management section was added in 2023 to summarize adaptive management efforts.

The Hope Valley Restoration and Aquatic Habitat Enhancement Project was completed in October 2020 through implementation of bank stabilization restoration activities at two locations in Hope Valley on California Department of Fish and Wildlife (CDFW) land. Because of the project extension through June 2027 to complete adaptive management actions, photo monitoring, water quality monitoring, and vegetation monitoring were conducted in 2025, extending beyond the Monitoring Timeline indicated in the Monitoring Plan.

As noted in a footnote on Table 1, in taking over this project I found there were errors made in transcribing water quality data into Table 1 and in representing the correct data in Figures 3 and 4 in past years' reports. The 2025 report has all errors corrected.

We will be in touch with you in 2026 to continue discussing the proposed adaptive management work and associated permitting and monitoring requirements, and to determine if closing out this permit is linked to that work or can be done based on this Annual Monitoring Report.

If you require any further information, or have any questions, please do not hesitate to contact me at awg.isabella@gmail.com or (530) 694-2327.

Sincerely,

Isabella Kurtz

Isabella Kurtz
Headwaters Coordinator

Hope Valley Restoration and Aquatic Habitat Enhancement Project

2025 Annual Monitoring Report

Prepared by Isabella Kurtz, Headwaters Coordinator

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Introduction

Alpine Watershed Group with project engineers, Waterways Consulting, Inc., and construction firm, Hanford Applied Restoration and Conservation, completed bank stabilization activities at two reaches aimed at repairing approximately 450 feet of river bank in Hope Valley. The purpose of the Hope Valley Restoration and Aquatic Habitat Enhancement Project is to help reduce erosion and sedimentation in the West Fork Carson River at the two project locations. The long-term goals of this project are to improve water quality and aquatic habitat and create a more connected and functional channel and floodplain.

In the mid-1800s, Hope Valley served as a stop-off point along the Mormon Emigrant Trail (Dustman, 2017). During that period, this Washoe homeland transformed into a settlement where pioneers initiated heavy grazing that caused lasting impacts to the meadow and stream channel. Recovery of Hope Valley hydrological functions may require many projects over many years, and therefore this project is considered a small piece in the bigger puzzle of reconnecting the West Fork Carson River with its adjacent floodplain.

Hope Valley Restoration and Aquatic Habitat Enhancement Project construction began on September 28, 2020. Heavy equipment construction was completed on October 8, 2020, and light handwork and watering tasks extended through the month of October 2020.

Lead Agency is Alpine Watershed Group (AWG).

Partners of the project included landowner California Department of Fish and Wildlife (CDFW), American Rivers, Friends of Hope Valley, United States Forest Service (USFS), Washoe Tribe of Nevada and California, and Carson Water Subconservancy District.

Project Funding for construction was provided by the National Fish and Wildlife Foundation (NFWF) and the CDFW Office of Spill Prevention and Response as part of the settlement of a State Water Board enforcement action through the Central Valley Regional Water Quality Control Board (CVRWQCB). Funding for planning and design was provided as part of the settlement of a State Water Board enforcement action through the Lahontan Regional Water Quality Control Board (LRWQCB).

Project Goal is to help reduce erosion and sedimentation in the West Fork Carson River in Hope Valley at the two project locations. The long-term goals of this project are to improve water quality and aquatic habitat and create a more connected and functional channel and floodplain. This project contributes to reestablishing a functional floodplain and meadow system to allow the river corridor to accommodate variable flows in the future. In addition, due to the potential for earlier spring runoff because of climate change, it will be important for these meadowlands to serve as natural storage areas.

Location of the project area is in Alpine County near the town of Woodfords outside of Markleeville. The West Fork Carson River meanders from its headwaters at Lost Lakes down through Hope Valley and then into the Carson Valley. The project area consists of two meanders in lower Hope Valley—Project Site 1 is the first meander approximately 300 feet downstream of the Highway 88 bridge, and Project Site 2 is approximately 0.5 miles farther downstream at the log crib/2015 American Rivers restoration site. Both project areas are located on CDFW land adjacent to Highway 88 in Hope Valley. See Figure 1.

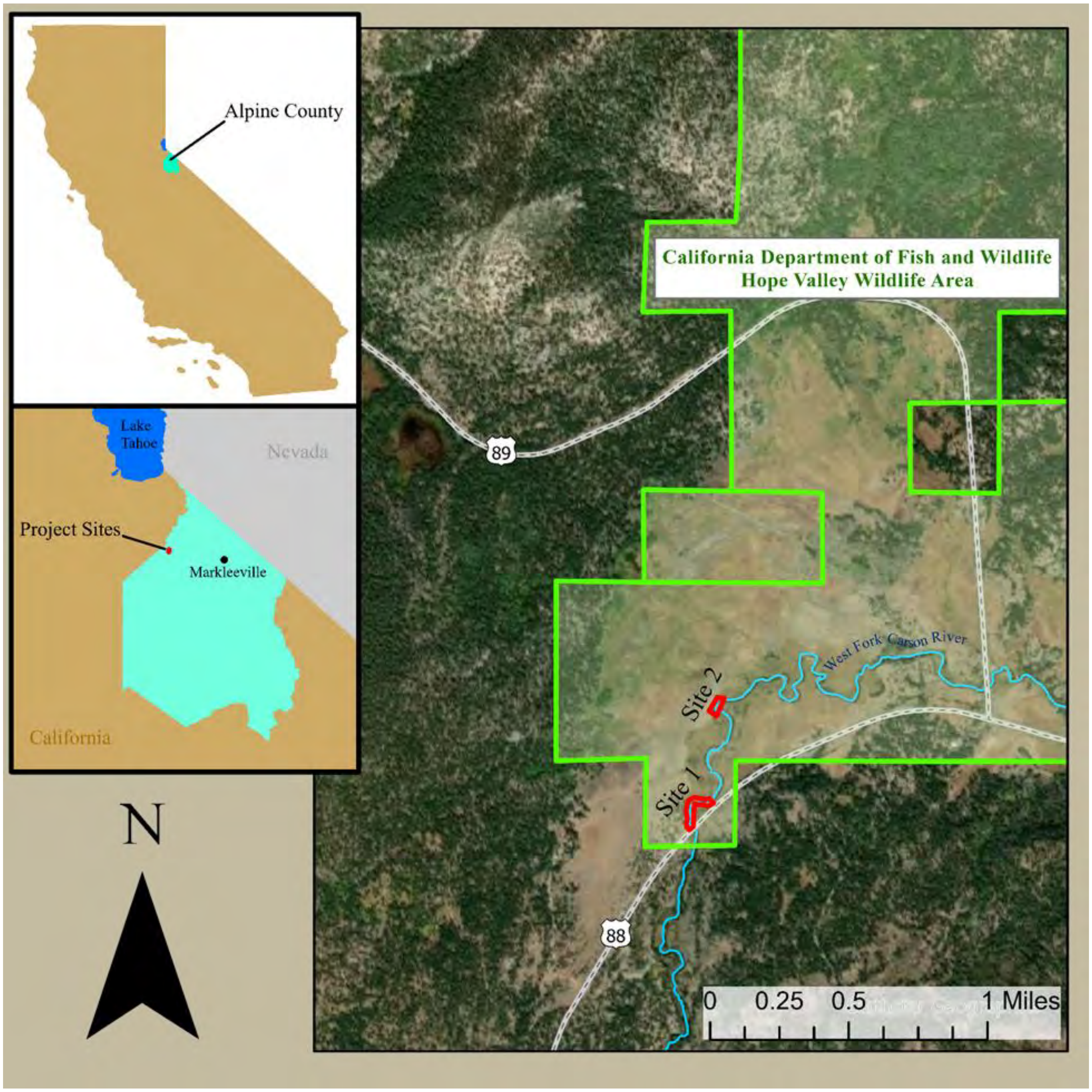

Figure 1: Overview map

Project Description of restoration techniques at Site 1 mimic an abandoned oxbow feature. A floodplain bench was created behind the failing bank and filled with live sod blocks, willow stakes, and live willow shrubs. The design plans for a more stable and capable streambank behind the current failing bank. The river will continue eroding the failing bank, and in the meantime the willows and sod in the newly created floodplain bench will have time to establish and serve as good habitat for birds and amphibians in the interim and eventually be vital fish habitat when the erosion pushes back that far.

At Project Site 2, updates were needed to divert stream energy from scouring behind the 2015 American Rivers project, a log crib structure. A basic approach of installing slash at the ends of Site 2’s reach was used to add the stability needed. Minor excavation of the downstream bank occurred to smooth out the bend and accommodate the introduction of new vegetative material. Sod was salvaged from the meadow toe during excavation and placed near the waterline below the slash to further assist with bank stabilization. Vertically placed anchor logs were installed with heavy equipment as deep as possible and slash was woven and secured with sisal rope in between the anchor logs. Willow stakes were placed at approximately 5-feet on center and also at strategically targeted locations throughout Site 2.

The project was executed according to the 100% design plans with one in-field adjustment. As part of the pre-construction kickoff meeting on September 28, 2020, a discussion of current in-field conditions was had by project engineers, CDFW staff, AWG staff, related permitting staff, attending partners, and the construction contractor. After close inspection, it was decided that the upstream end of the reach was not experiencing as much deterioration as the downstream end and, therefore, 90% of the upstream work was added on to the downstream end.

Monitoring

Pre-project monitoring began before project construction to capture pre-existing conditions.

Water Quality data is collected by AWG volunteers at eight locations four times a year as part of the routine River Monitoring program. Originally, data from a 10-year period starting in 2004, the year of AWG's River Monitoring program inception, to 2014 at two sites closest to the project area were chosen to establish baseline conditions for this project. However, in June 2021, AWG staff and the Restoration and Monitoring Committee (RMC) chose to use valid records only from 2005 to 2020 as the fixed period to establish the baseline, or "normal," conditions moving forward. This new time period was selected due to covering the majority of AWG's dataset while also including variable water years such as the 2014 drought and 2017 high-water years. New water quality objective standards were created and released in AWG's *Upper Carson River Watershed 2020 Water Quality Objectives Report*. For more information on how the data was chosen for the standards, please refer to this report which can be found on AWG's website. The new standards will provide a more accurate target for what normal conditions are in the watershed. Site #6 West Fork-Picketts Junction (WF-PKT) is located approximately one mile downstream, and Site #9 Red Lake Creek-Blue Lakes Road (RLC-BLR) is located approximately three miles upstream from the project locations. See Figure 2 to view the AWG river monitoring locations.

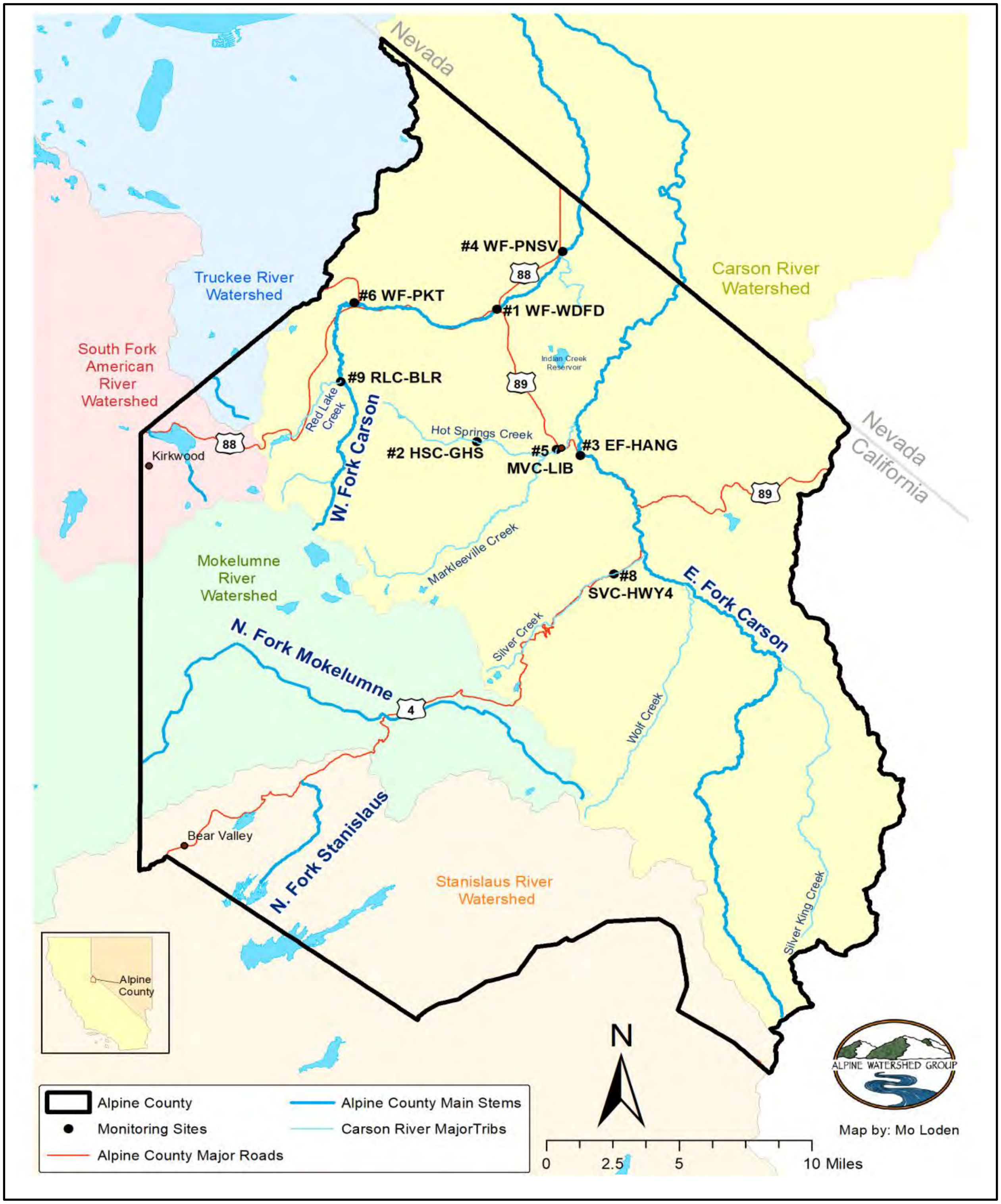

Figure 2: Map of Alpine Watershed Group's river monitoring locations

Water quality data collections include the following parameters: dissolved oxygen, pH, water temperature, specific conductance, and turbidity. These measured parameters give very specific information on the health of water systems and their ability to support wildlife and vegetation. No significant changes in the water quality parameters are expected until the failing bank erodes back to the well-established floodplain bench, which may take years or may not happen at all. Nevertheless, the project would still be considered a success by providing bird and frog habitat within the floodplain bench area. See Table 1 and Figures 3 and 4 to review summaries of 2019-

2025 water quality data; note that only the original baseline is represented in Figures 3 and 4. Note that Site 9 was only sampled three times in 2021 due to the creek being frozen for the March collection, partially sampled in March 2022 due to equipment failure, and both Sites 6 and 9 were not sampled in March 2023 due to snow conditions preventing access.

