

Title: Harvey Diversion Fish Passage Remediation Project

Name of Applicant: California Trout

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Executive Summary

Date: January 24, 2024

Applicant Name: California Trout (CalTrout)- Ventura Office

City: Ventura

County: Ventura County

State: California

We are a Category B applicant.

We are applying for funding under Task Area B: Construction.

One-paragraph project summary: California Trout, in collaboration with Harvey Diversion Joint Power Administration, will employ process-based restoration actions to restore connectivity, re-establish stream function, and modernize failing infrastructure at the Harvey Diversion. The diversion is a 35-foot diversion dam that poses a complete passage barrier to the upstream migration of adult Southern steelhead and resident rainbows that are pushed downstream. Above Harvey Diversion, the Santa Paula Creek has the highest quality habitat within the entire Santa Clara Basin. The removal of barriers would open access to 12 miles of perennial, cool water for spawning, rearing, and foraging. It would also provide critical over summering habitat for resident rainbows seeking thermal refugia. CalTrout will manage the project, producing an engineer-stamped, final plan set with design and technical specifications, environmental documents needed for implementation, and resource agency-approved manuals to allow immediate transition into construction with all required biologic and cultural monitoring in place. The project team will engage with local stakeholders and federal and state agencies regularly during the project.

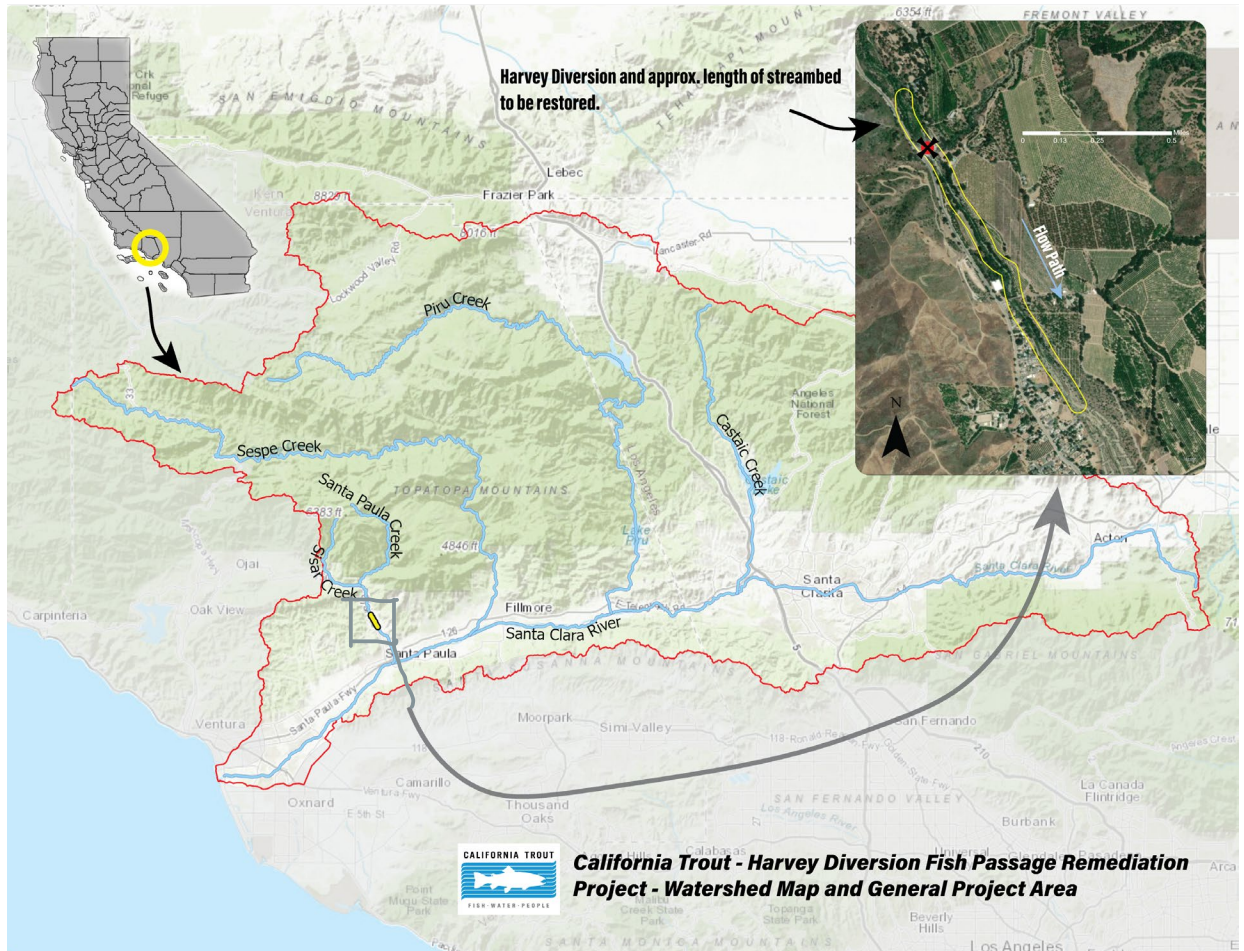
Length of Time of the Project: 4 years

Estimated Completion Date: 12/31/2028

The proposed aquatic ecosystem restoration effort is not focused on a Federal facility and does not involve Federal land.

Project Location

The Harvey Diversion structure is in Santa Paula Creek, alongside Highway 150, north of the city of Santa Paula, within the unincorporated portion of Ventura County. It is approximately 3.6 miles upstream from the confluence of Santa Paula Creek and Santa Clara River in the Santa Clara watershed. The coordinates are 34.395536, -119.076316.



Project Description

History of project development: In 2014, a comprehensive alternative analysis for the diversion was completed with funding by CDFW. This work involved multiple technical review panel meetings with subject matter experts and engaged stakeholders. In 2019, CalTrout secured grant funding from CDFW to advance 65% plan sets and submission-ready permit applications for NEPA, ESA Section 10, CEQA, CWA 404 and 401, and draft Operations and Maintenance manuals. To achieve this level of design and permitting, CalTrout collaborated closely with CDFW, NFMS, NOAA, USFWS, Ventura County, the City of Santa Paula, and USACE, all of which played integral roles in the development of the 30% and 65% plan sets. The owner, Harvey Diversion Joint Power Administration (JPA) and their contract operator, Canyon Irrigation Company (CIC) remain project proponents and provide site access as needed through annual renewal of site access agreements. Locally, this project and diversion are well known in the stream restoration community. Since the diversion was identified by NMFS as a complete barrier to the migration of Southern Steelhead in the 2012 Species Recovery Plan, many community members and professionals have reviewed project documents and assessments. CalTrout staff have held a presence in this community for years attending events and leading the Southern Steelhead Coalition, which coordinates effective Southern steelhead recovery actions amongst agency programs and the private sector. The Coalition partners include

CDFW, The Nature Conservancy, Friends of the Santa Clara River, Wishtoyo Chumash Foundation, and others. Today, we are requesting funding for Task B: Construction proposal.

How the preferred alternative for barrier removal was determined by the stakeholders and a description of the process that was or will be used to achieve common agreement: This project is a continuation of the preferred alternative, HD3 – partial removal of Havery Diversion and streambed stabilization. It was selected in 2014 as part of an exhaustive alternative analysis, with broad stakeholder engagement. A technical review team, consisting of CDFW, NMFS, Ventura County, City of Santa Paula, USWFS, USACE, SWRCB, and subject matter experts, was established. Iteration of concept review and comment was performed. This process included numerous public listening sessions and informational presentations to community stakeholders.

Description of specific construction processes proposed in this grant: This project, first and foremost, will achieve a principle federal recovery goal for endangered Southern steelhead – the remediation of Harvey Diversion. The project cost reflects the advanced level of engineering, modeling, analysis, species protections, environmental documentation, and implementation necessary to remove a 35-ft barrier and open access to 12 miles of stream through the installation of approximately 25 grade control structures over a mile-long reach. The project is a highly complex engineered solution that will restore the functional elements of Santa Paula Creek. Simple, elegant, and extremely important systems that have been out of balance for more than a century.

Southern steelhead, on the brink of extinction, need transformative action now and the remediation of Harvey Diversion is such. Partners NHC and Catalyst have led their respective tasks since the 2019 Feasibility Assessment through design, and submission-ready draft environmental documents that we have now. Each partner has a regional record of successful project delivery and a deep understanding of the project goals, iterations, challenges, and established relationships with stakeholders. The value of these items is not accounted for in their task budgets.

The cost of the tasks reflects the level of technical skills and expertise that will be required to implement this project. For instance, the grade control structures have been designed to absorb the sheer energy that Santa Paula Creek can produce during flood events. We will need highly technical construction contractors, operators, constant in-field inspection, day-to-day engineering review, biologic monitoring, cultural monitoring, and project management working effectively for 2 years in a constrained, dynamic location to fully implement this project. This has its cost. But the potential in this project is boundless. When the project is complete, will we have advanced stream ecosystem restoration science, natural resource engineering, endangered species recovery, native species protection, climate crisis resiliency, environmental justice, and equity stakeholder development. Importantly, this project will serve as the pilot for the upcoming Matilija Dam Ecosystem Restoration Project and the Malibu Creek Ecosystem Restoration Project. The centerpieces of these two projects are the removal of Matilija Dam and Rindge Dam. In addition to funding for engineering, natural resource planning, construction management services and implementation, we are requesting funding for Ventura County Public Works – Watershed Protection to actively engage in this

project. They own Matilija Dam and as the project lead will have the opportunity here to begin setting up their large barrier removal team, and be advised by this project TAC to develop strong monitoring plans and long-term management processes. CalTrout serves as a member of the Malibu Creek Ecosystem Restoration Project Technical Review Team. Harvey Diversion is much like Rindge Dam- situated in a steep canyon with only one road available to conduct removal. The construction logistics and management of moving resources in and out the Harvey Diversion Project Area, traffic, and community engagement will be lessons learned that can be taken directly to the Malibu Creek Ecosystem Restoration Project.

