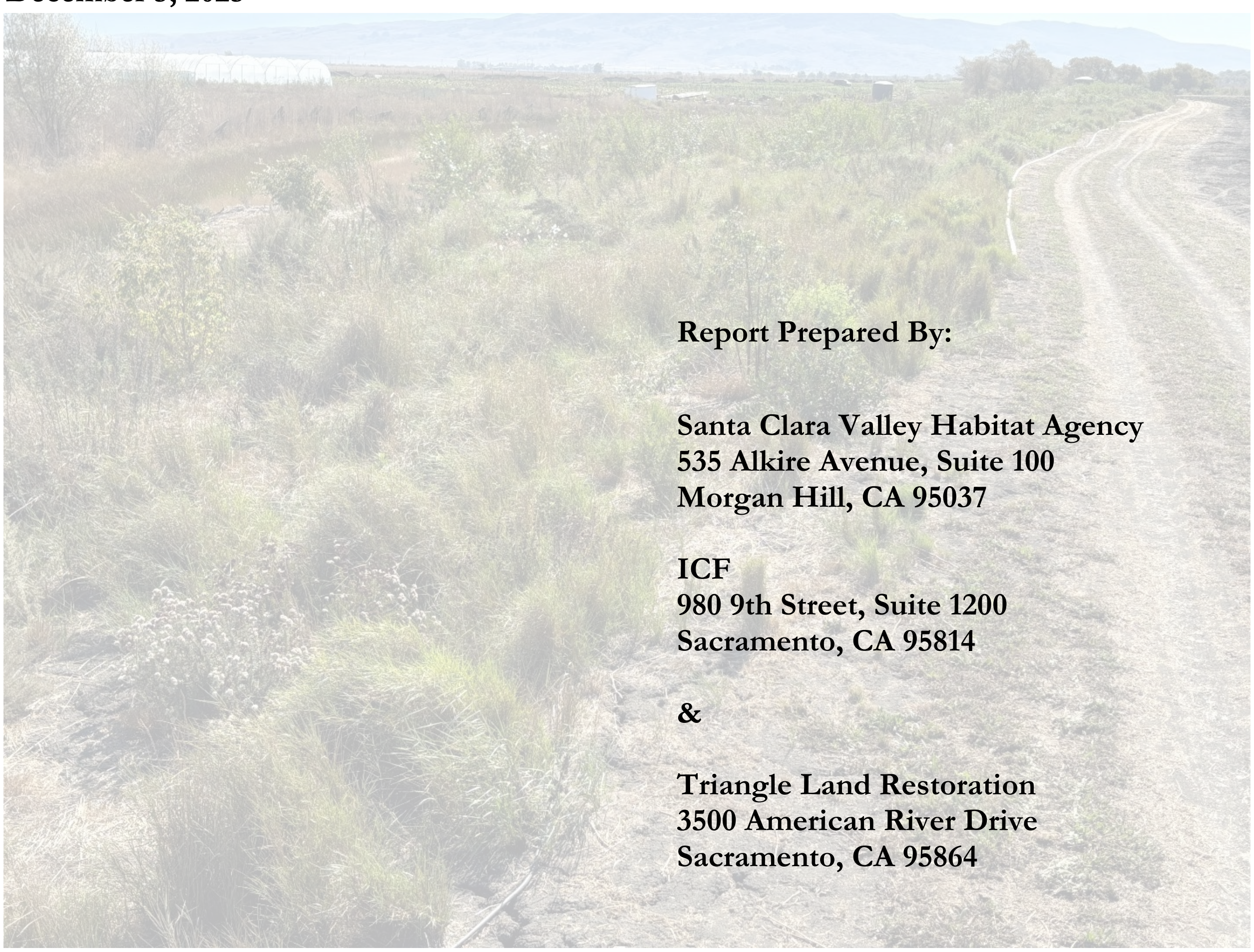
PAJARO RIVER RIPARIAN HABITAT RESTORATION PROJECT

YEAR 1 (2025)
ANNUAL MONITORING REPORT

December 5, 2025



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ATTACHMENTS

ABSTRACT

The Pajaro River Riparian Habitat Restoration Project aims to restore approximately 1.0 acre of seasonal wetland/marsh habitat and 4.0 acres of mixed riparian woodland along the Pajaro River near Gilroy, California. The project, by the Santa Clara Valley Habitat Agency and the Santa Clara Valley Open Space Authority, was constructed in Fall 2023, with plantings completed by June 2024. The Year 1 monitoring report (2025) documents progress toward ecological performance standards, including wetland vegetation cover, riparian vegetation survival, and invasive plant management. Results show 44.6% wetland vegetation cover, 93% survival of riparian vegetation, and minimal invasive plant cover, meeting Year 1 criteria. Maintenance activities included irrigation and weed management, including herbicide spot treatment applications. Photo documentation and geomorphic assessments indicate positive progress in habitat restoration and stream stability; however, there is some natural erosion that might be worth addressing through seeding or other methods to keep an eye on. The project is on track to achieve its long-term goals of enhancing ecological connectivity, biodiversity, and climate resilience.

2 Section A: General Project Information

2.1 Project Name:

Pajaro River Riparian Habitat Restoration Project (Phases I & II)

2.2 Permits:

- USACE SPN-2021-00269 (File No. SPN-2020-00269)
- Central Coast RWQCB Cert. No. 34322WQ05
- CDFW LSAA No. EPIMS-SCL-29372-R3

2.3 Permittee:

Santa Clara Valley Habitat Agency: 535 Alkire Avenue, Suite 100, Morgan Hill, CA 95037

Contact: Nathan Hale, (669) 258-4246, nathan.hale@scv-habitatagency.org

2.4 Project Location and Ownership

Figure 1 depicts the project vicinity location. In general, the project occurs southeast of the City of Gilroy, California along the Santa Clara County side of the Pajaro River upstream of the confluence with Llagas Creek and immediately downstream of the Frazier Lake Road bridge.

The property where the project occurs is known as the South Pajaro River Agricultural Preserve, and it is owned in fee title by the Santa Clara Valley Open Space Authority (OSA), a project partner. OSA is collaborating with the Santa Clara Valley Habitat Agency (Habitat Agency) to develop restoration projects along the Pajaro River to occur within the property. A conservation easement will eventually be placed over the restored portions of the property, which will be held by the Habitat Agency and comanaged by both organizations.

2.5 Project Purpose

The Pajaro River Riparian Habitat Restoration Project aims to restore a section of the Pajaro River and its surrounding riparian and floodplain habitats to enhance ecological connectivity, biodiversity, and resilience to climate change. The project includes planting native vegetation, grading channel banks to create low-flow benches, improving water quality, alleviating downstream flooding, and providing habitat for special-status species. The project aims to restore approximately 1.0 acres of seasonal wetland/marsh habitat and 4.0 acres of mixed riparian woodland (Figure 2).

3 Section B: Notices of Commencement/Completion

This restoration project was constructed (i.e., earthwork implemented) in Fall 2023 with irrigation and plantings installed through June 2024. A sizable number of replacement plantings were installed in December 2024.

All construction is considered complete (SCVHA 2024). This project has no active financial maintenance bond. The project was built by Triangle Land Restoration (formerly Triangle Properties, Inc.) with planting support by Point Blue Conservation Science through student planting days. Ongoing maintenance is provided by Triangle Land Restoration.