Site	**Parameter**	**2004-2014 Average** (original baseline)	**New Objective**[†] (new baseline from 2005-2020 valid records)	**2019 Average**	**2020 Average**	**2021 Average**	**2022 Average**	**2023 Average**	**2024 Average**	**2025 Average**
#6 WF-PKT	Dissolved Oxygen (mg/L)	8.74	x > 7.37 mg/L	10.50	8.75	9.15	9.09	9.55	9.15	9.61
	pH	7.26	7.31 < x < 8.31	8.27	7.72	7.71	7.77	7.51	7.39	7.75
	Water Temperature (°C)	6.92	x < 12.03 °C	6.68	11.73	8.89	11.89	10.04	9.84	10.58
	Turbidity (NTU)	1.28	x < 2 NTU	1.39	0.95	0.81	1.16	1.18	1.17	0.92
	Specific Conductance (µS/cm)	74.73*		64.40	73.53	86.76	77.89[‡]	61.10[‡]	82.43[‡]	82.37
#9 RLC-BLRD	Dissolved Oxygen (mg/L)	8.28	x > 7.37 mg/L	8.88	9.75	8.82	8.20	9.36	9.72	9.54
	pH	7.77	7.31 < x < 8.31	8.10	8.69	8.25[‡]	8.17	8.08	7.93	8.08
	Water Temperature (°C)	6.97	x < 12.03 °C	9.80	9.13	10.27	11.43	10.68	9.89	9.43
	Turbidity (NTU)	0.90	x < 2 NTU	2.07	1.72	1.28	1.36	1.30	1.92	1.76
	Specific Conductance (µS/cm)	94.58*		67.56	85.93	99.31	108.37[‡]	81.36[‡]	97.96[‡]	102.01

Table 1: Water quality data

Before 2019, AWG used handheld Oakton brand total dissolved solids (TDS) meters in the monitoring program. While these meters are labeled TDS, they actually measure conductivity and use a conversion factor internally to estimate the TDS of the sample. In 2019, AWG started using more advanced YSI Pro2030 meters to measure specific conductance. Because AWG doesn't have a record of the conversion factor set for the Oakton brand TDS meters, results before 2019 are not considered reliable. It is likely the conversion was set to 0.64 which is considered the standard estimate, but AWG has not been able to verify the conversion factor used prior to 2019, therefore previous measurements and current measurements may not be comparable (Fillmore, 2020).

[†] ***Normal conditions used to determine the specific values for the water quality objectives for stream temperature, dissolved oxygen, and pH are estimated averages based on valid records, as specified in AWG's Quality Assurance Project Plan's (QAPP, Schembri, 2007) field measurement precision standards, from AWG's 2005 to 2020 period of record (calculations outlined in the Appendix E).***

[‡] ***Data corrections were made due to errors found in past published reports from 2021, 2022, 2023, and 2024. These corrections are also reflected in Figures 3 and 4. All data tied to Figures 3 and 4 have been thoroughly reviewed, corrected, and updated in this 2025 report.***

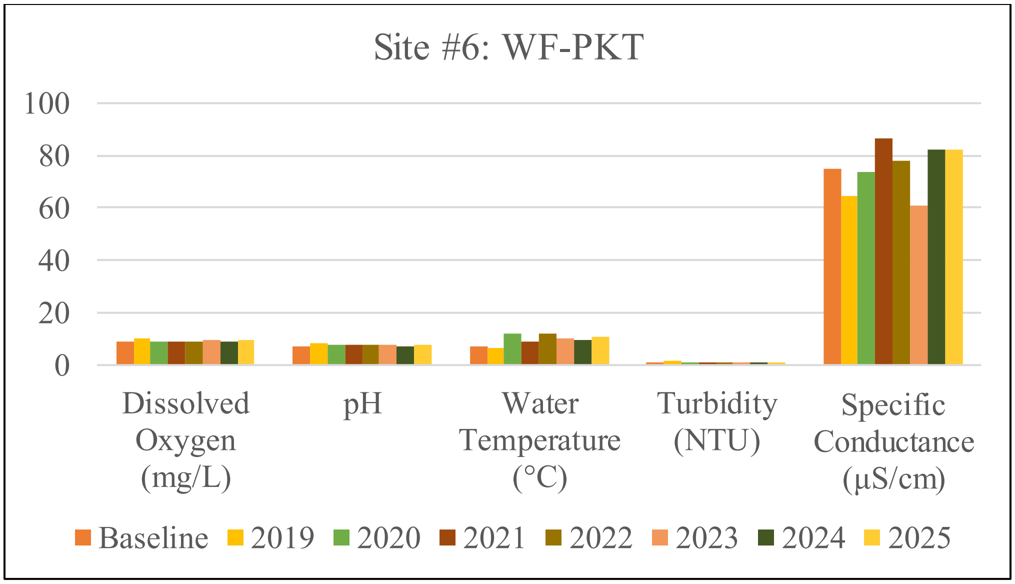

Figure 3: Water quality data summary for West Fork-Picketts Junction (WF-PKT)

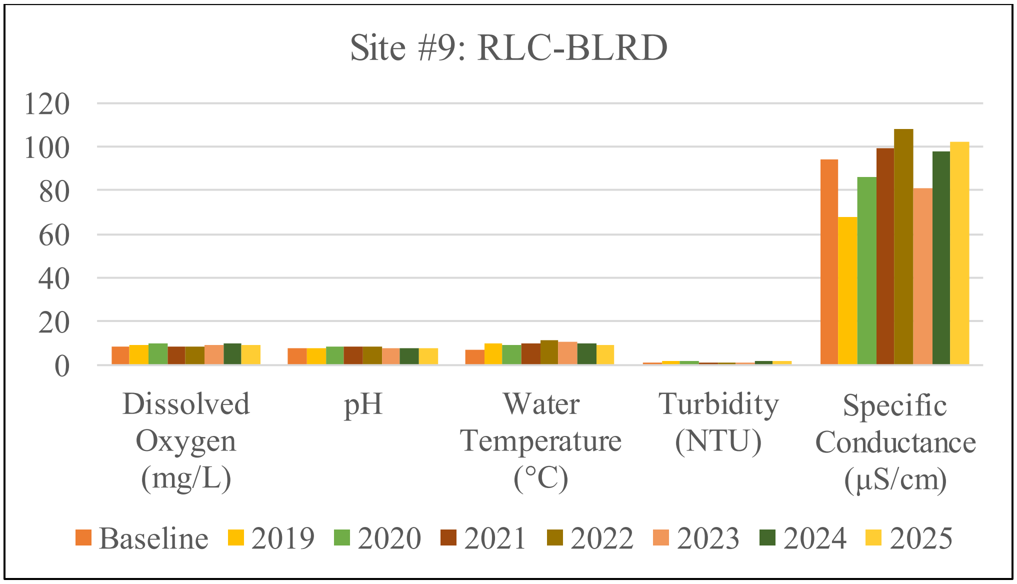

Figure 4: Water quality data summary for Red Lake Creek-Blue Lakes Road (RLC-BLRD)

Photo Monitoring was employed to capture qualitative observations and assist in the evaluation of any project geomorphology or function changes. It was anticipated that project sites would evolve somewhat following construction regrading. The project employed two standard types of photo monitoring:

FEATURE PHOTO POINT METHOD documents visual changes occurring at a fixed point through time. This method is used to document change resulting from a restoration activity, where photos are taken before, during, and immediately after construction. These photos were replicated in June and October/November through 2025 to demonstrate the long-term effectiveness of the project as described in the Hope Valley Restoration and Aquatic Enhancement Project Monitoring Plan (Appendix A). Based on early winter storms, in 2021 fall monitoring was moved to October, and in 2022 photos were taken at the end of November, but the landscape was mostly snow covered. Therefore from 2023 onward, fall photo monitoring was shifted to take place before snow covers the valley floor and not specifically in November. For each photo point, a GPS location was recorded with detailed directions to relocate the point and take photos. See Figure 5 for project feature photo point locations.

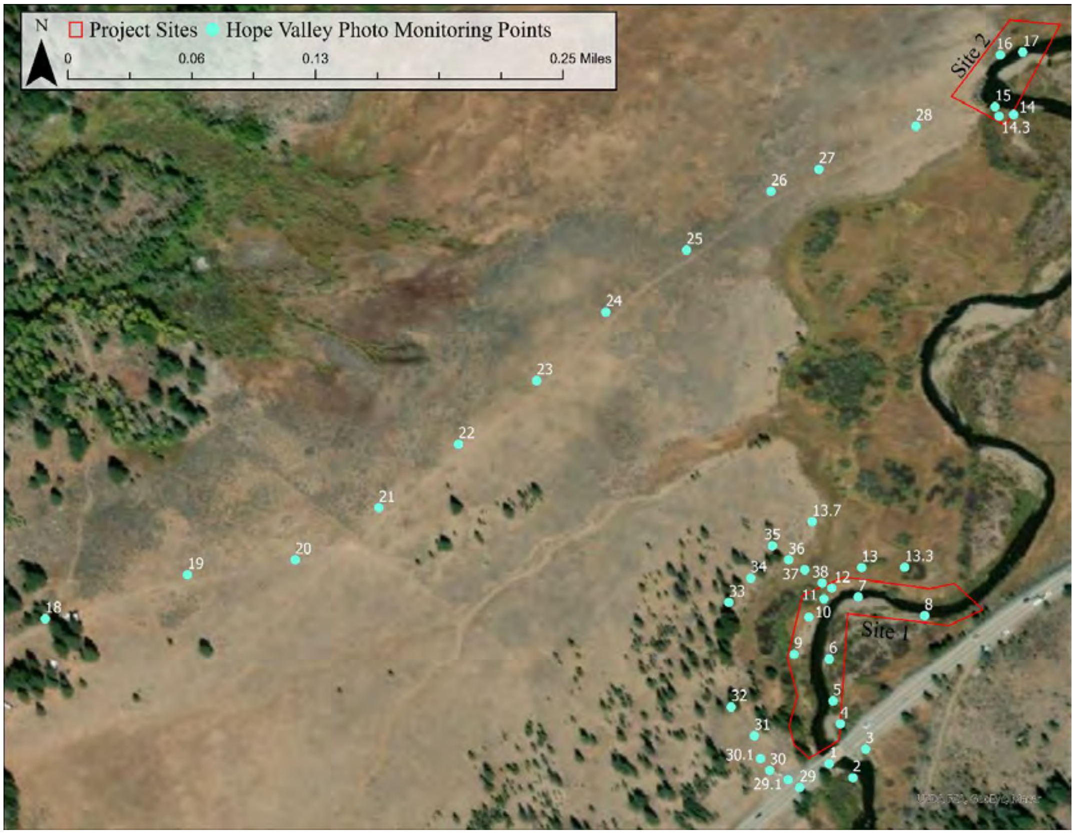

Figure 5: Project feature photo points

The majority of the feature photo points were established on June 26, 2019. Access route photo points were set up the day of construction on September 28, 2020, when AWG staff, project engineer, construction project manager, access route landowners (CDFW and USFS), and related access route permitting staff were able to meet onsite and determine access routes collectively. Feature photo points were captured on November 18, 2019 (before construction); June 17, 2020 (before construction); October 3, 2020 (during construction); October 12, 2020 (after construction); June 25 through July 1, 2021; October 18 through 21, 2021; June 25 and July 1, 2022; November 29, 2022; June 27 and 28, 2023; October 24 and 25, 2023; June 27, 2024; October 24, 2024; June 24, 2025; and October 24, 2025. The 2021, 2022, and 2023 photo monitoring dates ranged due to not being able to access all spots on the same day.

OPPORTUNISTIC PHOTOS are not taken from a permanently-marked location and are not intended to be formally repeated. They provide valuable information when taken during construction activities.

See Appendix B to view select feature photo points displaying project changes from before construction to afterwards. Contact Alpine Watershed Group's Headwaters Coordinator at (530) 694-2327 to request a comprehensive collection of the photo monitoring data.

Percent Coverage Monitoring at Site 1 is conducted in June of each year and will help the project team track vegetation reestablishment. The percent cover goal for Site 1 is greater than 50% by year 2 (2022), greater than 75% by year 3 (2023), and to meet pre-project percent coverage by year 4 (2024), which is approximately 90% coverage. The percent goal for 2022 was met for Site 1. The percent goal for 2023 was met for Site 1, with monitoring put off until

July 2023 due to water still inundating the site. The percent goal for 2024 of 90% was not met at Site 1 based on June 2024 monitoring. Percent coverage monitoring was conducted again in June 2025, and the pre-project percent coverage of 90% was again not met.

Percent coverage monitoring was established at Site 1 on June 17, 2019, at 23 transects and repeated the following years on June 21, 2020, and June 28, 2021. Percent coverage monitoring was repeated on June 23, 2022, but the decision was made to only monitor half the transects, as allowed in the Hope Valley Restoration and Aquatic Enhancement Project Monitoring Plan (Appendix A). The thirteen odd transects were randomly selected to monitor and were monitored again on July 27, 2023; June 28, 2024; and June 24, 2025. See Figure 6 and Table 2. Vegetation coverage was estimated within one square yard at 11 monitoring points evenly spaced along 15-meter-long transects. In 2019, some transects were marked with a medium-size nail in the meadow at the meadow edge farthest from the riverbank to assist with relocation of marked transects. Unfortunately, the nails may have been found and removed by a Hope Valley visitor, which is highly likely due to the ease of access and popularity at the site. Other explanations for the loss of the nails could be due to the increased growth of riparian vegetation (specifically the willow) along the meadow edge causing the nails to be overgrown and unreachable and/or the combined use of AWG's Garmin GPS 64st/65s and PYLE-SPORT PMD38 metal detector were not adequate enough to locate most markers. June 2020 and future data collections were based solely on GPS coordinates to relocate transects. Garmin GPS receivers claim to be accurate within 15 meters (or ~49 feet) 95% of the time—this means that relying on the Garmin GPS to locate the transect start and end points could have resulted in being off from the original transect points by 49 feet ("*GPS accuracy,"* n.d.). This range of accuracy may have caused the transect start and stop points to be drastically different from each other year after year following the 2019 baseline monitoring. Another possible explanation for the transects being skewed from the 2019 baseline monitoring, which may have also caused percent coverages to be vastly different than what was reported in prior years, could be due to the eroding streambank which has caused a decline in living vegetation and an increase of bare soil—this erosion caused some pieces of rebar to be lost that were used to locate the transect end points closest to the streambank.

