Salt River Ecosystem Restoration Project

Adaptive Management Plan
Monitoring Report 2019

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Salt River Ecosystem Restoration Project (Project) has been developed in collaboration with landowners and resource and regulatory agencies for over 30 years. The Humboldt County Resource Conservation District (HCRCD) is spearheading the Project on behalf of multiple private landowners throughout the Salt River watershed. The Salt River watershed is located in Humboldt County, California; approximately 15 miles south of the City of Eureka. The watershed surrounds the City of Ferndale and is bounded to the south by the Wildcat Mountains, to the east and north by the Eel River, and to the west by the Pacific Ocean. The watershed derives its name from the Salt River that historically flowed across the Eel River delta discharging into the Eel River estuary approximately 0.2 miles from the mouth of the Eel River.

The overarching goal of the Project is to restore and improve hydrologic function and fish and wildlife habitat in the Salt River watershed. The Project area includes the main stem of the Salt River, four Salt River tributaries originating in the Wildcat Hills above the town of Ferndale (Williams Creek, Francis Creek, Reas Creek, and Smith Creek), and the approximately 400-acre Riverside Ranch, which is contiguous to the Salt River estuary. The California Department of Fish and Wildlife (CDFW) acquired Riverside Ranch in 2012 from Western Rivers Conservancy, who had purchased the property from a willing seller. CDFW is an active partner in the Project. The remainder of the Project area is in private ownership.

The Project intends to restore natural hydrologic processes to a significant portion of the watershed, promoting restoration of ecological processes and functions. The Project is presented in two primary phases to distinguish between the tidal wetland restoration (known as Phase 1) and the riverine restoration work (known as Phase 2). The Project includes work that will be accomplished over several years. Within the two phases, the Project is further broken down in to four primary components, discussed below:

- **Upslope erosion control:** Work with willing landowners to implement upslope erosion control activities in the upper portions of the Francis, Williams, and Reas Creeks watersheds to reduce the level of sediment input and delivery to the Salt River, thereby improving water quality while reducing sediment deposits in the channel.
- **Riverside Ranch tidal marsh restoration:** Restore tidal marsh in the lower Salt River. This will also increase the tidal prism exchanged through the lower river, increasing sediment transport potential, increasing scour and promoting hydraulic connectivity with the upper watershed.

- **Salt River channel excavation:** Excavate and rehabilitate approximately 7.4 miles of the historic Salt River channel to restore hydrologic connectivity within the watershed thereby improving aquatic and riparian habitat, providing fish passage to tributaries, and improve drainage in the delta.

- **Adaptive Management:** Work with the community and regulatory agencies to implement an environmentally and geomorphically acceptable adaptive maintenance and management program to maintain hydraulic and ecological function in the Project area into the future.

In 2013, restoration of Riverside Ranch (Phase 1 of the Project) restored 330 acres of pasture land back to intertidal wetland habitat, while also preserving approximately 70 acres that will be agriculturally managed to provide short-grass habitat for Aleutian cackling geese and other wetland-associated birds. Three miles of internal slough networks were excavated to create additional habitat for salmonids, tidewater goby, and other fish and aquatic species, and provide areas for the natural recruitment of eelgrass. Two miles of setback berm were constructed to create a boundary between the tidal area and the retained agricultural area, and a gravel road was installed on top of the berm to provide access for monitoring and maintenance. This component of the Project also widened and deepened approximately 2.5 miles of the tidally influenced portion of the Salt River channel, thereby increasing tidal exchange and greatly improving fish passage and fish habitat in the lower Salt River channel.

The design of Phase 1 was intended to strike a balance between creating significant amounts of new tidal marsh habitat, retaining and enhancing some of the important existing upland and riparian features, preserving sufficient acreage to manage for short-grass habitat for Aleutian cackling geese, minimizing long-term site maintenance, and incorporating design features that accommodate sea-level rise. Earthwork on Phase 1 was balanced on site, with excavated materials all being utilized to construct a range of habitat features at varying elevations and to construct the 2-mile setback berm.

Phase 2 represents the Salt River “corridor restoration” portion of the larger project. Within Phase 2, design plans call for 4.5 miles of the Salt River channel and its adjacent floodplain to be excavated. Wetlands and riparian corridors will be re-vegetated with a diverse palette of native plants. Fish passage would be restored to three watershed tributaries – Reas, Francis and Williams Creeks.

Across the years of 2013, 2014, 2015, 2017, 2018, and 2019 a total of 6.2 miles of Salt River channel and floodplain were constructed and re-vegetated. These construction efforts also reconnected two tributaries (Reas and Francis Creek). The 2017 construction season also restored 0.5 miles of the channel and floodplain in Francis

Creek (Figure 1). It is anticipated that the remaining 1.2 miles of the Phase 2 construction will occur in 2022/2023, completing the Salt River corridor restoration.

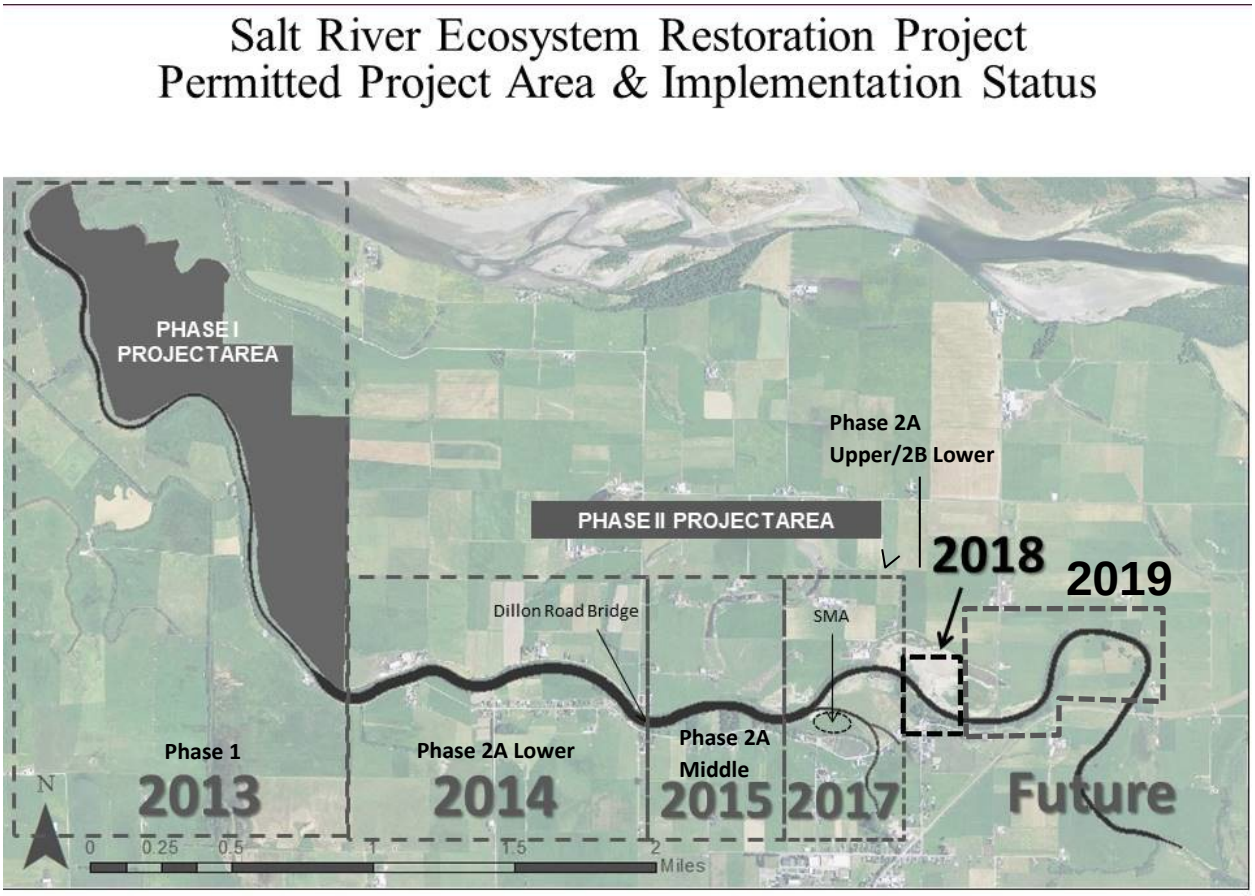

Figure 1: Salt River Ecosystem Restoration Construction Timeline as of 2019

On completed portions of the Project, monitoring is performed under direction of the Humboldt County Resource Conservation District and complies with requirements generated from Project documents, including the Salt River Ecosystem Restoration Project's Habitat Mitigation and Monitoring Plan (HMMP) and the Adaptive Management Plan (AMP). This report provides information on data collected for monitoring tasks pertaining to the AMP of the Salt River Ecosystem Restoration Project as follows:

- Phase 1: Year 6 (post construction 2013)
- Phase 2: Year 5, Year 4, Year 2, Year 1 (post construction 2014, 2015, 2017, and 2018 respectively)

As mentioned in the Summary of Conclusions section below, monitoring results demonstrate the Project is performing successfully and largely meeting Project goals.

SUMMARY OF CONCLUSIONS

As detailed in this report, the 2019 monitoring results provide a point of reference on how the restoration activities completed in 2013 (Phase 1), 2014 (Phase 2A Lower), 2015 (Phase 2A Middle), 2017 (Phase 2A Upper/2B Lower), and 2018 have responded to the area's environmental conditions during its formative years after construction. One important environmental input to consider is the previous season's amount of precipitation. The north coast of California generally experiences precipitation from October to the end of April. This period of time is referred to as a *hydrologic year*. The amount of the hydrologic year's precipitation prior to monitoring efforts can significantly affect the findings of a handful of monitoring tasks, such as riparian success and cross-sectional surveys. The 2018/2019 hydrologic year set rain records at the Eureka weather station on February 25 and 26, 2019. February 27th experienced severe flooding with water levels reaching the highest point since 1986 at Fernbridge, achieving 25.7 feet by 4pm that day. February saw a total of 14.43 inches of rain, the third most on record for that month. February also saw a 24-hour record, with 3.07 inches falling between Feb 26th and 27th, the greatest since 2002.