General Project Benefits

Santa Paula Creek in Ventura County, California faces several critical issues in its watershed. Harvey Diversion's condition and potential for catastrophic back failure is compounded by the inherent natural character of the Santa Paula Creek watershed, an extremely flashy system with high natural sediment load.

With increasing frequency, Santa Paula Creek floods, threatening bank stability in the Harvey Diversion Reach, in and around the City of Santa Paula immediately downstream and to private and public infrastructure. Ventura County Water Resource Monitoring Reporting identified high sediment deposition in the project reach that reduces carrying capacity, causing high flows to break through levees and flood the city. The 2009 Santa Paula Creek Watershed Assessment and Steelhead Restoration (Santa Paula Assessment) cited Lower Santa Paula Creek's history of flood risks to infrastructure and public safety due to the development of instream and stream side facilities that disrupt natural processes.

Sedimentation, due to the total load natural to this system and disruption of natural transport, has led to excessive sediment aggradation in the lower creek, which not only exacerbates flooding but alters channel configuration in Santa Paula Creek. This is particularly evident within our project reach. Santa Paula Creek as incised almost 30 ft below Harvey Diversion and sees excessive sediment deposition due to the unnatural high velocities and entrainment caused by the current condition of the Diversion.

Santa Paula Creek's water infrastructure management and land development has resulted in significant habitat degradation throughout the entire watershed and notably in the project reach. There is severe loss of riparian habitat and disruption of natural ecosystem processes due to Harvey Diversion, floodplain encroachment, channelization, altered hydrology, and invasive species. The Santa Paula Assessment found that historic diversion construction and channelization projects have degraded habitat maintenance process resulting in simplified habitat structure and reduced complexity. This resulted in long-term limiting of spawning, rearing and forging opportunities for Southern steelhead and loss of habitat for other listed native species include red-legged frog, Western Pond turtle and Southwestern willow fly-catchers. The 2040 Ventura County General Plan (2020) recognized the degradation of riparian habitat resulted in impacts to water quality, increases erosion, and reduces biodiversity. The General Plan specifically notes the high biodiversity of plant community structure that historically existing in the Santa Clara River basin and the dramatic loss of these communities that has resulted from floodplain and instream development like Harvey Diversion and lower flood control facilities.

The Santa Paula Assessment identifies Santa Paula Creek as one of three main historical

spawning tributaries for the endangered Southern steelhead. Presently there exists real and immediate threats to the long-term survival of this species endangered due to habitat barriers, altered flow regimes, loss of required habitat and water quality issues. All of these issues are present with the Harvey Diversion project area and larger watershed. The National Oceanic and Atmospheric Administration Fisheries (NOAA) 2012 Species Recovery Plan specifically identifies Harvey Diversion's impact to Southern steelhead and calls for immediate remediation as a critical federal recovery action.

These critical issues have been identified through long-term monitoring data by agencies like the Ventura County Watershed Coalition and the USGS, scientific studies - notably the 2005 Santa Clara River Steelhead Trout Assessment and Recovery Opportunities.

Quantitative Project Benefits

Remediating Harvey Diversion and restoring a more natural slope profile in Santa Paula Creek offers a multitude of benefits for aquatic ecosystems. We will see improved native plant and animal species abundances, increases in fish and wildlife habitat, increased riparian areas, and benefits to the overarching ecosystem function and integrity. We also anticipate reduced catastrophic stream bank failure as a result of flood. By allowing for efficient water flow, we can mitigate flooding downstream, protecting infrastructure and communities particularly at the vulnerable Bridge Road Bridge that has been severely undercut as a result of Harvey Diversion.

Restoration of natural processes within this reach, passage at this location, and habitat creation will allow Southern steelhead access to long disconnected, high-quality upstream habitat - vital for spawning and population recovery. Restoration of reach scale processes will result in increased habitat diversity. This project's specific focus is on the restoration of natural stream channel morphology that will restart crucial habitat maintenance processes leading to greater diversity of habitat niches for various aquatic creatures. This includes the creation and natural evolution of riffles, pools, runs and backwaters that cater to a greater number of species life stages and needs.

This project will result in improved riparian and floodplain connectivity - reducing instream flow velocities, better natural transport of sediments, and creation of habitat refugia during high flow events for fish. Providing the lateral and longitudinal connectivity this creek requires will enhance the food web dynamics, rebuild ecosystem integrity and resiliency.

We anticipate a number of improvements to overall water quality including better sediment management, great nutrient cycling and lower water temperatures. The project's plan to re-establish a natural slope profile over approx. 4,000 ft will reduce sediment export and allow for natural sediment sorting. Harvey Diversion has created a sediment trap on the upstream side and a severe channel incision below. This has lasting impacts on water quality and aquatic life. Remediating Harvey Diversion will allow for a more natural flow regime, better downstream sediment management and improved clarity. We will see enhanced nutrient cycling as well. Migrating Southern steelhead and connected riparian zones are both critical vectors to introduce oceanic and terrestrial sources of nutrients to freshwater ecosystems. These nutrients play a pivotal role in supporting aquatic plant and animal growth. Remediation of Harvey Diversion will directly facilitate this vital nutrient exchange. The restoration of fish passage and natural processes in Santa Paula Creek will enable access to cooler upstream

waters, providing crucial thermal refuges for fish during periods of hot summer droughts. Habitat surveys above the diversion clearly show the potential to create more critical over summering habitat within the project reach once the barrier is remediated.

This project will also bring about a number of stream and riparian habitat improvements. The restoration and stabilization of a natural slope profile will lead to enhanced channel stability. By restoring natural flow patterns, the remediation of Harvey Diversion significantly reduces severe downstream erosion and stabilizes failing streambanks. We will protect existing riparian vegetation, provide opportunities for expansion of riparian plant communities, and reduce excessive sediment export from impacting downstream ecosystems. The protection of existing riparian habitat and the increased riparian plant diversity will result in a number of positive outcomes. We anticipate improved water quality and restored streambanks. This will create favorable conditions for the re-establishment of a diverse riparian plant community that will provide shade, food, and habitat for numerous species.

The project offers a landscape scale nature-based solution in a high variable and dynamic setting. On completion we anticipate restoration of anadromous fish habitat connectivity, increased biodiversity and improved ecosystem function – a landscape better equipped to withstand the impacts of climate crisis. Remediating Harvey Diversion in Santa Paula Creek is not just about preventing the extinction of Southern steelhead, but about revitalizing the entire watershed. The project holds immense potential to create new habitat, improve water quality, enhance riparian conditions, and ultimately bolster the health and resilience of the entire Santa Paula Creek ecosystem.

Does the project affect water resources management in 2 or more river basins? No. This project will only directly impact one HUC-10 basin – Santa Paula Creek.

Regional Benefits

The Harvey Diversion Project will secure crucial benefits for fish and habitat restoration. By addressing these issues in Santa Paula Creek, we can also provide significant regional benefits for local communities including improving water quality, enhancing ecosystem service and honoring tribal heritage and culture. The restored natural flow and sediment transport regime as a result of this project will contribute to cleaner water for municipal use and downstream communities. The anticipated increased riparian habitat will enhance water quality through better filtration and nutrient cycling. The restoration natural processes at scale in Santa Paula Creek could lead to greater water storage capacity instream benefiting agricultural users during periods of drought. Robust and connected riparian areas also allow for better management of flood events, protecting infrastructure and agricultural land. This project will also make first steps in the region to uphold Tribal culture and heritage. The remediation of Harvey Diversion will align with efforts to restore healthy fish populations and thriving watershed that are culturally significant to heritage and livelihoods of tribal communities.

The Harvey Diversion Project will modernize an outdated and failing diversion facility. This project goal has the potential to reduce water conflicts by building lasting natural resource

management partnerships. It will also provide the owner and operators greater operation flexibility. Remediating Harvey Diversion and constructing a new diversion facility will set an example for stakeholder driven, ecologically sound, decision making process. This project has and will continue to bring conservation groups, agricultural users, and municipalities to the table. These settings have the amazing ability to build trust and foster dialogue about our shared responsibility for healthy watersheds. This is the only way to more sustainable water management practices and reduced conflict over competing water needs in an over-drafted basin.

A project of this scope will bring the regional benefits of job creation, improved public safety, and more opportunities for recreation. Jobs - including green collar restoration work, research opportunities, and local government monitoring and permit compliance positions. Improved flood control through restored riparian vegetation and natural stream channels can mitigate flood risks and enhance public safety in downstream communities. An aspect particularly important to CalTrout is that this project will be used as a valuable educational tool to raise awareness about environmental issues, water conservation, and the importance of healthy ecosystems.

Remediation passage at Harvey Diversion and addressing stream channel degradation in Santa Paula Creek offers us the opportunity to set out a comprehensive approach to water resource management. We can provide benefits not just for fish and native ecosystem, but also for diverse stakeholders across the region in terms of water use, climate resilience, economic development, and public well-being.