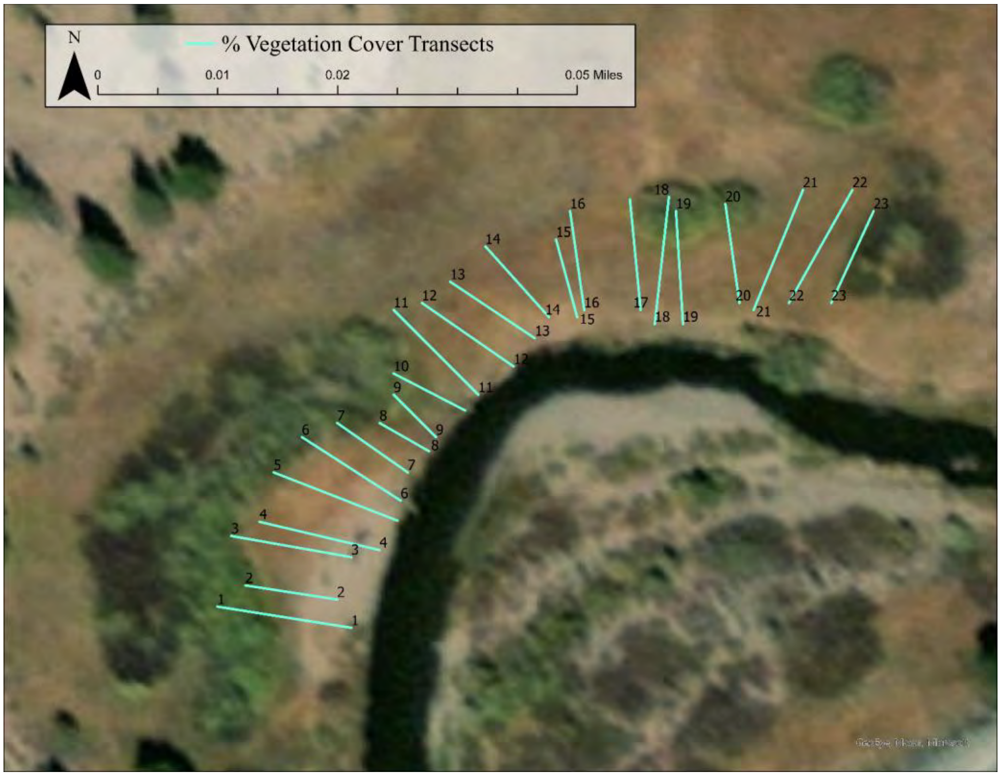

Figure 6: Site 1 percent vegetation cover transects

	Percent Cover						
Transect	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
1	74.7	72.7	44.0	62.6	79.1	61.2	38.0
2	65.2	50.8	44.1				
3	66.0	68.2	43.6	39.9	74.5	50.0	43.3
4	69.2	38.5	38.6				
5	83.9	83.2	41.0	81.3	55.9	63.2	49.2
6	85.4	71.8	42.2				
7	96.9	88.8	47.2	68.2	66.0	48.3	40.1
8	100.0	95.0	71.3				
9	100.0	NA	52.5	58.8	79.1	80.6	63.8
10	99.9	99.3	75.6				
11	99.9	98.6	48.2	66.3	79.4	90.5	56.1
12	96.3	99.1	31.5				
13	98.4	97.7	36.7	76.9	78.3	75.7	55.8
14	98.5	100.0	55.0				
15	96.3	99.6	48.2	68.3	75.0	92.5	47.1
16	97.6	95.4	52.5				
17	85.5	75.6	36.4	47.9	65.5	77.8	35.5
18	97.5	90.6	51.8				
19	95.0	98.5	56.0	78.2	91.3	87.8	40.6
20	99.1	100.0	55.5				
21	99.8	100.0	55.0	67.7	66.4	77.7	54.1
22	100.0	99.5	72.5				
23	100.0	100.0	93.8	76.8	99.5	100.0	65.0
TOTAL	**91.5%**	**86.8%**	**51.9%**	**66.1%**	**75.8%**	**75.4%**	**49.0%**

Table 2: Site 1 percent cover

Subject matters not considered when percent coverage goals were set are the increased surface area in the newly created floodplain bench and difference in plant species. The U-shaped floodplain bench constructed at Site 1 formed approximately 30% more surface area than the mostly flat meadow ground that existed before the project. The salvaged sod was strategically placed back in the bench to offer the most coverage available. Additionally, the pre-project meadow surface was primarily covered by grasses, but it now has been filled vigorously with willow shrubs and stakes which may affect how grasses take root in this area. It is also noteworthy that the 90% coverage goal was set after collecting just one year of transect data (2019); 2019 was a particularly wet winter with snowmelt into Hope Valley continuing well into July.

The Monitoring Plan (Appendix A) called for at least ten transects to be selected for Site 1 vegetation monitoring. In attempts to be thorough, to not miss any major area of the unbuilt bench, and to provide as much data as possible, more transects than necessary were monitored in June 2019 and June 2020. As described above, the project team could and did choose to scale down the vegetation monitoring to fewer transects in 2022 as shown in Table 2. Vegetation monitoring yearly goals in conjunction with photo monitoring will help the project team assess if further revegetation work needs to be done.

Due to the factors discussed above—eroding shoreline, missing nails meant to assist with locating transects/relying on GPS coordinates with a +/- 49 ft accuracy, and an unrealistic pre-project vegetation coverage goal of 90%—Site 1 percent coverage has not met the desired goal as of June 2025, but there are also additional factors. AWG has experienced several staff changes throughout the life of this project which may have created a lack of consistency for estimating percent coverage; it has been observed and discussed internally that some AWG staff tend to be more conservative when assessing percent cover, while others are overly generous despite having the percent cover guidance sheet in the field for each monitoring instance. The reach of Site 1 runs adjacent to a popular "fisherman's" trail and thus receives heavy traffic. The combination of eroding shoreline and heavy foot traffic alone causes the pre-project vegetation cover goal of 90% to be unachievable, and rerouting fishermen away from the river is not a viable option.

Access Route Percent Coverage Monitoring was conducted on September 28, 2020, before use took place on either Site 1 or Site 2's paths. See Figure 7 and Table 3. As mentioned before, access route determination was a collective decision with pertinent team members on the first day of construction, and therefore its vegetation monitoring was not feasible in June 2020 as planned in Appendix A. Access route percent coverage was conducted at one monitoring location within the access route and one adjacent to the access route at evenly spaced transects along each route.

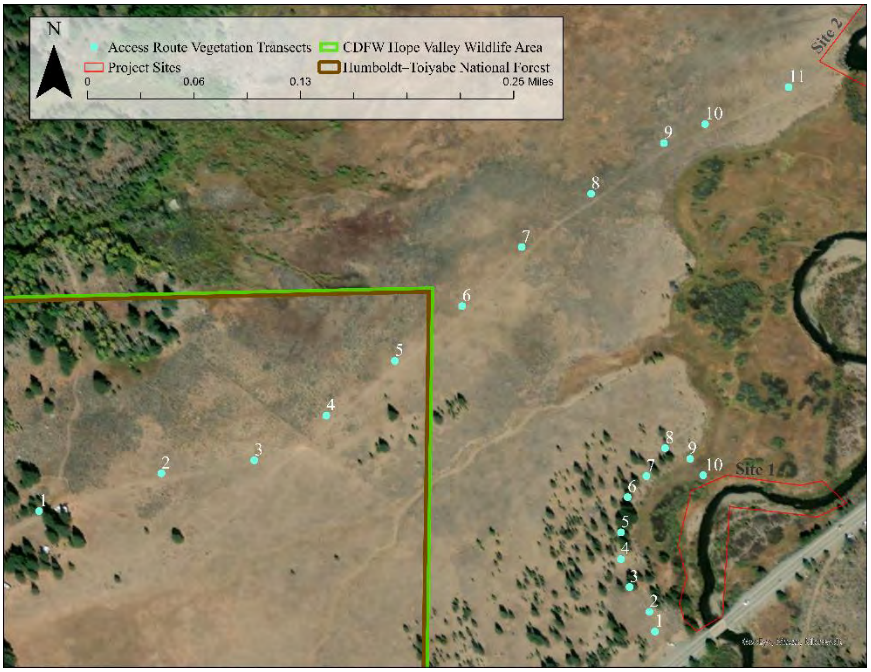

Figure 7: Site 1 and Site 2 access routes' percent vegetation cover transects

		2020 Percent Cover		**2021 Percent Cover**		**2022 Percent Cover**	
Access Route	Transect	In Access Route	Adjacent to Route	In Access Route	Adjacent to Route	In Access Route	Adjacent to Route
Site 1	1	5	75	30	30	25	25
	2	10	15	25	30	15	15
	3	15	20	25	30	40	15
	4	5	5	0	0	7	10
	5	5	0	0	10	3	5
	6	2	5	20	50	7	1
	7	5	7	20	10	10	10
	8	7	7	90	90	15	7
	9	20	20	80	80	80	70
	10	85	85	90	90	65	35
		15.9	**23.9**	**38**	**42**	**26.7**	**19.3**
Site 2	1	10	15	30	30		
	2	15	20	20	25		
	3	20	20	20	20		
	4	0	5	5	10		
	5	2	5	5	5		
	6	7	7	10	5		
	7	5	10	20	25		
	8	10	15	90	75		
	9	7	15	50	30		
	10	10	15	25	25		
	11	15	15	25	25		
		9.2	**12.9**	**27.3**	**25.0**		

Table 3: Access route percent vegetation cover

Access routes were selected to cause the least amount of impact by using paths in dry and minimally-vegetated areas. Access route percent coverage monitoring was repeated on June 28, 2021, to better align with other project vegetation data collections and peak phenology and therefore shows higher percent coverage.

Concerns about Site 2's access route usage were brought up during the project's September 28, 2020, pre-construction kickoff meeting. During this meeting, the access route was observed as rutted and sparsely vegetated in the tire tracks—far more than expected since its last permitted use for the American Rivers 2015 log crib project. It was assumed the route had been experiencing unauthorized vehicle use and, consequently, the route conditions were considered impacted before AWG's project implementation began. See Appendix C to view a Google Earth analysis showing how the access route was displaying signs of self-healing after the 2015 log crib project up until May 2021. Additional unauthorized vehicle use was observed across the meadow in Hope Valley on August 19, 2021. These tracks were reported to appropriate CDFW staff and are not believed to be related to the 2020 instances. However, the Site 2 unauthorized vehicle use observed in 2020 does not appear to be a continued problem at this time. Google

Earth analysis from 2021 does not show an increase in disturbance and further indicates that this may not be a continuing issue.

At Site 2 access route, transects 1-5 are on USFS land and transects 6-11 are on CDFW land. AWG's project team, with USFS and CDFW landowners, agreed to restore Site 2's access route to pre-project conditions as found on September 28, 2020. The agreed-upon approach to restore Site 2's route was to use a water truck to emulate a rain event and then provide selective hand-raking that protected the sparse vegetation already established in the wheel wells while further camouflaging the path. This technique dissolved the tire tracks caused by AWG's project, but it did not remove the rutting that existed prior to project commencement. AWG staff continued conversations with the USFS Rangeland Biologist who manages the grazing lease in Hope Valley to try to identify responsible parties and then stop the detrimental use of the route. Achieving pre-project conditions or better at Site 2 would likely be unattainable if the access route continued to receive the amount and type of use that transpired since summer of 2019 through 2020.

Access route seeding was executed at Site 1 as weather allowed in spring of 2021, but no seeding took place at Site 2. On May 27, 2021, AWG staff toured the site with the USFS project liaison, and the liaison deemed that AWG had met USFS expectations for rehabilitation from the USFS campground to Site 2 and did not need to do any seeding. AWG also toured Site 2 access route with CDFW project staff and received confirmation through email from the primary CDFW liaison to discontinue Site 2 Access Route Monitoring from 2022 and onward. In 2021 Site 1's access route was recovering equally as well, but AWG did not tour the site with the primary CDFW liaison. However, AWG received preliminary approval of satisfactory restoration conditions from other CDFW staff in person on August 25, 2021; the primary CDFW liaison confirmed over email that this was enough to confirm satisfaction of the remaining access routes' post-project condition (see Appendix F). AWG worked with the LRWQCB on whether further monitoring (vegetation or photo) would be needed after the 2022 Annual Monitoring Report was submitted, and AWG received sign-off on June 22, 2023, to stop monitoring the access routes due to satisfactory conditions.

Percent Success Monitoring at Site 2 began on June 28, 2021. Willow stakes installed during this project's implementation were tagged and recorded as dead, alive, or unknown. See Table 4. In 2021, no stakes were marked as dead because it was determined that they might need more time to show growth. Willow stake monitoring occurred again on June 23, 2022. The willows that were not found were marked as unknown, and those that showed no growth were marked as dead. When monitoring occurred in June 2022, surrounding water levels were low, and the rate of vegetation growth was noted as concerning. When members of the project team went out in August 2022, there was surprisingly more growth noticed, and a newly-built beaver dam downstream of Site 2 was causing water to pool at the project site. After the heavy water year of winter 2022-2023, Site 2 monitoring was conducted in July 2023. Once again, the method was used to mark those not found as unknown. Natural willow growth was noted within the log crib site which is positive for post-project success. On June 28, 2024, monitoring occurred at Site 2, and willows not found or showing no growth were recorded as dead. This decision was made by AWG staff given that some growth would be expected after nearly four years since planting. The 2.5% unknown in 2024 is reflective of live willow present in the Site 2 area where willow plantings occurred, but no tag was found to confirm that the growth was a specific tagged stake and not natural regeneration. As a result of this decision, no monitoring was conducted in 2025, and AWG staff removed additional willow tags that they were able to locate on October 24, 2025.

2021 Percent Success Monitoring Results	2022 Percent Success Monitoring Results	2023 Percent Success Monitoring Results	2024 Percent Success Monitoring Results
Dead: 0%	Dead: 41.25%	Dead: 40.0%	Dead: 96.25%
Alive: 58.75%	Alive: 16.25%	Alive: 11.25%	Alive: 1.25%
Unknown: 41.25%	Unknown: 42.50%	Unknown: 48.75%	Unknown: 2.50%

Table 4: Willow percent success rates

Adaptive Management

AWG staff, project partners, and the project engineer have been working together to identify project needs and adjustments post-construction. As stated above, seeding was done throughout the Site 2 access route in 2021. Team conversations led to sod plugs being planted at Site 1 to fill in vegetation gaps in September 2021 as part of AWG's annual Creek Day community workday, and additional willow stakes were planted at the edges of Site 2 during Creek Day 2022. After the high flows in 2023, the slash at the downstream end of Site 2 was washed out, and consequently AWG removed the roping in the fall of 2023 to prevent it from entering the waterway. On-site tours have taken place with the project engineer yearly. During the site tour on July 19, 2023, the project engineer stated that major adaptive management work at Site 2 would require heavy equipment that would be more harmful than beneficial. CDFW staff walked the site in August 2023 with AWG staff to discuss the impacts from the high-water year and future plans, including the project engineer's advice against additional work requiring heavy equipment at Site 2.

On July 3, 2024, AWG led a tour for the Technical Advisory Committee (TAC) to walk through both project sites, review project updates, and discuss potential next steps. There were 17 attendees, including representatives from project partners CDFW, American Rivers, Carson Water Subconservancy District, Friends of Hope Valley, USFS, and Washoe Tribe of Nevada and California; the project engineer; the project construction manager; and representatives of LRWQCB, The Institute for Bird Populations, and AWG. Group consensus was to initiate adaptive management work between the existing Site 1 and 2 consisting of microbenching and willow trenching at up to three sites. Microbenching would decrease incision and provide time for grass root development and willow growth; transverse willow lines in trenches would increase vegetation and add stability, as well as increase streambank complexity. In addition, adaptive management work may be completed at Sites #1 and #2, such as planting additional willow with a willow wand or installing willow brush mats on sandy areas.

In 2024 AWG staff initiated conversations with CDFW and LRWQCB permitting liaisons to begin discussing permitting needs for this work. AWG staff then worked to extend the grant timeline to allow for additional time to design adaptive management projects, obtain permits, and complete work. CVRWQCB and NFWF approved extending the project to June 30, 2027.

In spring 2025 AWG contracted the original project engineer to complete designs for the adaptive management work and received an estimate for implementation scalable to two or three weeks of work based on the amount of budget available. However, in continuing conversations with all permitting agencies, it was suggested that the adaptive management work agreed upon by the TAC is likely going to be considered a new project, requiring new permits, which could consume a large chunk of the remaining project budget; the remaining funding would likely not cover even the two-week implementation option. AWG is continuing discussions with our CDFW liaison to determine the best line of action.

California Rapid Assessment Method (CRAM) is a tool for standardized and cost-effective assessment of wetland conditions. CRAM generates numerical scores based on field evaluations for multiple attributes of physical and biotic condition (https://www.cramwetlands.org). Consultant Karri Smith, with AWG AmeriCorps Member Marina Vance's assistance, completed Project Site 1's pre-project CRAM on July 28, 2018, which tallied an 83/100 index score. The project aimed to increase the score by the end of the monitoring period in 2024. In December 2020, previous Watershed Manager Mo Loden brought up potential score inconsistencies with the original CRAM scores reported. Mo Loden and then-Watershed Coordinator Rachel Kieffer worked with Sarah Pearce of San Francisco Estuary Institute to correct some issues with the pre-project CRAM scores. The updated index score for pre-project conditions is 75/100. The post-project CRAM was completed in August 2024 by consultant C.S. Ecological Surveys and Assessments (CRAM practitioners Catherine Schnurrenberger and Katrina Smolen); the index score for post-project conditions was 90/100. See Appendix D to view the original CRAM datasheets, the updates from 2022, and the post-project CRAM datasheets. Pre-project and post-project CRAM results have been uploaded to EcoAtlas as required by LRWQCB under the project's General 401 Water Quality Certification WDID# 6A022004007.

