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TO: Angelo Raftopoulos, Gene Riordan and Agency Team

FROM: Julie Ash, PE, Johannes Beeby, and Karin Emanuelson, Stillwater, Jon Dauzvardis, PWS, ECOS, Casey Cisneros, Greenback Environmental

SUBJECT: Vermillion Creek Restoration at Diamond Peak Ranch – 2024 Annual Report - Adaptive Management and Monitoring Phase

1 INTRODUCTION

The final Monitoring and Adaptive Management Plan (MAM Plan) dated April 11, 2022, defined specific phases for Adaptive Management and Monitoring efforts for the Vermillion Creek Restoration Project (Project). The large flood event that occurred in October 2022 during construction implementation, compounded by subsequent high flow runoff events occurring in Spring 2023, necessitated adjustment to some timelines defined in the MAM Plan. Adjusted timeline information is conveyed in the phasing definitions below.

Adaptive Management Phasing

- Phase 1 construction activities (construction commenced in 2022 prior to the October 2022 flood event and completed in 2023 after the flood) – Activities described in detail in the 2023 Annual Report.
- Adaptive management began in the fall of 2023 after all construction activities were completed - Activities described in detail in the 2023 Annual Report.
- Adaptive management continued in 2024 after spring runoff - Activities described in detail in Section 3 of this report – 2024 Adaptive Management Activities.
- (Future) Adaptive management will continue in 2025 – Planned activities described in detail in Section 3.5 of this report – Recommendations for 2025 Adaptive Management Activities.

Monitoring Phasing

- Initial monitoring was conducted in 2023 after construction activities were completed with monitoring data described in detail in the 2023 Annual Report.
- 2024 Monitoring– Monitoring after completion of Phase 1 construction activities and 2023 adaptive management phase - Activities described in detail in Section 3 of this report – 2024 Monitoring Activities;
- (Future) 2025 Monitoring – Monitoring after 2024 Adaptive Management; and
- (Future) 2026 Monitoring – Monitoring after 2025 Adaptive Management.
- (Future) Per the MAM Plan, monitoring will continue until the submittal of two consecutive annual monitoring reports that demonstrate that all final performance standards have been met.

To lead 2024 adaptive management and monitoring efforts, the Project Restoration Team, comprised of Stillwater Sciences (Stillwater), Ecosystem Services, LLC (ECOS) and Greenback Environmental (GBE):

- Completed 2024 site assessments in June 2024 and during the last week in August 2024 (Stillwater, ECOS);
- Collected monitoring data (Stillwater, ECOS);
- Directed survey efforts (for completion by Epp & Associates, Professional Land Surveyor (PLS)) (Stillwater, ECOS)
- Identified priority adaptive management actions for completion by Diamond Peak Cattle Company (DPCC) staff) (Stillwater, ECOS, GBE); and
- Conducted weed management training for DPCC staff in June 2024 to help inform effective upland weed management treatments and actions (GBE).

As required by the MAM Plan, DPCC is providing an annual report to the Agency Team by December 31st following completion of 2024 Monitoring and 2024 adaptive management activities.

Section 2 of this 2024 Annual Report documents the Project goals and objectives that guide Project activities.

Section 3 of this 2024 Annual Report discusses adaptive management activities taken in 2024 and documents recommendations for 2025 adaptive management activities. 2024 adaptive management activities included revegetation measures, water management for the Little Joe Wetland, sitewide weed management, and treatment of the upstream headcut area. Additionally, Section 3 provides details addressing the Agency Team's list of discussion points conveyed via email on September 24, 2024, including:

- Willow Stakes
- Clover
- Tamarisk
- Little Joe Wetland
- Cottonwoods

Section 4 of this 2024 Annual Report presents 2024 monitoring data and results, including:

- Topographic Survey (Section 4.1)
- Shallow Groundwater Well Monitoring (Section 4.2)
- Peak Flow Monitoring (Section 4.3)
- Vegetative Monitoring (Section 4.4)
- Photo Documentation (Section 4.5)
- Qualitative Stream Evolution Model (SEM) Stage Assessment (Section 4.6)
- Independent FACWet Assessment (Section 4.7)

Section 5 of this report presents conclusions of 2024 adaptive management and monitoring efforts.