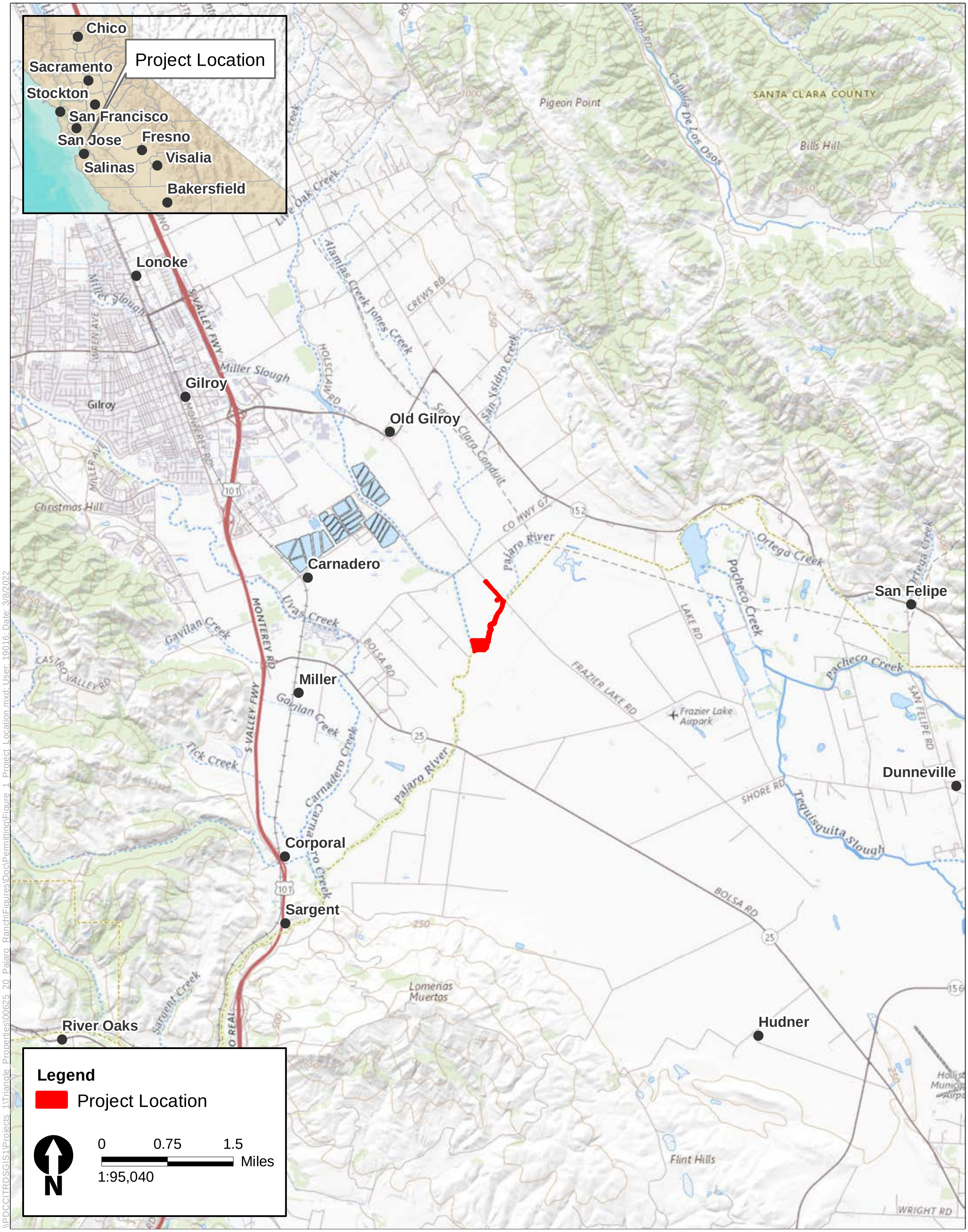

Figure 1
Project Location
Pajaro River Riparian Habitat Restoration Project

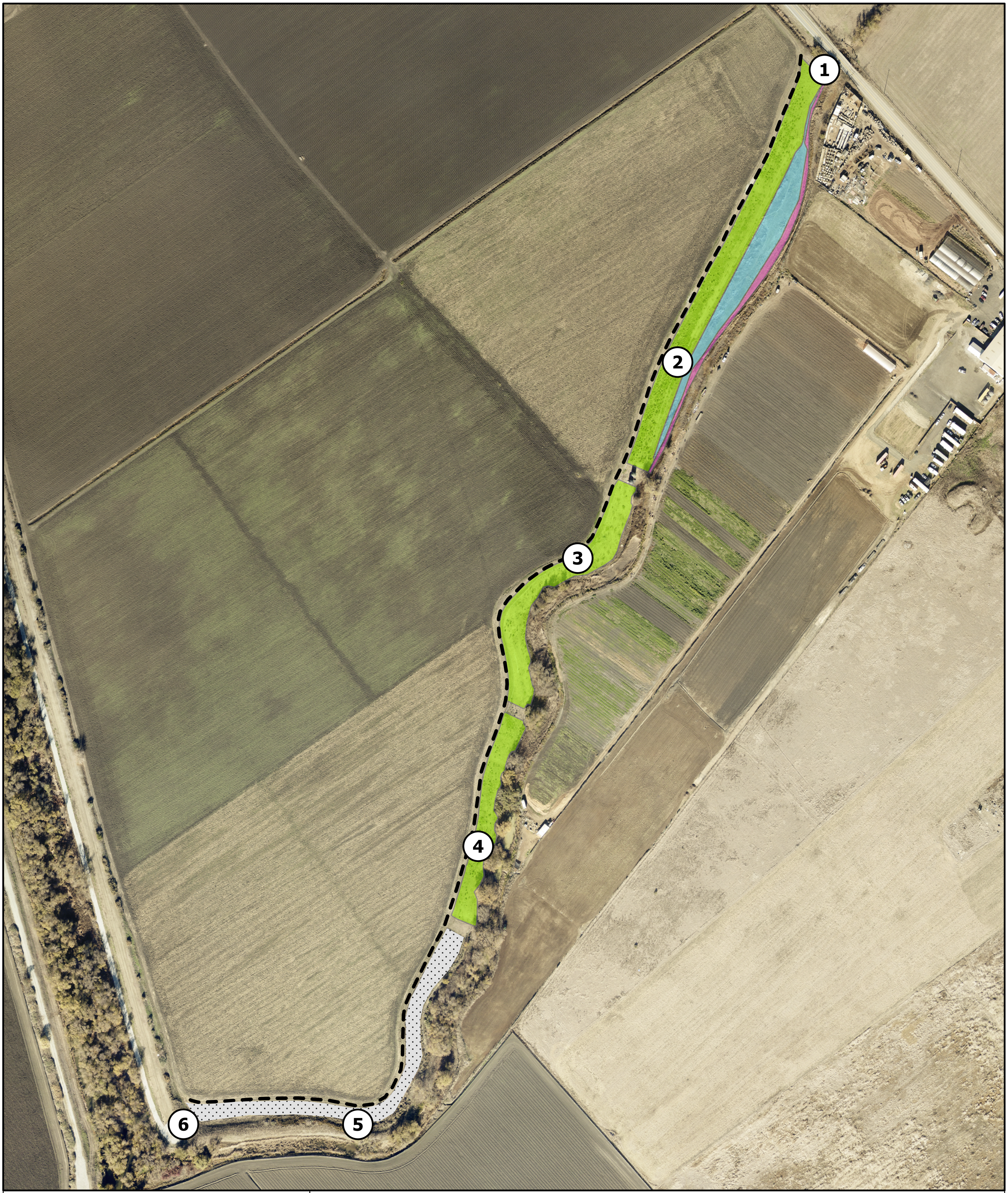

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Figure 2:
Habitat Restoration Area

Coastal and Valley freshwater marsh (perennial wetland) restoration

Seasonal wetland restoration

Willow riparian forest and scrub or mixed riparian forest and woodland restoration

Spoils Relocation

Farm Road

Photo Point

Folder: C:\Users\MatthewFogarty\OneDrive - Santa Clara Valley Habitat Agency\GIS\Reserve System\Pajaro River\Pajaro River Restoration\

4 Section C: Mitigation Monitoring Status

This monitoring report is documenting the first full year of restoration following construction in 2023 and early 2024. This is the first of 5 annual monitoring reports.

4.1 Management and Maintenance Activities Completed

During 2025, Triangle Land Restoration maintenance crews conducted weekly irrigation for riparian upland plantings, hand-pulled weeds, and applied herbicides to target invasive species—outside of herbicide restriction zones adjacent to the organic farm fields and creek channel buffer. Weeds targeted included bristly ox-tongue, perennial pepperweed, and stinkwort. Weeds were managed by hand in restriction zones.

In the wetland bench, irrigation was utilized during dry spells in the early part of the year, but no irrigation was provided thereafter. Invasive weeds were managed through hand-pulling, limited herbicide spot treatments, and mowing. Native plant species that were planted and seeded were encouraged to spread through adjacent weed management. Species like creeping wildrye and alkali heath continued to expand.

4.2 Adaptive Management Activities Completed

Other than irrigation of the wetland bench, no management actions were implemented that would be considered adaptive management measures. Following installation, overhead irrigation was applied within the wetland bench to encourage vegetation cover and native perennial plant spread; however, this method was determined to be unnecessary through the growing season of 2025.

4.3 Performance Standards

Table 1 summarizes the performance standards for this project. For an expanded discussion of Ecological Performance Standards being assessed through monitoring of this project, refer to the Pajaro River Riparian Habitat Restoration Project Mitigation and Monitoring Plan (ICF 2022; "MMP").

In addition to the performance standards depicted in the project MMP, the 401 Certification also requires that the project be subject to the following qualitative performance standard:

> *Visually inspect the project site and areas of waters of the State adjacent to Project impact areas following completion of Project construction and for five subsequent rainy seasons to ensure that the Project is not causing excessive erosion, stream instability, or other water quality impacts. (Central Coast RWQCB Cert. No. 34322WQ05).*

While specific performance standards are not described in the 401 Certification, the Habitat Agency has adopted typical standards associated with erosion and channel stability recommended by the project hydrologist/geomorphologist. These standards and the analysis of stream stability is included below in Appendix 1.

TABLE 1. ECOLOGICAL PERFORMANCE STANDARDS

Performance Standard	Year 1	Year 2	Year 3	Year 4	Year 5 (Final)
Wetland Vegetation Cover (%)	15% cover in planting zone	25% cover in planting zone	40% cover in planting zone	60% cover in planting zone	70% cover in planting zone
Riparian Vegetation Survival/Cover (%)	80% survival of plantings	80% survival of plantings	75% survival of plantings or 25% cover in planting zone	35% cover in planting zone (top canopy and understory cover combined)	50% cover in planting zone (top canopy and understory cover combined)
Invasive Plant Cover	Less than 25%	Less than 25%	Less than 20%	Less than 20%	Less than 15%
Wetland Establishment and Stream Rehabilitation Surface Area	NA	NA	NA	NA	At least 1.19 acre established in the Project site of USACE/RWQCB jurisdictional freshwater marsh habitat and rehabilitate 0.17 acre of stream along the Pajaro River

4.4 Monitoring Methods

4.4.1 Wetland Vegetation Cover

Plant cover for all vegetation within the wetland bench was evaluated using 1m x 1m plots. Using ArcGIS software, a subset of 20 sample points was randomly identified for placement of each $1m^2$ plot within the constructed wetland bench. Each plot was then treated as a sampling unit for measuring cover and species richness.

To monitor vegetation cover and species composition, cover estimates for total cover and each plant species were recorded at each plot. A combined and modified Daubenmire and Braun-Blanquet cover class system, as described in Mueller-Dombois and Ellenberg (1974) and Barbour et al. (1999), was used to record species cover. These estimates were entered on field data sheets and later calculated using the mid-point range of each cover class:

Cover Code	Range of Cover (%)	Mean
6	95-100	97.5 %
5	75-95	85%
4	50-75	62.5%
3	25-50	37.5%
2	5-25	15%
1	1-5	2.5%
†	< 1	0.1%
R	<< 1	–

All plots were then combined to form a composite sample of cover, invasive species cover, and species richness for the wetland restoration area

4.4.2 Riparian Vegetation Survival/Cover

A complete census of woody riparian plants was implemented during the summer (July and August). Plants were counted and each was evaluated based on a rapid assessment of health and vigor to serve management direction for the planting areas.

While not tied to success criteria, a riparian plant health and vigor informational assessment is included in the results section, below (Section 3.5). Ratings were averaged by species on a 0 to 10 scale with 0 being dead and 10 being high health and vigor. Ratings were based on relative canopy cover including leaf size and density, observed infestations, infections, wilting, sunburn/scald, or other damage to plant tissues.

4.4.3 Invasive Plant Cover

Invasive plants were formally surveyed within the wetland portion of the project as described in Section 4.4.1. No formal quantification of invasive plants was implemented in the riparian planting zones of the project during 2025. Due to the very low cover of invasive plants within the riparian planting zone, observational notes were made about invasive plants within the riparian planting zone by the project manager, Nathan Hale, which were then reported to the maintenance crew for subsequent treatment.

4.4.4 Wetland Establishment and Stream Rehabilitation Surface Area

This criterion is not required in Years 1 through 4. A formal wetland delineation will be implemented in year 5 (2029) to document the restoration. Currently, the project team estimates that 1.10 acres of seasonal wetland and marsh habitat has been re-established at the site and that 3.98 acres of mixed riparian woodland habitat will result from the project plantings.

4.4.5 Erosion and Geomorphic Monitoring

ICF scientists completed cross sections, longitudinal profiles, and a general assessment of channel stability. Some of the data were directly comparable to baseline conditions collected in 2020 during project pre-planning. Refer to Appendix 1 for a complete assessment of stream erosion and geomorphic stability methods and results.

4.4.6 Photo Point Documentation

Photo Point Documentation was collected from locations that were selected prior to implementation of project grading work or planting within Phase II. Photo documentation comparing pre-project conditions to 2025 conditions is included in Appendix 2.

4.5 Monitoring Results

Table 2 documents the Year 1 monitoring results

TABLE 2. YEAR 1 MONITORING RESULTS			
Indicator	**Result**	**Meets Criteria?**	**Notes**
Wetland Vegetation Cover (%)	**44.6**	**Yes**	
Riparian Vegetation Survival (woody plants)	**93%**	**Yes**	
Riparian Vegetation Health & Vigor (woody plants)	**8.4 out of 10**	**N/A**	There are no success criteria for this indicator. Data are provided to support management actions. Plants are consistently healthy and establishing well.
Invasive Plant Cover	**0.01% in wetland*; <2% in riparian zone**	**Yes**	Invasive species defined by the MMP are limited*; however, species not defined by the MMP are subject to management/control. E.G., within the wetland area, 7.1% of plant cover are species subject to weed management.
Waters of the State	[*refer to Appendix 1]*	**Generally, Yes**	There are no specific success criteria associated with geomorphic stream conditions; however, Appendix 1 includes self-assigned project criteria. In general this year provided a baseline assessment but did identify areas of potential instability including bank areas that are fairly barren and some cracking that are likely natural bank calving. Recommendations include monitoring the areas and considering including seeding or other planting.

* Invasive plant species are defined by the MMP as, "All species with a Cal-IPC rating of High…with the exception of those species that are naturalized to the region (i.e., bromes, fescues, filarees, and wild oats)". Species that are considered problematic to achieving native plant cover for this site include additional species that are not defined as invasive by the MMP, however, they are targeted to ensure . Therefore, species subject to management include any non-native plant that is invasive or determined by the project team to pose a risk to

4.6 Photo Point Documentation Log

Photos comparing pre-project conditions to Year 1 (2025) project conditions are included in Appendix 2.

5 Citations

Barbour, M. T., J. Gerritsen, B. D. Snyder, and J. B. Stribling. (1999). *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition*. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

ICF. (2022). *Pajaro River Riparian Habitat Restoration Project Mitigation and Monitoring Plan*. Prepared for the Santa Clara Valley Habitat Agency, October.

Santa Clara Valley Habitat Agency (SCVHA). (2024). *As-built Documentation: Pajaro River Riparian Habitat Restoration Project*. Memorandum prepared September 27, by Nathan Hale.

Mueller-Dombois, D. and Ellenberg, H. (1974). *Aims and Methods of Vegetation Ecology.* John Wiley & Sons, New York, 547 pages.