References

California Rapid Assessment Method. San Francisco Estuary Institute. Date of access: December 29, 2020 https://www.cramwetlands.org/

Dustman, K. *Hope Valley History*. Clairitage Press, October 2, 2017. https://www.clairitage.com/2017/10/02/hope-valley-history/

Fillmore, H. (2020). *Upper Carson River Watershed 2019 Water Quality Objectives Report*. Alpine Watershed Group.

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Loden, M. (2021). *Upper Carson River Watershed 2020 Water Quality Objectives Report*. Alpine Watershed Group.

Schembri, H. (2007). *Quality Assurance Project Plan for Alpine Watershed Group Volunteer Citizen Water Quality Monitoring Program*. Alpine Watershed Group.

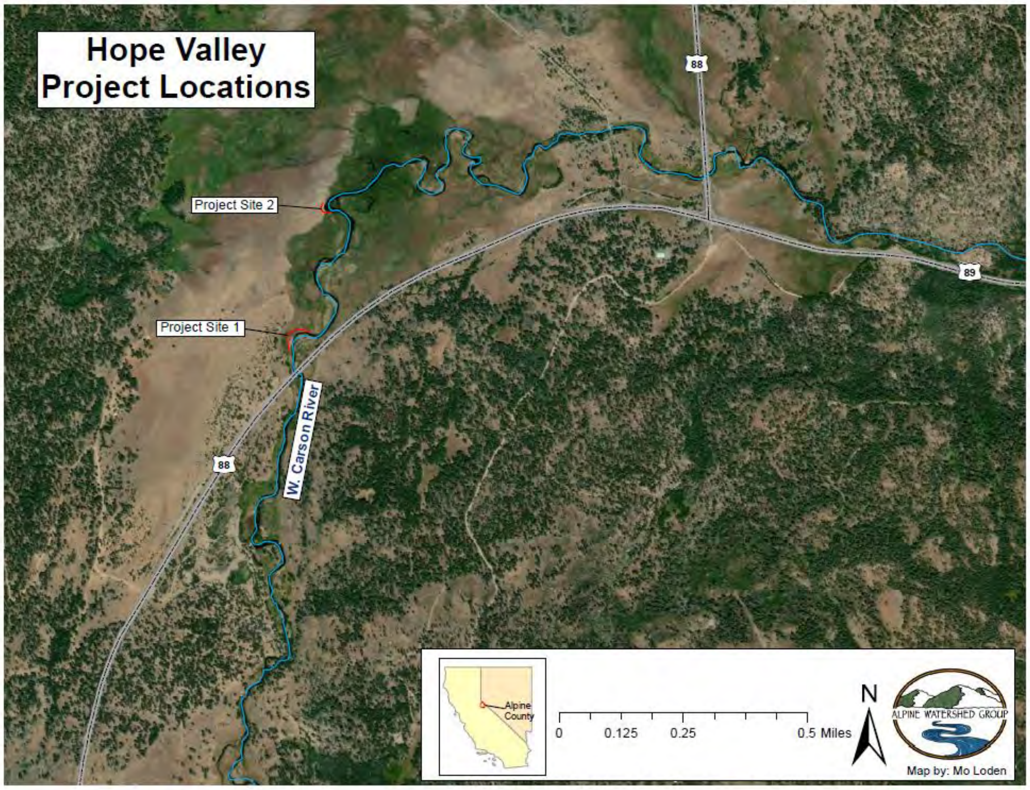
Hope Valley Restoration and Aquatic Habitat Enhancement Project Monitoring Plan (MP)

Reviewed and Approved by Technical Advisory Committee 5.4.2018
Reviewed and Approved by Jeff Brooks, Technical Contact at the
Lahontan Regional Water Quality Control Board 7.24.2018
Updated to reflect selected project design plans 3.17.2020
Updated to reflect SWB 401 permitting feedback 5.14.2020

Lead Agency: Alpine Watershed Group

Partners: American Rivers, Friends of Hope Valley, and the California Department of Fish and Wildlife (the landowner)

Location: Located in Alpine County near the town of Woodfords outside of Markleeville. The West Fork Carson River meanders from its headwaters at Lost Lakes down through Hope Valley and further into the Carson Valley. The project area consists of two meanders in lower Hope Valley— Project Site 1 is the first meander approximately 300 feet downstream of the Highway 88 bridge and Project Site 2 is approximately 0.5 miles further downstream at the log crib/2015 American Rivers restoration site. Both project areas are located on California Department of Fish and Wildlife land adjacent to Highway 88 in Hope Valley. See map below.



Function of Impacted Waters

The West Fork Carson River is a 303(d) listed water body in the California Integrated Report, and the pollutant categories this project aims to address are sediment, nutrients, and salinity. The project will help reduce erosion and sedimentation and provide shading in the West Fork Carson River at the two project sites.

Project Purpose and Goals
The project will enhance approximately 450 feet of stream banks located on California Department of Fish and Wildlife land, resulting in enhanced riparian vegetation and wildlife habitat, improved aquatic habitat, reduced erosion and sedimentation, and improved geomorphic and hydrologic function. This project is a part of the larger goal of reestablishing a functional floodplain and meadow system to allow the river corridor to accommodate variable flows in the future. In addition, due to the potential for earlier spring runoff, it will be important for these meadowlands to serve as natural storage areas. Meadow restoration projects have been demonstrated to increase water storage capacity. Reconnecting the meadow with its floodplain also reduces erosion and sediment delivery. In accordance with California Water Action Plan priorities and the Sierra Nevada Conservancy’s Watershed Improvement Program, this current project addresses the river and meadow between the 2015 (downstream) and 2016 (upstream) American Rivers’ projects, increasing ecological benefit by creating larger areas of connection of stream to meadow floodplains.

At Project Site 1, restoration techniques will mimic an abandoned oxbow feature by creating a trench behind the failing bank and filling it with live sod blocks, willow stakes, and live willow shrub transplants. It will be low impact and low risk. The trench construction will avoid disturbance of mature vegetation and produce approximately 500 cubic yards of soil to be hauled off site. The trench dimensions will be approximately 2.5 feet deep by 14 feet wide and will maintain a minimum 3-4 foot setback from top of river bank. Meadow sod blocks will be salvaged prior to excavation and reinstalled over the side slopes and bottom of the excavated floodplain bench during the revegetation phase. A temporary irrigation system will be installed to minimize plant stress and erosion by means of slow water delivery with low impact nozzles. The source of water will be from the West Fork Carson River. Temporary sprinklers will remain at Site 1 until November 15 or the first significant winter storm. The river will continue eroding the failing bank, and in the interim the willows and sod in the trench will have time to establish and serve as good habitat for birds and amphibians, and eventually will provide vital fish habitat when the erosion pushes back that far. The goal of this site’s design is to avoid massive bank failure, but erosion is a feature in the project plans.

At Project Site 2, the restoration work's primary focus is to update the previous American Rivers 2015 project by installing slash to the ends of the reach to provide additional stability, diverting stream energy from scouring behind the current log crib structure. The 4-inch diameter slash will consist of conifer and willow cuttings, sourced locally, and will be weaved in between vertically placed 8-inch x 10-foot slash anchor logs to create brush mattresses. The brush mattresses will last approximately 5-6 years and will allow vertically placed willow stakes, installed down to or near groundwater, to establish. The slash anchor logs will be embedded 7 feet into the ground using an auger to drill 8-inch holes for placement. The ends of the reach will require slight regrading in order to maintain future stable bank conditions and to create easier work conditions to properly place the slash anchor logs. Approximately 9 cubic yards of soil will be excavated during the bank regrading and dispersed in the adjacent upland areas flagged by the engineer. Soil disbursement will not exceed a depth of 6 inches in the meadow. Spoils will be hand raked to further disperse material. The reach in between the ends will have live stakes installed at 5 feet on center average spacing.

Baseline Conditions
Monitoring will begin before any restoration or development changes are made in order to capture pre-existing or baseline conditions. Pre-project photos will be taken to establish a record of baseline conditions. Water quality monitoring data, as reported on CEDEN, denotes three distinct water monitoring locations: West Fork Carson River near Picketts Junction, Red Lake Creek near the West Fork

Carson River confluence (approximately four river miles upstream of Project Site 1), and at Highway 89 (Hope Valley). Two different organizations monitor water quality—Alpine Watershed Group and the Lahontan Reginal Water Quality Control Board. Since 2004, AWG has been monitoring five water quality parameters in Hope Valley at two sites. See map of overview of Hope Valley monitoring sites below. Also provided below is a table describing the sites historically monitored for chemical parameters in the project area.

Site ID	Responsible Party	Parameters Monitored	Frequency Monitored	Average Result	Unit
RLC-BLRD	AWG	Oxygen, Dissolved, Total	4x/year since 2004	8.04	mg/L
		pH		7.57	pH
		Temperature		7.63	C°
		Turbidity, Total		0.88	NTU
		Total Dissolved Solids, Total		91.55	mg/L
WF-PKT	AWG	Oxygen, Dissolved, Total	4x/year since 2004	8.59	mg/L
		pH		7.30	pH
		Temperature		7.55	C°
		Turbidity, Total		1.07	NTU
		Total Dissolved Solids, Total		75.65	mg/L
633WCR002	SWAMP	Oxygen, Dissolved, Total	≈4x/year 2003 - 2013	10.82	mg/L
		pH	≈4x/year 2003 - 2015	7.77	pH
		Temperature		7.84	C°
		Turbidity, Total		1.81	NTU
		Total Dissolved Solids, Total		48.84	mg/L

Monitoring Systems

Two types of monitoring will be conducted including implementation monitoring and performance monitoring. Implementation monitoring will be used to document the proper implementation of the project and mitigation measures. Performance monitoring will be used to measure the project's effectiveness.

Implementation Monitoring

Implementation monitoring will be conducted to assess whether the activities—restoration of bank stabilization and re-vegetation of banks—were carried out as planned. This will consist of observations and documentation of the treatment sites during restoration activities. The project engineer and watershed program manager will ensure that appropriate areas are restored according to planned techniques. Turbidity monitoring will occur hourly during Site 2's excavation construction at the above and below project site locations seen below.

Performance Monitoring

Project effectiveness monitoring will be conducted to assess the success of the project implementation activities in meeting performance standards and complying with best management practices.

Performance Standards

Goal 1: Reduce erosion and sedimentation at the two project sites and improve water quality
1.1 Conduct regular photo monitoring to document changes at project area
1.2 Conduct water quality monitoring above and below project sites
1.3 Conduct erosion surveys to assess rate of erosion at project Site 1
1.4 Conduct turbidity monitoring above and below Project Site 2 during excavation construction

Goal 2: Provide shading in the West Fork Carson River watershed at the two project sites and/or at meanders with close proximity to the project sites
2.1 Identify areas that have little to no vegetation growth
2.2 Begin multiple years of plantings with techniques such as jute matting and seeding with native grass blend, and planting willows as stakes and potentially more mature plants

Performance standard	Monitoring method
Goal 1: Reduce erosion and sedimentation at the two project sites	Photo monitoring, water quality monitoring, erosion surveys, CRAM assessment pre- and four years post project
Goal 2: Provide shading in the West Fork Carson River watershed	Photo monitoring, vegetation percent coverage monitoring at Site 1, percent successful surveys for willow stakes at Site 2

Monitoring Methods

To best monitor the success of this project, we will use the following monitoring methods: water quality monitoring, photo monitoring, vegetation monitoring, erosion surveys, and California Rapid Assessment Method (CRAM). See table below for monitoring details.

Water Quality Monitoring will be conducted above and below the project area. The parameters monitored are considered vital signs of stream health. These parameters include: water/air temperature, dissolved oxygen, pH, specific conductance, and turbidity. These water quality measures and physical attributes of streams give very specific information on the health of waters systems and their ability to support wildlife and vegetation. We do not expect an increase in the water quality parameters until the failing bank erodes back to the well-established trench.

Photo Monitoring will employ qualitative observation and evaluation of any changes in geomorphology or function. Project sites are expected to evolve somewhat following regrading. The project will employ two standard types of photo monitoring:

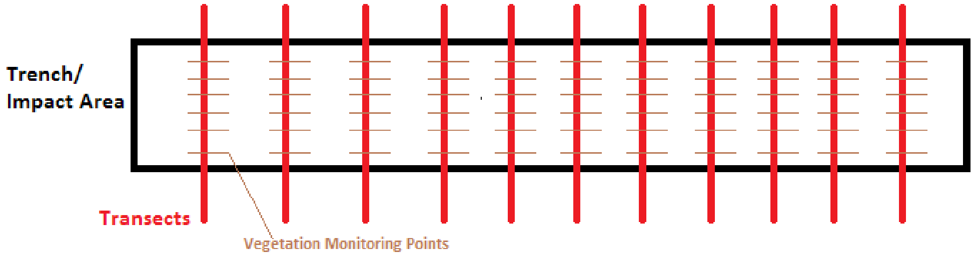
FEATURE PHOTO POINT METHOD documents visual changes occurring at a fixed point through time. This method is used to document change resulting from a restoration activity, where photos are taken before, during, and immediately after construction. The photos are periodically replicated thereafter to demonstrate the long-term effectiveness of the restoration. For each photo point, a marker will be placed in the field, record the GPS location, record detailed direction for locating the point and taking the photo, and develop a map of photo points. These photo points will be repeated annually in June and November for at least three years after construction is complete.

OPPORTUNISTIC PHOTOS are not taken from a permanently marked location and are not intended to be formally repeated. They provide valuable information when taken during construction activities, when used to document damages to a site that may require follow-up actions (such as high water events, fire, etc.), or as part of a vegetation/soil monitoring protocol to visually document a sample point.

Vegetation Monitoring

Percent coverage monitoring will be conducted in June of each year to best capture peak site phenology of both perennial and annual species at Site 1. Goal of percent cover is greater than 50% by year 2, greater than 75% by year 3, and finally to meet pre-project percent coverage by year 4, which is approximately 90% coverage. If benchmarks are not met, revegetation plans will be assessed.

Percent coverage monitoring will be conducted by selecting at least ten permanent transects across the trench and estimating vegetation cover within 1 square yard at 11 monitoring points evenly spaced along the transects. Some transects will be marked with a medium size nail in the meadow at the meadow edge farthest from the riverbank. Using a metal detector, data collections can be planned for the same area year after year. All transects will have recorded GPS coordinates of both the meadow edge and the stream edge.



Percent successful surveys will be conducted at Site 2 to monitor willow stake survival rates. During the monitoring period, other observations such as site stability and signs of excessive erosion will be conducted annually to gauge whether or not revegetation plans should be considered.

Erosion Surveys will allow us to monitor erosion rates. Using three of the same vegetation transects at top, mid, and end of reach, we will measure the distance from the nail in meadow to river bank in October after high flows have dissipated. This parameter only informs the monitoring team and will not need a trigger level set.

California Rapid Assessment Method (CRAM) For wetlands and riparian areas, CRAM is a tool for standardized and cost-effective assessment of wetland condition. CRAM generates numerical scores based on field evaluations for multiple attributes of physical and biotic condition. Scores are relative to the best achievable condition based on statewide surveys. It can also be used to assess ambient baseline conditions at any spatial scale, from statewide to local watersheds. As a standard method for assessing projects, CRAM can be used to evaluate how ambient conditions are affected by projects. Project Site 1's 2018 Index Score was 83/100. The project aims to increase the score by the end of the monitoring period in 2024.