Is this project a component of a broader strategy or plan to replace aging facilities with alternate facilities providing similar benefits?

The Harvey Diversion remediation Project will focus on replacing this facility within a broader strategy for restoring the Santa Clara River and its endangered Southern California steelhead population. The Santa Clara River Watershed Integrated Resource Management Plan (IRWMP) outlines long-term goals for the watershed, including restoring natural processes, improving water quality, and enhancing habitat for endangered species. The Harvey Diversion project directly aligns with these goals by remediating a major barrier to fish passage and improving ecosystem function. The Southern Steelhead Coalition has developed a specific conservation plan for Southern steelhead, which identifies the Harvey Diversion remediation as a key action for achieving population goals. The restoration goals of this project complement other restoration efforts like habitat enhancement, improved water management practices, and invasive species control, all part of the broader IRWMP and SCRSC goals. These synergistic efforts emphasize a holistic approach to revitalizing the river and its inhabitants.

Remediating Harvey Diversion is not a temporary fix. We plan to provide permanent, ongoing benefits for Southern steelhead, the ecosystem, and local communities. The long-term goal of all watershed restoration actions in Santa Clara is to prevent the extinction of Southern steelhead and enable future generations to benefit as a result. Southern steelhead are the best indicator we have of total watershed health. The more resilient to future climate

stressors - like droughts and flood - Southern steelhead populations are, the more resilient we will be. This simple tenet emphasizes the project's role in the comprehensive water use sustainability strategy and its lasting impact.

The Harvey Diversion remediation project contributes to a collaborative, nature-based approach. One that provides lasting benefits for fish, the environment, and the communities that depend on the river's health.

Species and Habitat Benefit

Southern California Steelhead (*Oncorhynchus mykiss*) were federally listed under the Endangered Species Act (ESA) in 1996. The Santa Clara River watershed is considered Core 1 habitat for Southern California steelhead, crucial for its recovery and prioritized for restoration actions. Santa Paula Creek within this project area is designated as critical habitat.

Populations are significantly declined due to habitat loss, dams, water diversions, and other factors. The Harvey Diversion has been identified as a major barrier to upstream migration and a substantial obstacle for population recovery by CDFW and NMFS.

This project directly contributes to the restoration of Southern California steelhead by restoring volitional passage at Harvey Diversion for all life-stages of Southern steelhead. This will restore access to critical upstream habitat for spawning, rearing, and foraging and expand the availability of required habitat in this important sub-watershed. This project is routinely identified as critical step for the recovery of a self-sustaining, resilient population of Southern steelhead in the Santa Clara River. Restoring passage on Santa Paula Creek will also benefit other anadromous fish species in the watershed, such as Pacific lamprey.

In 2012, National Marine Fisheries Service (NMFS). Finalized the Southern California steelhead Federal Recovery Plan. This plan outlines specific actions needed for the species' recovery, including removing barriers to fish passage like Harvey Diversion. Additionally, the Southern Steelhead Coalition, a coalition of agencies and public stakeholders, has developed a strategic regional conservation plan for Southern steelhead in the watershed. The Harvey Diversion remediation project is a key component of this plan.

Quantification of Specific Project Benefits

Species and Habitat Benefits: Currently, the Harvey Diversion blocks access to over 12 miles of high-quality spawning and rearing habitat upstream. (Stoecker 2005) Remediating Harvey Diversion will reconnect the fully anadromous reach of lower Santa Paula Creek to the headwaters. Access to this habitat is vital many reasons: Santa Paula Creek is truly the only watershed with persistent year-round flow in the lower Santa Clara River Watershed and the majority of the headwaters are held in public trust as part of the Los Padres National Forest System. Remediating Harvey Diversion barrier will allow Southern steelhead to utilize this area, potentially doubling the available habitat based on estimated stream length.

To achieve volitional passage at this location, we must restore a more natural slope profile over approximately 4,000 feet of stream channel. This process in combination with natural

flow conditions of Santa Paula Creek creates the opportunity for restoring this total length as habitat for all life-cycle stages of Southern steelhead and other native aquatic species. We additionally anticipate that we will provide the restored area and needed instream processes to expand the available riparian plant community over these a large percentage of the 4,000 linear stream feet.

Estimating specific population increases for Southern California steelhead due to the Harvey Diversion remediation project is challenging due to complex environmental factors, geographic difficulty in monitoring this species and the alarmingly low number of adult Southern steelhead still existing. Studies conducted by NMFS as part of their requirement to manage this species have produced population models and historical data assessment that suggest removing the Harvey Diversion could result in a significant increase the steelhead population in the Santa Clara River within 10-20 years (NMFS 2006, 2012). It is important to note that this is qualified by potential for catastrophic drought and other water management decisions but speaks to the known quality of habitat upstream of this location, the natural character of this watershed and the known stable population of resident Rainbow Trout that exist in upper Santa Paula Creek (Stoecker and Kelley, 2005). Improved access to upstream habitat can directly boost juvenile steelhead production by providing safe spawning and rearing grounds. Estimates suggest a potential increase in juvenile production within the newly accessible reaches. (NMFS 2012) More broadly, it is assumed that removing the passage barriers will eliminate a source of stress and mortality for migrating Southern steelhead and could lead to an increase of migration success rates by 10-20%. (NFMS 2023) This can further contribute to population growth.

As Southern California steelhead is listed as federally endangered under the ESA, the project holds significant importance for reducing extinction risk, improving critical genetic material frequencies, and establishing connections between fragmented populations (NMFS 2012). Remediation of Harvey Diversion could lead to significant increases in population size by expanding available habitat. Access to these habitats can promote genetic diversity within the watershed sub-population. This would make the sub-population more resilient to environmental challenges and future threats. Removing the barrier would also potentially establish connections with long since disconnected anadromous fraction of the total population. This would further strengthen the overall species recovery efforts and possibly lead to higher smolt production at the sub-basin level. These project outcomes could reduce the risk of extinction for the Santa Clara River steelhead population. This contributes directly to the goals of the ESA and the species' Recovery Plan.

Watershed Benefits: This project will result in improvements if water quality reducing sediment load, decreasing surface water temperatures and increasing nutrient cycling. The Harvey Diversion currently causes severe degradation of water quality by completely disrupting the natural sediment transport regime, degrading the quality of riparian canopy, and channelizing the stream reach. These impact water quality, water clarity and aquatic life. Remediating Harvey Diversion, it will allow for a more natural flow regime. Re-establishing Natural sediment sorting through this reach could lead to improved dissolved oxygen levels, lower water temperatures and better compliance with water quality standards. Sediment reduction can increase sunlight penetration, enhancing photosynthesis and elevating dissolved

oxygen levels. This is crucial for fish and aquatic organisms. Excessive sediment can violate Total Maximum Daily Load (TMDL) standards for specific pollutants. Restoring natural processes in Santa Paula Creek could reduce the total sediment load and help protect downstream water quality. We would also anticipate a reduced total export and more natural timing of downstream delivery to estuaries and marshes. These habitats play a critical function for many native and listed species.

Multiple geomorphic studies conducted prior to and as part of previous project phases have suggested the project could significantly reduce sediment load by in the Santa Clara River, depending on rainfall and flow conditions. (James et al 2012) Modeling of sediment load interaction with dissolved oxygen suggests potential increases in dissolved oxygen levels by 1-2 mg/L, particularly during critical summer months. Results from Sediment Management Strategies for the Los Angeles Region by the Southern California Coastal Water Research Project 2016 indicate the project could lower water temperatures by 1-2°C in downstream reaches, creating thermal refuges for fish during hot periods.

The Harvey Diversion disconnects the river from its floodplain, limiting natural processes and habitat functions. Restoring a more natural stream slope profile will broaden the active channel and allow for access to the floodplain in some locations while also providing areas for development of a more native riparian zone in the restored channel geometry. This will allow floodwaters to spread and reduce downstream flooding risks, restore riparian vegetation, providing stream shade and potential to lower surface water temps. It could also enhance nutrient cycling and water quality through floodplain filtration and absorption. The more natural stream slope and shape will promote the growth of native riparian plants. We anticipate coverage increases of 20-30% within 5-10 years.

To what extent will the project build ecosystem resiliency?

The remediation of Harvey Diversion presents an incredible opportunity to enhance the resilience of the Santa Clara River ecosystem in the face of serious challenges to native species and our community. This project will restore a more natural flow regime in a highly variable watershed, reduce the impact of urban development and climatic events, address habitat fragmentation, and protect native ecosystems.

Remediating Harvey Diversion will restore a more natural flow regime promoting a natural evolution of critical habitat types, creating the diverse mosaic required to build resilient and adaptive for native species in the face of rapidly changing climate conditions. Habitat complexity and maintenance in this reach will be important for creating and maintaining over summering pool habitat as air temperature climb higher. Riparian restoration can reduce water temperatures by 1-2°C, creating thermal refuges during heatwaves (James et al 2012). This project will also look to reduce the legacy of degradation from urban development. Remediation of Harvey Diversion will reconnect critical upstream habitat, previously inaccessible due to development and diversion. This will significantly expand the opportunities for native species and provide pathways for resilience during habitat disturbances. The stabilization of the project reach will result in reduced sediment load and restored riparian functions. This can improve water quality downstream, mitigating the stressors from future development-related sedimentation and pollution. Increased access to diverse habitats also allows species to adapt and relocate in response to development pressures in specific areas.