The following is a brief summary of the findings of the various monitoring efforts under the identified Adaptive Management Plan's monitoring categories. Please reference individual reports listed at the end of this report for more detailed findings.

Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Salt River Corridor

The cross-section surveys on Phase 2 of the Salt River corridor indicate that the Salt River channel is adjusting to the environmental conditions and is trending toward a scour process where channel bottom elevation is decreasing overall. Tidal exchange and water quality monitoring was required for the first three years after Project construction in tidally influenced regions. This monitoring was concluded in its entirety across all phases in the Salt River Ecosystem Restoration Project in 2016. Monitoring indicated that water quality parameters achieved ranges appropriate for salmonids at sampling sites and the restored tidal prism reached the predicted extent in the restoration area. Other monitoring under this heading included observing the function of bridges and culverts. For the 2019 monitoring period, existing Dillon Road Bridge and replaced Port Kenyon Road Bridges located within the constructed project footprint and were functioning normally as well as one installed private agricultural bridge on Francis Creek. No culverts were installed during the Phase 2 construction, though adjacent culverts are present along the Project footprint at Reas Creek, the Boynton swale, and Bush Street, and were found to be unimpeded. Geomorphic surveys for the Sediment Management Area (SMA) indicate that it captured approximately 15,000 cubic yards over the 2018/19 hydrologic year.

Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Riverside Ranch

Cross-section surveys on Phase 1 (Riverside Ranch) were not required in 2019 and will be performed again in 2020. Previous surveys indicate this tidally influenced Phase of the Salt River Ecosystem Restoration Project is highly dynamic with channel capacity fluctuating between years. Additional monthly general visual inspections of the Phase 1 elements include the setback berm, outboard ditches, and tide gates. The setback berm is structurally stable, and no significant changes were observed. The outboard ditches are functioning as designed. All three tide gates are functioning normally with typical leakage and doors have not been observed to have any obstructions.

Water Quality Monitoring and Adaptive Management for the Salt River Corridor and Riverside Ranch

Water quality monitoring was required for the first three years after Project construction in tidally influenced regions. Water quality monitoring was concluded in its entirety across all phases in the Salt River Ecosystem Restoration Project in 2016. Monitoring indicated that water quality parameters achieved ranges appropriate for salmonids at sampling sites and restored tidal prism reached the predicted extent in the restoration area. Additional water quality spot measurements are taken monthly in spring and summer during fish surveys at each monitoring site and indicate appropriate water quality parameters for healthy fish habitat are being met.

Habitat Development, Vegetation and Invasive Species Monitoring, and Adaptive Management for Salt River Corridor and Riverside Ranch

A variety of monitoring and management actions are included under this category, primarily relating to fish and vegetation. A fish sampling program has been ongoing since 2014 in constructed phases of the Project. The 2019 sampling effort took place from March to August (excluding July) at six sites in the Phase 2 corridor. Thirteen anadromous, freshwater, and marine species were captured in 2019. Phase 1 and the completed portions of Phase 2 were mapped to depict all projected habitat acreages for the various habitat types, including: tidal salt marsh, high marsh ecotone, riparian, and channel wetlands. In 2019 (5 years post-implementation), the project is within the 90% success criteria for riparian acreages in Phase 1. Phase 2A Lower and Middle riparian areas are on a positive trajectory and represents 31% of the total Phase 2 project riparian habitat acreages. The 2019 percent cover sampling results indicate that Phase 1, Phase 2A Lower, Phase 2A Upper, and Phase 2B Middle are achieving and exceeding native plant success criteria. However, Phase 2A Lower exceeds the minimum threshold for non-native non-invasive and invasive vegetation. Recommendations for addressing non-native non-invasive and invasive vegetation is stated in the 2019 vegetation monitoring

report. Average tree diameter/basal area was estimated for planted riparian areas in Phase 1 and Phase 2A Lower. A comparison between 2017 and 2019 estimated basal area for those areas indicate that basal area is increasing significantly for each riparian area.

INTRODUCTION

The Salt River Ecosystem Restoration Project (SRERP) took some 30 years to develop and drew upon several studies and assessments completed during that time that examined cultural, biological, geological, aquatic, and vegetative resources as well as tidal influences in the watershed. Project proponents also developed documents to guide implementation, maintenance, and long-term monitoring. Monitoring documents include the Salt River Monitoring Plan, Habitat Mitigation and Monitoring Plan, the Adaptive Management Plan, and other specialized plans to assure the protection of sensitive wildlife habitats, landowner properties, and the hydrologic system itself.

As outlined in the Project's CEQA and the Adaptive Management Plan documents, a variety of monitoring tasks are required to be conducted to help determine if Project goals and objectives are being achieved, as well as to guide Project management and maintenance. Most of the monitoring tasks are to be completed over a period of ten years, post-implementation. Monitoring was conducted prior to beginning Project implementation to establish baseline data and/or assist in identifying and protecting resources in the Project area. Post-implementation monitoring is being conducted as required by the Project's various funders, permit requirements, and environmental compliance documents. Many of the individual reports are available from the Humboldt County Resource Conservation District upon request or can be accessed on the website (http://humboldtrcd.org/salt_river_ecosystem_restoration_project/reports_and_documents).

This report is structured and provides findings related to the monitoring requirements in the four identified Adaptive Management Plan categories:

- *Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Salt River Corridor*
- *Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Riverside Ranch*
- *Water Quality Monitoring and Adaptive Management for the Salt River Corridor and Riverside Ranch*

- *Habitat Development, Vegetation and Invasive Species Monitoring, and Adaptive Management for Salt River Corridor and Riverside Ranch*

Within each category is a description that identifies 1) the discrete task called for, 2) the agency requiring the task, 3) the reference document, 4) description of the task, 5) goals and objectives of the tasks, 6) the resulting monitoring report (if applicable), 7) a description of methods, and 8) a results and discussion section.

Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Salt River Corridor

Monitoring Task: Cross Sectional and Longitudinal Surveys-Salt River Channel Corridor –Phase 2 - Erosion and Sediment Deposition Surveys

Agencies/Acts: Coastal Commission, and California Environmental Quality Act (CEQA)

Compliance Documents: Coastal Development Permit- Special Conditions; Salt River Ecosystem Restoration Project Final Environmental Impact Report (FEIR); and Salt River Ecosystem Restoration Project Adaptive Management Plan

Description: Cross-sectional and longitudinal profile surveys are performed across and along the main channel Salt River.

Goals:

- Cross-sectional and longitudinal surveys will describe how the channel is remaining consistent with restoration designs, or if areas are aggrading or eroding to the point of intervention.

Report: *Channel Profile Report: Salt River Ecosystem Restoration Project – Phase Two – Year 2019 by Melissa Kobetsky. December 2019.*

Methods: The 2019 channel profile surveys in the Phase 2 project area consisted of four cross-sections and a longitudinal profile (Figure 2). The longitudinal channel profile covers a distance 3.5 kilometers from the confluence of Reas Creek to immediately upstream of cross-section ten. Cross-sections one, five, and seven were established in 2015 (Medel 2017). Cross-section ten was established in 2019 to include the most recent completed portion of channel construction. Only the monument for cross-section seven was reoccupied in 2019, other cross-section locations were approximated using a handheld Garmin Global Position System (GPS) with an accuracy of ± 10 m. Permanent benchmarks were installed at the start of each cross-section to ensure accurate reoccupation of transect locations in future surveys. Permanent benchmark elevations

were measured with a Trimble (Model XXX) Real-time Kinematic GPS receiver to position and orient the total station.

Elevation were collected using a Nikon DTM 322 Total Station, tripod, prism pole and reflector in the 1988 North American Vertical Datum (NAVD88). Data for cross-sectional surveys were collected across the floodplain, channel slope, water's edge, thalweg and across the bottom of the channel. The length of each cross-section varied due to private property or thick riparian vegetation that impeded access on either side of the floodplain. Measurements were taken at a minimum of 2 meter intervals across the floodplain, and at higher resolutions across areas with greater morphological complexity. Elevation points for the longitudinal profile were collected at 60 meter intervals where possible, and coarser resolutions where channel height and/or vegetation prevented sighting of the prism.

Figure 2: Salt River Phase 2 Cross-Section Sites

Results and Discussion: Four cross-sections sites were surveyed in the 3.5 kilometers of the 2014, 2015, 2017, and 2018 restored reaches of the Salt River (Figure 2). The following graphs (Figures 3 to 6) each show cross-sections from years 2015, 2016, 2017, and 2018 of sites 1, 5, and 7. The following cross-sectional profile graphs are presented looking downstream. The following is an excerpt from the channel profile report that describes the cross-section sites and the longitudinal survey:

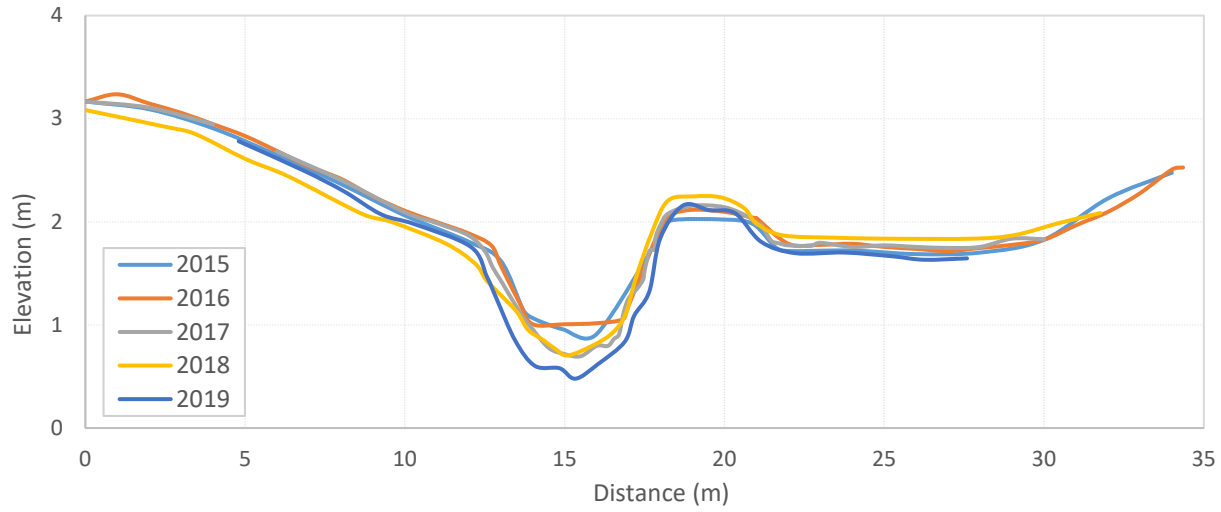

Figure 3: Cross-section one, profile for years 2015-2019.