Monitoring Parameter	Monitoring Parameters	Sampling Frequency	# Sites	Sampling Dates
Water Quality	pH, dissolved oxygen, specific conductance, air/water temp, and turbidity	4 times/ year	2	March June August September
Sedimentation	Turbidity	Hourly	2	Every day during Site 2's excavation construction
Photo Monitoring	Visual Observations	Twice/year	20	June/November
Vegetation	Percent Coverage	Once/year	Project Site 1	June
Vegetation	Percent Successful	Once/year	Project Site 2	June
Erosion Surveys	Bank Erosion Rate	Once/year	3	October
CRAM	Assessment of wetland condition	One pre- and four years post project	1	June 2017 & June 2024

Monitoring Timeline

Monitoring will take place from 2019 to 2024 as outlined in the above table.

Reporting

The data collected from the monitoring of Hope Valley will be reported to the CEDEN (online database for water quality parameters within California). Alpine Watershed Group will submit a monitoring program report to the State Water Board annually in December every year.

Adaptive Management Strategies

Photo points may be added or abandoned to better capture restoration progress or effectiveness, but photo points will never be moved. Additional water quality parameters or sampling events may be added, based on available funds, to better capture restoration progress or effectiveness.

Special Environmental Considerations (Permits)

Alpine Watershed Group obtained a River Monitoring Letter of Authorization from California Department of Fish & Wildlife to conduct sampling on Hope Valley Wildlife Area property.

Appendix B: Hope Valley Photo Monitoring (HVPM)

Site 1

HVPM 6.1: Looking at upstream end of Site 1 from across river on river right*


June 17, 2020 (Pre-construction)


October 3, 2020 (During Construction)


October 12, 2020 (After Construction)


June 25, 2021


October 21, 2021


July 15, 2022


November 29, 2022


June 27, 2023

October 24, 2023


June 27, 2024


October 24, 2024


June 24, 2025


October 24, 2025

**River right and river left are determined when looking downstream*

HVPM 7.0: Looking at upstream end of Site 1 from across river on river right*


June 17, 2020 (Pre-construction)

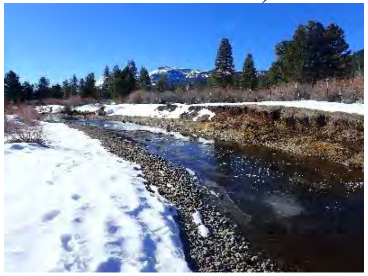

October 3, 2020 (During Construction)


October 12, 2020 (After Construction)


June 25, 2021


October 21, 2021


July 15, 2022


November 29, 2022


June 27, 2023

October 24, 2023


June 27, 2024


October 24, 2024


June 24, 2025


October 24, 2025

River right and river left are determined when looking downstream

HVPM 10.1: Looking downstream at Site 1 on river left*


June 17, 2020 (Pre-construction)

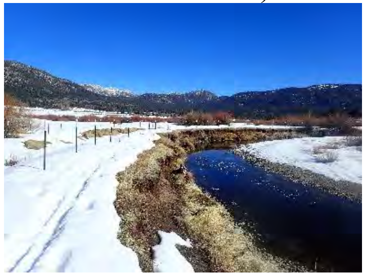

October 3, 2020 (During Construction)


October 12, 2020 (After Construction)


June 28, 2021


October 20, 2021


July 15, 2022


November 29, 2022


June 27, 2023

October 24, 2023


June 27, 2024


October 24, 2024


June 24, 2025


October 24, 2025

River right and river left are determined when looking downstream

HVPM 13.2: Looking upstream at Site 1 on river left*


June 17, 2020 (Pre-construction)

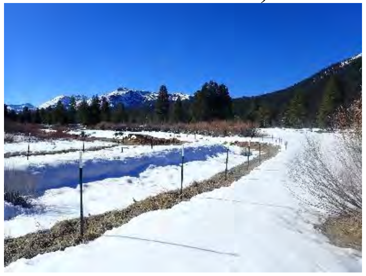

October 3, 2020 (During Construction)


October 12, 2020 (After Construction)


June 25, 2021


October 20, 2021


July 15, 2022


November 29, 2022


June 27, 2023

October 25, 2023


June 27, 2024


October 24, 2024


June 24, 2025


October 24, 2025

**River right and river left are determined when looking downstream*

Site 1 Access Route

HVPM 30.0: At entrance of Site 1 access route near Highway 88 pull off

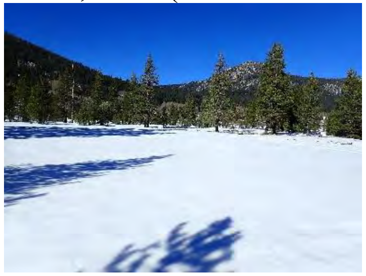

September 28, 2020 (Pre-construction)


October 12, 2020 (After Construction)


June 28, 2021


October 21, 2021


July 15, 2022


November 29, 2022

HVPM 31.1: At entrance of Site 1 access route looking back at Highway 88 pull off


September 28, 2020 (Pre-construction)


October 12, 2020 (After Construction)


June 28, 2021


October 21, 2021


July 15, 2022


November 29, 2022

HVPM 34.0: Mid-route via Site 1 access route


September 28, 2020 (Pre-construction)


October 12, 2020 (After Construction)


June 28, 2021


October 21, 2021


July 15, 2022


November 29, 2022

HVPM 37.0: Site 1 access route near end at project site in wetland area


September 28, 2020 (Pre-construction)


October 12, 2020 (After Construction)


June 28, 2021


October 21, 2021


July 15, 2022


November 29, 2022

HVPM 37.1: Site 1 access route near end at project site in wetland area looking back at upland area


September 28, 2020 (Pre-construction)


October 12, 2020 (After Construction)


June 28, 2021


October 21, 2021


July 15, 2022


November 29, 2022

**River right and river left are determined when looking downstream*

Site 2

HVPM 14.0: Looking downstream at Site 2 on river left*


June 17, 2020 (Pre-construction)


October 3, 2020 (During Construction)


October 12, 2020 (After Construction)


June 28, 2021


October 20, 2021


July 15, 2022


November 29, 2022


June 27, 2023


October 24, 2023


June 27, 2024


October 24, 2024


June 24, 2025


October 24, 2025

**River right and river left are determined when looking downstream*

HVPM 15.1: Looking downstream at Site 2 on river left*


June 17, 2020 (Pre-construction)


October 3, 2020 (During Construction)


October 12, 2020 (After Construction)


June 28, 2021


October 20, 2021


July 15, 2022


November 29, 2022


June 27, 2023


October 24, 2023


June 27, 2024


October 24, 2024


June 24, 2025


October 24, 2025

River right and river left are determined when looking downstream

HVPM 16.0: Looking upstream at Site 2 on river left*


June 17, 2020 (Pre-construction)


October 3, 2020 (During Construction)


October 12, 2020 (After Construction)


June 28, 2021


October 20, 2021


July 15, 2022


November 29, 2022


June 27, 2023


October 24, 2023


June 27, 2024


October 24, 2024


June 24, 2025


October 24, 2025

River right and river left are determined when looking downstream

HVPM 17.0: Looking upstream at Site 2 on river right*


Log Crib Pre-2015 Construction


July 2018 (Pre-construction)


October 3, 2020 (During Construction)


October 12, 2020 (After Construction)


June 28, 2021


October 21, 2021


July 15, 2023


November 29, 2022


June 28, 2023


October 24, 2023


June 27, 2024


October 24, 2024


June 24, 2025


October 24, 2025

River right and river left are determined when looking downstream

Site 2 Access Route

HVPM 18.1: At entrance of Site 2 access route near USFS dispersed camping area (*monitoring discontinued in 2021 due to sign off by project partners)


September 28, 2020 (Pre-construction)


October 12, 2020 (After Construction)


July 1, 2021


October 21, 2021

HVPM 19.0: Near entrance of Site 2 access route near USFS dispersed camping area


September 28, 2020 (Pre-construction)


October 12, 2020 (After Construction)


July 1, 2021


October 21, 2021

HVPM 24.0: Mid-route via Site 2 access route


September 28, 2020 (Pre-construction)


October 12, 2020 (After Construction)


July 1, 2021


October 20, 2021

HVPM 28.0: Site 2 access route near end at project site

September 28, 2020 (Pre-construction)

October 12, 2020 (After Construction)

July 1, 2021

October 20, 2021

4.16.2015

6.22.2016

8.11.2017

6.7.2018

8.11.2019

5.30.2021

Appendix C:
Site 2 Google Earth
Access Road Analysis

Appendix D: California Rapid Assessment Method Datasheets

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: W. Fork Carson River

Project Name: Hope Valley W. Fork Carson Restoration + Aquatic Habitat Enhancement Project

Assessment Area ID #: 1

Project ID #: 1 **Date:** 7/26/2018

Assessment Team Members for This AA: Karri A. Smith, PWS and Marina Vance, AWG

Average Bankfull Width: 16.6m

Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 166 m

Upstream Point Latitude: 38°46'21.87"N **Longitude:** 119°56'04.13"N 7085'

Downstream Point Latitude: 38°46'24.30"N **Longitude:** 119°55'58.83" W 7087'

Wetland Sub-type:

☐ Confined ☒ Non-confined

AA Category:

☒ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

Did the river/stream have flowing water at the time of the assessment? ☒ yes ☐ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☒ perennial ☐ intermittent ☐ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1	C1U	Upstream	38°46'20.85"N	119°56'04.25"W	
2	C2ML	Middle Left	38°46'23.30"N	119°56'01.68"W	
3	C3MR	Middle Right	38°46'22.26"N	119°56'01.93"W	
4	C4DS	Downstream	38°46'24.68"N	119°55'58.77"W	
5					
6					
7					
8					
9					
10					

Site Location Description:

1.049 Km West of Picketts Junction (Hwy 88 and Hwy 89 Junction) Hope Valley Califorinia.

AA begins Aproximately 92 m downstream of Hwy 88 Bridge Crossing.

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: W. FORK CARSON RIVER

Date:

Comments

Bridge HWY 88

Attribute 1: Buffer and Landscape Context (pp. 11-19)

	Alpha.	Numeric
Stream Corridor Continuity (D)	A	12
Buffer:		
Buffer submetric A: Percent of AA with Buffer	A	12
Buffer submetric B: Average Buffer Width	B	9
Buffer submetric C: Buffer Condition	A	12
Raw Attribute Score = D+[C x (A x B)½]½		23.2
Final Attribute Score = (Raw Score/24) x 100		96.5

Attribute 2: Hydrology (pp. 20-26)

	Alpha.	Numeric
Water Source	A	12
Channel Stability	B	9
Hydrologic Connectivity	A	12
Raw Attribute Score = sum of numeric scores		33
Final Attribute Score = (Raw Score/36) x 100		91.6

Attribute 3: Physical Structure (pp. 27-33)

	Alpha.	Numeric
Structural Patch Richness	A	12
Topographic Complexity	B	9
Raw Attribute Score = sum of numeric scores		21
Final Attribute Score = (Raw Score/24) x 100		87.5

Attribute 4: Biotic Structure (pp. 34-41)

Plant Community Composition (based on sub-metrics A-C)

	Alpha.	Numeric
Plant Community submetric A: Number of plant layers	A	12
Plant Community submetric B: Number of Co-dominant species	B	9
Plant Community submetric C: Percent Invasion	A	12
Plant Community Composition Metric *(numeric average of submetrics A-C)*		11
Horizontal Interspersion	C	6
Vertical Biotic Structure	C	6
Raw Attribute Score = sum of numeric scores		23
Final Attribute Score = (Raw Score/36) x 100		83

Overall AA Score (average of four final Attribute Scores)

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands (P.12)

office

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	10	1	10
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	10	Downstream Total Length	10

A

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

SEE AERIAL photo

Percent of AA with Buffer: ______ %

Worksheet for calculating average buffer width of AA

B

Line	Buffer Width (m)
A	250 m.
B	250 m
C	250 m
D	250M
E	24 m
F	12.5 M
G	11 m
H	40 M
Average Buffer Width *Round to the nearest integer*	1087 ÷ 8 = 136 M

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☑ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA.
	☑ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it.
	☑ There is leaf litter, thatch, or wrack in most pools (if pools are present).
	☑ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area.
	☐ There is little or no active undercutting or burial of riparian vegetation.
	☑ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation.
	☑ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar).
	☑ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA
	☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☑ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs.
	☑ There are abundant bank slides or slumps.
	☑ The lower banks are uniformly scoured and not vegetated.
	☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel.
	☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation.
	☐ The channel bed appears scoured to bedrock or dense clay.
	☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided).
	☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year.
	☐ There are partially buried living tree trunks or shrubs along the banks.
	☐ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced.
	☐ There are partially buried, or sediment-choked, culverts.
	☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour.
	☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☑ **Equilibrium** ☐ **Degradation** ☐ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	**Replicate Cross-sections** ⟶	**TOP**	**MID**	**BOT**	$\bar{X}$
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	17.8m	15.5	16.6 m	16.6m
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	1.0 m	1m	1m	1m
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	2m	2m	2m	2m
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	32.8m	63.7m	150 m	82m
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	1.84	4.1	9.04	5
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			5	

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

**Please refer to the CRAM Photo Dictionary at www.cramwetlands.org for photos of each of the following patch types.*

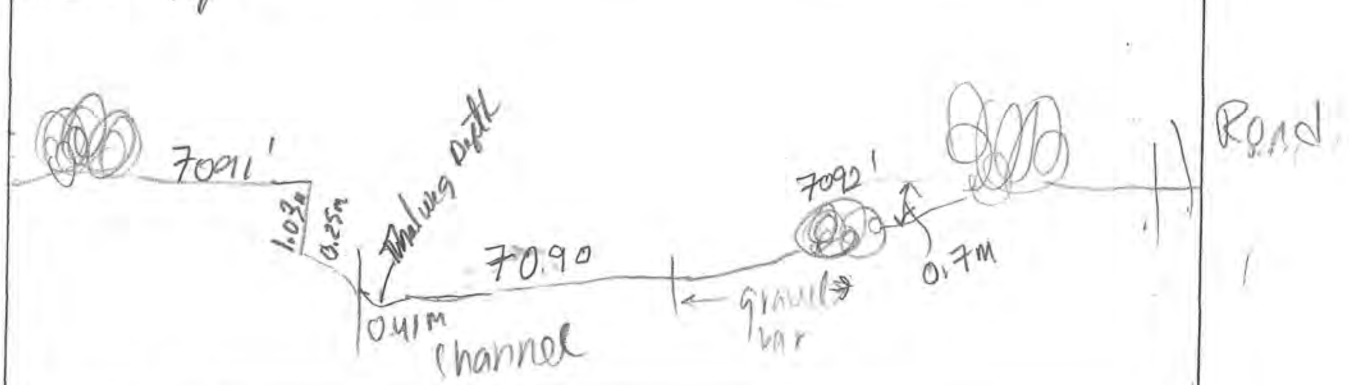
STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	**3 m^2**	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain	[✓ 1]	1
Bank slumps or undercut banks in channels or along shoreline	[✓ 1]	1
Cobbles and/or Boulders	[✓ 1]	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	[✓ 1]	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	[✓ 1]	1
Pools or depressions in channels (wet or dry channels)	[✓ 1]	1
Riffles or rapids (wet or dry channels)	[✓ 1]	1
Secondary channels on floodplains or along shorelines	[✓ 1]	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	[✓ 1]	N/A
Swales on floodplain or along shoreline	[✓ 1]	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	[✓ 1]	1
Vegetated islands (mostly above high-water)	[✓ 1]	N/A
Total Possible	17	12
No. Observed Patch Types (enter here and use in Table 14 below)	12	