In compliance with MAM Plan-directed reporting, this 2024 Annual Report meets the reporting requirement upon completion of Phase 1 construction activities and 2023 adaptive management activities. The Project Restoration Team will review site conditions following spring runoff in 2025 to determine whether/what additional adaptive management activities are warranted in 2025. Additionally, Stillwater and ECOS will monitor the Project in August or September 2025.

2 PROJECT GOALS AND OBJECTIVES

The following text is taken from the Vermillion Creek Restoration at Diamond Peak Ranch – Restoration Plan; Basis of Design Report, dated March 28, 2022.

> The goal of the Project is to remedy impacts to jurisdictional Waters of the U.S., including wetland habitat, caused by earthwork activities in 2012 that altered channel and floodplain configurations that reduced aquatic resource area and functions on private and BLM lands.
>
> The objective of the Project is to replace lost functions by restoring Vermillion Creek, its fringe wetlands, and the Little Joe Creek tributary wetland complex. The Project is a result of the settlement of a federal enforcement action. The project will result in a minimum of 8.47 acres of wetlands and return Vermillion Creek to an alignment similar to pre-disturbance alignment and sinuosity.

Performance standards must be met to achieve project objectives. A FACWet analysis based on Regional References was prepared by Dr. Brad Johnson, Johnson Environmental Consulting (JEC). The FACWet data (Vermillion Creek Functional Assessment 2021-06-01 LR.pptx and Vermillion FACWet – 2021-06-01.xls) were delivered to the Agency Team via email on June 8, 2021, and reviewed in the field on May 26, 2021.

Because the wetlands to be restored are primarily supported by Vermillion Creek and its tributaries, designing for channel and floodplain conditions that are sustainable long-term is critically important. The Project Restoration Team has applied a process-based restoration approach, similar to Beechie et al. (2010) and Wheaton et al. (2019), which works with natural fluvial and ecological processes. This process-based approach is intended to deliver long-term functionality to this dynamic system.

3 2024 ADAPTIVE MANAGEMENT ACTIVITIES

Precipitation in 2024 was near average at the Project site. Conditions within the inset floodplain were observed to be notably drier than 2023, allowing for significant vegetation establishment within the inset floodplain. Additionally, the Project Restoration Team observed channel responses and natural processes under much different conditions than 2023, which in combination with 2023 monitoring activities informed 2024 adaptive management activities. The following sections discuss individual adaptive management activities that occurred during 2024.

3.1 Additional Seeding and Planting Measures

No further seeding (upland or wetland) was performed in 2024 pending observation of seed installed in 2023 and efficacy of 2024 weed management activities. Upland seed germination and establishment was poor in 2024 due to low and inconsistent precipitation throughout the growing season. Temporary irrigation was recommended to establish upland seed.

Three hundred (300) native dormant cottonwood poles (12-16 feet in length) were harvested from within the watershed and planted on point bars and banks in April 2024, approximately 3-4 feet above the groundwater elevation where existing cottonwood whip recruitment was observed. Most of the poles were depredated by elk except for those that were out of reach. These poles were collected when leaves were off. After leaf-out it was discovered that narrow-leaf cottonwood (Populus angustifolia) was planted.

Sources of Freemont cottonwood (Populus fremontii) poles were identified in 2024 prior to leaf-drop. See Fremont cottonwood pole source Photo 1 in Appendix A. Dead narrowleaf cottonwood poles will be removed and replaced with Freemont cottonwood poles in early spring 2025. Protective measures will be implemented to prevent future depredation. See live and dead narrowleaf cottonwood pole Photos 2-3 in Appendix A.