The profile for cross-section one (Figure 3) indicates both widening and deepening in the main channel but nominal elevation change in the active bench and floodplain. Degradation was relatively uniform across the channel, with a decrease in thalweg elevation of 0.23m compared to 2018.

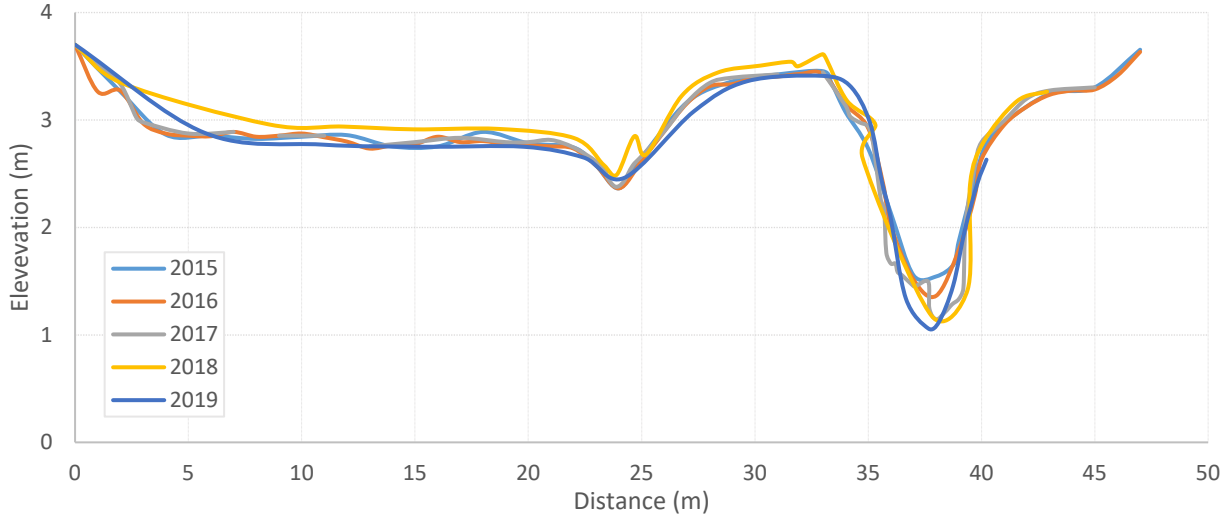

Figure 4: Cross-section five, profile for year 2018-2019.

Cross-section five maintained a similar width-to-depth ratio compared to 2018, with a decrease in thalweg elevation of 0.12 m (Figure 4). The cross-sectional profile shows floodplain elevations consistent with previous survey years but slight aggradation in the side channel (0.08 m).

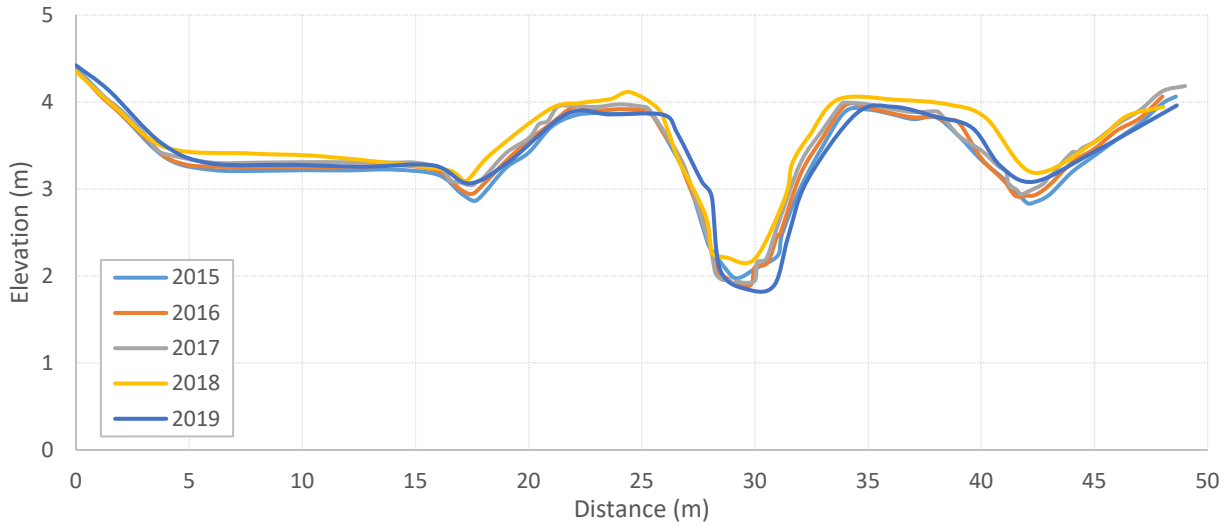

Figure 5: Cross-section seven, profile for years 2015-2019.

The channel in cross-section seven experienced scour towards the right bank, resulting in slight widening and decrease in thalweg elevation of 0.26 m compared to 2018 (Figure 5). Channel geometry remains relatively stable with potential for more lateral migration based on visual observation in the field of slumping on the right bank.

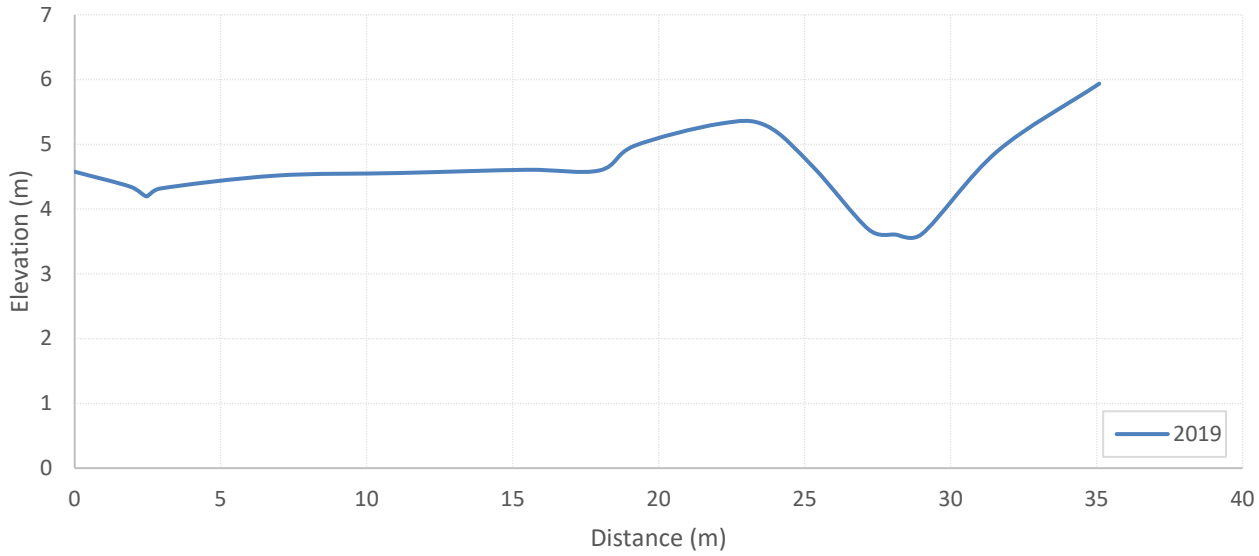

Figure 6: Cross-section ten, profile for year 2019.

Cross-section ten (Figure 6) was established to capture the most recent phase of the SRERP and the 2019 cross-sectional profile serves as baseline data.

Table 1: Cross-section thalweg elevation (m) for each survey period.

Cross-section	***2015***	***2016***	***2017***	***2018***	***2019***	***Total Change***
One	*0.91*	*1.01*	*0.70*	*0.70*	*0.47*	*0.44*
Five	*1.54*	*1.36*	*1.14*	*1.18*	*1.06*	*0.48*
Seven	*1.99*	*1.89*	*1.91*	*2.10*	*1.84*	*0.15*

Channel degradation is the dominant trend across transects; particularly in cross-sections one and five, which have decreased in thalweg elevation by almost a half a meter since 2015 (Table 1). Cross-section one has been more dynamic throughout the five survey years and experienced deposition in 2016 and 2018 whereas cross-section five shows a more consistent trend of elevation loss. Cross-section seven also shows a trend toward erosion in the channel but of less overall magnitude than the other cross-sections.

The longitudinal profile spans a distance of 3,700 m and is presented in two segments that cover Phase 2 (Figure 7) and a recently completed section that extends upstream of the Francis Creek sediment retention basin (Figure 8). Data resolution is courser in portions of the reach due to dense vegetation and channel incision that prevented sighting of the prism. The distribution of elevation points is illustrated by markers to show areas with less data, notable sections include between 1,000 and 1,500 m (Figure 7) as well as from 2,300 to 2,600 m (Figure 8). Results for these segments are not presented due to the low confidence interval in making topographic comparisons with a small sample size.