Worksheet for AA Topographic Complexity

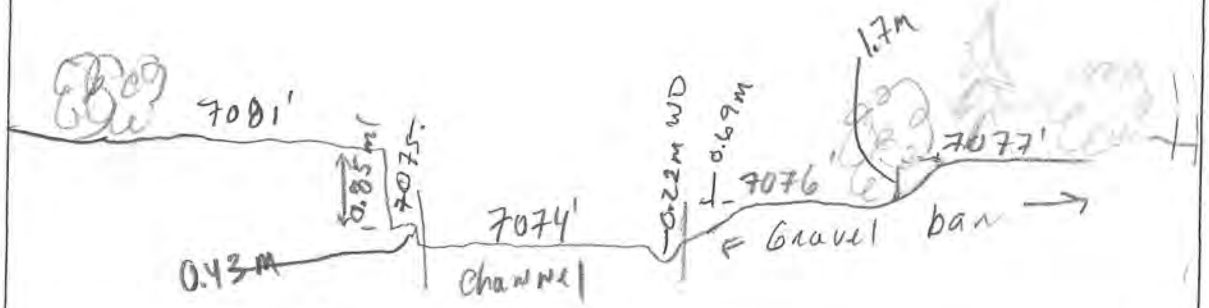
B2

At three locations along the AA, make a sketch of the profile of the stream from the ~~AA boundary~~ down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

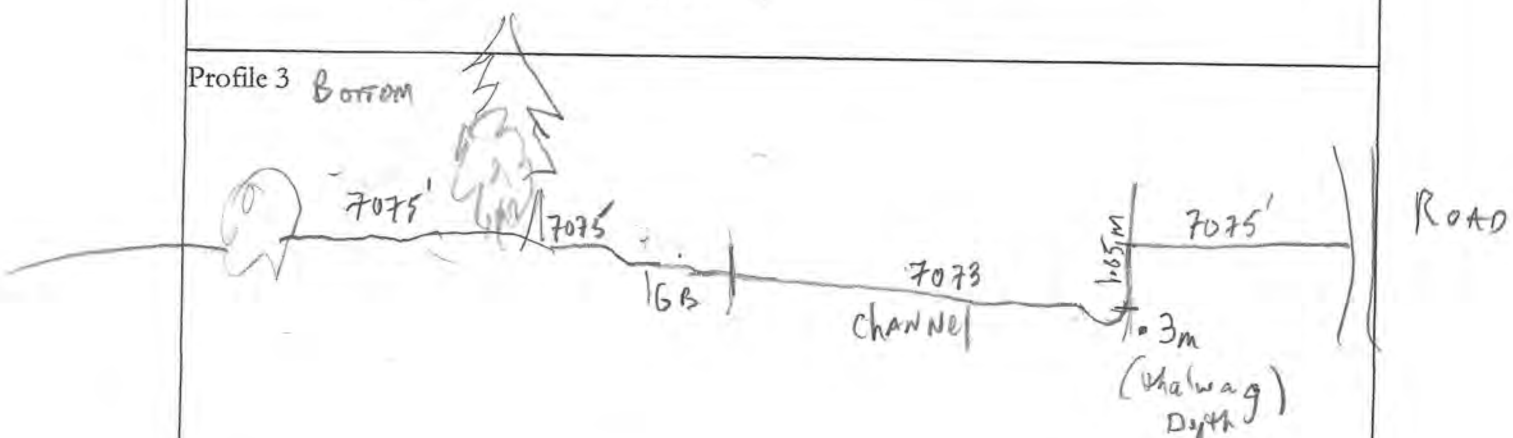
Profile 1 Top



Profile 2 Middle



Profile 3 Bottom



Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands

(A dominant species represents ≥10% *relative* cover)

Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

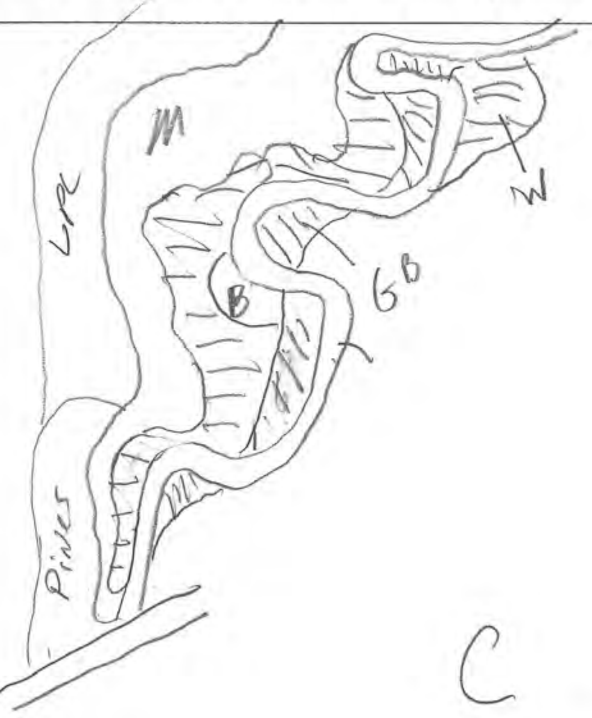
Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
		Eleocharis palustris	
		Juncus balticus	
		Poa pratensis	
		Carex filifolia	
		Poa cusickii	

Medium (0.5-1.5 m)	Invasive?	Tall (1.5-3.0 m)	Invasive?
Carex nebrascensis		Salix lemmonii	
Carex utriculata			
Carex athrostachya			

Very Tall (>3.0 m)	Invasive?		
Pinus contorta		Total number of co-dominant species for all layers combined (enter here and use in Table 18)	10
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	0

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) Gravel Bar – early successional
2) Willow (Riparian) - W willow / Herb understory
3) Bare / Sand (B) (No Veg)
4) Meadow (M)
5) Channel (OW)
6) Trees (Pines) Herb/graminoid Understory – Carex / Shrub UPL

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	[✓ Yes]	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	[✓ other]
If yes, then how severe is the disturbance?	✓ likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type? N/A	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Historic Grazing -

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	✓ (ROAD)	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	✓ Bridge	Somewhat
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)	✓ (DOWNSTREAM)	
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		

Comments

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed	✓	
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		

Comments

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation	Fishing/trails top of bank/willow seedling trampling	
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species	✓(?) FOHV	
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer		

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)	✓ Historic	Y
Transportation corridor	✓	Y
Rangeland (livestock rangeland also managed for native vegetation)	✓ Historic	Y
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)	✓	
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	✓	Fishing trails prevent willow growth
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments

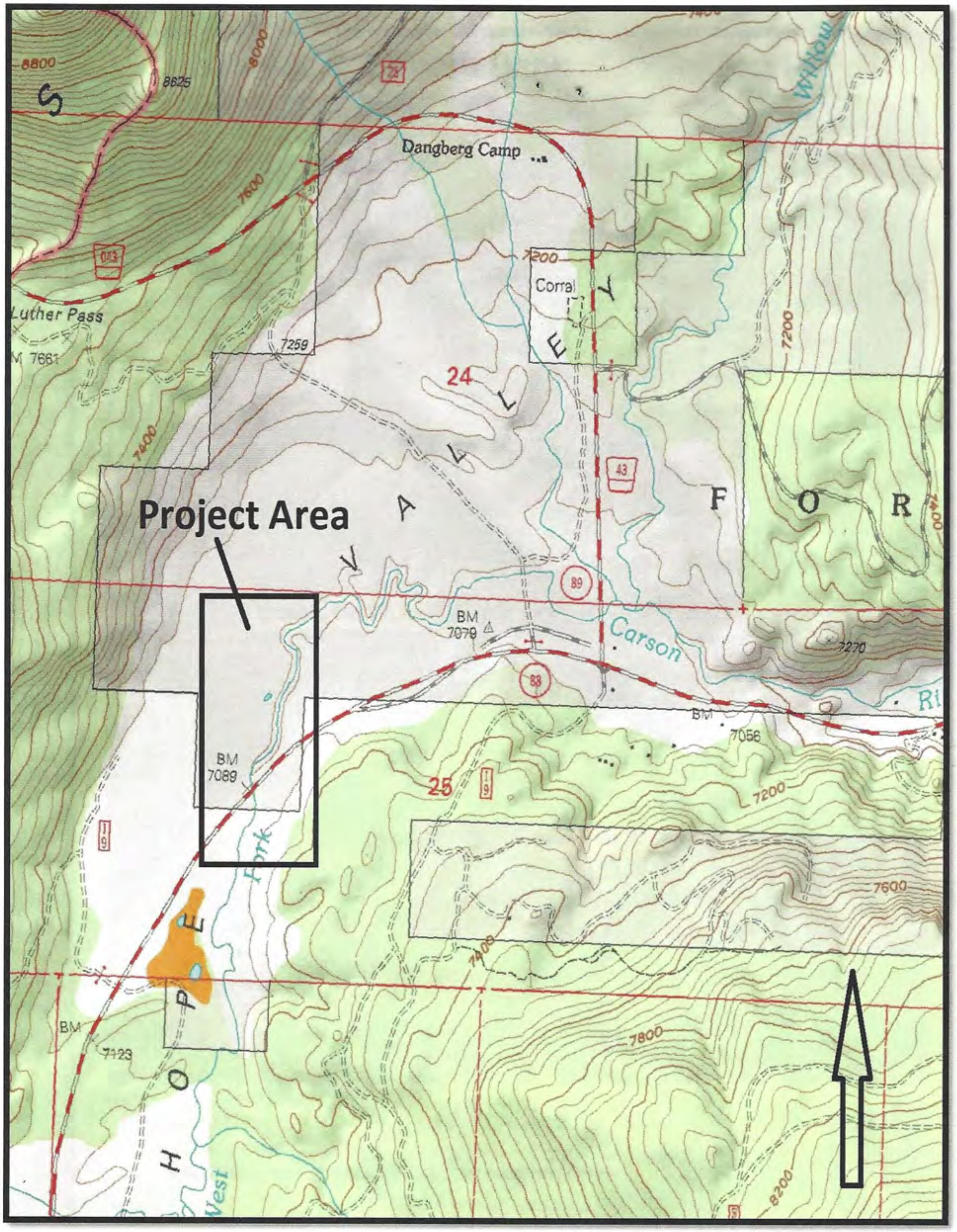
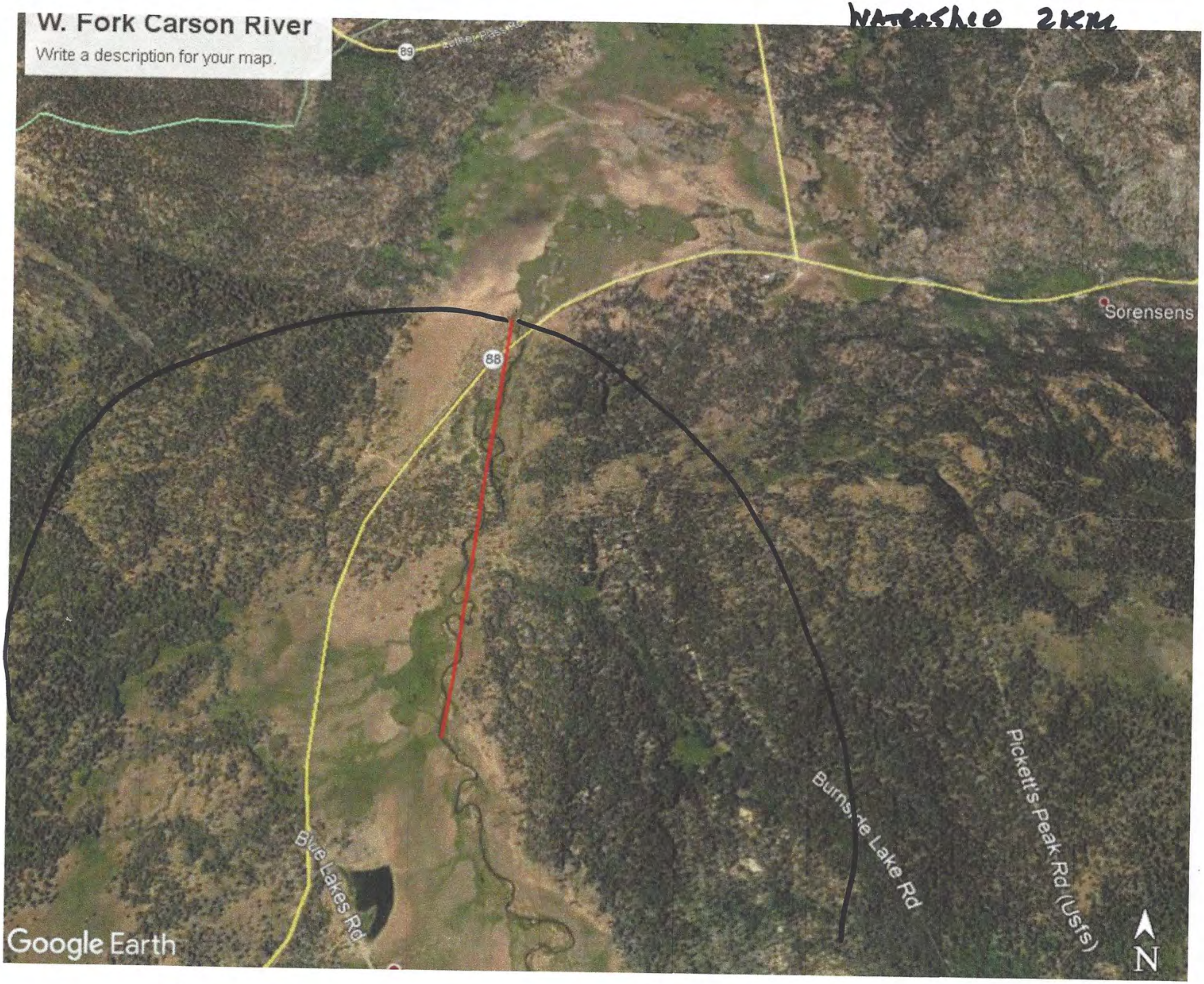


Exhibit 1. Hope Valley W. Fork Carson River Restoration and Aquatic Habitat Enhancement Project Location (USGS Topo Map)


AA
88
Carson Pass Hwy
Google Earth
© 2018 Google
N
400 ft


Google Earth
© 2018 Google
88
Carson Pass Hwy
A
B
C
D
AA
E
F
G
H
500M
500M
NON-BUFFER
(30M+10M)
Burnside Rd
1000 ft
N

WATERSHED 2KM



Updated Data Sheet 2022

West Fork Carson River				
Assessment Date		Pre-Construction (2018)	Corrected Pre-Construction	Year 5
Attribute	Metric			
Buffer and Landscape Context		96.53		
	Stream Corridor Continuity	12		
	Buffer: Percent of AA with Buffer	12		
	Buffer: Average Buffer Width	9		
	Buffer: Buffer Condition	12		
Hydrology		91.66		
	Water Source	12		
	Channel Stability	9		
	Hydrologic Connectivity	12		
Physical Structure		50.00		
	Structural Patch Richness	9		
	Topographic Complexity	3		
Biotic Structure		61.11		
	Plant Community: No. of plant layers	9		
	Plant Community: No. of codominants	9		
	Plant Community: Percent Invasion	12		
	Horizontal Interspersion	6		
	Vertical Biotic Structure	6		
CRAM Index Score		75		