3.2 Little Joe Wetland

Water supply of Little Joe Wetland was managed throughout the 2024 growing season to establish seeded areas and natural recruitment of wetland species. Water management consisted of fine tuning the inundation frequency, flow-through, and hydroperiod of the wetland cells via the slide-gate system installed to circuitously disperse approximately 1 cfs of water through the system. This water regime is estimated to provide enough water to saturate a maximal wetted permitter of the constructed wetland and adjacent pre-existing wetlands within the overbank floodplain. Inundation and standing water when initially applied draws down after approximately 2 days exposing saturated soil to sunlight thereby preventing the drowning of emerging wetland species. Wetland vegetation was starting to emerge in 2024 as a result of the current water management program.

3.3 Weed Management

Weed management actions are aimed at reducing plant competition with desirable species and to reduce the presence of state listed noxious weeds at the restoration site. Prior to the 2024 growing season, Greenback Environmental (GBE) joined the Project Restoration Team to provide additional specialized technical assistance and to provide DPCC worker training in weed management protocols.

The Vermillion Creek Restoration Project Weed Management Plan (WMP) (Appendix B) was refined in 2024 by ECOS and GBE in response to Agency Team comments to include specific herbicides, timings and techniques to use on each troublesome or noxious species surveyed at the site. The WMP and a Pesticide Use Plan (PUP) were submitted and approved by the BLM field office.

GBE conducted a site assessment on June 8, 2024, to prioritize weed management activities. Following the assessment, GBE provided selective herbicides and training to the DPCC supervisor who would oversee weed management at the restoration site.

In July, DPCC workers sprayed, hand pulled, and whipped down troublesome/noxious weeds specifically targeting Canada thistle, common burdock, kochia, musk thistle, perennial pepperweed, Russian knapweed, Russian olive, and tamarisk. As noted previously by the Agency Team, young tamarisk are growing throughout the restoration site. The 150 tamarisk identified as not yet woody were hand pulled. Other young tamarisk were treated with a selective herbicide.

On August 28, 2024, ECOS flagged the entire outer perimeter of Restoration Site (i.e., edge of buffer) to establish a visual boundary in which to focus weed management activities. ECOS recommended that DPCC memorialize the perimeter with more permanent wood and metal stakes.

While flagging the perimeter of the Restoration Site, ECOS mapped State Listed Noxious Weed patches, including tamarisk, Russian olive, and perennial pepperweed to be treated in 2025. See 2024 Weed Map, which is included with the WMP in Appendix B.

In the winter of 2024/2025, DPCC workers have been directed to begin removing and treating mature Russian olive and tamarisk trees from the Restoration Site

3.4 Headcut Treatment

Upstream Headcuts

A headcut treatment was requested by the Agency Team to slow progress of the upstream headcuts on Vermillion Creek. The following paragraph provides a summary of the upstream headcut treatment. The upstream headcut technical memo, including design drawings, can be found in Appendix C. The technical memo presents assumptions, methods, and findings of the quantitative analysis including a calculations spreadsheet.

> In general, two rock ramps were designed to protect from mobilization and scour up to the 10-year flood event on the main and overflow channels (Photos 7-8 in Appendix A). The rock ramps were constructed in late August and early September 2024 and included 10ft rock key-ins at the upstream ends of the rock ramps that also spanned the valley floor between the two channels (Photos 4-6 in Appendix A). A 3-ft rock toe-down was installed at the downstream end of both rock ramps to help protect against scour. Adaptive management of the rock ramps will include adding additional rock, soil, and/or branchy materials, as needed, if the headcuts begin to flank around the rock structures

Downstream Headcut

As part of adaptive management of the rock ramp headcut treatment at the downstream end of the project area, additional rock was added to the structure to help slow flanking along the river left side (Photo 9 in Appendix A).

3.5 Recommendations for 2025 Adaptive Management Activities

Observations by the Project Restoration Team in 2024 show that planted and recruited vegetation has continued to establish on bars, within the inset floodplain, and throughout the wetland complex, indicating positive progression along the intended geomorphic trajectory. With continued vegetation establishment and effective weed management, the Project is anticipated to continue progressing along this geomorphic trajectory towards healthier, more functional SEM stages, and wetland acreage expansion, as needed for compliance with Project goals and objectives. A recommended focus in 2025 is on weed management within the upland buffer.