Appendix 1
Erosion and Geomorphic Assessment

1.1 Introduction

Per the *Water Quality Certification No. 34322WQ05 for Pajaro River Riparian Habitat Restoration Project, Santa Clara County* (Water Quality Certification) (Central Coast Regional Water Quality Control Board 2022), a hydrogeomorphic assessment with an emphasis on erosion observations was conducted for the Phase 1 & 2 area of the Pajaro River Riparian Restoration Project (Project) on the South Pajaro River Agricultural Preserve (PRAP) in September 2025.

Specifically, Monitoring and Reporting Requirement 1 states:

> Visually inspect the Project site and areas of waters of the State adjacent to Project impact areas following completion of Project construction and for five subsequent rainy seasons to ensure that the Project is not causing excessive erosion, stream instability, or other water quality impacts. If the Project does cause water quality impacts, contact the Central Coast Water Board staff member overseeing the Project. You will be responsible for implementing corrective measures to protect water quality and obtaining any additional permits necessary corrective measure implementation.

In order to comply with this monitoring and reporting requirement, the erosion and geomorphic assessment examined the post-construction stability of the entire Pajaro River and its streambanks on the PRAP (a distance of approximately 4,000 feet), with a focus around the Phase 1 & 2 restoration areas (a distance of approximately 2,500 feet) (Figure 1). The upstream-most 1,000 feet of the restoration area was where grading activities occurred, while the downstream areas included additional plantings and spoils placement from the removal of material within the Phase 2 Restoration area and planting activities.

Data collected during the field assessment included an erosion inventory and collection of topographic data (longitudinal profile and cross sections). A host of geomorphic attributes, or indicators were collected at each cross section location to better understand the fluvial geomorphic dynamics within the Project site.

1.2 Methods

The erosion and geomorphic assessment were conducted in early fall 2025 to evaluate the bed and banks with the lowest amount of water possible. The assessment was conducted by a geomorphologist with expertise in channel and floodplain restoration, channel stability analyses, and topographic surveying techniques. The geomorphologist was assisted by an engineer with similar expertise.

1.2.1 Erosion Inventory

Erosion features within the Pajaro River riparian corridor and adjacent floodplain throughout the Project sites were recorded on a site map and with a GPS unit. They were also photographed and described. The root cause of the erosion feature and the potential for sediment to be delivered to the

Figure 1
Pajaro River Reaches and Cross Section Locations

local

channel network (or if such deposition has already affected the network) was determined. The severity of the erosion feature was ranked by size, impact, condition, and presence of stability and instability elements.

The erosion features inventory focused on identifying erosion features within channels or other areas of concentrated flow (e.g., swales and drainages), as well as the adjacent floodplains. Channels, other areas of concentrated flow, and floodplains were emphasized, because in-channel erosion often contributes most of the sediment to the system, primarily from headcuts, bank erosion, and gully erosion. Features not always associated with concentrated flow conditions, such as stand-alone rotational slumps and tensile cracks, were also documented.

The erosion inventory was completed for the entire length of the Pajaro River within the Project site (a distance of approximately 4,000 linear feet). Erosion features were classified as either potentially unstable or unstable.

Bank stability[1] is defined as the natural streambank that has stable groundcover. Stable ground cover includes rooted trees, shrubs, herbaceous plants, and naturally occurring rocky substrates. The terms defined in Table 1 were used to describe observed bank stability conditions, and banks were either described as stable, potentially unstable, or unstable. However, professional judgment (as further described below) was also incorporated to rank stability.

Table 1. Terms Used to Describe Bank Stability Conditions [a]

Category	Term	Definition
Streambanks	Stable streambank	Has 75% or more cover of live plants and/or other stability elements that are not easily eroded and has no instability elements
	Potentially unstable streambank	Has 75% or more cover, but has one or more instability element(s)[b]
	Unstable streambank	Has less than 75% cover of live plants and/or other stability elements and/or one or more instability element(s) (unstable streambanks are often bare or nearly bare streambanks composed of non-cohesive soil that is susceptible to fluvial erosion; particle size may vary depending on streambank material)
Stability elements	Live plants	Perennial herbaceous species, such as grasses, sedges, rushes; woody shrubs, such as willows; broadleaf trees, such as cottonwood and alder; conifer trees; and plant roots that are on or near the surface of the streambank and provide substantial binding strength to the streambank material

[1] The term bank instability refers to streambanks that are either actively retreating or have the potential to retreat in the near future. In brief, weakening processes are any bank or near-bank processes that act to erode or prepare streambanks for further erosion (Lawler 1992). The purpose of assessing this indicator was to identify fluvial erosion (erosion associated with flowing water) and bank failure (erosion associated with gravitational forces and weakening processes). Fluvial erosion is closely related to boundary shear stress, which can be loosely approximated by unit stream power variations, and bank failure is collapse of all or part of the streambank in situ (Lawler 1995).

Category	Term	Definition
	Rock	Boulders, bedrock, and cobble/boulder aggregates that are combined to form a stable mass
	Downed wood	Logs firmly embedded in streambanks
	Erosion-resistant soil	Hardened conglomerate or cohesive clay/silt streambanks
Instability elements	Bank height	Moderately high to high bank height relative to surrounding streambanks
	Fracturing, blocking, or slumping	Cracks near the top of the streambank, slumping streambanks, and blocks of soil/plant material that have fallen off or slid down the streambank
	Mass movement	Bank failure from landslides and gravity erosion of over-steepened streambank slopes
	Undercutting	Frequent or continuous scour; significant to severe undercutting

[a] Based on definitions of streambank conditions in the U.S. Forest Service Region 5 Stream Condition Inventory Guidebook.

[b] Exception: Streambank would be classified as stable if bank height is the only instability element present.

1.2.2 Cross Section and Longitudinal Profile Surveys

1.2.2.1 2020 Methods Summary

In 2020, seven permanent[2] cross sections were established throughout the Project site perpendicular to the primary channel following the methodology of Harrelson et al. (1994).[3] In the field, a topographic cross section was collected at seven permanent locations throughout the Project site, occurring approximately every 500 to 600 feet (Figure 1). Each transect was surveyed using ground-based surveying equipment to capture and track channel morphology; elevations along the cross section were collected at intervals close enough to capture slope breaks and distinct morphological features within the floodplain, and along the channel sides and bottom.

The location of each cross section was permanently marked in the field using 4-foot-tall metal t-posts or wooden lathes (to easily find the general transect location) and with rebar driven vertically into the ground surface, capped with an appropriate cover (to establish known permanent elevations [permanent monuments or benchmarks] on each side of the transect). The permanent benchmarks for each transect was placed in a stable location above the active channel on the left (south) and right (north) banks (or terraces) of the channel. Transect endpoints (i.e., the permanent monuments) were documented using a GPS unit. Numerous representative photographs were taken at each cross section.

In addition to the cross sections, a longitudinal profile was surveyed throughout the length of the channel within the Project site. The longitudinal profile encompassed the entire length of the Project site (approximately 4,000 feet). The spacing between channel bed data points varied depending on

[2] As described below in the Results section, the morphology of some of these cross sections (especially within the Phase 2 Restoration Area) was altered due to Phase 2 restoration activities.

[3] In addition to the seven permanent cross sections that were established in the field, an eighth cross section was interpolated (cross section XS-4) using LiDAR. This cross section is at the upstream end of Reach 2a (Figure 1), downstream of where anticipated grading activities were expected to occur in Reaches 1a and 1b.

the complexity of the channel bed characteristics, averaging roughly every 40 feet (spacing was significantly smaller in the upstream portion of the Project site [Reaches 1a and 1b] where a majority of the Phase 2 restoration activities would occur). Digital photographs were taken in the upstream and downstream directions at various locations throughout the longitudinal profile. The location of each cross section was surveyed on the longitudinal profile for graphical plotting purposes.

1.2.2.2 2025 Methods Summary

In 2025, four of the original seven 2020 cross sections were re-measured. These included cross sections XS-1[4], XS-2, XS-3, and XS-6. Cross section XS-1 now serves as a "control" cross section – it is located upstream of the grading activities (shown as Phase 2 Grading Area on Figure 1). Cross section XS-2 is located in the middle of the graded/restored area. Note that the right bank monument at cross section XS-2 that was installed at Station 75 in 2020 was no longer present in 2025, as grading activities associated with lowering the (former bank) surface removed it. Its total length was subsequently increased to 120 feet in 2025 (and a new right bank permanent monument was installed). Cross section XS-3 is located immediately downstream of the graded area, in the vicinity of the two water towers. Cross section XS-6 is downstream of the graded area and was chosen as the most downstream cross section because that is where riparian planting activities on the right bank terminate.

The methods described above for the 2020 surveys were used to re-measure the cross sections in 2025.

In addition to topographic surveying of the four selected cross sections, bankfull width and depth measurements were recorded to assess the hydraulic capacity of the channel. Active width and depth measurements were recorded as well. In addition to bankfull and active channel width and depth measurements, the bankfull and entire channel width-to-depth ratio and the bankfull cross sectional area were subsequently calculated for each cross section. Finally, average channel bed elevation was calculated for each cross section by taking the average of all surveyed points, including both permanent monuments on each bank.

For the longitudinal profile, the overall distance measured was 1,395 feet. The longitudinal profile extended from the bridge over the river at Frazier Lakes Road to cross section XS-3 and fully encapsulated the area that was graded/restored. As with the 2020 longitudinal profile, the spacing between channel bed data points varied depending on the complexity of the channel bed characteristics but roughly averaged every 20 to 25 feet in the Phase 2 restoration area (and slightly greater downstream of the Phase 2 restoration area). Digital photographs were taken in the upstream and downstream directions at various locations throughout the longitudinal profile. The location of each cross section was surveyed on the longitudinal profile for graphical plotting purposes.

Sinuosity, gradient, and average channel bed elevation of the longitudinal profile were determined.

[4] Cross section XS-1, the most upstream cross section within the Project site was relocated about 50 feet upstream from where it was established in 2020 because neither 2025 permanent monument could be located.

1.2.3 Other Geomorphic Indicators

Each cross section (and the area upstream and downstream of it for a distance of two times the active channel width) also included an evaluation of the following indicators:

- Riparian Vegetation Condition
- Bankfull Width and Depth and Wetted Width
- Bank Instability and Bank Characteristics
- Channel Bed Substrate Composition and Embeddedness
- Channel Complexity
- Degree of Channel Incision
- Stage of Channel Evolution

Methods for collection of these indicators are described below.

Riparian Vegetation Condition

Riparian condition, or canopy cover, refers to a description of the general health of the riparian area, focusing on the amount and type of vegetative cover. Riparian condition was described as low (0–25 % vegetative cover), moderate (25–50 % vegetative cover), high (50–75 % vegetative cover), or very high (75–100% vegetative cover) and a densiometer (set up in the center of the channel) was used to derive the percentage. In addition, the size and approximate age of any riparian vegetation growing in the active channel margin was documented since this is evidence of channel adjustment and possible restabilization from a prior disturbance. Finally, the approximate percentage of ground cover on each bank, as well as the approximate height of the tallest riparian planting was recorded.

Bankfull Width and Depth and Wetted Width

Bankfull width and depth measurements were recorded to assess the hydraulic capacity of the channel. Specifically, a geomorphic or effective bankfull surface was identified in the field. The geomorphic bankfull or effective surface is the surface that gets inundated by the discharge that performs the most geomorphic work on a system, typically a flow that occurs every 1.5 to 2 years (Knighton 1999). This discharge, known as the geomorphic bankfull discharge, is defined as that water discharged when stream water just begins to overflow into the active floodplain. The geomorphic bankfull or effective surface was identified based on the methodology of Harrelson et al. (1994) and Hauer and Lamberti (1996). Once this surface was recognized, width and depth measurements were recorded.

Similar to bankfull width and depth measurements, wetted width and depth measurements were recorded. Specifically, the wetted surface was identified in the field, and once determined, width and depth measurements were recorded.

In addition, the “active channel” width was identified, which represents a typical low to moderate flow regime within the site and, in the case of the Pajaro River, is typically bounded by the width of the in-channel vegetation.