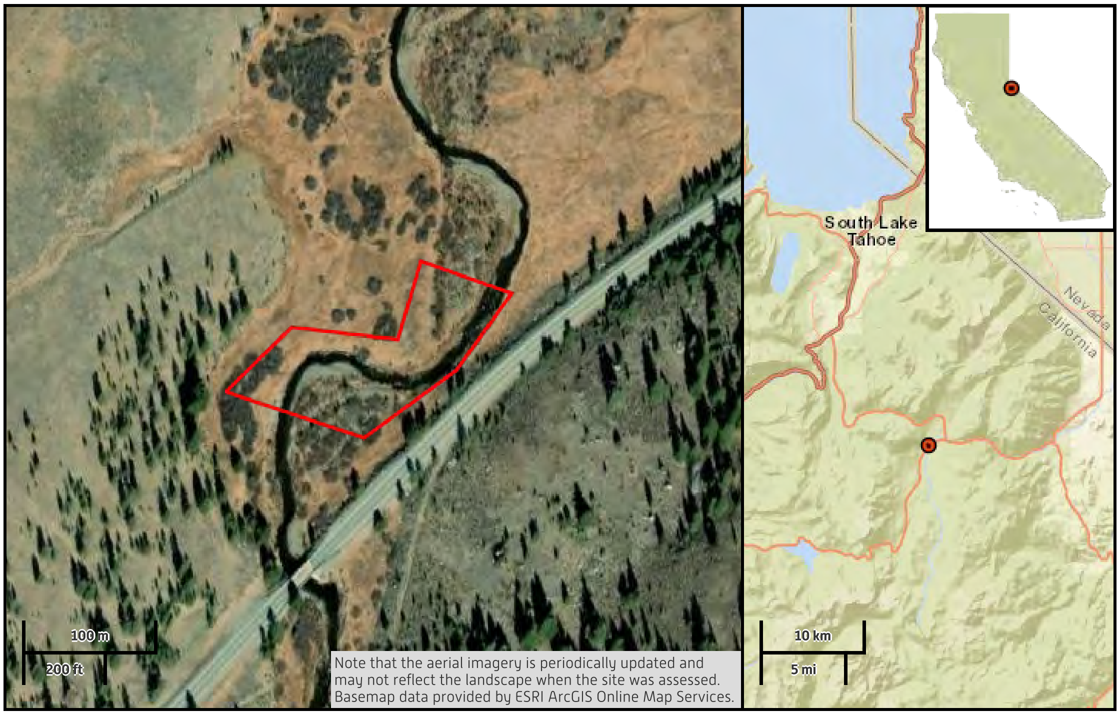
Rationale
Bridge Hwy 88 is break
20m break upsteam and then 0m break downstream
Average is 136m
Mostly native plants, not much soil disruption, not much human visitation
No modified hydrology
Some degradation
Score of 5
No vegetated islands
No benches with lumpy bumpy
Short, medium, and tall present, but no very tall (need 5% patch to count)
Species count 9 (not 10). Removed pinus contorta because not large enough patch to count
0% invasion
25-50% have 2 layers overlap

WWW.CRAMWETLANDS.ORG

CRAM

California Rapid Assessment Method

Summary Assessment Report



Note that the aerial imagery is periodically updated and may not reflect the landscape when the site was assessed. Basemap data provided by ESRI ArcGIS Online Map Services.

Basic Information

eCRAM ID	8474
Assessment Area Name	W. Fork Carson River
Project Name	
Assessment Area ID	1
Project ID	1
Wetland Type	riverine non-confined
CRAM Version	6.1
Visit Date	2018-07-26
AA Category	restoration
Practitioners	Karri Smith (lead practitioner)
Other Practitioners	Marina Vance
County	Alpine
Ecoregion	sierra
AA Centroid Latitude	38.77309
AA Centroid	-119.93386

Longitude	
AA Size (Hectares)	0.79987
Approximate Length of AA	166
Average AA Width	
Average Bankful Width	16.6
Flowing water at time of assessment?	Yes
Apparent Hydrologic Flow Regime	perennial
Tidal Stage	not recorded
Is this a public record?	Yes
AA Comment	Original CRAM occured in 2018, with some questions resolved in 2022 by Sarah Pearce and Rachel Kieffer. Changes were made based off of data corrections, CRAM photographs, and knowledge of project area. This score should be used in reference to the project over the previous score. See notes below on each section.

Metric Scores

Attribute	**Buffer And Landscape Context**	**96.54**
	Stream Corridor Continuity	A (12)
	Percent Of AA With Buffer	A (12)
	Average Buffer Width	B (9)
	Buffer Condition	A (12)
Attribute	**Hydrology**	**91.67**
	Water Source	A (12)
	Channel Stability	B (9)
	Hydrologic Connectivity	A (12)
Attribute	**Physical Structure**	**50.00**
	Structural Patch Richness	B (9)
	Topographic Complexity	D (3)
Attribute	**Biotic Structure**	**61.11**
	Number Of Plant Layers Present	B (9)
	Number Of Co-Dominant Species	B (9)
	Percent Invasion	A (12)
	Plant Community Score	10
	Horizontal Interspersion And Zonation	C (6)
	Vertical Biotic Structure	C (6)
Index Score		**75**

Stressors **12** total, **3** with significant negative effect - indicated below with *

Attribute	**Biotic Structure**
	Excessive human visitation
	Predation and habitat destruction by non-native vertebrates (e.g., Virginia opossum and domestic predators, such as feral pets)
	Treatment of non-native and nuisance plant species
Attribute	**Buffer And Landscape Context**
	Active recreation (off-road vehicles, mountain biking, hunting, fishing)
	Passive recreation (bird-watching, hiking, etc.)
	Ranching (enclosed livestock grazing or horse paddock or feedlot)*
	Rangeland (livestock rangeland also managed for native vegetation)*
	Transportation corridor*
Attribute	**Hydrology**
	Engineered channel (riprap, armored channel bank, bed)
	Flow obstructions (culverts, paved stream crossings)
	Non-point Source (Non-PS) discharges (urban runoff, farm drainage)
Attribute	**Physical Structure**
	Excessive sediment or organic debris from watershed

This report was created on Thursday February 10, 2022, 9:39 AM using the SFEI eCRAM Mapper at www.cramwetlands.org

The data provided in this report is for informational purposes only and may not be sufficient for the purposes of fulfilling the requirements of a regulatory permit. Please see "Using CRAM (California Rapid Assessment Method) To Assess Wetland Projects As an Element of Regulatory and Management Programs" CWMW, Oct. 13, 2009.

Basic Information Sheet: Riverine Wetlands

eCRAM ID 8474 (2018)

Assessment Area Name: W. Fork Carson River

Project Name: Hope Valley

Assessment Area ID #: 1

Project ID #: 1 **Date:** 8/6/24

Assessment Team Members for This AA:

Catherine Schurrenberger

Katrina Smolen

Average Bankfull Width: 13.1 m

Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 166m

NAD 83 (N.A.)

Upstream Point Latitude: 38.77272 **Longitude:** 119.93452 7085'

Downstream Point Latitude: 38.77352 **Longitude:** 119.93299 W 7087'

Wetland Sub-type:

Confined [✓ Non-confined]

AA Category:

[✓ Restoration] Mitigation Impacted Ambient Reference Training

Other:

Did the river/stream have flowing water at the time of the assessment? [✓ yes] no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

[✓ perennial] intermittent ephemeral

Centroid point – 38.77298, 119.93368 NAD 83 N.A.

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1	1	Upstream	38.77246	119.93451	NAD83
2	2	Middle Left	38.77314	119.9338	NAD 83
3	3	Middle Right	38.7725	119.93387	NAD83
4	4	Downstream	38.77352	119.93299	NAD 83
5					
6					
7					
8					
9					
10					

Site Location Description:

1.49 Km West of Pickets Jnct. on Hwy 88
AA begins approx. 92m downstream of
Bridge over Hwy 88.

Comments:

~100 m downstream of bridge. ~4' incised channel
bank Ⓛ, floodplain on Ⓡ

Scoring Sheet: Riverine Wetlands

AA Name:				**Date:** 8/6/24
Attribute 1: Buffer and Landscape Context (pp. 11-19)				**Comments**
		Alpha.	Numeric	
Stream Corridor Continuity (D)		A	12	
Buffer:				
	Alpha.	Numeric		
Buffer submetric A: *Percent of AA with Buffer*	A	12		
Buffer submetric B: *Average Buffer Width*	B	9		
Buffer submetric C: *Buffer Condition*	A	12		
Raw Attribute Score = D+[C x (A x B)$^{1/2}$]$^{1/2}$			23.17	**Final Attribute Score = (Raw Score/24) x 100** 96.5
Attribute 2: Hydrology (pp. 20-26)				
		Alpha.	Numeric	
Water Source		A	12	
Channel Stability		B	9	
Hydrologic Connectivity		A	12	
Raw Attribute Score = sum of numeric scores			33	**Final Attribute Score = (Raw Score/36) x 100** 91.6
Attribute 3: Physical Structure (pp. 27-33)				
		Alpha.	Numeric	
Structural Patch Richness		B	9	
Topographic Complexity		B	9	Bench on Ⓡ Bank upstream Bench on Ⓛ Bank downstream end of AA
Raw Attribute Score = sum of numeric scores				**Final Attribute Score = (Raw Score/24) x 100** 75
Attribute 4: Biotic Structure (pp. 34-41)				
Plant Community Composition (based on sub-metrics A-C)				
	Alpha.	Numeric		
Plant Community submetric A: *Number of plant layers*	B	9		
Plant Community submetric B: *Number of Co-dominant species*	A	12		
Plant Community submetric C: *Percent Invasion*	A	12		
Plant Community Composition Metric *(numeric average of submetrics A-C)*			11	
Horizontal Interspersion		A	12	
Vertical Biotic Structure		A	12	
Raw Attribute Score = sum of numeric scores			36	**Final Attribute Score = (Raw Score/36) x 100** 97.2
Overall AA Score (average of four final Attribute Scores)				90.1

calculation for attribute 1

$$12+\left[12\times(12\times9)^{1/2}\right]^{1/2}$$

10.39

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	10	1	
2	10	2	
3		3	
4		4	
5		5	
Upstream Total Length	20	Downstream Total Length	0

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

See map aerial imagery

Percent of AA with Buffer: ______ %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	150
B	150
C	150
D	150
E	36.68
F	14.10
G	6.66
H	8.92
Average Buffer Width *Round to the nearest integer*	134

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☑ Ⓡ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA.
	☑ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it.
	☑ There is leaf litter, thatch, or wrack in most pools (if pools are present).
	☑ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area.
	☐ There is little or no active undercutting or burial of riparian vegetation.
	☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation.
	☑ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar).
	☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA
	☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☑ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs.
	☑ There are abundant bank slides or slumps.
	☐ The lower banks are uniformly scoured and not vegetated.
	☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel.
	☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation.
	☐ The channel bed appears scoured to bedrock or dense clay.
	☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided).
	☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☑ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year.
	☐ There are partially buried living tree trunks or shrubs along the banks.
	☑ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced.
	☐ There are partially buried, or sediment-choked, culverts.
	☑ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour.
	☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	[✓ **Equilibrium** 5] **Degradation** 2 **Aggradation** 3

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections ⟶	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	13.5	12.2	13.5
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	.91	.82	.91
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	1.82	1.64	1.82
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	70	50	48.5
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	5.85	4.1	3.59
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			4.51

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

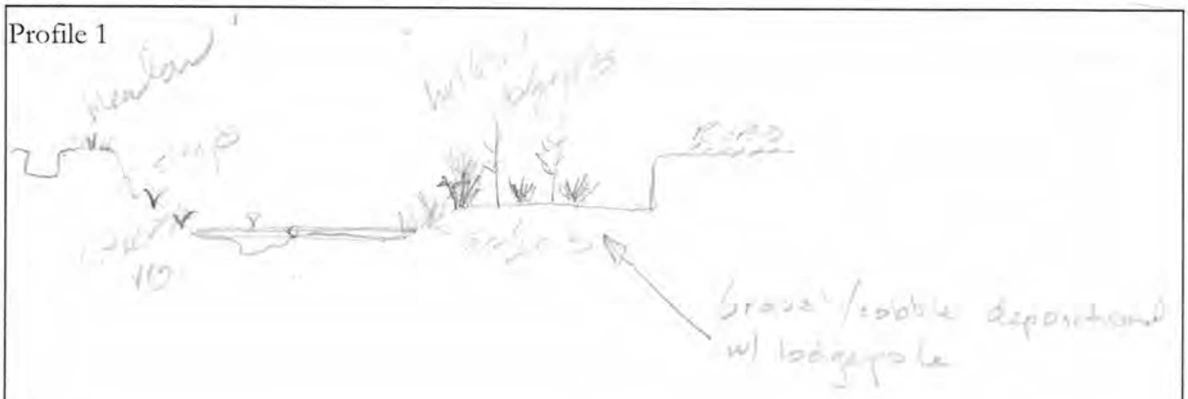
**Please refer to the CRAM Photo Dictionary at www.cramwetlands.org for photos of each of the following patch types.*

STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	**3 m^2**	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain	[✓ 1]	1
Bank slumps or undercut banks in channels or along shoreline	[✓ 1]	1
Cobbles and/or Boulders	[✓ 1]	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	[✓ 1]	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	[✓ 1]	1
Pools or depressions in channels (wet or dry channels)	[✓ 1]	1
Riffles or rapids (wet or dry channels)	[✓ 1]	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	[✓ 1]	N/A
Swales on floodplain or along shoreline	[✓ 1]	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	9	

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

Profile 3

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands

(A dominant species represents ≥10% *relative* cover)

Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

X=co-dom

Trifolium longipes ⊗

Cirsium scariosum

Juncus orthophyllus

Deschampsia cespitosa ⊗

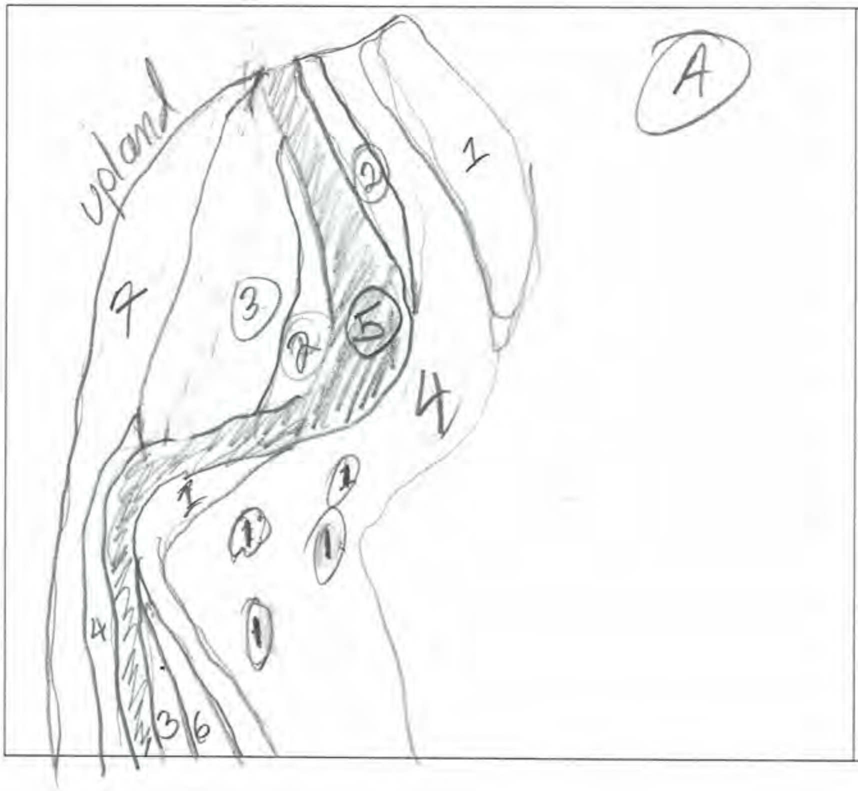
Carex utriculata ⊗

Juncus nevadensis

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
		Ranunculus flammula	
		Mentha arvense	
		Epilobium ciliatum	
		Equisetum arvense	⊗
		Potentilla gracilis	⊗
		Symphyotrichum spathulatum	⊗
		Solidago elongata	⊗
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
⊗ Juncus balticus		Salix lemmonii	⊗
⊗ Poa pratensis		Salix geyeriana	⊗
⊗ Carex nebrascensis		Salix lasiandra	⊗
⊗ Carex pellita			
Carex lenticularis			
Rumex salicifolia			
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and use in Table 18)**	13
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	0