Table 1 outlines the design team's recommended adaptive management actions for 2025. The recommended actions will be refined based on the 2025 site assessment, which will occur after 2025 spring runoff. Recommended activities that address the Agency Team concerns conveyed via September 24, 2024 email are incorporated into Table 1 recommendations. Response to each concern is provided below:

- Willow Stakes: ECOS has recommended 6000 additional willow cuttings will be collected and planted throughout the Site in early spring 2025.
- Clover: Clover and alfalfa are nitrogen fixing plants that provide interim stability and roughness elements and are not hindering willow growth and establishment. Efforts to remove clover and alfalfa via chemical or mechanical removal (i.e., mowing or cutting) carry potential adverse effects, including damage to establishing willows. Once willows become taller than the clover and alfalfa, the potential for adverse effects from weed removal decreases. Monitoring in 2025 will include re-evaluation of clover and alfalfa versus willow establishment. If clover and/or alfalfa have become problematic to willow

establishment, weed management to remove clover and/or alfalfa will be added to adaptive management activities.

- Tamarisk: ECOS and GBE have recommended chemical and mechanical treatment of seedlings, adolescent and mature tamarisk in 2025 as per the WMP.
- Little Joe Wetland: Water supply and distribution throughout the wetland was effective in 2024 and will continue in 2025. Treatment of Kochia as per the WMP around Little Joe is recommended.
- Cottonwoods: Planting and caging of approximately 300 Fremont cottonwood poles are planned in 2025 to replace dead Narrowleaf cottonwood poles. As noted in Section 3.1, protective measures will be implemented to prevent future depredation.

Table 1: Summary of recommended 2025 adaptive management actions

Area	Action	Date
Vermillion Creek Channel	Willow stake harvest	April 2025
	Willow staking	May 2025
	Fremont cottonwood pole harvest	April 2025
	Fremont cottonwood pole planting	May 2025
	Herbaceous noxious weed management	May-June 2025
	Alfalfa management	July 1, July 15, August 1, 2025
	Summer - noxious weed management	July 1, July 15, August 1, 2025
	Late summer - map weeds and mark trees for removal	End of Aug - Sept 2025
	Fall/winter - cut-stump treatment and removal of Russian olive and tamarisk	Sept 15 - Dec 31, 2025
	Fall - treat fall regrowth of noxious weeds	Sept 15 – Nov 15, 2025
Upland	Late spring - noxious weed management	May-June 2025
	Late spring - kochia management	June 15 - 30 2025
	Summer - noxious weed management	July 1, July 15, August 1, 2025
	Late summer - map weeds and mark trees for removal	End of Aug or Sept
	Fall/winter - cut-stump treatment and removal of Russian olive and tamarisk -	Sept 15 - Dec 31, 2025
	Fall - treat fall regrowth of noxious weeds	Sept. 15 – Nov 15, 2025
	Re-seeding	Late Oct - Nov 2025
Little Joe	Water management	Continuously throughout growing season
	Late spring - Russian olive and tamarisk - seedlings management	Mid-June 2025
	Late spring - noxious weed management	Mid-June 2025
	Summer - noxious weed management	July 1, July 15, August 1, 2025
	Late summer - map weeds and mark trees for removal	End of Aug. or Sept.