In the Santa Clara River Basin at large, non-native aquatic species and invasive plants play a sizable role in the degradation of native species and plant communities. This project would promote healthy native riparian vegetation that can outcompete invasive species. We would also hope to create a natural barrier to their spread of invasive plants and promote the restoration of native plant communities. Increased habitat diversity, variability, and connectivity can better support healthy native species that can outcompete or better avoid aquatic invasive species. Remediating Harvey Diversion will restore the natural flow patterns creating a wider range of microhabitats, fostering diversity among native species and reducing dependence on specific, vulnerable habitats. Riparian restoration along the project reach could lead to a 20-30% increase in native plant cover within 5-10 years, suppressing invasive species growth.

Remediation Harvey Diversion will lead to direct improvements by reducing the total habitat fragmentation in Santa Paula Creek. Volitional passage at this location will reconnect 12 miles of previously inaccessible high quality aquatic habitat. This is a significant reduction of habitat fragmentation for Southern California steelhead and other fish species. Restoring a more natural stream slope and morphology allows for better longitudinal and lateral movement of water and organisms. This will improve the connectivity between aquatic and terrestrial habitats and reduce isolation of different river sections over approximately 4,000 feet of Santa Paula Creek. This project will provide access to diverse habitats and facilitate movement and gene flow between populations. This will enhance the overall resilience and genetic diversity for native species.

Restoring natural processes at this location will also provide landscape scale assistance to natural communities to recover from disturbances. The restored slope profile, channel geometry and riparian zone will provide additional water storage capacity. This could reduce downstream flood risks and facilitate recovery after flood events. The National Research Council's 2002 Report, "Reconnecting Rivers to Floodplains: Benefits for Flood Risk Reduction and Ecosystem Restoration", found that reconnecting stream adjacent lands can reduce downstream flood peaks by 5-10%. This would provide additional flood management capacity, a critical need in the Santa Paula Creek watershed. The improved sediment transport we anticipate as a benefit of this project could accelerate post-disturbance habitat restoration and reduce recovery time. While also providing increased habitat diversity that can buffer the impacts of localized disturbances on overall species populations.

Water Supply Benefits: The mainstem of lower Santa Paula Creek (i.e., below the confluence of Sisar Creek and "upper" Santa Paula Creek) has very high rates of sediment transport. This is a function of a relatively high gradient (0.0145 – 0.0229) and the high sediment yields from upstream. The channel bed surface is comprised primarily of cobble deposits, but even the coarsest materials (90th percentile; boulders) are estimated to be mobile during large flood events. The stream experiences significant morphological changes in large flood events, such as the one that occurred in 2023. Harvey Diversion presents a flow constriction wherein sediment deposition occurs upstream of the structure and incision occurs immediately downstream of the structure, creating streambed drops that are physically impossible for fish to overcome. Aggradation has occurred behind flow constrictions, and the channel has widened a maximum of 200 meters in the past several decades between Harvey Diversion and the USACE fish ladder. The dynamics of flow and sediment transport in Santa Paula Creek are

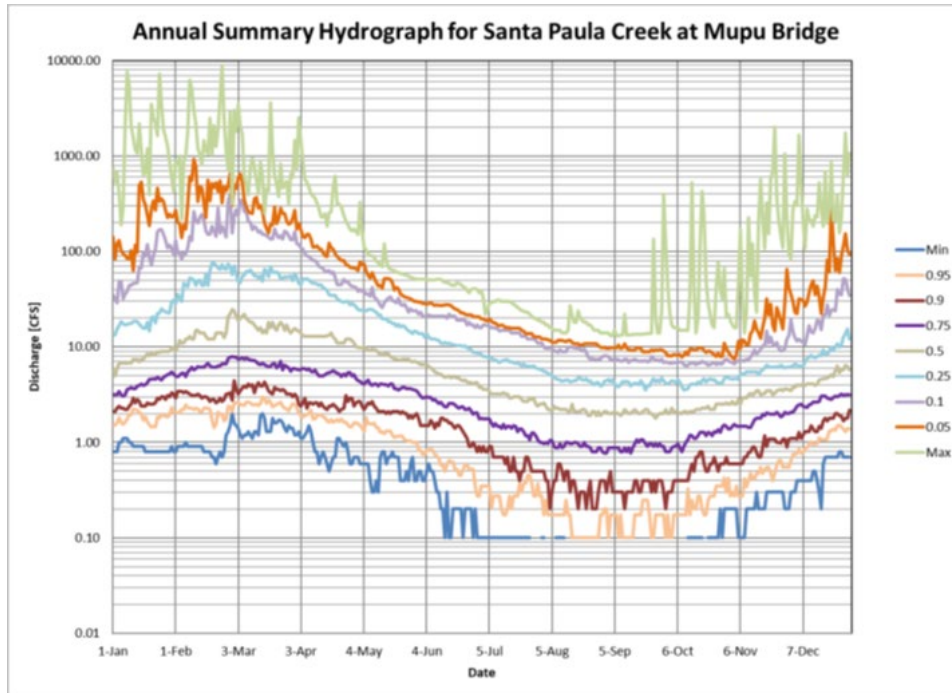
such that the largest single flow is also the dominant, channel-forming discharge. This is in comparison to more moderate “bankfull” flood flows that shape many rivers and streams (RBF 2009).

Over time, numerous actions have been taken to address sedimentation and fish passage issues in Santa Paula Creek. All of these efforts have failed due to the effects of the high-intensity, short duration rainfall events and resultant mobilization of large volumes of sediment and debris. The debris collectively damages downstream improvements, including the Harvey Diversion Dam, the USACE fish ladder, spur dikes, and other instream features. A severe flood event in 2005 damaged these features, including washing out a subsurface fishway at the Harvey Dam. Under current conditions, the vertical jump requirements to cross the Harvey Diversion are beyond the physiological limitations of fish, including to steelhead. Restoring habitat in the watershed is a critical component of southern California steelhead recovery. This Project proposes to reopen Santa Paula Creek to steelhead trout and other fish up to Sisar Creek (RBF 2014) by addressing the long-standing full fish passage barrier at the Harvey Diversion.

The Harvey Diversion Fish Passage Project presents several potential benefits for water supply within the Santa Paula Creek ecosystem, focusing on increasing and optimizing instream flow for ecological enhancement. This project will increase water supply for aquatic ecosystems by establishing new permit conditions at the direction of the resource agencies for year-round instream flow and constructing a new instream infiltration gallery to allow the diversion greater operational flexibility. It is critical to remember that presently Harvey Diversion is a 35-ft barrier and the entire stream’s discharge is routed through the diversion. The Harvey Diversion JPA take their water right then pass the remainder back into Santa Paula Creek using the defunct fish ladder.

In what will be marked change in operation of the diversion for the JPA, NMFS and CDFW regulatory staff have set the requirement that from November through April, during steelhead migration, there will be a minimum instream flow requirement of 5 cfs. A 2 cfs minimum instream flow requirement is required for the remainder of the year. These flows will also serve as the adult and juvenile low fish passage design flows, respectively. These are new permit conditions for the JPA that will be included in any agency approved Operation and Maintenance Manual and an important part of the Habitat Conservation Plan in draft for this facility. They will stipulate minimum bypass flows at the diversion, ensuring a direct increase in instream flow throughout the year.

The infiltration gallery that will be installed as part of this project is designed to allow the JPA the ability to exercise their water rights by withdrawing stream flow with minimal impacts on fish passage. The gallery was expected to reduce maintenance needs and improve conditions for fish passage by eliminating the need to routinely excavate the stream bed and totally re-route the stream into the diversion. This is a practice currently used to maintain surface water diversions.



Annual summary hydrograph showing seasonal variation in lines of equal exceedance probability based on mean daily flows at USGS Gage 11113500 (1927-2019)

The project must maintain the water supply per the 1983 court decree. Monthly flow durations were developed from USGS stream gage 1113500 data (Feasibility Assessment Appendix E – NHC 2020a). Project design criteria and operating parameters were used to conduct a preliminary hydraulic analysis to determine surface diversion yield for a range of total stream flows. The results of these analyses were combined to estimate average monthly and annual surface diversion yield of 1,761 AF. The average yield estimated is similar to CIC's 1,650 AF diversion volume in 2019, which was larger than recent previous years. Yield would vary substantially with runoff conditions in specific water years, and the subsurface infiltration gallery could provide supplementary yield during years with low surface flows.

The Project would utilize both a subsurface infiltration gallery and surface diversion to ensure that Canyon Irrigation Company and others remain able to exercise their water rights by withdrawing stream flow with minimal impacts to fish passage. The Project would replace the entire existing diversion pipeline, which was found to be compromised by obstructions in the pipeline and stability issues, likely associated with tree loading, steep slopes, and road drainage (Gannett Fleming 2021). The surface diversion pipeline would be connected to new intake facilities that include a fish bypass. The subsurface and surface water diversions are described below.

The increased water availability and flow variability throughout the year will create and maintain diverse aquatic habitats for Southern steelhead and other native fish. As you can see in the figure above, almost 90% all recorded discharges on USGS gage station above this project have a non-zero value. Santa Paula Creek, to the disbelief of many, is almost a year-round flowing system in dry parched Southern California. These new flow requirements and the natural character of Santa Paula Creek will lead to improved spawning success, juvenile

growth, and overall population health and resilience. Ensuring instream flow will promote healthier riparian plant growth that will stabilize stream banks, reduce erosion, create cooler water temperatures and more diverse microhabitats for aquatic organisms. Increased water availability and improved habitat quality can make the ecosystem more resilient to droughts and heatwaves, buffering the impacts of climate change on fish and wildlife populations.