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) willows

2) gravel bar little/no veg

3) vegetated gravel bar, willows dominant + some scattered lodgepole pine

4) meadow sedges & grasses dominant

5) channel

6) low terrace/sedge & willow w/scattered lodgepole & willows

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	[✓ No]		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	**Present**	**Significant negative effect on AA**
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	Road	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		

Comments

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	**Present**	**Significant negative effect on AA**
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		

Comments

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	**Present**	**Significant negative effect on AA**
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation	✗	
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer		

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	**Present**	**Significant negative effect on AA**
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	✓	✓
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments

Appendix E: Water Quality Objectives Calculations

Stream temperature (degrees Celsius)

Date Range: 2005-2020 (August and September)
Record Count: 195
Mean: 12.03 degrees Celsius

Dissolved oxygen (mg/L)

Method 1 (10% depression of normal):
Date Range: 2005-2020 (August and September)
Count: 182
Mean: 8.19 mg/L
10% Depression of Mean = 8.19 x 0.90 = 7.37 mg/L

Method 2 (80% saturation):
Average Temperature (2005-2020): 12.0 degrees Celsius
Barometric pressure at 6000-feet elevation: 81.2 kiloPascals[1]
DO at 100% saturation: 8.61 mg/L[2]
DO at 80% saturation = 8.61 x 0.80 = 6.88 mg/L

pH

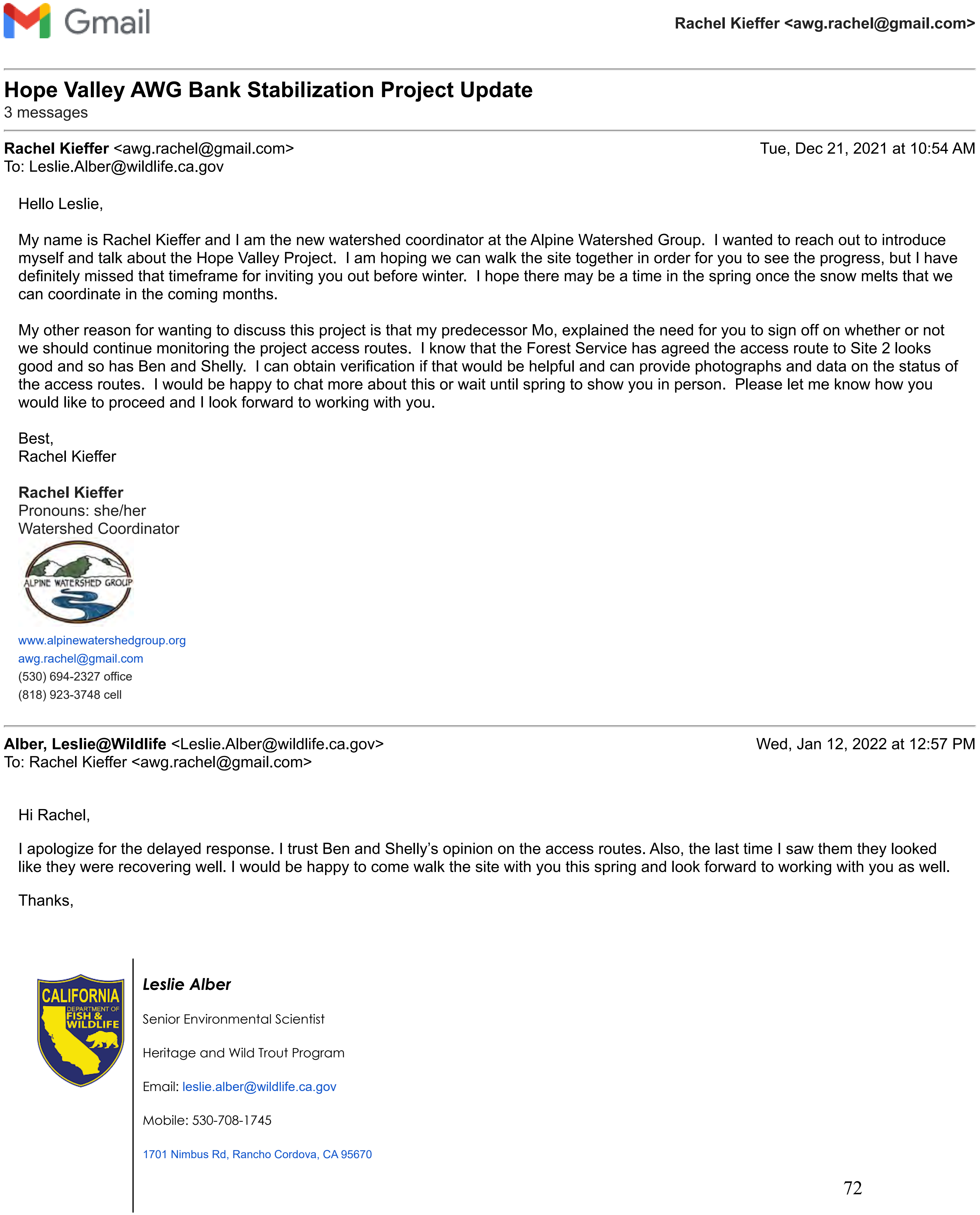
Date Range: 2005-2020 (All Months)
Record Count: 458
Mean: 7.81
Minimum pH = 7.81 – 0.5 = 7.31
Maximum pH = 7.81 + 0.5 = 8.31

Conductivity (µS/cm) to TDS (mg/L)

Conversion factor = 0.64 (estimated for irrigated agriculture beneficial use)[3]
TDS = Conductivity * 0.64[4]

1. Engineering ToolBox, (2003). Atmospheric Pressure vs. Elevation above Sea Level. https://www.engineeringtoolbox.com/air-altitude-pressure-d_462.html [Accessed 10.31.2021].
2. United State Geological Survey. (2018). *Dissolved Oxygen Solubility Tables.* https://water.usgs.gov/software/DOTABLES/
3. Lenntech. (2020). *Water Conductivity.* https://www.lenntech.com/applications/ultrapure/conductivity/water-conductivity.htm
4. Hem, J.D. (1985). *Study and Interpretation of the Chemical Characteristics of Natural Water.* 3rd edition USGS Water-Supply Paper 2254. U.S. Government Printing Office, Washington D.C. https://pubs.usgs.gov/wsp/wsp2254/pdf/wsp2254a.pdf

Appendix F: Site Access Route Communication with CDFW



Gmail **Rachel Kieffer <awg.rachel@gmail.com>**

Hope Valley AWG Bank Stabilization Project Update

3 messages

Rachel Kieffer <awg.rachel@gmail.com> Tue, Dec 21, 2021 at 10:54 AM
To: Leslie.Alber@wildlife.ca.gov

Hello Leslie,

My name is Rachel Kieffer and I am the new watershed coordinator at the Alpine Watershed Group. I wanted to reach out to introduce myself and talk about the Hope Valley Project. I am hoping we can walk the site together in order for you to see the progress, but I have definitely missed that timeframe for inviting you out before winter. I hope there may be a time in the spring once the snow melts that we can coordinate in the coming months.

My other reason for wanting to discuss this project is that my predecessor Mo, explained the need for you to sign off on whether or not we should continue monitoring the project access routes. I know that the Forest Service has agreed the access route to Site 2 looks good and so has Ben and Shelly. I can obtain verification if that would be helpful and can provide photographs and data on the status of the access routes. I would be happy to chat more about this or wait until spring to show you in person. Please let me know how you would like to proceed and I look forward to working with you.

Best,
Rachel Kieffer

Rachel Kieffer
Pronouns: she/her
Watershed Coordinator

ALPINE WATERSHED GROUP

www.alpinewatershedgroup.org
awg.rachel@gmail.com
(530) 694-2327 office
(818) 923-3748 cell

Alber, Leslie@Wildlife <Leslie.Alber@wildlife.ca.gov> Wed, Jan 12, 2022 at 12:57 PM
To: Rachel Kieffer <awg.rachel@gmail.com>

Hi Rachel,

I apologize for the delayed response. I trust Ben and Shelly’s opinion on the access routes. Also, the last time I saw them they looked like they were recovering well. I would be happy to come walk the site with you this spring and look forward to working with you as well.

Thanks,

Leslie Alber

Senior Environmental Scientist

Heritage and Wild Trout Program

Email: leslie.alber@wildlife.ca.gov

Mobile: 530-708-1745

1701 Nimbus Rd, Rancho Cordova, CA 95670 www.wildlife.ca.gov

From: Rachel Kieffer <awg.rachel@gmail.com>
Sent: Tuesday, December 21, 2021 10:55 AM
To: Alber, Leslie@Wildlife <Leslie.Alber@wildlife.ca.gov>
Subject: Hope Valley AWG Bank Stabilization Project Update

WARNING: This message is from an external source. Verify the sender and exercise caution when clicking links or opening attachments.

[Quoted text hidden]

Rachel Kieffer <awg.rachel@gmail.com> Fri, Jan 14, 2022 at 8:22 AM
To: "Alber, Leslie@Wildlife" <Leslie.Alber@wildlife.ca.gov>

Hi Leslie,

Thank you for letting me know and I will start the conversation with LRWQCB on removing the need to monitor access routes moving forward. As for the spring site walk, I know it is impossible to predict the weather, but potentially something in May? How does your schedule look so far for May?

Best fishes,
Rachel Kieffer
Pronouns: she/her
Watershed Coordinator

ALPINE WATERSHED GROUP

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awg.rachel@gmail.com
(530) 694-2327 office
(818) 923-3748 cell

[Quoted text hidden]

CALIFORNIA
Water Boards

Gavin Newsom
GOVERNOR

Yana Garcia
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

25 September 2024

Kimra D. McAfee
Alpine Watershed Group
P.O. Box 296
Markleeville, CA 96120

CERTIFIED MAIL
7022 2410 0001 5093 8367

Tom Fortune
Kirkwood Mountain Resort
P.O. Box 1
Kirkwood, CA 95646

CERTIFIED MAIL
7022 2410 0001 5093 8374

SECOND EXTENSION REQUEST APPROVAL FOR THE SUPPLEMENTAL ENVIRONMENTAL PROJECT ASSOCIATED WITH STIPULATED ORDER R5-2017-0540, KIRKWOOD MOUNTAIN RESORT, AMADOR AND ALPINE COUNTIES

The Central Valley Regional Water Quality Control Board received a request from the Alpine Watershed Group dated 11 September 2024 for an extension of the Supplemental Environmental Project (SEP) completion deadline (Extension Request) specified in Stipulated Order R5-2017-0540 (Stipulated Order). The SEP consists of stabilization of approximately 450 feet of eroding banks along the West Fork of the Carson River. A previous extension dated 10 May 2019 was previously granted extending the deadline to complete the SEP specified in the Stipulated Order from 31 December 2019 to 31 December 2024.

According to the September 2024 Extension Request, project construction was completed in October 2020, supplemental annual monitoring was completed for the following three years, and the California Rapid Assessment Method (CRAM) wetlands assessment required for four years following project construction was completed. The project budget allowed for adaptive management to be completed as needed after project construction. As detailed in the Extension Request, because no adaptive management was needed at Sites 1 and 2, there is funding remaining that will not be expended by the current project completion date of December 31, 2024. According to the Extension Request, $287,671 has been expended as of June 30, 2024, with an additional $10,500 in anticipated expenditures for July through December 2024. This leaves approximately $62,741 remaining for the period of the extension.

The project's Technical Advisory Committee is proposing to stabilize approximately 450 feet of eroding banks along the West Fork of the Carson River in the area between the two existing project sites. This work cannot be completed by December 31, 2024, due to time requirements for design, permitting, and implementation prior to October 15, 2024, or onset of wintry weather. To allow adequate time for design and implementation, the Extension Request proposes an extension to complete the additional restoration and expend the remaining funds by 30 June 2027.

The Stipulated Order allows the Executive Officer of the Central Valley Regional Water Quality Control Board to grant an extension of the deadlines found in the Stipulated Order if the delay was due to circumstances beyond the control of the Project Proponent. This letter approves the Extension Request to expend the remaining SEP funds through 30 June 2027. Please continue to submit the required quarterly deliverables as described in Attachment C of the Stipulated Order.

If you have any questions or comments regarding this extension, please contact Mike Fischer at (916) 464-4663 or michael.fischer@waterboards.ca.gov.

Digitally signed by John J. Baum
Date: 2024.09.25 14:14:42 -07'00'

For Patrick Pulupa
Executive Officer

cc: Naomi Rubin, State Water Board Office of Enforcement, Sacramento
Wendy Johnson, Department of Fish and Wildlife, Sacramento

Kimra McAfee <awg.kimra@gmail.com>

Approval of Amendment for Project Easygrants #66547, Hope Valley Restoration and Aquatic Habitat Enhancement Project - Phases II & III (CA)

1 message

---

easygrants@nfwf.org <easygrants@nfwf.org> Fri, Oct 18, 2024 at 9:26 AM
To: awg.kimra@gmail.com
Cc: eliza.braendel@nfwf.org

Dear Kimra McAfee:

The National Fish and Wildlife Foundation ("NFWF") and Alpine Watershed Group ("Recipient") executed a Project Funding Agreement pertaining to the above-referenced project, effective October 1, 2019 (as the same has been amended from time to time, "Agreement"). NFWF received and reviewed your request for an amendment ("Amendment"), dated October 4, 2024, to modify the Term and Work. NFWF hereby agrees to the requested Amendment. Capitalized terms used but not defined herein shall have the respective meanings assigned thereto in the Agreement.

In Section 2 ("Project to be Funded") of the Agreement, the Project Description and Work are hereby amended in accordance with the section titled "Scope Change Explanation" and all applicable supporting documentation set forth in the Amendment.

In Section 3 ("Term") of the Agreement, the amended Term is from October 1, 2019 to January 26, 2028. The new Termination Date is January 26, 2028, and the new Completion Date is June 30, 2027.

The Scope Change Explanation and all applicable supporting documentation shall be deemed to modify the Project set forth in the Agreement.

In Section 7 ("Reporting") of the Agreement, remaining reporting task requirements are as follows:

Report Due Dates:

October 31, 2024:

1. Interim Programmatic Report
2. Annual Financial Report

October 31, 2025:

1. Interim Programmatic Report
2. Annual Financial Report

October 31, 2026:

1. Interim Programmatic Report
2. Annual Financial Report

July 30, 2027 (30 days after the Completion Date):

1. Draft Final Programmatic Report
2. Draft Final Financial Report

December 27, 2027 (30 days prior to the Termination Date):

1. Final Programmatic Report
2. Final Financial Report

Payment Request Task Due Dates:

July 30, 2027 (30 days after the Completion Date):

1. Draft Final Payment Request

December 27, 2027 (30 days prior to the Termination Date):

1. Final Payment Request

Recipient and NFWF acknowledge and agree that Recipient's request for the Amendment and NFWF's agreement thereto as set forth herein constitute, as of the date of this approval, a formal amendment to the Agreement in accordance with Section 16 ("Amendments") of the Agreement. Recipient and NFWF acknowledge that, except as expressly provided herein, all other conditions of the Agreement shall remain the same.

Please contact Eliza Braendel with any questions.

Thank you,

National Fish and Wildlife Foundation

66547 Amendment Request 2 (10.4.24).pdf
54K