	Fall - woody tamarisk and Russian olive management	Sept 15 - Dec 1, 2025
	Fall/winter - cut-stump treatment and removal of Russian olive and tamarisk	Sept. 15 - Dec 1, 2025

4 2024 MONITORING ACTIVITIES

As specified in the MAM Plan, Phase 1 monitoring started in 2024 after the completion of Phase 1 construction activities and the first year of adaptive management activities. 2024 monitoring included the following activities:

- Resurvey at least 12 of the previously established valley-wide topographical cross sections to establish as-built conditions as baseline condition to compare any potential future change;
- Locate and survey longitudinal topographic transect (i.e., longitudinal profile) to establish as-built conditions as baseline condition to compare any potential future change;
- Use the valley-wide topographical cross sections and longitudinal topographic transect and shallow groundwater well data at representative intervals to estimate lateral extents of water distribution;
- Establish photo points and provide photographic documentation of as-built conditions;
- Review and summarize the data and recommended adjustments that may be necessary to maintain a trajectory toward a functional Creek that will support the required wetland acreage and a FACWet Composite FCI score of 81;
- Perform a baseline, FACWet Level 2 - Rapid Assessment; and
- Perform a visual, qualitative SEM stage assessment.

4.1 Topographic Survey

A PLS from Epp & Associates collected a comprehensive topographic survey on October 24 and 25, 2024, including drone flight using DJI Mavic 3 Enterprise RTK and ground survey with a RTK GPS. Epp & Associates processed drone data using Pix4d and contoured data to 1-ft intervals.

Additionally, ground survey of the monitoring, control, and crest-stage gage cross sections (locations shown in Appendix D), longitudinal profile, groundwater well locations, and crest-stage gage datum was completed in unison to capture the channel bottom topography that was inundated with water during the drone flight. All cross sections were surveyed from top of bank to top of bank. The longitudinal profile followed the channel thalweg.

Ground survey data was merged with drone survey data to develop valley-wide cross sections. Cross sections and longitudinal thalweg profiles comparing the 2024 monitoring survey data with the 2023 monitoring data and proposed design elevations (referred to as “Constructed Sept 2022”) is presented in Appendix E. See Table 2 for a summary of all survey data collected to date.

Table 2: Summary survey data collected to date.

Survey Type	Date(s)	Surveyor	Method	Description
As-built	Sep-Oct 2022	Epp & Associates	Ground Survey	As-built design elevations were verified onsite with a RTK GPS to be within 0.2 feet of proposed design elevation. X Field Services had surveyor verify as-built design elevation as mass grading sections were completed. Because no ground survey data were stored during design checks and no ground survey was completed before the October 2022 flood event, no survey data was collected to establish as-built conditions and the proposed design elevations were used as the baseline condition when using the monitoring survey data to track changes.
Post-Flood Monitoring	June 29, 2023	Epp & Associates	Drone Flight	Drone flight was completed using a DJI Phantom 4 Pro and was processed using Pix4d. Drone data was contoured to 1 ft intervals. These survey data capture the top of water rather than channel bottom for inundated areas within the inset floodplain.
2023 Monitoring	11/9/2023 & 11/14/2023	Epp & Associates	Ground Survey & Drone Flight	Survey of the monitoring and control cross sections, survey of a longitudinal profile, survey of the groundwater well locations, and survey of the crest-stage gage datum and cross section. Ground survey picked up all cross sections from top of bank to top of bank and the longitudinal profile following the channel thalweg. Ground survey data were merged with drone survey data to develop valley-wide cross sections.
2024 Monitoring	10/24/2024 & 10/25/2024	Epp & Associates	Ground Survey & Drone Flight	Survey of the monitoring and control cross sections, survey of a longitudinal profile, survey of the groundwater well locations, and survey of the crest-stage gage datum and cross section. Ground survey picked up all cross sections from top of bank to top of bank and the longitudinal profile following the channel thalweg. Ground survey data were merged with drone survey data to develop valley-wide cross sections.

4.2 Shallow Groundwater Well Monitoring

Groundwater depth data was collected using pressure transducer data loggers (In-situ Rugged TROLL 100) at 26 groundwater well locations located at the toe of bank on the river left and river right side of each monitoring transect (locations shown in Appendix D). The location of the groundwater wells at the toe of banks along each monitoring transect was strategic to provide information on the lateral extents of groundwater influence within the inset floodplain in addition to the groundwater depth data.