Prior Restoration Planning and Stakeholder Involvement and Support

Harvey Diversion is a total fish passage barrier that completely halts the upstream migration of endangered Southern California Steelhead in Santa Paula Creek. The Southern Steelhead Coalition, a coalition of agencies and public stakeholders, has prioritized the Harvey Diversion remediation project as a key component of their strategic plan for the watershed. Barriers to migration within the Santa Clara River basin are identified as a critical factor, limiting the recovery and resilience of Southern California steelhead. The barrier prevents any resident rainbow trout that was pushed downstream past the dam from returning to long-term persistent critical over-summering habitat.

Santa Paula Creek has consistent flow throughout the year and holds the highest priority for restoration actions in the recovery of Southern steelhead. In the Federal Recovery Plan (NMFS 2012), remediation of Harvey Diversion was specifically identified as a critical recovery action for Southern steelhead. In 1996, the California Department of Fish and Wildlife officially recognized Southern steelhead as the most jeopardized of all California's steelhead populations. In the University of California Davis Watershed Center 2017 State of the Salmonid Report, it's stated that Southern steelhead were at critical risk of extinction in the next 25-50 years. Each document identified habitat fragmentation as a leading cause of significant declines in the anadromous fraction of the distinct population.

The 2012 National Marine Fisheries Service Southern California Steelhead Recovery Plan found that there is significant opportunity for restoration actions to recover a viable population in this watershed. The Federal Recovery Plan ranked Harvey Diversion as a 1A barrier. Sub-watershed-specific recommended activities for Santa Paula Creek that will be addressed by this restoration project include:

- SP-SCS-4.1 – Provide fish passage around dams and diversions (e.g. Harvey Diversion)
- SP-SCS-4.2 - Develop and implement water management plan for diversion operation
- SP-SCS-5.1 - Develop and implement flood control maintenance program
- SP-SCS-7.1 - Develop and implement plan to restore natural channel features
- SP-SCS-7.3 - Develop and implement stream bank and riparian corridor restoration plan

The 2023 NMFS 5 Year Status Review established Harvey Diversion as a population-specific ongoing habitat concern. It noted the need to complete and implement plans to remediate the fish passage issues at Harvey Dam (NMFS 2012a: Recovery Actions SP-SCS-4.1).

The CDFW Steelhead Restoration and Management Plan (1996) for California listed the "impending extinction" of Southern steelhead to happen within 25 years. Southern steelhead were given the highest priority for department management conservation action. The management plan stated that blocked access to headwater spawning and rearing areas has major impacts to Southern steelhead populations. CDFW determined that maintenance of periodic access to headwater refugia is essential to healthy populations. Dam and diversion construction has permanently eliminated access to headwaters, which has resulted in

extirpation or severe declines of the anadromous forms. The Steelhead Restoration Plan (1996) recommends that removal or modification of barriers is necessary to halt declines in populations. It also aligns with CDFW's Steelhead Restoration and Management Plan's 2015 Task List, addressing Anadromous Salmonid Recovery and Limiting Factors.

The California Water Action Plan CAWAP (2014) emphasizes objectives relevant to the Harvey Diversion project. The Water Action Plan calls for securing more dependable water supplies, restoring vital species and habitats, and establishing a more robust and sustainable water resources system. The objective is to restore watersheds that are capable of withstanding future environmental challenges. The Harvey Diversion Project will modernize a failing diversion facility and install an infiltration galley, which will significantly reduce the total energy consumption of the facility. The updated diversion facility and infiltration gallery will allow this project to ensure a greater likelihood of year-round instream flow.

The area around the project site has been impacted by unforeseen natural events, like wildfires, mudslides, and storms. The impact of these events is exacerbated by the unevenly distributed effects of climate crisis on water flow patterns. This project will work to enhance the reliability of agricultural water supply and sediment transport. This aligns with the Water Action Plan's mission to safeguard and restore the resilience of our ecosystems, support fish and wildlife populations, enhance water quality, and restore natural systems.

The State Wildlife Action Plan (2015) and this project are aligned in the goal of protecting and restoring anadromous fish habitat by removing a priority anadromous fish passage barrier. This project addresses the California Wildlife Action Plan's South Coast Province's Native Fish Assemblage Target and Conservation Strategy 6, focusing on improving fish passage by collaborating with federal, state, and local agencies to identify and remove key fish barriers to fish movement and sediment flow. The project aims to maintain and enhance ecosystem integrity by conserving essential natural processes, habitat characteristics, and sustainable native species population levels. This work builds resilience in California's ecosystems against changing environmental conditions and climate crisis. It also prioritizes the protection of critical habitat linkages, sensitive habitats, and specialized habitats for species of greatest conservation need (SGCN).

Locally, the Harvey Diversion Project aligns with the goals of the local Watersheds Coalition of Ventura County's Integrated Regional Water Management Plan (2014), which aims to protect and restore habitat and ecosystems in watersheds. This plan places emphasis on our responsibility to prepare for and adapt to climate crisis as a part of watershed restoration planning and implementation.

The 2018 CA Climate Adaptation Strategy, also known as Safeguarding California, highlights watershed/habitat management and protection of vulnerable species. The project aligns with Strategy 2 - Reducing Climate Risk, which involves restoring fish passage to support the California Essential Habitat Connectivity Strategy. And the project promotes habitat connectivity, aids genetic material movement, boosts coastal protection against sea-level rise, and enhances estuary conditions.

The Santa Clara River Core 1 population (NMFS 2012) is part of the Monte Arido BPG and is recognized for its significant potential to promote anadromy and full life cycle development. Through barrier removal, invasive species eradication, and Southern steelhead habitat enhancement, this project will make significant progress towards NMFS species recovery

goals.

Santa Paula Creek experiences extended periods of low to no flow, punctuated by flash flood events triggered by short, intense precipitation episodes that swiftly traverse the watershed. These flood events are characterized by rapid increases in discharge over a short timeframe, resulting in a sudden peak discharge compared to the usual base flow (Ward 1978). The creek faces considerable annual flow variability, prolonged droughts, and intense seasonal flooding. Despite any alterations proposed in this project, the region will always carry a significant risk of flooding due to the climate conditions in Southern California, the specific hydro-geomorphology of Santa Paula Creek, and the loss of floodplain connectivity along its course. The project area's hydrology and flood potential are closely linked to the channel's features, primarily influenced by the profound impact of Harvey Diversion on in-stream processes. Upstream of the diversion, the channel resembles historical conditions, with low sinuosity and variable widths between 150 and 300 feet, dependent on flow rates. Downstream of the diversion, the channel becomes deeply incised, straighter, and exhibits a consistent width regardless of flow rates, leading to considerably higher stream velocities during major floods. In the downstream area, the existing stream hydrology reflects the expansion of the channel and floodplain width as it transitions into a broader, lower floodplain valley. Flow widths in this region exhibit more variability than in the project reach, but a Ventura County Flood Control District spur dike field also constrains flow.

Notable flood events in 1969, 2005 and 2019 carried substantial sediment and led to significant alterations in the channel within the project area. Despite the channel being more deeply incised than in historical conditions during these events, similar processes involving deposition and widening occurred upstream of bedrock controls and in areas that were once wider alluvial sections. Substantial channel maintenance efforts, including sediment removal, channel clearing, and channel straightening, took place in response to these events.

Modeling of the 65% plan set indicates that in the 100-year simulation, floodwater elevations downstream of the diversion rise nearly to the top of the bank, leading to overbank flow on both the left and right banks in agricultural areas where the old channel was located. This is seen now under existing conditions. Upstream velocities experience minimal change from existing, but downstream of the diversion, velocities increase. Post-project simulations show a more widespread occurrence of high stream velocities in the center of the channel, gradually decreasing towards the stream bank. Overbank flow may also occur upstream of the diversion on the right bank, spilling onto Highway 150, mirroring existing conditions.

During the 10-year peak flow, floodwaters remain within the channel banks downstream of the diversion post-project implementation. Velocities increase slightly both upstream and downstream of the diversion. Flood event modeling suggests an increased flood risk for adjacent agricultural properties downstream of the diversion. While the project unavoidably raises floodwater surface elevations, it significantly reduces the potential for catastrophic bank failure by stabilizing the bed and widening the channel. Enlarging the channel downstream, as indicated by the modeling, could mitigate both velocity and the potential for overbank flows. The remediation of the Harvey Diversion will reconnect vital habitat for Southern steelhead in Santa Paula Creek, playing a pivotal role in establishing a robust wild population that meets NMFS viability criteria. The successful execution of this project will diversify habitat types and complexity within the restoration area, address failing infrastructure, install modern

agriculture facilities for long-term water supply, while facilitating fish migration in this critical watershed.

The Harvey Diversion spans across an unincorporated section of Ventura County and Santa Paula Creek, approximately 3.6 miles upstream from its convergence with the Santa Clara River. The diversion was established in 1910, and water diversion for agricultural use dates back to 1860. Santa Paula Creek is a perennially flowing stream that serves as a lifeline for endangered Southern steelhead, offering access from the ocean to the headwaters. This section represents one of the most promising avenues for rescuing this species from the brink of extinction, as it marks a transitional point in the watershed, where refuge during migration becomes a critical factor for the survival and prosperity of the species (NMFS 2012).