Bank Instability and Bank Characteristics

Bank instability at the cross section level was determined using the methods described above under Section 1.2.1, *Erosion Inventory*.

In addition, the composition and the height of each bank was determined in the field. Bank height was measured from the toe of the bank (i.e., the location at the grade break between the channel bed and the bank) to the top of the bank. This information, in conjunction with the other indicators, was used to detect where the channel may still be downcutting, as suggested by over-steepened banks, and describe the potential for the channel to potentially migrate laterally and increase the risk of bank (and crossing) instability.

Channel Bed Substrate Composition and Embeddedness

Substrate composition and embeddedness refer to the size of the substrate materials on the channel bed, and the degree to which these materials are embedded. These conditions indicate how frequently the channel substrate is mobilized. Substrate composition and embeddedness typically are measured using the methods described by Bunte and Abt (2001). However, formal pebble counts were not necessary because of obvious fine-dominated nature of the channel bed. Accordingly, substrate composition and embeddedness were visually described (not directly measured).

Channel Complexity

Channel or habitat units (e.g., riffle, flatwater, pool) were delineated according to standard habitat mapping descriptions in the vicinity of each cross section. The stream habitat inventory was based on the methods described in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al. 2010). Stream habitats were delineated into one of the 24 Level-IV habitat classification types (Table 2), based on morphological characteristics, including: over-all channel gradient, water velocity and depth, substrate, and, where applicable, the channel features (e.g., boulder, bedrock, woody material, converging flow) causing the formation of the habitat unit through scour and sediment deposition (Flosi et al. 2010). Ground-level images of each habitat unit were taken with a high-resolution digital camera.

Table 2. Level-II, Level-III, and Level-IV Habitat Types

Level-II Habitat Type	Level-III Habitat Type	Level-IV Habitat Type	Abbreviation
Riffle	Riffle	Low Gradient Riffle	LGR
		High Gradient Riffle	HGR
	Cascade	Cascade	CAS
		Bedrock Sheet	BRS
Flatwater	Flatwater	Pocket Water	POW
		Glide	GLD
		Run	RUN
		Step Run	SRN
		Edgewater	EDW

Level-II Habitat Type	Level-III Habitat Type	Level-IV Habitat Type	Abbreviation
Pool	Main Channel Pools	Trench Pool	TRP
		Mid-Channel Pool	MCP
		Channel Confluence Pool	CCP
		Step Pool	STP
	Scour Pools	Corner Pool	CRP
		Lateral Scour Pool - Log Enhanced	LSL
		Lateral Scour Pool - Root Wad Enhanced	LSR
		Lateral Scour Pool - Bedrock Formed	LSBk
		Lateral Scour Pool - Boulder Formed	LSBo
		Plunge Pool	PLP
	Backwater Pools	Secondary Channel Pool	SCP
		Backwater Pool - Boulder Formed	BPB
		Backwater Pool - Root Wad Formed	BPR
		Backwater Pool - Log Formed	BPL
		Dammed Pool	DPL

Notes:
Habitat type hierarchy based on *California Salmonid Stream Habitat Restoration Manual* (Flosi et al. 2010).

Degree of Channel Incision

The degree to which the channel is incised was recorded. The degree of incision was qualitatively analyzed using the following criteria.

- **Identification of any Quaternary landforms on the floodplain (e.g., terraces, low floodplain, fan, etc.).** Terraces typically have steep streambanks, and the channel may not necessarily be incised. Steep, unstable streambanks adjacent to low floodplain surfaces; however, typically indicate incision.
- **Identification of bedforms downstream of the site where and if the channel is less incised.** Bed and streambank material from incised channels would typically be deposited downstream in somewhat uncharacteristically large deposits on the channel bed (downstream aggradation).
- **Recognition of base level changes downstream.** Dams and other barriers can create upstream changes in channel bed elevation (i.e., headward migration of incision).
- **Visual survey of channel bed at the Project site.** Channel or habitat sequences, such as pool-riffle sequences, are rare in incised channels, and those that do exist do so for only limited time intervals. Additionally, the increased depth of flow associated with incision, coupled with an increased flashy regime, results in bed armoring and a decreased frequency of bed mobilization.
- **Determination of the health of the riparian and floodplain plant species.** Plants that are found in similar, un-incised reaches are usually not present in incised reaches. No vegetation at all is an indicator of no hydrologic interaction between the floodplain and the channel and therefore incision.
- **Identification of recent evidence of overbank deposition of fine sediment, plant debris, or other organic matter.** A channel that floods its streambanks frequently would typically have

splay (i.e., sand) deposits and vegetation with a smoothed, flooded appearance in the downstream direction. Natural levee development is also an indication of frequent flooding.

The degree of incision was recorded as negligible, low, moderate, high, or very high.

Stage of Channel Evolution

A stream evolution model (Cluer and Thorne 2013) was applied to provide a template for understanding geomorphic responses and processes within the immediate watershed. The stream evolution model of Cluer and Thorne (2013) revisits and updates two well-established channel evolution models (Schumm et al. 1984; Simon and Hupp 1987) in light of recent research and the authors' practical experiences.

1.3 Results

Results from the erosion and geomorphic assessment are described below.

1.3.1 Erosion Inventory

The relevant information collected for each erosion feature via the inventory is presented in Table 3; Figure 2 illustrates the location of each erosion feature. As shown in Table 3 and Figure 2, seven erosion features within the Project site were documented in 2025, six of which were classified as potentially unstable bank segments and one which was classified as an unstable bank segment.

Table 3. Erosion Inventory Results (2025)

Feature ID	Instream/ Upland	Type	Bank	Length (feet)	Area (square feet)	Magnitude
1	both	eroding bank	right	185		potentially unstable
2	instream	eroding bank	right		145	potentially unstable
3	instream	eroding bank	right		92	potentially unstable
4	both	eroding bank	right	56		potentially unstable
5	upland	eroding bank	right	78		unstable
6	both	eroding bank	right	25		potentially unstable
7	both	eroding bank	right	207		potentially unstable

The six potentially unstable bank segments each lacked 75% vegetative cover – this by itself typically renders the bank segment as unstable per Table 1; however, each of these bank segments is composed of extremely cohesive soil (Willows clay, 0% slopes, MLRA 14[5]) that is non-susceptible to fluvial erosion, and each of these bank segments exhibited no other instability elements. As such, a rank of potentially unstable was given to these particular bank segments. Photograph 1 shows an example of one of these potentially unstable bank segments, Erosion Feature #6 in Reach 2a.

[5] In a typical profile, the soil has a 4-inch-thick, clay "A" horizon and various clay and silty clay "B" horizons to a depth of 72 inches or more. The soil structure is mostly prismatic (California Soil Resource Laboratory 2021).

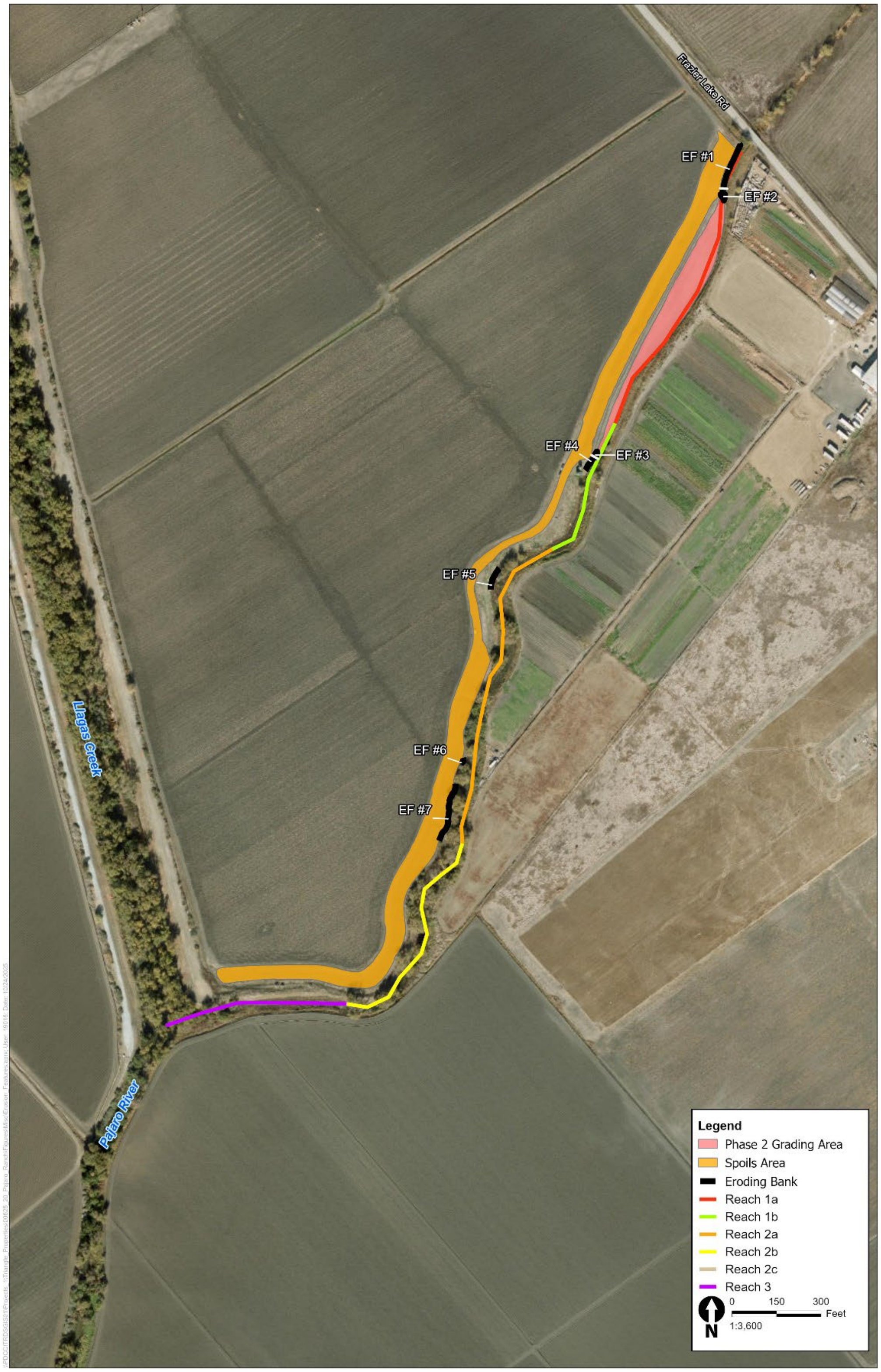

Figure 2
Pajaro River Erosion Feature Location

Photograph 1. Potentially unstable right bank segment in Reach 2a (Erosion Feature #6).

Erosion Feature #5, the only bank segment that was classified as unstable, exhibited one instability element (as shown in Table 1) – a tensile crack that could eventually lead to additional bank retreat in Reach 2a (Photograph 2). However, due to the high soil expansiveness of this streambank, this tensile crack could very well "correct" itself once the precipitation season begins and the soils become saturated once again.[6] Future monitoring will provide better insight as to how this particular bank segment behaves.

Photograph 2. Unstable right bank segment with tensile crack in Reach 2a (Erosion Feature #5).

[6] As a Vertisol, the high content of smectic clay minerals causes the soil to shrink and swell as a result of seasonal changes in soil moisture content, resulting in soil cracks to form at the surface in the summer and fall.

The total length of potentially unstable banks was 514 feet, accounting for roughly 13% of the right bank of the Pajaro River in the Project Site. The total length of unstable banks was 78 feet, accounting for roughly 2% of the right bank of the Pajaro River in the Project Site

No other erosion features, such as headcuts, eroding gullies, or slumps, were documented within the Project site in 2025.

It should be noted that the erosion inventory was conducted in the fall during the driest season in this region of California. During a site visit in the spring of 2024 (soon after Phase 2 restoration activities were conducted), there was ample vegetative coverage on the streambanks in most, if not all, of the areas that were classified as potentially unstable in the fall of 2025. Photographs 3 and 4 show a side-by side comparison of one such area, at the upstream end of the Project site in Reach 1a.