Groundwater depth data was collected continuously at a 1-hour interval from May 17, 2024 at 12:00am to September 19, 2024 at 12:00am at 25 groundwater well locations. Due to equipment malfunction, which was detected and remedied in July/August, groundwater depth data on the river right side of monitoring transect 1 was only collected from August 2, 12:00pm to September 19, 2024 at 12:00am at a 12-hour interval.

Data was downloaded and exported using WinSitu 5. The groundwater data was corrected using atmospheric pressure data from a barometric pressure sensor (In-situ Rugged BaroTROLL) installed on-site at the start of the groundwater monitoring. The atmospheric pressure data for each well was then converted to water stage to determine a depth of groundwater above the data

logger in the well. To determine the groundwater elevation of each well, a combination of survey data and field measurements were used to approximate the data logger elevation. The groundwater stage was then added to the data logger elevation to determine a groundwater elevation.

Analysis of the groundwater elevation data included using a python code to determine the maximum groundwater elevation that occurred for 14 consecutive days. This maximum groundwater elevation was then compared to ground elevation data from the survey, as well as 1 ft below ground elevation. This analysis showed that 11 of the 26 groundwater wells had a 14-consecutive day maximum groundwater elevation within 1 foot of the ground surface at the monitoring well.

As noted above, the groundwater wells were installed at the toe of banks along each monitoring transect to provide information on the lateral extents of groundwater influence within the inset floodplain. At some transects, this toe of bank location is higher than the majority of the inset floodplain. The importance of this distinction is that the 14-consecutive day maximum groundwater elevations are within 1 foot of the ground surface for the majority of the inset floodplain footprint, even at transects with groundwater elevations that are not within 1 foot of the ground surface right at the groundwater well.

To visually demonstrate actual extents, the 14-consecutive day maximum elevation was overlaid onto the monitoring transect cross sections (Appendix E) to display the groundwater elevation relative to the channel bottom elevation throughout the cross section. The extents represent only the potential groundwater contribution to supporting wetland conditions. Both groundwater and surface water sources support wetland conditions, so the extents are a conservative indicator of potential wetland hydrology.

Refer to Appendix F for plots of each groundwater well including the time series of groundwater elevation, ground surface elevation, 1’ below ground surface elevation, and the 14-consecutive day maximum elevation.

4.3 Peak Flow Monitoring

As specified in the MAM Plan, stage readings are to be taken from the crest-stage gage after each precipitation event measuring ≥ 0.5 inches. No events of this magnitude occurred during the 2024 monitoring period.

DPCC monitored the rain gage anytime a major rain event occurred on the project site. Two rain events were recorded on May 8, 2024 and May 24, 2024 with 0.3 in and 0.45 in of precipitation measured respectively (Photos 9-10 in Appendix A).

4.4 Vegetation Monitoring

Vegetation monitoring included visual observations by ECOS, as summarized below.

- Overall absolute percent cover of dominant wetland species (OBL, FACW or FAC) have nearly doubled since 2023 (from 15 to 30-40% cover) with a great deal of natural recruitment of herbaceous wetland species;
- Overall absolute percent cover of trees, shrubs and herbs by strata have increased since 2023 as follows:
    - Upland Shrubs and Grasses from 0 to 5% cover;
    - Riparian Trees from 0 to 10% cover of cottonwood seedlings and whips;

  - Wetland Shrubs from 6 to 12% cover of willow with many spreading by natural recruitment from willow cutting root stock;
  - Wetland Herbs from 9 to 30% cover; and
  - Common Weeds/Ruderal Species from 10 to 50% cover of alfalfa, sweet clover and kochia which are common on recently disturbed sites. Kochia cover along the berms within and in between the Little Joe and the creek was high. Mowing is recommended to reduce cover and encourage underlying seed germination.
- Overall absolute percent cover of noxious weeds has remained relatively constant since 2023 as follows:
  - List A are not present;
  - List B species are less than 10% total vegetation cover. List B noxious weeds on site include Canadian and bull thistle, Russian knapweed, Russian olive, perennial pepperweed, and tamarisk. Tamarisk seedlings are emerging in preferred willow areas that could increase cover percentages over time; and
  - List C species are less than 10% total vegetation cover. List C species include cheatgrass.