The diversion has had a significant impact on ecosystem processes at reach and watershed scales. This is exemplified by the pronounced incision immediately downstream from the structure and the disruption of sediment transport to the lower floodplain sections of Santa Paula Creek and the broader Santa Clara River lower basin (Stillwater 2007). The current diversion infrastructure poses a substantial obstacle to sediment connectivity and serves as a complete barrier to the migration of Southern steelhead. Under the current circumstances, the likelihood of channel recovery appears remote and future catastrophic failure of both the diversion facility and the degraded down slopes is high.

In 2000, CDFW built a "jump box" fish ladder facility affixed to the existing diversion. Due to the disruption in natural sediment transport regime caused by diversion, the creek continued to aggressively erode and further deteriorate Santa Paula Creek downstream of the diversion structure. To address this, additional steel jump boxes have been added to the ladder's downstream end. In 2005, a severe storm caused substantial damage to the ladder. The upstream intake was completely buried under feet of sediment. The steel jump boxes were filled with sediment and excessive erosion of bed material occurred at the ladder's downstream end. As a result, the jump height into the lowest jump box was no longer considered passable. Due to the intense flashiness and high sediment load of Santa Paula Creek, state and federal agencies determined that the fish ladder at this location was untenable.

The failure of previous passage solutions at this site and repeated geomorphological and channel stability assessments have highlighted the critical role of restoring downstream connectivity for transporting coarse sediment, especially in terms of channel incision (Stillwater 2007). This project looks to address ecological issues at the largest scale possible. By re-establishing natural processes at reach-scale, we will reduce stream incision and reintroduce the natural sediment transport regime. This will lead to rejuvenated riverine ecosystem functions at a landscape level.

This project holds the potential to enhance connectivity at the watershed scale, expanding habitat patches for a diverse array of aquatic and terrestrial species, including those of special conservation concern, such as the least Bell's vireo, southwestern willow flycatcher, red-legged frog, and arroyo toad. It's essential to emphasize that this project is located within the wildland-urban interface. By addressing this fish passage barrier, we aim not only to increase the safety and resilience of wildlife, but also to improve the well-being of local communities.

Other benefits of this project will include:

- Creation of 237 jobs for the local community
- Provision for 2,000 students in the Santa Clara watershed - of field-based and in-classroom lessons to learn about Southern steelhead and fish passage
- Protection of 8,000 creek-side residents from exposure to flood risk
- Communication with 380,000 community members (200,000 residents in Oxnard, 150,000 residents in Ventura, and 30,000 residents in Santa Paula) through digital messaging focused on Southern steelhead and fish passage
- Improved water quality for the 30,000 residents downstream of the project site through the instream improvements

Stakeholder Support for the Proposed Task B: Construction Project

Overall, the planning for the Harvey Diversion remediation project was comprehensive, collaborative, and science-based, addressing concerns from various stakeholders and prioritizing solutions that maximize ecological benefits while addressing other crucial issues like water supply and public safety. The watershed as a whole is well studied with studies to support previous modifications of Harvey Diversion completed 2007 by Stillwater Sciences and in 2011 by Fuego. This work serves to establish the baseline understanding of hydrogeomorphic character of Santa Paula Creek and provided evidence that there is substantial habitat above Harvey Diversion that is suitable for Southern steelhead. This is consistent with previous reports that suggest that the Santa Paula Creek watershed has high habitat quality relative to other Santa Clara River tributaries and is one of the greatest potential creeks for recovery of the Southern California O. mykiss DPS (Stoecker and Kelley 2005) In 2014, a comprehensive alternative analysis for the diversion was completed with funding by CDFW. This work involved multiple technical review panel consisting of CDFW, NMFS, Ventura County, City of Santa Paula, USWFS, USACE, SWRCB, subject matter experts, and active engagement with stakeholders. A public comment period and multiple public meetings were held to solicit stakeholder input on the project's proposed alternatives and environmental assessment. Iteration of concept review and comment was performed. This process included numerous public engagement listening sessions and informational presentations to community stakeholders. Comments received addressed various concerns, including potential impacts on downstream water rights, long-term management costs, and potential benefits for recreation and public access. The technical review team selected the preferred alternative, HD3 – partial removal of Havery Diversion and streambed stabilization. This project is a continuation of this stakeholder supported project plan decision. In 2019, CalTrout secured grant funding from CDFW to advance 65% plan sets and submission-ready permit applications for NEPA, ESA Section 10, CEQA, CWA 404 and 401, and draft Operations and Maintenance manuals. To achieve this level of design and permitting, CalTrout collaborated closely with CDFW, NFMS, NOAA, USFWS, Ventura County, the City of Santa

Paula, and USACE, all of which played integral roles in the process and had opportunities to provide input during the development of the 30% and 65% plan sets. The owner, Harvey Diversion Joint Power Administration (JPA) and their contract operator, Canyon Irrigation Company (CIC) remain project proponents and provide site access as needed through annual renewal of site access agreements. Locally, this project and diversion are well known in the stream restoration community. Since the diversion was identified by NMFS as a complete barrier to the migration of Southern Steelhead in the 2012 Species Recovery Plan, many community members and professionals have reviewed project documents and assessments. CalTrout staff have held a presence in this community for years, currently attending 10+ community engagement events every year. This project is also supported by the Southern Steelhead Coalition, which coordinates effective Southern steelhead recovery actions amongst agency programs and private sector activities. The Coalition partners include CDFW, The Nature Conservancy, Friends of the Santa Clara River, Wishtoyo Chumash Foundation, and others. CalTrout, as a member of the Southern Steelhead Coalition, routinely updates the coalition on the progress of this project. The Wishtoyo Chumash Foundation, a coalition member and frequent collaborator, has provided input on previous design iterations. The Wishtoyo Chumash Foundation routinely conducts resident rainbow trout/O.Mykiss population surveys in the headwaters of Santa Paula Creek. We work closely with them to support this effort. CalTrout is in the process of hiring a Ventura based tribal liaison to increase tribal involvement in this and other Coalition projects.

Project Implementation and Readiness to Proceed

In 2019, CalTrout was awarded Proposition 68 funds to advance the restoration plans for remediation passage at Harvey Diversion and to address downstream stream channel degradation. This design phase, led by NHC, began with a feasibility assessment of the preferred alternative, partial removal and natural stream slope profile restoration to ensure continued consensus of all stakeholders. Following a public comment period on the plan, NHC proceeded to do rigorous modeling and engineering work with stakeholder review and comment periods at the 30% and 60% design levels. Presently we have 75 % plan set and specifications in hand. CalTrout has led a comprehensive effort, encompassing data collection, analysis, engineering and broad stakeholder engagement to advance the preferred alternative.

The current Hydraulic Basis of Design Report to support and justify all design decisions to date includes:

Understanding the Situation:

- Existing conditions and project objectives: Initial work focused on characterizing the creek's geomorphology, hydrology, and biology, as well as existing infrastructure. This established the baseline for project goals, aiming to improve fish passage while meeting agricultural needs.
- Early 2023 storm impacts: A dedicated study assessed the damage caused by early

2023 storms, informing the need for resilient design solutions.

Gathering Data:

- Feasibility assessment information review: Existing facilities, geotechnical aspects, sediment transport, and hydraulics were thoroughly examined to understand the site's physical constraints and opportunities.
- Detailed surveys and assessments: Downstream channel assessments, diversion area surveys, and pipeline stability evaluations provided crucial data for informed design decisions.

Designing the Channel:

- Channel history and current controls: An understanding of the channel's evolution and existing control structures, both upstream and downstream of the diversion, was crucial for designing a compatible and effective solution.
- Sediment transport assessment: Evaluating sediment movement patterns informed the design of the channel profile to minimize erosion and ensure long-term stability.
- Selected design profile: A final design profile incorporating grade control structures and roughened channels was chosen to slow water flow and create a more fish-friendly habitat.

Hydraulics and Fish Passage Design:

- Flow frequencies and modeling: Analyzing various flow scenarios using HEC-RAS 2D simulations ensured the new channel's hydraulics could handle both high and low water conditions.
- Existing and post-project hydraulics: Comparing the hydraulics before and after the project implementation predicted the flow changes and their impact on fish passage.
- Channel stabilization: Grade control structures with robust geotechnical and structural design were incorporated to stabilize the channel and prevent erosion.
- Fish passage considerations: Specific features, including baffles and fish ladders within the grade control structures and roughened channels, were designed to facilitate safe upstream and downstream fish passage.

Diversion Design:

- Infiltration feasibility: The possibility of an infiltration diversion system was explored but ultimately deemed not feasible.
- Hydrologic design: Water rights, diversion capacity, water use, steelhead migration periods, and creek hydrology were all factored into the final design to balance agricultural needs with fish protection.
- Instream and surface diversion options: Both instream and surface diversion designs were developed, with the surface diversion ultimately chosen due to its compatibility with fish passage requirements.
- Detailed surface diversion design: A specific schematic outlining the diversion structure, incorporating fish protection criteria and detailed hydraulic considerations, was created.
- Subsurface diversion and pumping station: The design also includes a subsurface diversion option and a pumping station to manage water flow efficiently.
- Fish passage at the diversion crest: Specific features were designed to ensure safe fish

passage over the diversion crest, minimizing the risk of harm or entrapment.

- Geotechnical and structural considerations: Cantilever and soil nail walls were designed to provide structural support for the intake area.

Civil Design and Construction Planning:

- Access, staging, and site preparation: Plans for access roads, staging areas, and initial site preparation activities were established.
- Earthwork and utilities: The design specifies the earthwork required for construction and addresses any necessary utility relocations.
- Vegetation management: A plan for vegetation removal and restoration after construction was included.