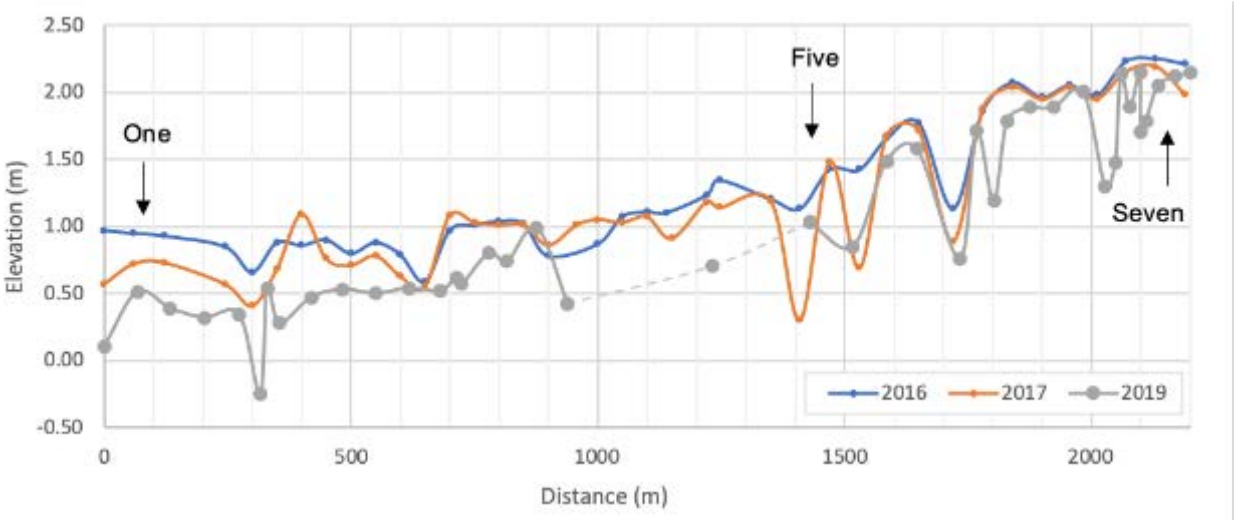

Figure 7: Section of longitudinal profile for the Phase 2A portion of the SRERP with locations of cross sections labeled. *The dashed line for 2019 indicates a segment with course data resolution that may not accurately reflect trends in channel morphology.*

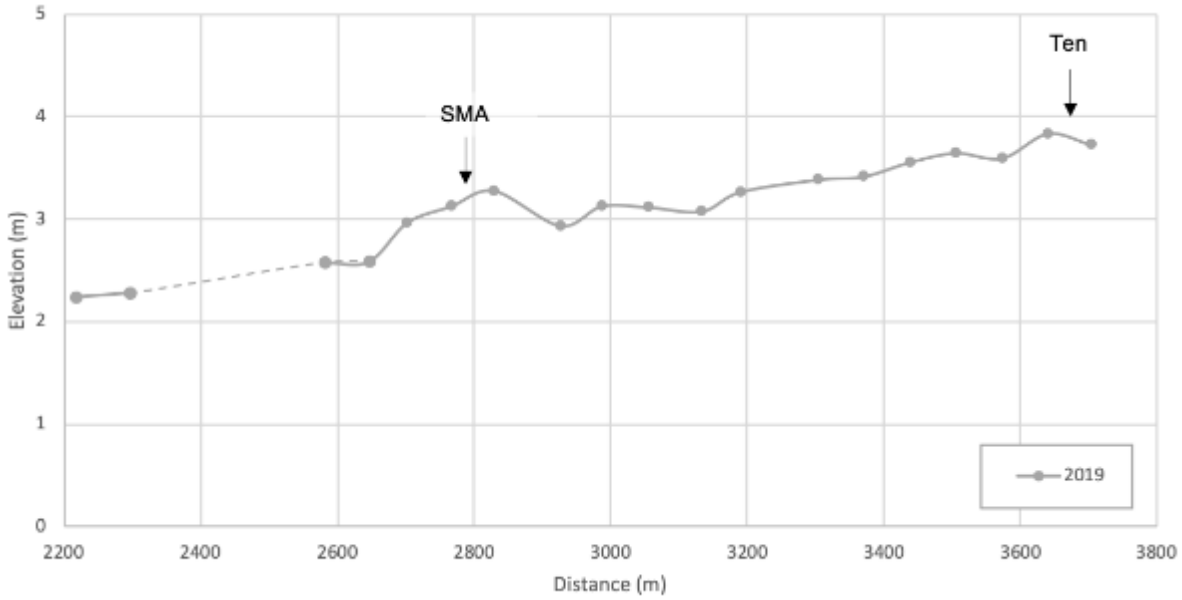

Figure 8: New section of the longitudinal profile that continues upstream from previous years surveys.

Cross-section ten and the sediment management area (SMA) at the confluence with Francis Creek are labeled. The dashed line indicates a segment with course data resolution that might not accurately reflect trends in channel morphology.

In agreement with cross-sectional surveys, the longitudinal profile shows a dominant trend of scouring as illustrated by reductions in elevation throughout majority of the channel. The downstream portion (0-950 m) had the greatest overall erosion compared to other channel segments. The first 875 m displayed relatively uniform bed lowering, with a mean elevation decrease of 0.31 m. An existing pool at approximately 300 m continued to scour, but at a higher magnitude compared to previous years with a decrease in elevation of 0.66 (Figure 15).

The upstream portion (1,400-2,200 m) displayed variable erosion dynamics with more scouring compared to other survey years and a mean elevation 0.13 m lower than in 2017. The most downstream pool deepened slightly with a decrease in thalweg elevation of 0.12 m. Two incipient pools formed that deepened the channel thalweg elevation by approximately 0.85 m. Minor deposition (0.15 m) occurred upstream of the sediment management area, but the average relief of the channel downstream of the SMA decreased at a rate relatively consistent with the rest of the channel.

Overall, the data shows trends of decreased channel elevations and potential net sediment transport out of the project area, which is consistent with past survey years.

Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Salt River Corridor

Monitoring Task: Bridges and Culvert Inspections on Salt River Corridor

Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions; Salt River Ecosystem Restoration Project Adaptive Management Plan

Description: Annual visual inspection of culverts and bridges in the restored Salt River corridor.

Goals:

- All culverts and bridges on the restored Salt River corridor are to remain unobstructed and functional.

Report: N/A. Observational data sheets are available upon request.

Methods: All culverts and bridges will be visually inspected upstream and downstream, inlet/outlet, at low and high water flows to determine that these structures are functioning as intended and not being occluded by debris or sediment deposition. Erosion factors will also be noted. Dillion Road, Sousa, Albin, Francis, and Fulmor Bridges span the restored Salt River as of 2019 monitoring season. Existing and adjacent culverts at Reas Creek, Boynton Swale, and Bush Street deliver flows to the Salt River (Figure 9).

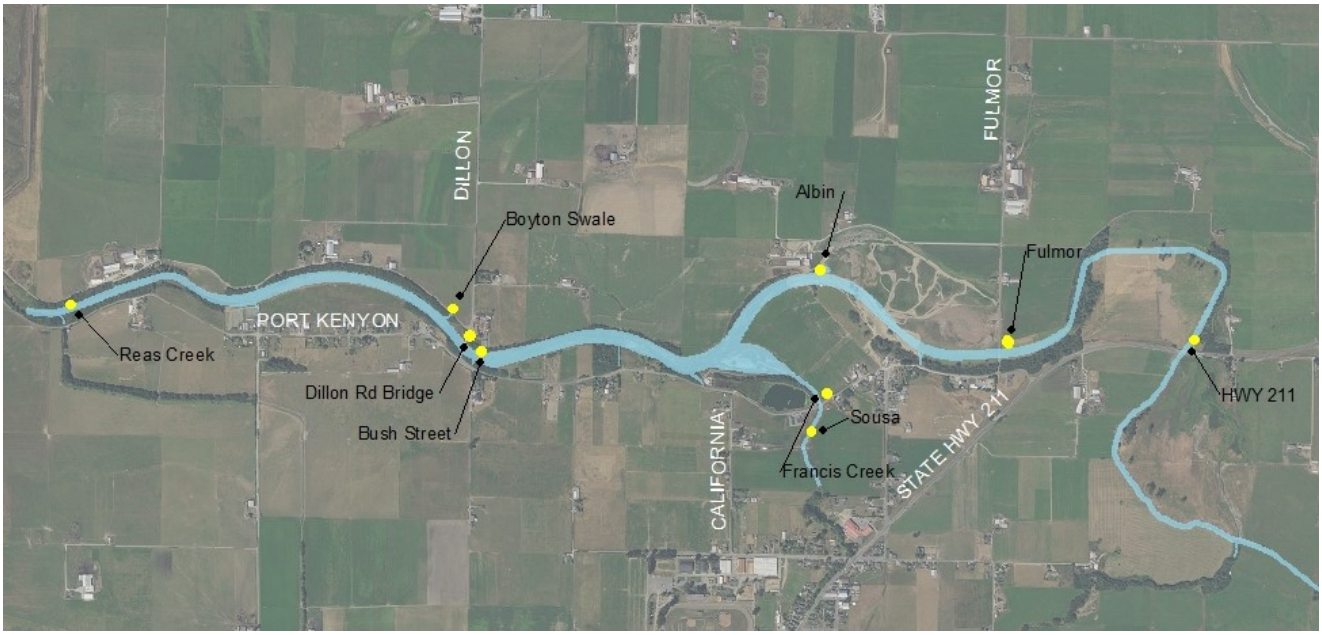

Figure 9: Bridges and Culverts Locations on the Salt River restored corridor

Results and Discussion: Four bridges (Dillion Road, Albin, Sousa, Francis, and Fulmor) span the restored Salt River channel as of the 2019 monitoring period. The Albin, Sousa, and Francis were bridges replaced or constructed as part of the Salt River restoration. All bridges were observed during low and high flows and no debris in the channel or flood plain are racking up on the bridge abutments or installed rock slope protection. Erosion around the footings is not occurring. The Reas Creek, Boynton Swale, and Bush Street culverts have been observed during high and low flows and appear to be functioning normally.

Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Salt River Corridor

Monitoring Task: Inspection of Sediment Management Areas
Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions; Salt River Ecosystem Restoration Project Adaptive Management Plan

Description: Annual inspection of the sediment management area at the confluence of Francis Creek and the Salt River as well as passive sediment management areas in the restored Salt River corridor.

Goals:

- Sustain hydraulic conveyance and ecological function.

- Minimize sediment management maintenance activities.

Report: N/A

Methods: Methods to determine sediment deposition in the active and passive sediment management areas include topographic surveys.

Visual inspections of the active sediment management area (SMA) at the confluence of Francis Creek and Salt River are performed annually in the late spring. Two staff plates are installed at the west and east ends areas of the SMA. If staff plates indicate that significant sediment appears to be deposited in the SMA, sediment deposition will be measured. A drone flight collected data to develop a topographic surface map. Resulting elevations were compared to 8.0 feet and 9.0 feet elevations (NAVD88) and a volumetric analysis was completed. If the SMA capacity is reduced by 25%, sediment removal shall be considered.