Qualitatively:

- Overall vegetation cover is immature and needs more time to establish;
- Natural recruitment of willow is significant, rooting from cuttings that appear dead;
- Willow cuttings have doubled in height;
- There has been some natural willow mortality but willow cutting survival is estimated to be 60-70%;
- Natural recruitment of cottonwood seedlings is significant, especially in the lower reaches where existing cottonwoods are located;
- Natural recruitment (invasion) of tamarisk is significant, especially in the lower reaches where existing, mature tamarisk are/were pervasive prior to the project;
- Upland buffer area vegetation is immature and requires more and consistent precipitation to germinate and establish;
- Common weed cover following ground disturbance is as expected, but increased the overall cover and soil stability in the buffer; and
- Alfalfa and sweet clover are not inhibiting the growth or spread of willow.

4.5 Photographic Documentation

Photos were taken at established photo points at each monitoring transect from the central of the channel documenting 2024 stream and wetland conditions, including Little Joe Wetland. 2024 photos were added to Appendix G - USACE Monitoring Report Form, including those taken in 2023 for comparison. Additional supplementary photos were taken by multiple team members to document and graphically describe site conditions. Refer to Appendix A – Photo Log.

4.6 Qualitative SEM Stage Assessment

A Stream Evolution Model (SEM) stage assessment was conducted after spring runoff on June 10, 2024. Results from the 2024 SEM assessment were compared to the 2023 SEM assessment to help determine the current trajectory of Vermillion Creek. Annual comparisons will continue each year during the monitoring period.

Overall, the SEM assessment showed minimal change in SEM stage from 2023 to 2024. Only one SEM reach changed trajectory in the lower half of the project area (Figure 1). Reach 5 showed slightly more channel incision since 2023 which changed its stage from SEM 5 (Aggradation and

Widening) to SEM 4/5 (Degradation and Widening/Aggradation and Widening). Consequently, Reach 5 was merged with Reach 4 since they now have the same SEM stage.

Generally, some minor channel incision (~1ft or less) did occur at the downstream end of the project area between 2023 and 2024. However, the incision was not resulting in degradation and widening, therefore, the SEM stages stayed the same. Vermillion Creek in the upper half of the project area showed no significant change. Overall, vegetation is beginning to establish along the channel bottom which will help push Vermillion Creek towards Stage 6 (Quasi-equilibrium), Stage 7 (Laterally Active), or Stage 8 (Anastomosed) (Figure 2).