Additional Work Completed to date: See *History of Project Development* on pg. 3.

Securing Required Permits:

- Regulatory landscape: Stream restoration projects in California necessitate a mosaic of permits from various agencies, including:
 - Federal Government
 - Anadromous Fish - Endangered Species Act – Habitat Conservation Plan (Draft)
 - Terrestrial Species – Biological Assessment (Draft)
 - State of California
 - CDFW – Consistency Determination and Lake and Streambed Alteration Agreement (Draft)
 - USACE and Regional Water Quality Control Board (RWQCB) 404/401 (Draft)
 - Ventura County – Floodplain Development Permit/CLMR (Draft)
 - Other Local agencies, such as the county or city – grading permit, access agreements, traffic impact mitigation, etc (pending.)

Permit coordination: The project team will engage in a proactive permitting process, coordinating with these agencies to ensure compliance with environmental regulations and secure the necessary approvals.

A critical component of all permit applications will be the long-term management and responsibility of all entities that have jurisdictional or permit compliance requirements after implementation. We have a Harvey Diversion Operation and Maintenance Manual and a Santa Paula Creek: Harvey Reach – Adaptive Management Plan in draft form.

Operation and Maintenance Manual:

- A detailed Operation and Maintenance (O&M) manual will be further developed to provide clear guidance for the long-term management of the project's infrastructure and habitat features.
- Key elements: The manual will address:
 - Regular inspections and maintenance schedules
 - Troubleshooting and repairs
 - Vegetation management
 - Monitoring protocols
 - Emergency response procedures

Adaptive Management Program:

- An Adaptive Management Program (AMP) will be further developed to ensure that the project remains effective and adaptable in response to unforeseen challenges or changing conditions.
- Key components:
 - Monitoring of project performance and ecological responses
 - Regular data collection and analysis
 - Adjustments to management strategies as needed
 - Collaboration with stakeholders and experts

This project encompasses several critical phases and tasks, including project management, planning and engineering, permitting, implementation, revegetation, and monitoring. We have grants for this project pending with NOAA, CA Department of Fish and Wildlife and the CA Wildlife Conservation Board. This grant, if awarded would begin in 2025 with the process of draft bid documents and the hiring of the General Contractor to lead construction tasks through an open competitive bid process. Also in 2025, the completion of a tribal sacred sites inventory for the project reach and resolution of all other permit issues. We think presentation of the total remaining project scope illustrates the readiness of this project to secure final designs and effectively move into implementation. I cannot stress enough that we have 65% plan and specifications in hand along with submission ready federal and state permit applications. Final plan set production and permitting began in Fall 2024, with plans and permits expected to be finalized in 2025- 2026. Groundbreaking is scheduled for 2027, and construction should be completed by 2028. Following construction, the project site will undergo revegetation and restoration in the same year. All task start dates are contingent on execution of grant agreement and receipt of notice to proceed.

Total Request - CalTrout - Bureau of Reclamation WaterSMART Grant App					
Tasks	Year 1 (2025)	Year 2 (2026)	Year 3 (2027)	Year 4 (2028)	Task Total
Task 1: Grant Mgmt. and Admin	\$ 111,425.16	\$ 115,925.16	\$ 113,354.14	\$ 112,839.96	\$ 453,544.42
Task 2: Implementation Services	\$ 12,964.70	\$ 26,068.31	\$ 10,967.00	\$ -	\$ 50,000.00
Task 11 - Implementation	\$ -	\$ -	\$ 7,434,386.27	\$ 11,968,208.64	\$ 19,402,594.91
Indirect	\$	\$	\$	\$	\$

(18.64%)	23,186.27	26,467.58	23,173.46	21,033.37	93,860.68
Grand Total	\$ 147,576.13	\$ 168,461.05	\$ 7,581,880.86	\$ 12,102,081.97	\$ 20,000,000.00

Total Project Scope and Budget

Task 1: Grant Administration and Project Management

Applicant (CalTrout) will furnish technical and administrative services essential for executing and concluding the project. These services encompass the management of the Grant Agreement, the confirmation of permit finalization, the administration of subcontracts, handling invoicing and payments, drafting and finalizing quarterly progress and final reports, data management plan, Tier 1 monitoring, coordinating project activities, stakeholder engagement, project communications, and any other task or work necessary to ensure successful execution of grant and project objectives. Includes indirect calculation per NICRA agreement.

- Start Date: 10/1/2024 End Date: 12/31/2028
- Deliverables: Invoicing, Progress Reporting, Close-out Reporting
- Total Task Cost: \$1,424,904.21

Task 2. Final Plans, Specifications, Basis of Design Report, and Construction Services

Northwest Hydraulic Consultants (NHC) will oversee various critical project aspects, beginning with updating the Project Base Map, assuming the availability of LiDAR base mapping data from Ventura County. They will revise the draft 75% Plans, focusing on stream channel refinement while maintaining the core design concept. NHC's involvement extends to reviewing and collaborating on drafting the Annual Maintenance Plan (AMP) alongside Ventura County Watershed Protection District (VCWPD), as well as engaging with Canyon Irrigation Company (CIC) to develop an Operations and Maintenance (O&M) Manual. This engagement includes stakeholder meetings, resource agency reviews, and a summary meeting to initiate the 90% design phase. Deliverables include meeting agendas, presentations, notes, and comment resolution tables. NHC will conduct comprehensive physical modeling, produce detailed scale models, and employ Computational Fluid Dynamics (CFD) modeling to enhance project precision. They will also develop 90% Plans, technical specifications, and a Basis of Design Report, collaborating with Canyon Irrigation Company on equipment selection. NHC will further refine the draft O&M Manual and AMP, ensuring flexibility for future supplier-specific maintenance guidelines. They will provide essential estimates for earthwork quantities, construction schedules, vegetation resources, and traffic control activities. NHC will prepare Final Construction Plans, Technical Specifications, and a Basis of Design Report to guide the construction phase. They will facilitate the pre-bid meeting, ensuring contractors are well-informed, and maintain a Submittal Log to track project-related communication. NHC will lead various critical meetings twice per month (on average), including kickoff, design review, coordination, and environmental meetings. These efforts will be supported by comprehensive project management, encompassing schedule, and budget oversight.

- Total Project Task Term: 10/1/2024 - 10/1/2026
- Deliverables: Final Plan set with Technical Specifications, Basis of Design Report, Operation and Maintenance Manual, Adaptive Management Program, Construction

support documentation, and Invoicing and Reporting

- Total Task Cost: \$2,771,826.00

Task 3. Natural Resource Planning, Environmental Documents, and Monitoring

Catalyst Environmental Solutions (CES) will be responsible for all natural resource studies, obtaining all permits required for implementation and long-term management, and adherence to environmental documents during the construction phase. Catalyst will coordinate with relevant agencies throughout this phase. Presently the project will require Section 10 Consultation with Habitat Conservation Plan, NEPA, CEQA, CESA, CWA 404 and 401, CDFW LSAA, Ventura County Grading Permit, Watercourse permit and FEMA CLOMR. CEQA compliance will be triggered with the submittal of application for Water Quality Certification to the RWQCB and application for Streambed Alteration Agreement to CDFW. We anticipate that the Project will qualify for the Statutory Exemption for Restoration Project (SERP) and we have prepared documentation to support this application in March 2023. All permit applications are near submission-ready draft level. No lead agency has been designated. Catalyst will lead the development of on-site Best Management Practices (BMPs) concerning threatened and endangered species that are highly likely to inhabit the project area. They will oversee the implementation of these BMPs and conduct necessary field surveys during various construction and demolition stages. Catalyst will handle reporting requirements and coordinate with agencies. Catalyst's experience in the region, particularly in water infrastructure projects, positions them well to execute this collaborative approach effectively. A tribal inventory of sacred sites within the project reach will be completed.

- Total Project Task Term: 10/1/2024 - 12/31/2028
- Deliverables: All environmental documents needed to support implementation including, but not limited to, final HCP, final NEPA Document, CA CESA Consistency Determination, 404/401 certification, Approved LSAA, Grading Permit, and Floodplain development approvals
- Total Task Cost: \$405,261.00

Task 4. Project Site Revegetation Plan and Implementation

The Revegetation Plan Specialist (RPS, TBD, Consultant) will draft and finalize a stream restoration revegetation plan, considering ecological conditions and native plant species selection. The plan will detail planting techniques, maintenance protocols, and monitoring strategies. RPS will lead all necessary work to implement revegetation plan once project site is ready. They will work in close collaboration with the project team, permit agencies, and funders.

- Total Project Task Term: 9/1/2025 - 12/31/2028
- Deliverables: Final Revegetation Plan, Success Monitoring Reports, Invoicing, and Reporting
- Total Task Cost: \$1,132,500.00

Task 5. Tribal/Cultural Resource Monitoring and Design Review

The Tribal Monitor (TM, To Be Determined, Consultant) will lead in overseeing tribal monitoring activities that span the periods before, during, and after construction. This role will involve close coordination with the Permitting Team to ensure alignment in survey methods, timing, identification, and marking of culturally significant areas. This collaborative effort will

also encompass discussions regarding the data collection plan (if necessary), participation in plan set review meetings, the installation of wildlife exclusion fences before vegetation clearing, an updated archaeological site survey encompassing various aspects, and the finalization of a revegetation plan with a focus on restoring native vegetation of historical and cultural significance.