Cross-sectional surveys and visual inspections of connection points of passive sediment management areas (floodplains) to the main stem Salt River are also used as an evaluation method for site specific deposition. Visual assessments of vegetation growth within passive sediment management areas will determine whether present vegetation affects flow and deposition.

Results & Discussion: The active sediment management area at the confluence of Francis Creek and Salt River was constructed in the fall of the 2017 and experienced its second winter. By spring of 2019, the SMA captured substantial sediment. The SMA was dewaterd and a drone flight captured topographic data and a surface map was created. It was estimated that the SMA captured approximately 15,000 cy of sediment, reaching capacity. The 2019 Salt River construction contractor (McCullough Construction Inc.) managed the SMA sediment in order to for it to dry out enough to excavate and haul to appropriate sediment reuse sites. Minor excavation also occurred immediately outside of the mouth of the Francis Creek and Salt River confluence where accumulation of sediment was observed.

In previously restored portions of the Phase 2 channel corridor, passive sediment management areas are identified as specific constructed floodplain features. Cross-sectional surveys of the floodplains show varying deposition since 2015 (see Figures 3 - 5 above). It appears that the 2018/2019 winter scoured depositional sediments occurring across the floodplain benches back to 2015 levels.

Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Riverside Ranch

Monitoring Task: Cross Sectional and Longitudinal Surveys- Phase 1 - Riverside Ranch Erosion and Sediment Deposition Surveys

Agencies/Acts: Coastal Commission, and California Environmental Quality Act (CEQA)

Compliance Documents: Coastal Development Permit- Special Conditions; Salt River Ecosystem Restoration Project Final Environmental Impact Report (FEIR); and Salt River Ecosystem Restoration Project Adaptive Management Plan

**Phase 1 Cross Sectional and Longitudinal Surveys were not required in 2019*

Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Riverside Ranch

Monitoring Task: Culvert and Tide Gate Inspections on Riverside Ranch

Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions; Salt River Ecosystem Restoration Project Adaptive Management Plan

Description: Annual inspection of tide gates, culverts, and outboard drainage ditch.

Goals:

- All tide gates and remaining culverts on Riverside Ranch remain unobstructed and operational.
- The Riverside Ranch outboard ditch will be monitored for flow and erosion impacts and maintained.

Report: N/A. Observational data sheets are available upon request.

Methods: Any culverts or tide gates remaining or installed in Riverside Ranch (Figure 10) as part of the restoration design will be inspected annually and regularly maintained to ensure that they are functioning as designed. Annual reconnaissance of the outboard drainage ditch adjacent to the Riverside Ranch berm will also be conducted to identify areas of impacted flow conveyance and/or erosion and any maintenance recommendations.

Although the SRERP's Adaptive Management Plan calls for annual monitoring, during

2018, HCRCD staff monitored the above items periodically to ensure tide gates and the outboard ditch were working properly to prevent high salinity water from encroaching onto neighboring lands. A site-check form has been developed to help monitor various elements on Riverside Ranch. The form includes observations pertaining to the tide gates, outboard ditch, pasture conditions, fencing, wildlife, roads, structures, etc. The forms are reviewed by the HCRCD Project Manager to determine any issues that need to be addressed.

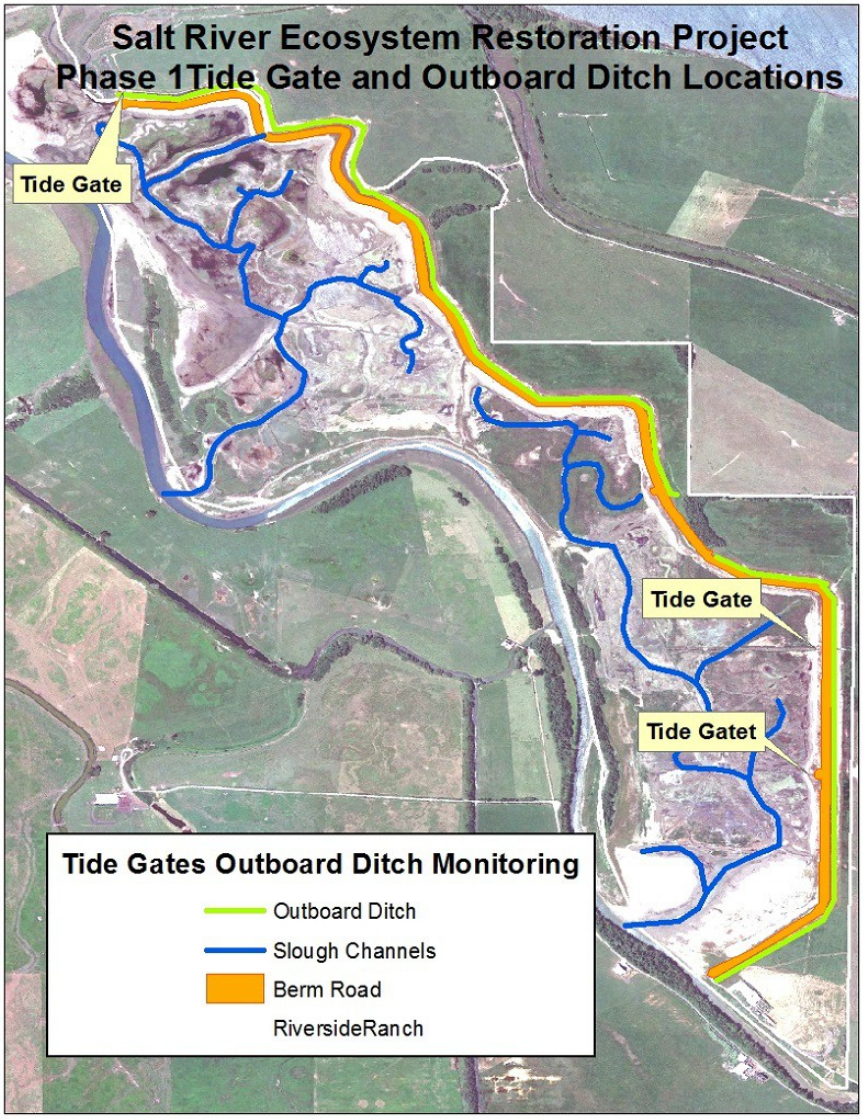

Figure 10: Tide Gates and Outboard Ditch Locations

Results and Discussion: The Phase 1 (Riverside Ranch) project area is monitored for various items, which include the three tide gates and the outboard ditch. The 2019 monitoring was conducted on a periodic basis. No culverts remain on Riverside Ranch; all culverts were removed during construction. The installed tide gates are functioning

as expected. No debris has been observed to obstruct the closing or opening of the tide gates thus far. Vegetation in the outboard ditch is managed through grazing activities by the agricultural lessee.

Erosion, Sediment Deposition, and Geomorphic Condition Monitoring and Adaptive Management for Riverside Ranch

Monitoring Task: Setback Berm Inspection

Agencies/Acts: Coastal Commission, and California Environmental Quality Act (CEQA)

Compliance Documents: Coastal Development Permit- Special Conditions; Salt River Ecosystem Restoration Project Adaptive Management Plan; and Salt River Ecosystem Restoration Project Final Environmental Impact Report (FEIR)

Description: Visual inspections for evidence of erosion and/or cracks after major storm events and high tides.

Goals:

- Determine if any annual maintenance is needed on the setback berm (berm road).

Report: N/A. Observational data sheets are available upon request.

Methods: Monitoring will consist of qualitative monitoring including visual inspections performed annually and after major storm and high tide events. Monitoring will look for evidence of obvious erosion caused by flooding or erosion resulting from wind generated waves. If significant erosion or signs of potential failure are observed, engineering evaluations will be performed to determine whether any structural repairs are needed.