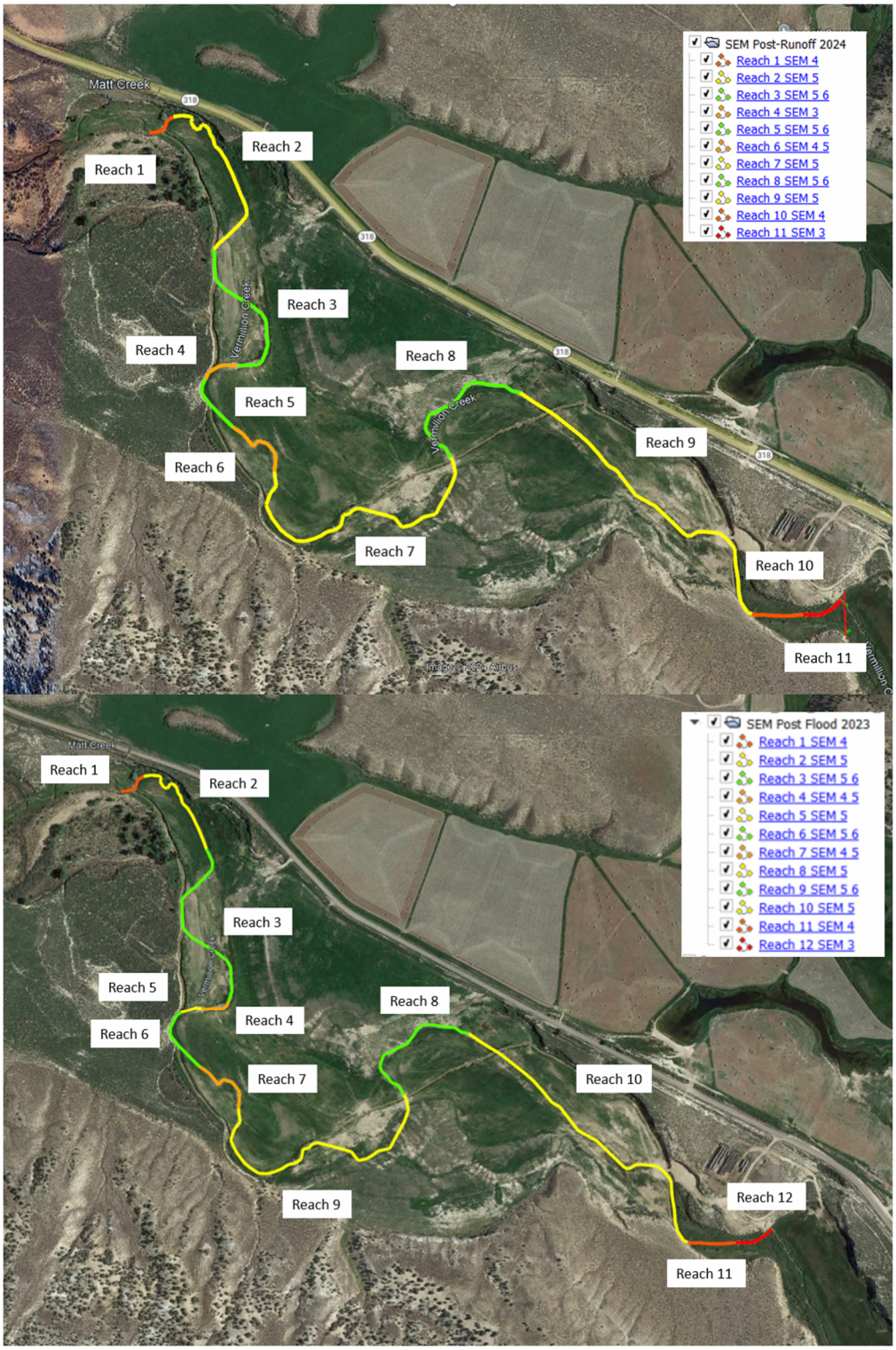

Figure 1 - Stream Evolution Model (SEM) assessment results from 2024 (top) and 2023 (bottom).

Figure 2 – Vegetation is beginning to establish along the channel bottom which help push Vermillion Creek towards SEM stage 7 and/or stage 8.

4.7 Independent FACWet Assessment

All functional assessment work for the Project is conducted by Dr. Brad Johnson, Johnson Environmental Consulting, LLC (JEC), using the Functional Assessment of Colorado Wetlands (FACWet) method, consistent with FACWet methodology that JEC used for the initial assessment that supports and is included in the MAM Plan.

As specified in the MAM Plan, Phase 1 monitoring includes a baseline, FACWet Level 2 - Rapid Assessment. In 2023, JEC conducted the site-level FACWet Level 2 -Rapid Assessment and prepared the FACWet baseline report. Results from the FACWet baseline assessment helped inform 2024 adaptive management activities. The composite FACWet score for the baseline assessment was a C- (72) as compared to the C+ (78) regional reference, which is 9 points short of a target score of 81 (B-) and better than the typical regional condition. The 2023 annual report included JEC's baseline report, which is also provided for convenience in Appendix H of this report.

For this 2024 report, JEC completed a 2024 remote independent functional assessment, based on current site conditions, as an update to the 2023 site-level FACWet baseline assessment. The 2024 FACWet update is provided in Appendix I of this report.