Photographs 3 and 4. Side-by-side comparisons of floodplain and bank vegetation from spring 2024 and fall 2025 (Reach 1a in the Phase 2 Restoration Area).

The implications of this are further discussed in Section 1.4, *Summary and Recommendations*.

1.3.2 Cross Section and Longitudinal Profile Surveys

Appendix 1-A shows graphical illustrations of the cross sections and longitudinal profile that were surveyed within the Project site. Note that, when possible, the 2020 cross sections are shown on the same graph to provide a comparison to the earlier conditions. Also note that the "Qbf" on the cross section graphs stands for the bankfull surface and that both the bankfull surface and active channel lines represent the conditions as observed in 2025. Finally, there are two graphs for the longitudinal profile – one for the entire profile that was surveyed in 2020, and one for just the extent of the measured 2025 longitudinal profile.

1.3.2.1 Channel Geometry Metrics

Table 4 shows the relevant geomorphic characteristics of the cross sections. Table 5 summarizes the average channel bed elevation, channel gradient, water surface slope, and sinuosity for the longitudinal profile.

Table 4. Pajaro River Cross Section Characteristics (2025)

	XS-1	XS-2	XS-3	XS-6
Bankfull Width (feet)	37.5	57.0	40.0	45.5
Average Bankfull Depth (feet)	0.89	0.87	1.65	2.32
Maximum Bankfull Depth (feet)	1.5	1.52	1.99	3.06
Bankfull W/D	42.2	65.3	24.2	19.6
Active Channel Width (feet)	18.0	19.0	30.0	36.7
Average Active Channel Depth (feet)	0.64	0.15	0.27	0.94
Cross Sectional Area (feet^2)	31.48	41.55	66.23	105.68
Average Channel Bed Elevation (ft)	142.4	141.17	140.83	140.28

Table 5. Longitudinal Profile Average Channel Bed Elevation, Channel Gradient, and Sinuosity (2025)

Longitudinal Profile Length (ft)	Average Channel Bed Elevation (ft)	Bed Slope	Sinuosity
1,395	138.89	0.0016	1.04

Cross Sections

As illustrated in Appendix 1-A, most cross sections are typified by high banks on each end of the transect that slope down to the bank toes. Inset floodplain benches and other evidence of topographic variability within the cross sections are minimal, except for cross section XS-1 where there is an inset bench on the left portion of the channel about 20 feet long, and cross section XS-2 (where the river right floodplain has been graded as part of the Phase 2 restoration activities). In general, bankfull width-to-depth values are indicative of wider and shallower cross sections upstream (at cross sections XS-1 and XS-2), and somewhat narrower and deeper channels downstream (at cross sections XS-3 and XS-6).

As shown in Table 4, active channel width measurements ranged from 18.0 to 36.7 feet (average of 25.9 feet), while (average) active channel depths ranged from 0.15 to 0.94 feet (average of 0.5 feet). Cross-sectional area increased in the downstream direction, from 31.48 to 105.68 ft^2, owing to the general transition to a narrower and deeper channel with more overall bankfull capacity.

Longitudinal Profile

One longitudinal profile was established within the Project site in 2025, with a total length of 1,395 feet with a channel bed slope of 0.0016, and an average channel bed elevation of 138.89 feet (Table 5). The upstream thalweg elevation at Station 0 was 140.545 feet and the most downstream thalweg elevation at Station 1,395 was 138.27 feet, representing the absolute top and bottom elevations with an elevation change of 2.28 feet over the course of the profile. Although there are certain locations where the channel gradient changes (i.e., steepens) within a short longitudinal distance, the changes in elevation are generally less than 1 foot and in general the channel bed decreases in an evenly spaced manner throughout the length of the entire profile. Sinuosity (the ratio of actual channel distance between identified points compared to straight/down-valley distance[7]) is straight (although the thalweg exhibited a slightly sinuous pattern in certain locations).

[7] The following represent possible ratios that define sinuosity: straight (1); slightly sinuous (1.1-1.3); sinuous (1.4-1.7); meandering (1.8 and above).

Photographs 5 through 8 are representative images of the longitudinal profile, showing the different channel morphologic characteristics throughout the Project site.

Photograph 5. Looking downstream at upper end of Phase 2 Restoration Area (STA 200).

Photograph 6. Looking upstream at lower end of Phase 2 Restoration Area (STA 600).

Photograph 7. Looking downstream at pool habitat (STA 975).

Photograph 8. Looking upstream at dense instream vegetation (STA 1,395).

1.3.3 Other Geomorphic Indicators

Results from geomorphic assessment at the four cross sections are described below. Refer to Table 6 for a synthesis of the measured indicators.

Table 6. Project Site Cross Section Geomorphic Characteristics

	Cross Section			
Indicator	**1**	**2**	**3**	**6**
Canopy Cover (channel center densiometer)	Essentially absent	Essentially absent	Very high	High
Bankfull Width (feet)	37.5	57.0	40.0	45.5
Average Bankfull Depth (feet)	0.89	0.87	1.65	2.32
Wetted Width (feet)	N/A	N/A	N/A	N/A
Bank Stability	Left bank –stable / Right bank – potentially unstable (Erosion Feature #1)	Left bank –stable / Right bank – stable	Left bank – stable / Right bank – stable	Left bank – potentially stable / Right bank – potentially unstable (Erosion Feature #7)
Bank Composition	Alluvium (primarily clay)	Alluvium (primarily clay)	Alluvium (primarily clay)	Alluvium (primarily clay)
Bank Height (feet)	LB: 3.6 / RB: 5.8	LB: 3.4 / RB: 4.5	LB: 3.9 / RB: 4.6	LB: 4.1 / RB: 6.0
Substrate Types	Clay and organics	Clay and organics	Clay and organics	Clay and organics
Channel Complexity	Minimal (flatwater-dominated glide)	Minimal (flatwater-dominated glide)	Minimal (flatwater-dominated glide)	Minimal (flatwater-dominated glide)
Degree of Incision	Low-moderate	Low	Low - moderate	Low - moderate
Stage of Channel Evolution	Channelized	Channelized / restored	Channelized	Channelized

N/A = not applicable

1.3.3.1 Riparian Vegetation Condition

Table 6 shows that canopy cover (as measured from the center of the channel with a densiometer) ranged from absent (at cross sections XS-1 and XS-2) to very high (at cross section XS-3). This is to be expected this early in the monitoring effort (and perhaps for the duration of the required monitoring) as active channel widths at cross sections XS-1 and XS-2 are significant (X and Y, respectively), and because cross section XS-1 is 150 feet upstream of the Phase 2 restoration area and cross section and XS-2 is in the center of it.

Towards the downstream reaches within the Project site (starting around the center of Reach 1b), both instream and bank vegetation increase. This increase was captured with the higher canopy cover values at both cross sections XS-3 (in Reach 1b) and XS-6 (in Reach 2c). Typical riparian trees on the banks include red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*). Typical instream vegetation includes broadleaved cattail (*Typha latifolia*), hardstem bulrush (*Schoenoplectus acutus*), and American bulrush (*Schoenoplectus americanus*).

Ground cover at the cross sections ranged from 50% on the left bank of cross section XS-3 to 100% at cross sections XS-2. The left bank cross sections (non-restored/non-planted) had an average of 76% ground cover; the right bank cross sections (restored/planted) had an average of 71% ground cover. The maximum height of a plant ranged from 1 foot on the left bank of cross section XS-3 to 8 feet on the right bank of cross section XS-3. The left bank cross sections (non-restored/non-planted) had an average plant maximum height of 1.9 feet; the right bank cross sections (restored/planted) had an average plant maximum height of 5.0 feet.

All riparian vegetation (in the form of trees) growing within the active channel margin appears to be mature, suggesting that there have been no major channel adjustments and restabilization following a prior disturbance (Photograph 9).

Photograph 9. Mature willow growth on left bank, cross section XS-6.

1.3.3.2 Bankfull Width and Depth

As shown in Tables 4 and 6, bankfull width measurements ranged from 37.5 to 57.0 feet (average of 45.0 feet), while (average) bankfull depths ranged from 0.87 to 2.32 feet (average of 1.43 feet). With the exception of cross section XS-2 in the Phase 2 graded area, variation in bankfull width in the downstream direction is fairly minimal, equating to a relatively similar channel geometry with an average bankfull width of approximately 40 feet.

1.3.3.3 Bank Instability and Bank Characteristics

Based on site observations, the banks exhibited varying degrees of stability, although all banks at each cross section either fell under the stable and potentially unstable categories (Table 6). The potential instability of the left bank segments at cross section XS-1 and XS-6 stems from lack of 75% vegetative cover, as described above under Section 1.3.1, *Erosion Inventory*. The potentially unstable left bank at cross section XS-6 stems from oversteepening and poor land use practices (improper erosion control) on the farmland property on the left bank terrace. Photographs 10 and 11 show examples of stable and potentially unstable banks as observed during the geomorphic assessment.

Photograph 10. Stable left bank, cross section XS-3.

Photograph 11. Potentially unstable right bank, cross section XS-1.

Bank composition is extremely uniform throughout the Project site, dominated by clay (Table 6). Lenses of silt and fine sand were observed in various locations as well.

As shown in Table 6, bank height measurements (as measured from the toe of each bank to the top of each bank) ranged from 3.4 to 4.1 feet (average of 3.8 feet) on the left bank; and ranged from 4.5 to 6.0 feet (average of 5.2 feet) on the right bank.

1.3.3.4 Channel Bed Substrate Composition and Embeddedness

The channel bed substrate is dominated entirely by clay at each cross section (Table 6). Organic material resulting from decomposition of the abundant in-channel vegetation is also present. Although the small size of the substrate lends itself to being readily entrained and transported, the high clay content, excessive in-channel vegetation, and limited hydrologic regime presumably renders the channel bed immobile at most times of the year.

1.3.3.5 Channel Complexity

No gravel bar development was observed at any cross section within the Project site. Additionally, no evidence of scour features and/or significant deposition areas was determined at any cross section. Pool and riffle habitats containing in-channel structures (e.g., instream woody material) that create complexity and habitat niches for aquatic organisms were absent. In brief, the dominant channel or habitat units at each cross section are flatwater-dominated (primarily glide[8]).

1.3.3.6 Degree of Channel Incision

Degree of incision was recorded as low to moderate at each cross section (Table 6), except for cross section XS-2 in the center of the Phase 2 restoration area, where incision was recorded as low.

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[8] A glide is defined as flatwater channel or habitat unit with a wide, uniform channel bottom; flow with low to moderate velocities; and minimal turbulence (Flosi et al. 2010: III-33).

Although there is some oversteepening of the left bank at various locations within some of the reaches, the Pajaro River in the vicinity of the Project site is not significantly incised. The connection to the floodplain is adequate (i.e., the channel can access its floodplain on a semi-regular basis).

1.3.3.7 Stage of Channel Evolution

Aerial photography (Google Earth imagery from 1985 to 2025) was reviewed for recent channel changes. Based on review of the available photography, the project site has remained relatively static during that time period. No marked vegetative loss or other evidence of a widening trend over the past 30 years was noticeable. However, the resolution of the imagery for certain years was of lower quality; therefore, it is difficult to determine the exact amount of recent bank retreat in this area. Nonetheless, the lack of marked vegetative loss suggests relatively static channel conditions.

According to the channel evolution model of Cluer and Thorne (2013), the channel in the surveyed area is a Stage 2 channelized channel, which is characterized by anthropogenic manipulation of the channel.

1.4 Summary and Recommendations

In brief, findings from the 2025 erosion and geomorphic indicate a very stable channel and floodplain environment with minimal erosion. The following sections summarize the key findings.