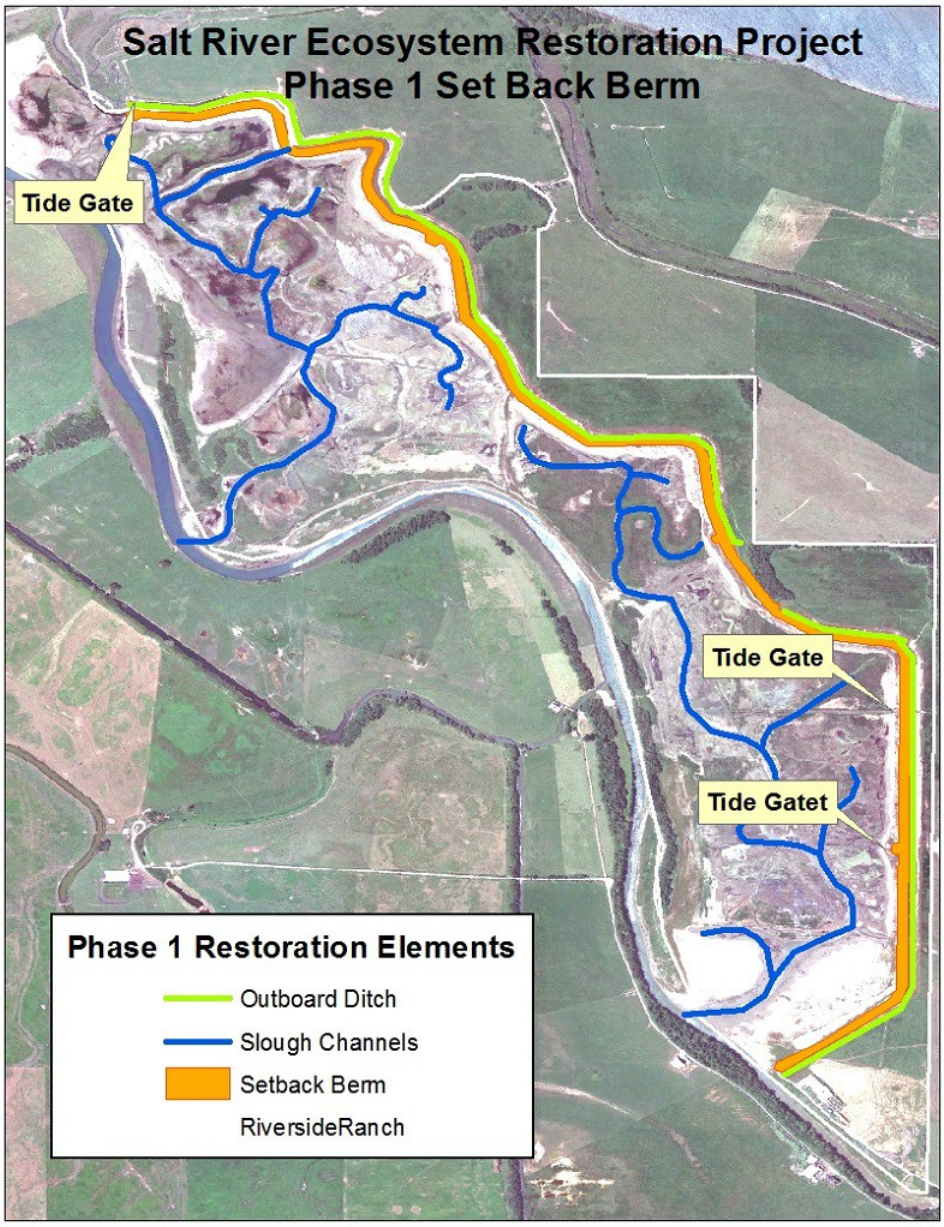

Figure 11: Setback Berm Location

Results and Discussion: Observations of the setback berm and the berm road (Figure 11) are were performed periodically in 2019. Minor rills are observed on the estuary side of the berm and have been stable since 2016. Some minor erosion caused by wind wave fetch during large winter events is also evident on the northern end of the berm on the estuary side. The road that leads up to the berm from the barn was impacted by a very large Eel River flood event in February 2019, where all gravel and road base material were washed away. California Department of Fish and Wildlife (Riverside Ranch landowner) still needs to address the impacts to the road, as of April 2020.

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Water Quality Monitoring and Adaptive Management for the Salt River Corridor and Riverside Ranch

Monitoring Task: Tidal Exchange and Water Quality

Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions; Salt River Ecosystem Restoration Project Adaptive Management Plan

**Water level and water quality parameters within the tidally influenced areas of the restored project were required to be conducted for the first three years post-construction. The 2016 monitoring effort marked the end of water level and water quality monitoring. Therefore, water level or water quality monitoring data was not produced for this 2018 monitoring report. Additional water quality spot measurements are taken monthly from spring to summer during fish surveys at each monitoring site and indicate appropriate water quality parameters for healthy fish habitat are being met.*

Habitat Development, Vegetation and Invasive Species Monitoring, and Adaptive Management for Salt River Corridor and Riverside Ranch

Monitoring Task: Salmonid and Tidewater Goby Monitoring

Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions 12, 13; SRERP Habitat Mitigation and Monitoring Plan and the Adaptive Management Plan

Description: Survey for presence of salmonids and tidewater gobies on Phase 1 in the spring through summer months.

Goals:

- Surveys will show that salmonids and tidewater gobies will utilize the restored Salt River main channel and the tidal slough networks.

Report: Results of Fish Species Presence and Distribution Monitoring Conducted From March to August 2019 within the Salt River, Eel River Estuary, Phase 2 Project Area, Humboldt County California. Prepared by Doreen Hansen of the Humboldt County Resource Conservation District.

Methods: The California Department of Fish and Wildlife, Humboldt State University, and the Humboldt County Resource Conservation District led and/or participated in the fish monitoring program.

A fish sampling program was developed in the spring of 2014 and is conducted annually across the constructed reaches of the SRERP. In 2019, project monitoring documents only required that the Phase 2 river corridor be monitored for fish presence and distribution (i.e. Phase 1 was NOT included in the 2019 monitoring effort).

In 2019, once a month, from March to August (excluding July), sites across the restored portions of Phase 2 (Figure 12) of the Salt River Ecosystem Restoration Project were surveyed for salmonids and tidewater gobies during low tide periods. Six (6) sites on constructed portions of the Phase 2 restoration areas were surveyed for fish presence and species distribution which include sites #20, #21, #22, #23, #24, and #25. These sites represent the diversity of channel size and habitats in the main Salt River channel. Sites where the channel was wide enough (Sites #20, #21, #24, and #25) were sampled using a 1/8th inch mesh pole seine net. Typically, a single pass with an 1/8-inch seine was made at each site. Non-seined sites were solely sampled by minnow traps which were deployed for at least an hour.

Captured fish were held in aerated buckets, identified to species, counted, and released back into the waterway. Additionally, juvenile salmonids were measured, held in a recovery bucket, and then released back into the waterway. Captured non-native pike minnow were enumerated into 100 millimeter size classes by visual estimation, and were humanely euthanized and buried via permit requirement. A start time, end time, and air and water temperatures, measured by thermometer, were recorded for each minnow trap and seine deployment. In previous years, minnow traps were deployed at each site, but results did not significantly add further information to the seining effort, thus minnow trapping has since been limited to specific sites.

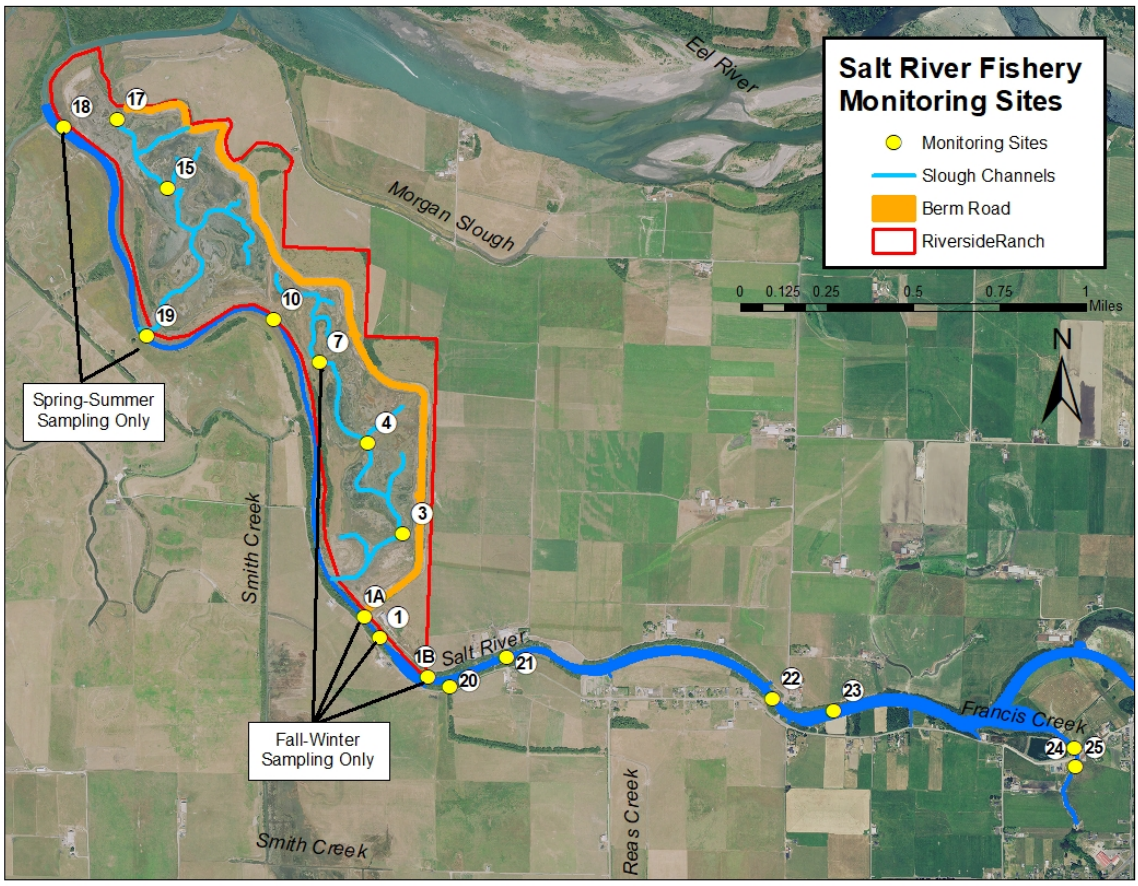

Figure 12: Fish Monitoring Sites Across Phase 1 and 2 of the Salt River Ecosystem Restoration Project

Results and Discussion: Concurrent with the fish seining and trapping, water quality measurements are recommended to be taken for temperature, salinity/conductivity (depending on what equipment was available), and dissolved oxygen. Unfortunately, monitoring equipment was unavailable for most of the spring-summer survey dates. Temperature was the only reliable water quality measurement taken in 2019. Over the five month sampling period, water temperatures ranged between a maximum of 22.2°C (August) and a minimum of 9.0°C (March).

Seining and minnow trapping efforts at the six fisheries monitoring sites identified the presence of 13 known species. Approximately 1,147 individuals were captured (approximate numbers in 2019 were often estimated during the capture of large numbers of three-spined stickleback). The following table (Table 2) presents the total number of fish and marine invertebrates sampled from March to August in 2019 (excluding the month of July).

Nineteen Coho salmon (*Oncorhynchus kisutch),* one Steelhead *(Oncorhynchus mykiss),* two Cutthroat (*Oncorhynchus clarkii*), and one unidentified salmonid were present during

the April 2019 monitoring efforts. All salmonids captured were juveniles. Most of these salmonids were captured at sites #20, #24, and #25.

Given that the only the Phase 2 portion of the Salt River corridor was sampled in 2019 (i.e. not including Phase 1), it is not unreasonable that zero tidewater goby were captured. Two sites (#20 and #21) are tidally influenced. In the past, site #20 occasionally held one or two tidewater gobies in the step pools during low water flows. Site #21 is open channel and is not suitable habitat for gobies.

Three-spined stickleback (*Gasterosteus aculeatus*) continue to be captured in high numbers. The 2019 sampling effort captured less than 40 Staghorn sculpins (*Leptocottus armatus*), unlike recent past years where sculpins numbered into the hundreds. The number of captured Sacramento pikeminnow (*Ptychocheilus grandis*) continue to decrease from 2017 to 2019.