1.4.1 Erosion Inventory

The erosion inventory was completed for the entire length of the Pajaro River within the Project site (a distance of approximately 4,000 linear feet). Erosion features were classified as either potentially unstable or unstable. Seven erosion features within the Project site were documented in 2025, six of which were classified as potentially unstable bank segments and one which was classified as an unstable bank segment. The six potentially unstable segments lacked 75% vegetative cover but were considered otherwise stable due to the high clay content and their non-erosive nature. The tensile crack associated with the once unstable bank segment could very well “correct” itself once the precipitation season begins and the soils become saturated once again. No other erosion features, such as headcuts, eroding gullies, or slumps, were documented within the Project site in 2025.

1.4.2 Topographic Surveys

As illustrated in Appendix 1-A, most cross sections are typified by high banks on each end of the transect that slope down to the bank toes. Inset floodplain benches and other evidence of topographic variability within the cross sections are minimal, except for cross section XS-1 where there is an inset bench on the left portion of the channel about 20 feet long, and cross section XS-2 (where the river right floodplain has been graded as part of the Phase 2 restoration activities).

One longitudinal profile was established within the Project site in 2025, with a total length of 1,395 feet with a channel bed slope of 0.0016, and an average channel bed elevation of 138.89 feet (Table 5). Sinuosity is straight (although the thalweg exhibited a slightly sinuous pattern in certain locations).

No performance standards for the cross section surveys are identified in the Water Quality Certification. Therefore, the project geomorphologist has employed industry standards based on the known characteristics of the site to assess site performance. Graphical cross section comparisons will be used to detect morphological changes between the 2025 baseline year and subsequent monitoring years. In addition, a net change (i.e., aggradation or degradation based on the average channel bed elevation) of more than 1.0 foot relative to baseline monitoring is recommended to trigger a causal analysis to determine the cause(s) of the geomorphic alterations. Finally, changes of ±25% in bankfull cross-sectional area relative to baseline monitoring will also trigger a causal analysis to determine the cause(s) of the geomorphic alterations.

Similar to the cross section, no performance standards for the longitudinal profile survey are included in the Water Quality Certification; however, graphical longitudinal profile comparisons will be used to detect significant morphological changes between the 2025 baseline year and subsequent monitoring years. In addition, a net change (i.e., aggradation or degradation based on the average channel bed elevation) of more than 1.0 foot relative to baseline monitoring will trigger a causal analysis to determine the cause(s) of the geomorphic alterations.

1.4.3 Geomorphic Assessment

With regards to the geomorphic assessment at the cross sections, canopy cover ranged from absent to very high. Towards the downstream reaches within the Project site (starting around the center of Reach 1b), both instream and bank vegetation increase. Typical riparian trees on the banks include red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*). Typical instream vegetation includes broadleaved cattail (*Typha latifolia*), hardstem bulrush (*Schoenoplectus acutus*), and American bulrush (*Schoenoplectus americanus*). Ground cover at the cross sections ranged from 50% to 100%. The left bank cross sections (non-restored/non-planted) had an average of 76% ground cover; the right bank cross sections (restored/planted) had an average of 71% ground cover.

As shown in Tables 4 and 6, bankfull width measurements ranged from 37.5 to 57.0 feet (average of 45.0 feet), while (average) bankfull depths ranged from 0.87 to 2.32 feet (average of 1.43 feet). With the exception of cross section XS-2 in the Phase 2 graded area, variation in bankfull width in the downstream direction is fairly minimal, equating to a relatively similar channel geometry with an average bankfull width of approximately 40 feet.

The banks exhibited varying degrees of stability, although all banks at each cross section either fell under the stable and potentially unstable categories (Table 6). Bank composition is extremely uniform throughout the Project site, dominated by clay (Table 6). Bank height measurements ranged from 3.4 to 4.1 feet (average of 3.8 feet) on the left bank; and ranged from 4.5 to 6.0 feet (average of 5.2 feet) on the right bank.

The channel bed substrate is dominated entirely by clay at each cross section. Organic material resulting from decomposition of the abundant in-channel vegetation is also present.

The dominant channel or habitat units at each cross section are flatwater-dominated (primarily glide).

Degree of incision was recorded as low to moderate at each cross section, except for cross section XS-2 in the center of the Phase 2 restoration area, where incision was recorded as low.

Finally, according to the channel evolution model of Cluer and Thorne (2013), the channel in the surveyed area is a Stage 2 channelized channel, which is characterized by anthropogenic manipulation of the channel. Of most importance to this restoration project is that fact that channelization has reduced the wetted area and channel complexity relative to flow. Outside of the Phase 2 restoration area, the extent, connectivity, and functionality of the riparian area, floodplain, and any adjacent wetlands are generally reduced.

1.4.4 Recommendations

For Erosion Features #1 through #7, it is recommended that seeding and perhaps additional erosion control measures (e.g., willow plantings, coir at the bank toes, and/or blankets on the bank slopes) be used to try and revegetate the barren portions of these bank segments. These efforts would need to occur at the appropriate time of the year to allow rapid growth of the seedlings. For Erosion Feature #5, a wet-season assessment of the feature should be made to understand if the clay soils have self-corrected prior to implementing corrective measures.

Erosion monitoring could occur in the spring when erosion is most visible after winter precipitation events; however, erosion features (especially on the channel bed) could be obscured by the presence of water. It is recommended that a wait-and-see approach be utilized for the optimal timeframe to conduct monitoring in 2026.

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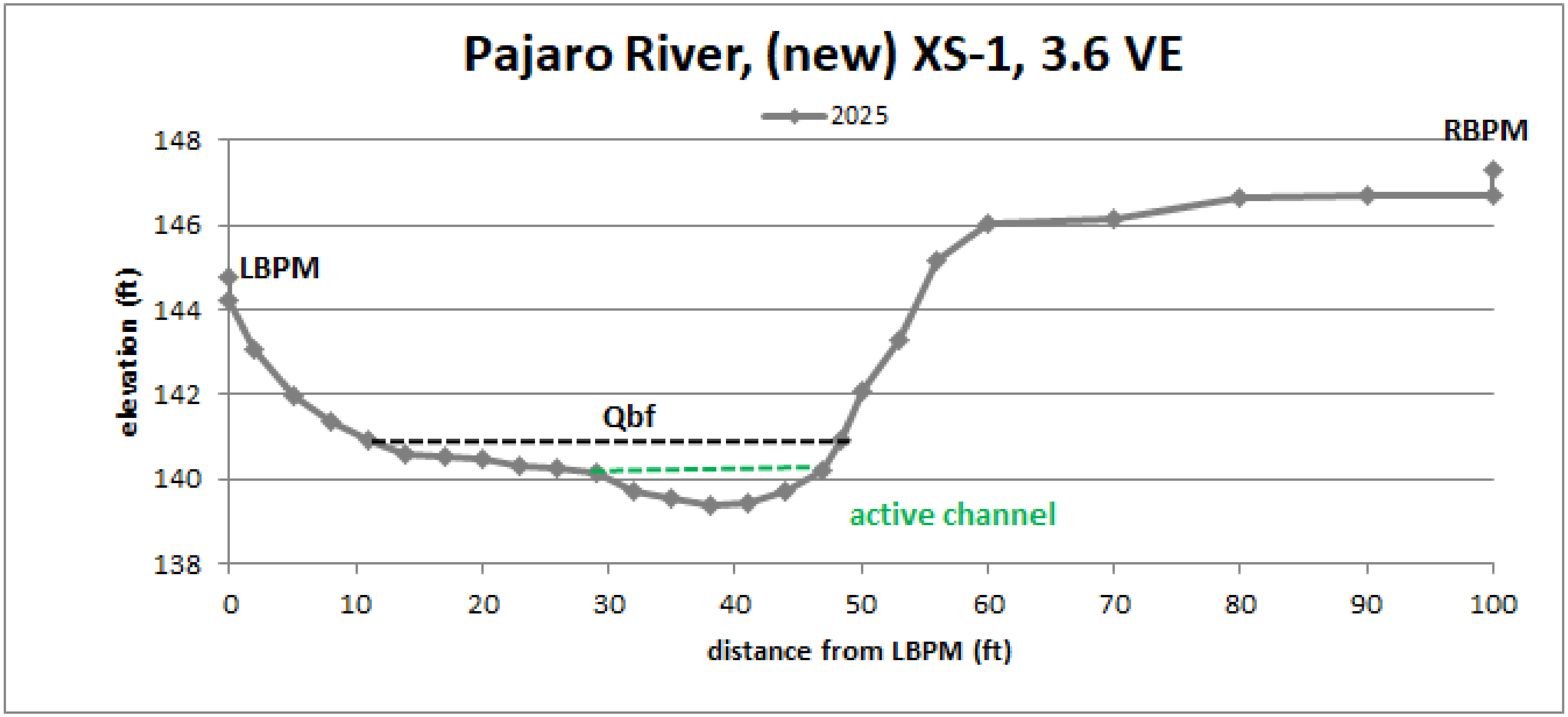
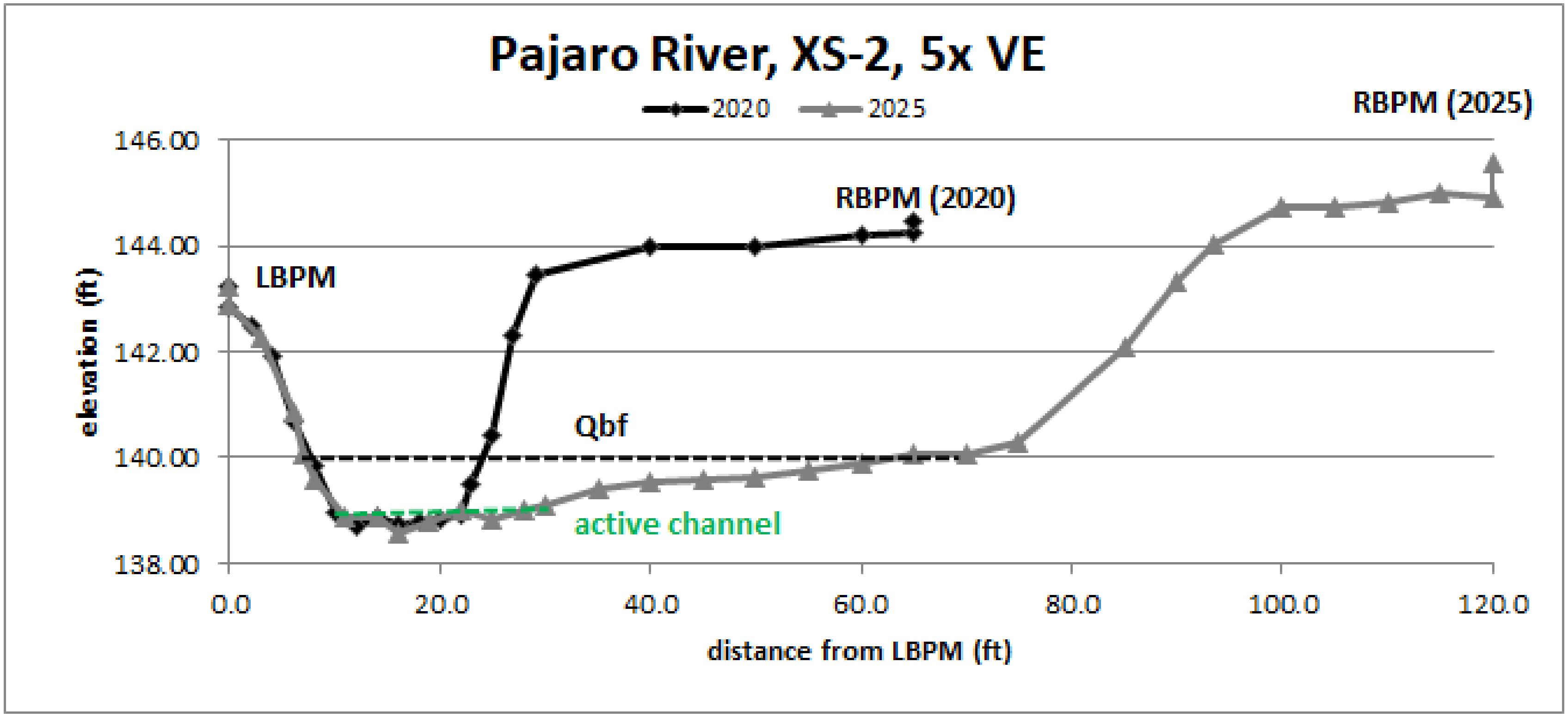