Table 2: Number of individual fish captured by each month's fish survey efforts in 2019 SRERP Phase 2 area

	2019					
Common Species Name	**March**	**April**	**May**	**June**	**August**	**TOTAL**
Tidewater Goby	0	0	0	0	0	**0**
Coho Salmon	0	19	0	0	0	**19**
Steelhead	0	1	0	0	0	**1**
Cutthroat	0	2	0	0	0	**2**
Unidentified Salmonid	0	1	0	0	0	**1**
Bay Pipefish	0	0	0	0	30	**30**
California Roach	0	1	0	0	0	**1**
Lamprey Sp.	0	0	7	0	0	**7**
Lined Shore Crab	0	0	0	0	1	**1**
Prickly Sculpin	0	8	0	0	0	**8**

Three-Spined Stickleback	7	92	66	535	259	**959**
Sacramento Pikeminnow	1	15	3	35	10	**64**
Staghorn sculpin	0	3	15	5	16	**39**
Starry Flounder	0	0	0	0	1	**1**
Un. ID Sculpin	9	1	4	0	0	**14**
TOTAL	**17**	**143**	**95**	**575**	**317**	**1147**

Habitat Development, Vegetation and Invasive Species Monitoring, and Adaptive Management for Salt River Corridor and Riverside Ranch

Monitoring Task: Aleutian Goose Short-Grass Habitat Monitoring

Agencies/Acts: California Department of Fish and Wildlife (CDFW)

Compliance Documents: Salt River Ecosystem Restoration Project Adaptive Management Plan

Description: Approximately 72 acres of land is retained on Phase 1 (Riverside Ranch) of the Salt River Ecosystem Restoration Project to be agriculturally managed. Agricultural activities will follow CDFW protocols in order to achieve short-grass habitat for migrating flocks of Aleutian cackling geese and other wetland-associated birds.

Goals:

- Develop a pasture management plan on Phase 1.
- Annual evaluation of vegetation on Phase 1.
- Provide short-grass habitat for Aleutian Cackling Geese.

Report: N/A

Methods: Monitoring methods will verify procedures identified in the submitted and contracted annual management plan from the agricultural lessee to CDFW as well as performing an annual evaluation of vegetative composition.

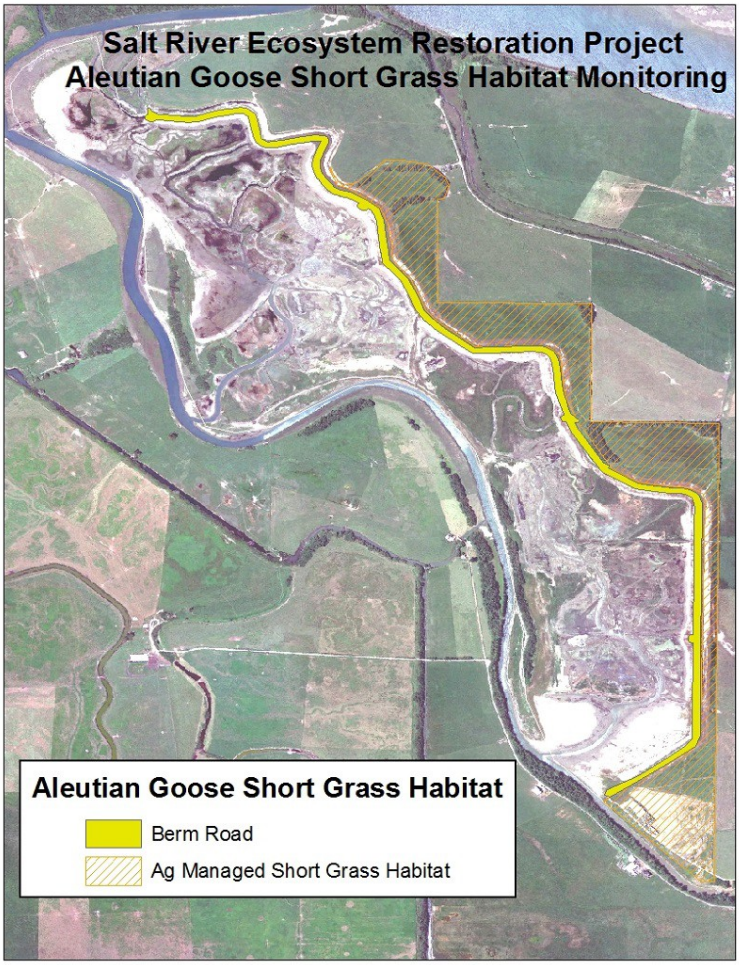

Figure 13: Proposed Managed Short-Grass Habitat on Phase 1

Results and Discussion: From 2001 through 2012, a Memorandum of Understanding (MOU) between the HCRCD and the California Department of Fish and Wildlife (CDFW) allowed for the HCRCD to manage leases and oversee agricultural activities on several CDFW-owned Wildlife Management Areas (WMAs). The purpose of these types of activities was to achieve a variety of wildlife habitat goals through well-managed agricultural practices. Livestock grazing and/or other agricultural management techniques are used to create, maintain and/or enhance habitat for plants, wetland associated birds such as Canada Goose, Aleutian cackling goose, waterfowl, shorebirds, or wading birds and other wildlife. To this end, CDFW and HCRCD jointly developed the *Protocol for Prescribing Agricultural Activities on Lands Within the North Coast Wildlife Area Complex,* to outline the process to determine and monitor specific agricultural activities, such as livestock grazing, haying, mowing, irrigation, fertilizing and seeding on all CDFW WMAs in Humboldt County, including Riverside Ranch.

Under the MOU, HCRCD provided ongoing monitoring and oversight and made recommendations for agricultural practices to be adjusted as needed to achieve CDFW

goals. This successful model was utilized by CDFW up and down the State until it was ended in late 2012 when an internal CDFW audit revealed that the practice of allowing RCDs to manage lands and lease payments for CDFW conflicted with State regulations. The 72 acres of agricultural lands (Figure 13) on Riverside Ranch was not managed from 2013 to 2017 due to the State suspending activities on all California WMAs. Currently CDFW WMAs are managed by CDFW.

In March 2018, CDFW released a Request for Proposals for Permit for Excess Vegetation Disposal on the Salt River Unit of the Eel River Wildlife Area (aka Phase 1/Riverside Ranch). An adjacent dairy producer was awarded a 3-year lease and began management practices in the summer of 2018. CDFW approved the dairy producer's submitted agricultural management practices for Riverside Ranch which includes rotational grazing of 40 to 200 heifers, depending on grass height, with the option to hay after August 15th to maintain desired grass height.

Due to the 5-year management suspension, the agricultural pasture lands need to be rehabilitated through grazing and other agricultural practices. The pastures will be evaluated for short-grass habitat status in 2020.

Habitat Development, Vegetation and Invasive Species Monitoring, and Adaptive Management for Salt River Corridor and Riverside Ranch

Monitoring Task: High Marsh Ecotone Vegetation Percent Cover Survey

Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions; SRERP Habitat Mitigation and Adaptive Management Plan

**The High Marsh Ecotone vegetation percent cover was not scheduled to be performed in 2019.*

Habitat Development, Vegetation and Invasive Species Monitoring, and Adaptive Management for Salt River Corridor and Riverside Ranch

Monitoring Task: Woody Vegetation Management

Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions; SRERP Adaptive Management Plan

Description: Perform woody vegetation management (e.g. removal or planting of woody vegetation) to ensure the hydrologic function of the Salt River channel.

Goals:

- Woody vegetation will be managed consistent with the goal to maintain structure and function of the Salt River corridor.
- Manage situations that impede channel function.
- Woody vegetation management cannot contribute to bank or channel erosion.

Report: Refer to:

- Channel Profile Report: Salt River Ecosystem Restoration Project – Phase Two – Year 2019 by Melissa Kobetsky. December 2019.

Methods: Review results of the vegetation monitoring and cross-sectional & longitudinal surveys to determine if channel hydrologic function is being affected by the presence or removal of woody vegetation.

Results & Discussion: Results from the geomorphic surveys indicate that although discreet channel sites are experiencing some sedimentation and erosion, these situations are not caused by woody vegetation that is growing, has fallen, or been removed in or along the channel. A channel corridor walk in late spring also did not observe any needed woody vegetation removal. Additionally, one to two downed existing alders have fallen into the larger Salt River channel within the Phase 1 footprint and have been observed over the past three years. The downed alders and do not appear to be adversely impacting channel function or the banks.

Habitat Development, Vegetation and Invasive Species Monitoring, and Adaptive Management for Salt River Corridor and Riverside Ranch

Monitoring Task: Weed Abatement

Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions; SRERP Adaptive Management Plan

Description: After 3 years post construction – weed abatement shall be performed using a variety of methods

Goals:

- Limit colonization of weedy species within the restoration area.
- Ensure that weedy species do not dominate the restoration area or expand onto adjacent properties.
- Weedy species do not present a detriment toward maintaining a self-sustaining riparian forest or tidal salt marsh.

Report: Refer to:

- 2019 Annual Habitat Monitoring Report - Salt River Ecosystem Restoration Project, Prepared for the Humboldt County Resource Conservation District by J.B. Lovelace & Associates

Methods: Review vegetation/habitat monitoring report for non-native non-invasive and invasive findings to determine location and percent cover of weed species. Weed abatement may include mechanical or manual control by paid staff, contractors, or volunteers. Controlled and limited flash grazing may also be used to control weeds.

Results & Discussion: Staff observation and the vegetation/habitat monitoring effort have found that numerous weedy species exist and are becoming prolific in the restored portions of the project area. *Spartina densiflora*, reed canary grass (*Phalaris arundinacea)*, creeping bent grass (*Agrostis stolonifera)*, and a variety of thistles (*Helminthotheca echioides and Cirsium vulgare)* are present and need to be addressed.

No formal reach wide weed abatement efforts were made on the restored project footprint. However, HCRCD staff removed tansy (*Tanacetum vulgare*) and blessed thistle (*Cnicus benedictus*) from the restored reach on Francis Creek. Staff also removed bull thistles (*Cirsium vulgare*) and bristly oxtongue (*Picris echioides)* around the SMA area and in the 2017 restored areas of the Salt River. It has been recommended by re-vegetation experts that much of the reed canary and creeping bent grasses will eventually be controlled when woody riparian species achieve a shaded canopy in the river corridor. Funding proposals are periodically submitted for *Spartina densiflora* treatment, however no awards were received.