Pajaro River, (new) XS-1, 3.6 VE
2025
RBPM
LBPM
Qbf
active channel
elevation (ft)
148
146
144
142
140
138
0
10
20
30
40
50
60
70
80
90
100
distance from LBPM (ft)


Pajaro River, XS-2, 5x VE
2020
2025
RBPM (2025)
RBPM (2020)
LBPM
Qbf
active channel
146.00
144.00
142.00
140.00
138.00
elevation (ft)
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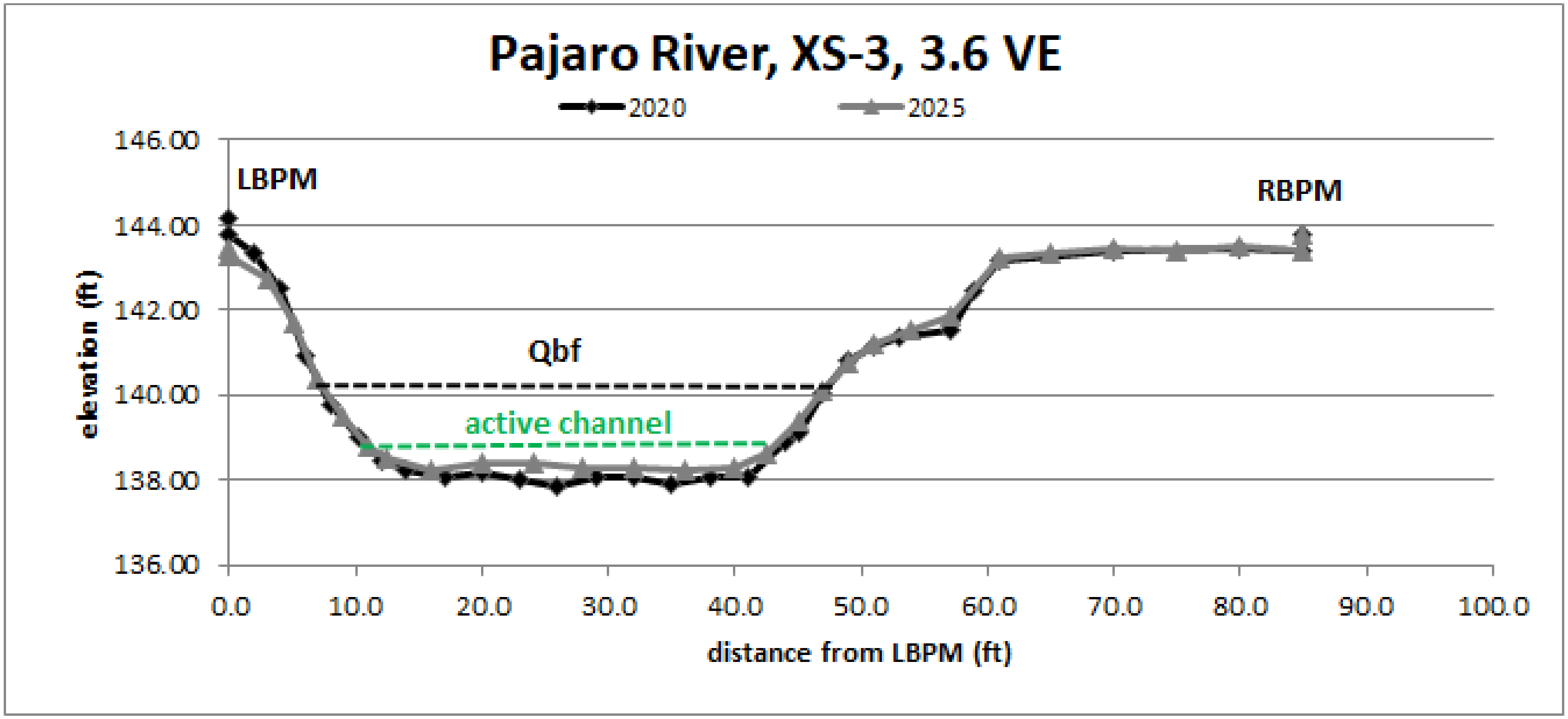
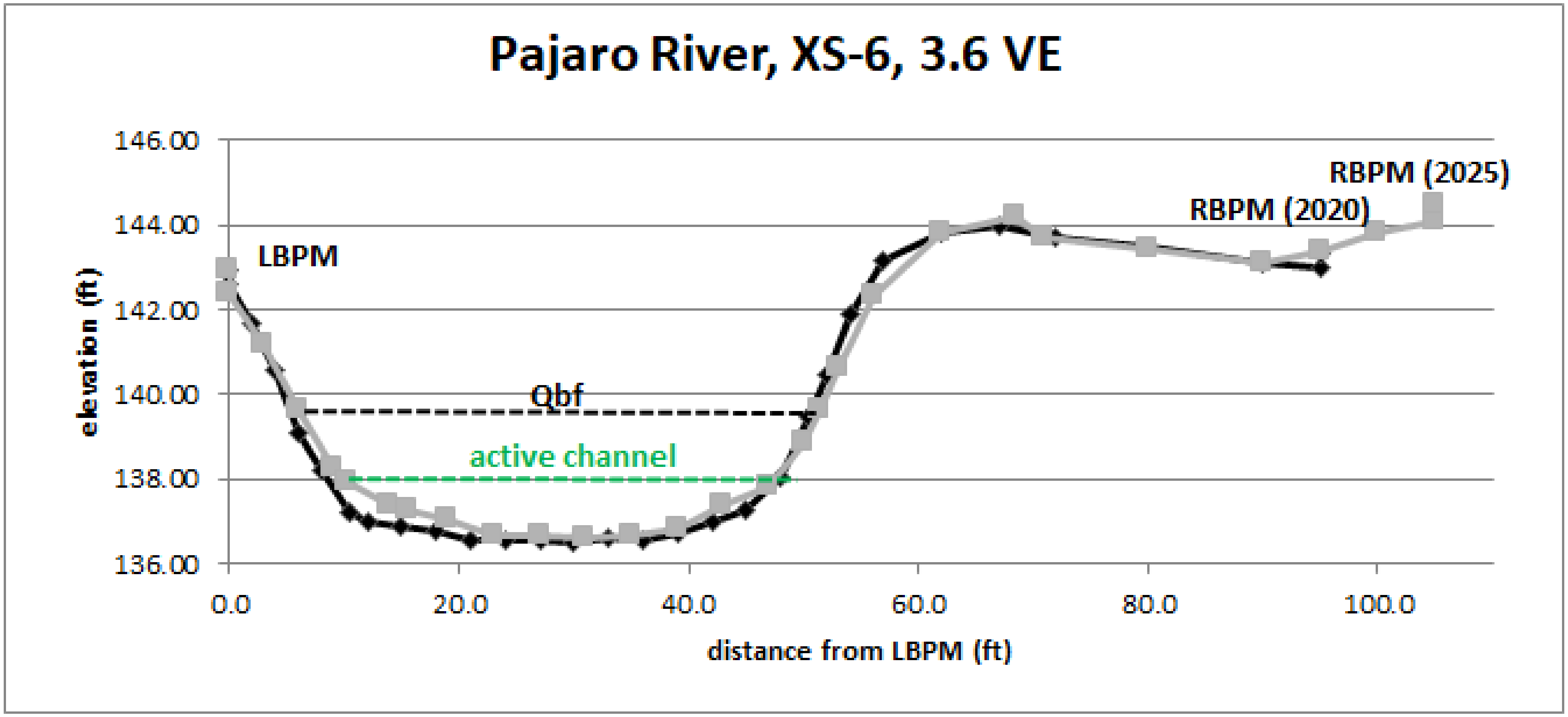
20.0
40.0
60.0
80.0
100.0
120.0
distance from LBPM (ft)


Pajaro River, XS-3, 3.6 VE
2020
2025
146.00
144.00
142.00
140.00
138.00
136.00
elevation (ft)
LBPM
RBPM
Qbf
active channel
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
distance from LBPM (ft)


Pajaro River, XS-6, 3.6 VE
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144.00
142.00
140.00
138.00
136.00
elevation (ft)
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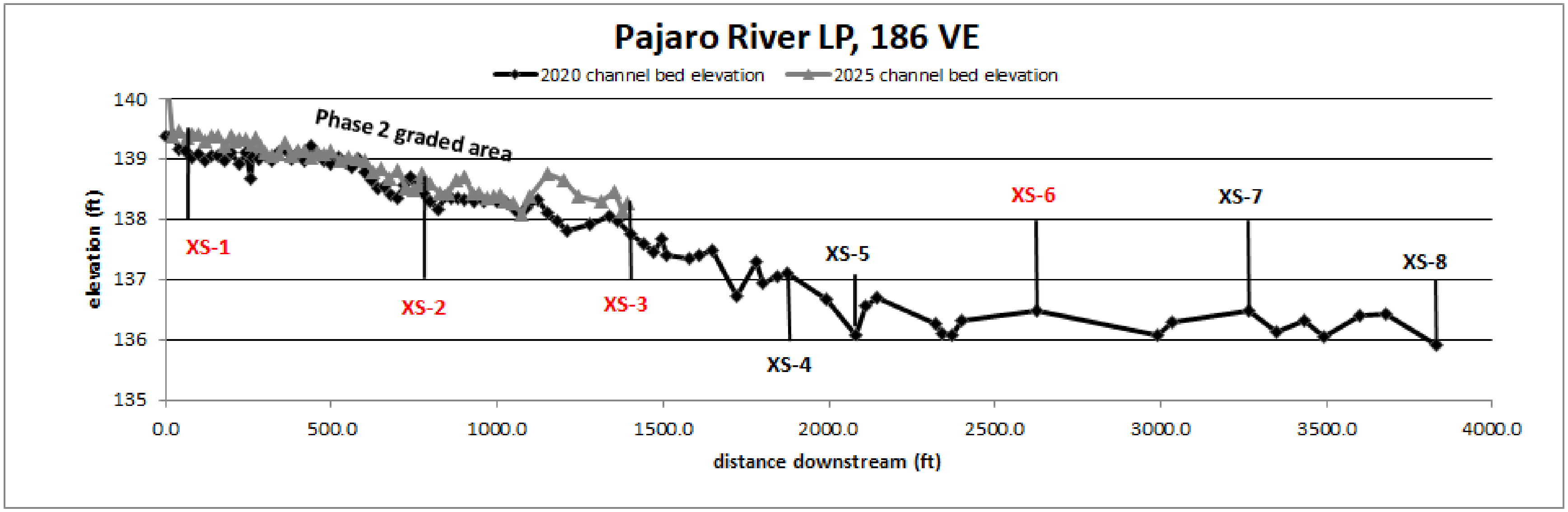
20.0
40.0
60.0
80.0
100.0
distance from LBPM (ft)
LBPM
Qbf
active channel
RBPM (2020)
RBPM (2025)


Pajaro River LP, 186 VE
2020 channel bed elevation
2025 channel bed elevation
elevation (ft)
distance downstream (ft)
Phase 2 graded area
XS-1
XS-2
XS-3
XS-4
XS-5
XS-6
XS-7
XS-8
140
139
138
137
136
135
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500.0
1000.0
1500.0
2000.0
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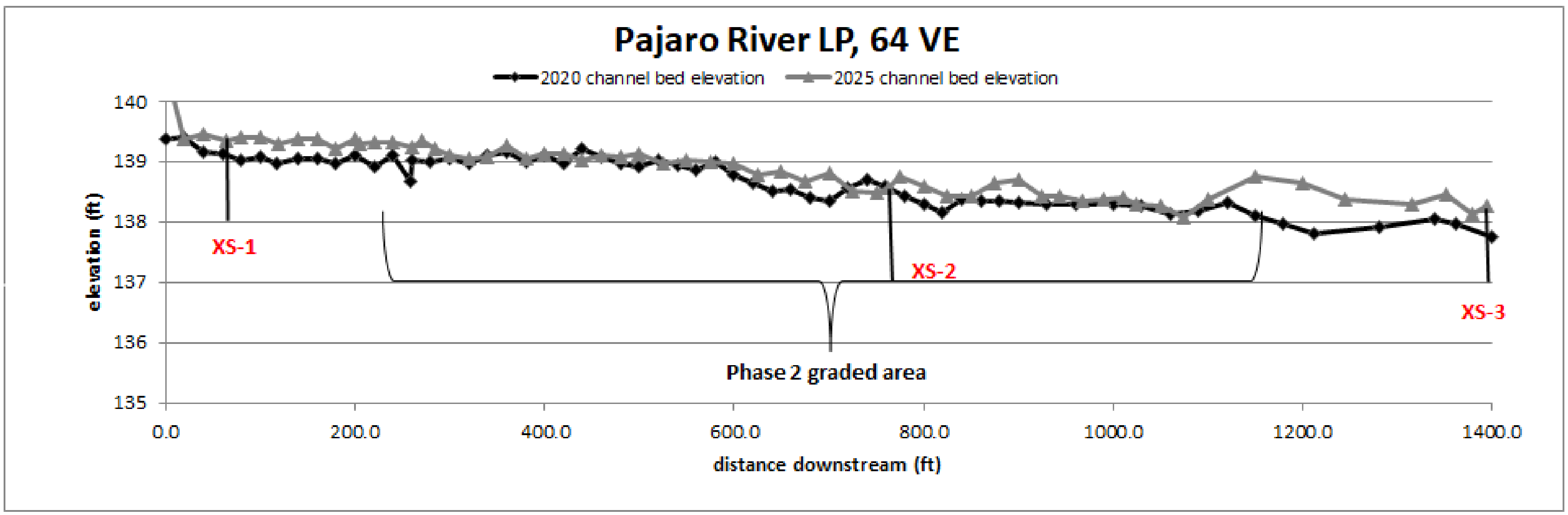
3500.0
4000.0


Pajaro River LP, 64 VE
2020 channel bed elevation
2025 channel bed elevation
elevation (ft)
distance downstream (ft)
XS-1
XS-2
XS-3
Phase 2 graded area
140
139
138
137
136
135
0.0
200.0
400.0
600.0
800.0
1000.0
1200.0
1400.0

Appendix 2: Photo Documentation

October 7, 2025

Drone Comparison Photos

July 2023: Pre-project view (above) looking downstream. Non-native weeds dominated farm setback area that had been mowed.

Aug. 2025: Post-grading/planting showing establishing riparian forest and developing seasonal wetland/marsh complex on right bank of the Pajaro River channel.

July 2023: Pre-project view looking upstream.

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Aug. 2025: Post-grading/planting showing establishing riparian forest and developing seasonal wetland/marsh complex on right bank of the Pajaro River channel.

Paired pre- & post-construction project photos of the Pajaro River Restoration Project.

Point 1. Looking downstream

December 5, 2022 (above); October 7, 2025 (below)

Point 2-A. Looking upstream

December 5, 2022 (above); October 7, 2025 (below)

Point 2-B. Looking downstream

December 5, 2022 (above); October 7, 2025 (below)

Point 3-A. Looking upstream

December 5, 2022 (above); October 7, 2025 (below).
Both photos taken after a pilot planting trial had been started in this area

Point 3-B. Looking downstream

December 5, 2022 (above); October 7. 2025 (below)

Point 4-A. Looking upstream

December 5, 2022 (above); October 7, 2025 (below)

Point 4-B. Looking downstream

December 5, 2022 (above); October 7, 2025 (below)

Point 5-A. (Spoils spreading area) Looking upstream

December 5, 2022 (above); October 7, 2025 (below)

Point 5-B. (Spoils spreading area) Looking downstream

December 5, 2022 (above); October 7, 2025 (below)

Point 6-A. (Spoils spreading area) Looking upstream

December 5, 2022 (above); October 7, 2025 (below)

Appendix 3: Flora Inventory

TRIANGLE
LAND RESTORATION

PAJARO RESTORATION PROJECT
SANTA CLARA COUNTY

Flora Inventory
Spring/Summer 2024-25

ANGIOSPERMS, EUDICOTS

<u>ADOXACEAE</u> (MUSKROOT FAMILY)	
Sambucus mexicana[+]	Blue elderberry
<u>ANACARDIACEAE</u> (SUMAC or CASHEW FAMILY)	
Toxicodendron diversilobum	Western poison oak
<u>APIACEAE</u> (CARROT FAMILY)	
*Conium maculatum**	Poison hemlock
*Foeniculum vulgare**	Fennel
*Torilis arvensis**	Hedgeparsley, Tall-sock destroyer
<u>APOCYNACEAE</u> (DOGBANE FAMILY)	
Asclepias fascicularis	Narrow-leaf milkweed
<u>ASTERACEAE</u> (SUNFLOWER FAMILY)	
*Anthemis cotula**	Mayweed, Dog fennel
Artemisia californica	California sagebrush
Artemisia douglasiana[+]	Mugwort
Baccharis glutinosa	Marsh baccharis
Baccharis pilularis subsp. *consanguinea*	Coyote brush
Baccharis salicifolia subsp. *salicifolia*[+]	Mule fat
Carduus pycnocephalus subsp. *pycnocephalus**	Italian thistle
*Centaurea solstitialis**	Yellow star-thistle
*Cichorium intybus**	Chicory
*Cirsium vulgare**	Bull thistle
*Dittrichia graveolens**	Stinkwort
Erigeron canadensis	Horseweed
Grindelia camporum	Common gumplant
*Helminthotheca echioides**	Bristly ox-tongue
*Lactuca serriola**	Prickly lettuce
*Senecio vulgaris**	Common groundsel
*Silybum marianum**	Milk thistle i
*Sinapis arvensis**	Charlock
Sonchus asper subsp. *asper**	Prickly sow thistle
*Sonchus oleraceus**	Common sow thistle
Symphyotrichum subulatum	Eastern annual saltmarsh aster
*Xanthium spinosum**	Spiny cocklebur
Xanthium strumarium	Cocklebur
<u>BORAGINACEAE</u> (BORAGE FAMILY)	
Amsinckia intermedia	Common fiddleneck

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[+] Observed only through planting

<u>BRASSICACEAE</u> (MUSTARD FAMILY)	
*Brassica nigra**	Black mustard
*Capsella bursa-pastoris**	Shepherd's purse
*Lepidium didymium**	Lesser swine cress
*Lepidium draba**	Heart-podded hoary cress
*Lepidium latifolium**	Perennial pepperweed
*Raphanus raphanistrum**	Jointed charlock
*Raphanus sativus**	Radish
<u>CARYOPHYLLACEAE</u> (PINK FAMILY)	
*Cerastium glomeratum**	Sticky mouse-ear chickweed
*Stellaria media**	Common chickweed
<u>CHENOPODIACEAE</u> (GOOSEFOOT FAMILY)	
Atriplex lentiformis	Big saltbush
*Atriplex prostrata**	Fat-hen
*Chenopodium murale**	Nettle leaf goosefoot
<u>CONVOLVULACEAE</u> (MORNING-GLORY FAMILY)	
*Convolvulus arvensis**	Bindweed
<u>EUPHORBIACEAE</u> (SPURGE FAMILY)	
Croton setiger	Doveweed, Turkey-mullein
<u>FABACEAE</u> (LEGUME FAMILY)	
*Lotus corniculatus**	Bird's-foot trefoil
*Medicago polymorpha**	California burclover
*Melilotus indica**	Sourclover
*Vicia sativa**	Spring vetch
Vicia villosa var. *varia**	Winter vetch
<u>FRANKENIACEAE</u> (ALKALI HEATH FAMILY)	
Frankenia salina	Alkali heath
<u>GERANIACEAE</u> (GERANIUM FAMILY)	
*Erodium cicutarium**	Redstem filaree
*Geranium molle**	Dove's-foot crane's-bill
*Geranium dissectum**	Cutleaf geranium, Cranesbill
<u>HELIOTROPIACEAE</u> (HELIOTROPE FAMILY)	
Heliotropium curassavicum var. *oculatum*	Salt heliotrope
<u>LAMIACEAE</u> (MINT FAMILY)	
*Lamium amplexicaule**	Henbit
Saliva mellifera[+]	Black sage
<u>LYTHRACEAE</u> (LOOSESTRIFE FAMILY)	
*Lythrum hyssopifolia**	Hyssop loosestrife
<u>MALVACEAE</u> (MALLOW FAMILY)	
Malvella leprosa	Alkali-mallow
*Malva parviflora**	Cheeseweed, Little mallow

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<u>MONTIACEAE</u> (MINER'S LETTUCE FAMILY)	
Calandrinia menziesii	Red maids
<u>OLEACEAE</u> (OLIVE FAMILY)	
Fraxinus latifolia+	Oregon ash
<u>ONAGRACEAE</u> (EVENING PRIMROSE FAMILY)	
Epilobium brachycarpum	Annual willowherb
Epilobium ciliatum subsp. *ciliatum*	Fringed willowherb
<u>PLANTAGINACEAE</u> (PLANTAIN FAMILY)	
*Plantago lanceolata**	English plantain
Veronica peregrina subsp. *xalapensis*	Purslane speedwell
*Veronica persica**	Persian speedwell
<u>POLYGONACEAE</u> (BUCKWHEAT FAMILY)	
Eriogonum fasciculatum+	California buckwheat
Polygonum aviculare subsp. *depressum**	Common knotweed
*Rumex conglomeratus**	Clustered dock
*Rumex stenophyllus**	Narrowleaf dock
<u>ROSACEAE</u> (ROSE FAMILY)	
Heteromeles arbutifolia+	Toyon, Christmas berry
Rosa californica	California wild rose
Rubus ursinus+	California blackberry
<u>SALICACEAE</u> (WILLOW FAMILY)	
Populus fremontii subsp. *fremontii*+	Fremont cottonwood
Populus trichocarpa+	Black cottonwood
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
<u>SAPINDACEAE</u> (SOAPBERRY FAMILY)	
Acer negundo+	Box elder

ANGIOSPERMS, MONOCOTS

<u>CYPERACEAE</u> (SEDGE FAMILY)	
Bolboschoenus maritimus subsp. *paludosus*	Saltmarsh bulrush, Alkali bulrush
Cyperus eragrostis	Tall flatsedge
Schoenoplectus acutus var. *occidentalis*	Common tule
Schoenoplectus americanus	Olney's three-square bulrush
<u>JUNCACEAE</u> (RUSH FAMILY)	
Juncus balticus subsp. *ater*	Baltic rush
Juncus effusus	Soft rush
Juncus xiphioides	Iris-leaved rush
<u>POACEAE</u> (GRASS FAMILY)	
*Avena barbata**	Slender wild oat
*Avena fatua**	Wild oat

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+ Observed only through planting

*Bromus diandrus**	Ripgut brome
*Bromus hordaceaus**	Soft chess brome
*Distichilis spicata**	Salt grass
Elymus triticoides	Creeping wildrye
Festuca microstachys	Pacific fescue
*Festuca myuros**	Six-weeds fescue, Rattail fescue
*Festuca perennis**	Rye grass
Hordeum marinum subsp. *gussoneanum**	Mediterranean barley
Hordeum murinum	Hare wall barley
*Phalaris minor**	Little-seeded canary grass
*Phalaris paradoxa**	Hood canary grass
*Polypogon monspeliensis**	Rabbitfoot grass, Annual beard grass
*Poa annua**	Annual blue grass
*Triticum aestivum**	Wheat

TYPHACEAE (CATTAIL FAMILY)

Sparganium eurycarpum var. *eurycarpum*	Broad-fruit bur reed
Typha latifolia	Broad-leaved cattail
Typha domingensis	Southern cattail

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