Habitat Development, Vegetation and Invasive Species Monitoring, and Adaptive Management for Salt River Corridor and Riverside Ranch

Monitoring Task: Invasive Species Management – Vegetation

Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions; SRERP

Adaptive Management Plan

Description: Monitor invasive vegetation species during vegetative surveys required by the Habitat Mitigation and Monitoring Plan for the Salt River Ecosystem Restoration Project. Treat identified areas.

Goals:

- Total invasive plant species (dwarf eel grass, *Spartina desiflora,* and reed canary grass) within sampling areas will not exceed a percent cover of 5%.

Report: 2019 Annual Habitat Monitoring Report - Salt River Ecosystem Restoration Project, Prepared for the Humboldt County Resource Conservation District by J.B. Lovelace & Associates

Methods: Species are categorized as being native, non-native non-invasive, and invasive. Non-native invasive plants are defined by the California Invasive Plant Council (Cal-IPC 2017). A stratified, randomized sampling approach characterized the abundance, species composition, and structural composition of in each vegetation sampling area. GIS data and ArcMap software were used to determine vegetation sampling areas. Thirty-tow sample plots were randomly allocated in each sampling area. A 1 meter^2 quadrate was used to frame the sample plots. Visual estimates were made to determine percent cover of each species.

Results & Discussion: It is established that the final success criteria for non-native non-invasive shall not exceed 15% percent cover. The Phase 1 and Phase 2A Lower monitored habitats are all within the non-native success criteria (Table 14). The most recently constructed phases, Phase 2A Upper/2B Lower in 2017 and Phase 2B Middle in 2018, do not achieve the non-native non-invasive level of <15%. This could be attributed to colonizing non-native vegetative species as reflected in the higher non-native percent cover in the most recently restored areas as compared to the preceding restored areas. The final success criterion for invasive vegetation is not to exceed 5% cover. Unfortunately, all phases exceed this limit considerably, especially Phase 2A Lower. *Spartina densiflora* is becoming dominant in large areas of Phase 1 and a suite of *Phalaris arundinacea* (“reed canary grass”), *Agrostis stolonifera* (“creeping bent”), *Ranunculus repens* (“creeping buttercup”), *Lotus corniculatus* (“bird’s-foot trefoil”), *Helminthotheca echioides* (“bristly ox-tongue”), and *Cirsium vulgare* (“bull thistle”) are found throughout the Phase 2 footprint. Recommendations include the continuation of monitoring and instituting a robust invasive species control program, notably addressing the Phase 2A Lower restoration area.

Table 14: Summary of 2019 SRERP Quantitative Vegetation Percent Cover Sampling Results & Respective Success Criteria. (Mean percent cover estimates are in bold and associated 95% confidence intervals follow in parentheses.)

Summary of 2019 SRERP Quantitative Vegetation Percent Cover Sampling Results & Respective Success Criteria.
Mean percent cover estimates are in bold and associated 95% confidence intervals follow in parentheses.

	Mean Percent Cover for Vegetation Categories of Interest								
	Total Vegetation[1]	Native Vegetation		Non-Native Non-Invasive Vegetation		Invasive Vegetation		Sterile Hybrid Wheatgrass[1]
SRERP Habitat Sampling Area	Observed	Observed	2019 Success Criteria[2]	Observed	Final Success Criteria[3]	Observed	Final Success Criteria[3]	Observed
Phase 1 – Riverside Ranch Tidal Marsh Restoration Area								
Replanted Riparian Forest (n=32)	**100.0** NA	**47.5** (38.2, 57.2)	≥40%	**8.8** (6.2, 12.1)	<15%	**43.7** (34.8, 52.3)	<5%	**0.0** NA
Phase 2 – Salt River Corridor Restoration Area								
Phase 2A (Lower) – Salt River Channel Wetlands								
Active Channel (n=32)	**82.0** (74.3, 87.5)	**59.9** (51.9, 67.8)	≥50%	**3.9** (1.9, 7.1)	<15%	**18.3** (14.1, 22.9)	<5%	**0.0** NA
Active Bench (n=32)	**94.4** (90.4, 97.0)	**62.5** (54.4, 70.0)	≥50%	**1.2** (0.4, 2.9)	<15%	**30.6** (23.0, 38.9)	<5%	**0.0** NA
Phase 2A (Lower) – Riparian Planting Zones								
Replanted Riparian Forest (n=32)	**100.0** NA	**66.6** (53.8, 77.1)	≥40%	**0.9** (0.0, 2.4)	<15%	**32.6** (21.8, 45.4)	<5%	**0.0** NA
Active Riparian Berm (n=32)	**97.0** (94.5, 98.4)	**72.0** (62.1, 79.4)	≥40%	**1.2** (0.4, 2.7)	<15%	**23.9** (16.3, 34.5)	<5%	**0.0** NA
Phase 2A (Upper)/Phase 2B (Lower) – Salt River Channel Wetlands								
Active Channel (n=32)	**90.5** (84.6, 94.4)	**62.2** (53.3, 70.2)	≥20%	**7.1** (3.7, 13.6)	<15%	**21.2** (15.3, 29.7)	<5%	**0.01** (0.0, 0.03)
Active Bench (n=32)	**92.3** (87.6, 95.5)	**44.5** (35.6, 54.1)	≥20%	**20.8** (13.7, 29.4)	<15%	**26.7** (18.8, 37.2)	<5%	**0.3** (0.0, 1.0)
Phase 2A (Upper)/Phase 2B (Lower) – Riparian Planting Zones								
Replanted Riparian Forest (n=32)	**98.8** (96.4, 99.7)	**43.8** (34.4, 54.0)	≥15%	**19.7** (14.0, 27.0)	<15%	**33.4** (25.3, 43.2)	<5%	**1.5** (0.5, 3.0)
Active Riparian Berm (n=32)	**85.3** (75.7, 91.4)	**32.7** (26.5, 40.9)	≥15%	**26.5** (18.9, 35.1)	<15%	**24.7** (18.0, 33.1)	<5%	**1.8** (0.8, 3.1)
Phase 2B (Middle) – Salt River Channel Wetlands								
Active Channel (n=32)	**70.0** (60.3, 77.3)	**31.6** (25.1, 38.1)	≥10%	**31.0** (24.6, 39.5)	<15%	**6.8** (4.1, 10.4)	<5%	**0.6** (0.1, 1.9)
Active Bench (n=32)	**75.8** (65.0, 83.8)	**11.5** (7.2, 18.1)	≥10%	**46.5** (35.8, 56.3)	<15%	**17.0** (12.6, 22.3)	<5%	**0.8** (0.2, 2.8)
Phase 2B (Middle) – Riparian Planting Zones								
Replanted Riparian Forest (n=32)	**91.1** (83.1, 95.1)	**22.5** (14.5, 34.0)	≥10%	**49.6** (40.2, 58.3)	<15%	**17.1** (12.3, 22.9)	<5%	**1.9** (0.8, 3.5)
Active Riparian Berm (n=32)	**89.5** (85.3, 92.7)	**19.3** (13.7, 26.4)	≥10%	**50.5** (40.7, 58.4)	<15%	**18.5** (13.8, 28.1)	<5%	**1.2** (0.5, 3.5)

[1] No specific success criteria are indicated in the HMMP (H.T. Harvey & Associates with Winzler & Kelly 2012).

[2] Adapted from Tables 8-10 of the HMMP (H.T. Harvey & Associates with Winzler & Kelly 2012).

[3] Must be achieved by the final monitoring year for each respective habitat sampling area (i.e., Year 5 for Salt River Channel Wetlands or Year 10 for all others) (H.T. Harvey & Associates with Winzler & Kelly 2012).

Habitat Development, Vegetation and Invasive Species Monitoring, and Adaptive Management for Salt River Corridor and Riverside Ranch

Monitoring Task: Invasive Species Management - Pikeminnow

Agencies/Acts: Coastal Commission

Compliance Documents: Coastal Development Permit- Special Conditions; SRERP Adaptive Management Plan

Description: Attempt to control pikeminnow (*Ptychocheilus grandis)* populations.

Goals:

- Reduce occupation of pikeminnow in newly created habitat.

- Increase occupation by native fish species in newly created habitat.

Report: Refer to:

- Results of Fish Species Presence and Distribution Monitoring Conducted From March to August 2019 within the Salt River, Eel River Estuary, Phase 2 Project Area, Humboldt County California. Prepared by Doreen Hansen of the Humboldt County Resource Conservation District.

Methods: The California Department of Fish and Wildlife, Humboldt State University, and the Humboldt County Resource Conservation District developed a fish monitoring program in early 2014. During the development of this program, participants determined that pikeminnow populations cannot be eradicated or controlled in the Salt River watershed. However, a standard practice was adopted for all pikeminnow encountered during fish monitoring will be humanely euthanized. Additionally, if pikeminnow individuals are longer than 10 inches, those individuals will be measured and the stomach contents examined for evidence of piscivory and findings recorded.

Results & Discussion: During the 2019 spring-summer fish monitoring effort, 64 pikeminnow were captured and euthanized (<100 mm), down from 174 individuals in 2018. All pikeminnow were captured using a seine net. All pikeminnow were captured in fresh water reaches of the project footprint.

Fish monitoring efforts will continue to capture and euthanize Sacramento Pikeminnow to reduce their occupation in newly created and restored habitats.

LIST OF AVAILABLE REPORTS

H. T. Harvey with Winzler and Kelly. 2012. Salt River Ecosystem Restoration Project Habitat Mitigation and Monitoring Plan. Prepared for the Humboldt County Resource Conservation District. Eureka, California

Hansen, Doreen. 2019. Salt River Ecosystem Restoration Project Spring-Summer Fish Monitoring Program 2019. Results of fish species presence and distribution monitoring conducted from March to August 2019 within the Salt River, Eel River Estuary, Phase 2 Project areas, Humboldt County California. Prepared for the Humboldt County Resource Conservation District.

J.B. Lovelace & Associates. 2019. 2019 Annual Habitat Monitoring Report - Salt River Ecosystem Restoration Project, Prepared for the Humboldt County Resource Conservation District.

Kobetsky, Melissa. 2019. Channel Profile Report: Salt River Ecosystem Restoration Project – Phase Two – Year 2019. Prepared for the Humboldt County Resource Conservation District. December 2019.