- Total Project Task Term: 9/1/2024 - 12/31/2028
- Deliverables: Final Revegetation Plan, Project site plan implementation, Success Monitoring Reports
- Total Task Cost: \$450,000.00

Task 6. Ventura County Coordination and Collaboration

The Ventura County Public Works Watershed Protection District will engage a Technical Consultant for the purpose of assessing the Adaptive Management Program and Habitat Conservation Plan produced for long-term oversight of Harvey Diversion. This will include review and approval of AMP/HCP tasks, the definition of activities in documents, and the development of an actionable AMP checklist to drive all work. This task includes Ventura County Staff time required to execute all monitoring activities, encompassing both routine operations and responses to high-flow events. This can include the allocation of funds to effectively tackle repair work following high-flow events and all expenses related to designs, administrative tasks, and construction monitoring associated with this undertaking.

- Total Project Task Term: 9/1/2024 - 12/31/2028
- Deliverable: MOU on long-term management and maintenance
- Total Task Cost: \$870,000.00

Task 7. Construction Management and Inspections

The Construction Manager (CM, Consultant, TBD) is the central liaison between the Project Lead, General Contractor, and all project stakeholders, ensuring effective communication. CM assumes full control and management responsibility for the project from start to finish, maintaining a collaborative and proactive approach. Their duties include coordinating construction progress meetings, monitoring compliance, overseeing all construction activities, and resolving any delays or issues that arise. CM possesses technical expertise to facilitate day-to-day construction activities and is well-versed in relevant regulations and standards. They actively manage change orders, payment processing, public relations and address resident and agency complaints. CM will maintain meticulous project records, both electronically and in hard copy, and utilize project management tools if necessary. CM will aid in project closeout procedures. CM will lead all Inspection Services and daily tasks, including contract document review, attendance at meetings, continuous on-site presence during construction, schedule monitoring, compliance documentation, and coordination among various project stakeholders. CM reviews submittals, assesses Contractor performance, oversee material tests, and supports public outreach. CM prepares detailed inspection reports, monitors traffic control measures, ensures health and safety compliance, performs inspections for various construction activities, and maintains accurate as-built plans. The CM will assist with punch list creation and follow-up, ensuring project completion and compliance.

- Total Project Task Term: 9/1/2026 - 12/31/2028
- Deliverables: Invoicing, Inspection Reports, Labor Reports, Progress Reports, Close-Out

Report

- Total Task Cost: \$4,943,687.25

Task 8. General Contractor

A General Contractor (GC, TBD, consultant) will oversee obtaining permits and licenses from the relevant authorities, procuring equipment and materials, hiring contractors and additional staff, allocating resources, supervising laborers, verifying wage payments and compliance with prevailing wage requirements, evaluating project progress, and preparing reports. They will also ensure adherence to safety protocols and environmental regulations, issue the final contract voucher certificate, oversee pre-construction submittals, coordinate fabrication inspections, collaborate with inspectors and geotechnical engineers, and lead punch-list walkthroughs. Both the CM and GC will manage contractor schedules, compile weekly status updates, create agendas and summaries for Project Team meetings, coordinate Requests for Information (RFI's) and submittals, maintain field note records, collect scale certifications, manage commitment files, handle change orders, and regularly update and assess risk management matrices.

- Total Project Task Term: 9/1/2026 - 12/31/2028
- Deliverables: Invoicing, Labor Reporting, Progress Reports, Close-Out Report, Environmental compliance documentation
- Total Task Cost: \$150,000.00

Task 9. Public Outreach and Engagement

Dr. David White, an embedded community member and Program Director of Once Upon a Watershed (OUW), will establish connections with the school board to expand the curriculum related to Harvey Diversion's fish passage and sediment transport, complementing the existing OUW Southern steelhead program. OUW will provide training to over 10 educators to integrate this knowledge into the current curriculum and prepare students for field experiences along the Santa Clara River. OUW will expand in-classroom presentations to 2,000+ students in three predominantly Hispanic and disadvantaged school districts: the Rio Elementary School District, the Santa Paula Unified School District, and the Fillmore Unified School District. In addition, they will expand hands-on ecological restoration experiences for over 2,000 youth at the Santa Clara Nature Preserve and potentially the Cienega Springs Ecological Reserve. A Community Environmental Justice partner will develop a paid Santa Clara watershed education training program with a suite of materials. A videographer will document these activities for distribution through CalTrout and partner channels.

- Total Project Task Term: 9/1/2024 - 12/31/2028
- Deliverables: Education material, Public Handouts and other media, Invoicing and Reports, Progress Reports
- Total Task Cost: \$206,173.72

Task 10. Tier 1 Monitoring Tier 1 Implementation

Monitoring Plan will be implemented. Fixed point and drone video photography of work activities will occur through the entire grant term.

- Start Date: 10/1/2024 End Date: 12/31/2028
- Deliverables: Close-Out Report
- Total Task Cost: \$80,000.00

Task 11. Construction

The Construction Contractor (CC, TBD, Contract) will assume leadership of all activities necessary for the successful completion of the Harvey Diversion Implementation tasks. This leadership role entails maintaining constant communication and coordination with all Construction Management Staff, NHC, Catalyst, CalTrout, CIC, VCWPD, and any other relevant project stakeholders. Throughout the project, constant attention will be devoted to adhering to the final plan set, technical specifications, and full compliance with all environmental documents. The process of mobilization and demobilization will be carefully managed, ensuring a seamless transition for project personnel, equipment, and supplies to and from the site. Site preparation and clearing will be executed in precise accordance with project specifications, encompassing the construction of temporary diversion structures. CC will establish and maintain access routes and staging areas. Stream excavation activities will focus on responsible removal of excess material from the site or staging it for environmentally sustainable reuse. Stream fill work will follow stringent guidelines, aligning precisely with project plans, specifications, and environmental mandates. The construction phase will include the installation of Type A and Type B Grade Control Structures, the creation of a roughened channel, placement of multiple rock groins for erosion control, and the construction of a new diversion facility. CC will lead construction of infiltration gallery subsurface intake structure, concrete surfaces for the diversion facility intake, soil nail walls, access gratings, handrails, pump stations, and head tanks. CC will build access roads and related features like guardrails and fencing within the project area. Identification and adaptation of drainage features, as needed to support construction will be undertaken, with utility providers actively engaged to implement any necessary utility protection measures or relocations as part of the project. CC will complete systematic project close-out, ensuring that equipment, materials, and facilities are removed, and project area is restored to meet permit condition requirements effectively.

- Total Project Task Term: 3/1/2027 - 10/15/2028
- Deliverable: Invoicing, Reporting, Environmental Compliance Reporting, and Labor Reporting
- Total Task Cost: \$32,957,915.00

For the Harvey Diversion Fish Passage Project to succeed, there were two key challenges that needed to be tackled: navigating a complex web of permits and securing Ventura County's commitment to long-term management.

The project needs approval from various agencies with overlapping jurisdictions, each with their own environmental regulations. Navigating this intricate landscape is crucial to ensure that Southern steelhead have access to their historic headwaters for decades to come and to remain compliant with all permits throughout the project's 50-year lifespan. Also, a thorough tribal investigation of sacred sites upfront will allow the project to precede with shared benefit.

Ventura County Public Works plays a vital role. Their Watershed Protection Comprehensive Plan, adopted in 1994, included Santa Paula Creek. Their mandate required them to oversee control of floodwaters and conservation of rivers and streams, while protecting watercourses and property. As the project falls within this plan's area, Ventura County's full partnership is critical for the project's success, but also legally required.

CalTrout is currently working with the County to revise floodway maps and draft an agency-

approved adaptive management program - essential for restoring the stream bed elevation and ensuring long-term stability, and will proceed to FEMA once they're approved.

Limited capacity and budget made Ventura County hesitant to take on long-term management. We have worked hard to bring them on board and have allocated resources in the project budget to support their initial involvement. Additionally, the revised floodway maps may require obtaining easements for them, which CalTrout is committed to securing upon map approval.

Open and close collaboration with Ventura County is paramount. By addressing their concerns proactively and working together seamlessly, we can secure their buy-in for the project's long-term success. Building capacity in the County to monitor and adaptively manage steelhead and ecosystem well-being will be leveraged many times over with the removal of Rindge and Matilija dams in the near future and with it the opportunity for regional restoration and DPS level steelhead population recovery.

Potential hurdles in the permitting process and easement acquisition could delay project implementation. Resolving these issues promptly will be essential for staying on track. The project team is prepared to address potential challenges through:

- Proactive communication and collaboration with stakeholders and agencies.
- Adapting the project design to address agency concerns while staying true to its core objectives.
- Seeking additional funding sources if unforeseen cost increases arise due to permitting requirements or easement negotiations.

Failure to address these issues could lead to:

- Project delays
- Increased costs due to permitting extensions or design modifications.

The project team is committed to working diligently and transparently to overcome any obstacles and ensure the successful implementation of the Harvey Diversion Fish Passage Remediation Project for the long-term health of Santa Paula Creek and its vital aquatic ecosystem.

Presidential and Department of the Interior Priorities

According to the Climate and Economic Justice Screening tool, the project area is classified as a disadvantaged community. Below, we've outlined some of the extreme risks this community faces, along with metrics that capture the potential impact of this project on human populations.

This community is extremely vulnerable to increasingly catastrophic climatic events with economic loss to building value resulting from natural hazards each year ranked in the 96th percentile of American communities. The Thomas Fire in December 2017, the largest wildfire in modern California history at the time demolished over a thousand structures and burnt a reported 281,893 acres (440 sq mi). The Maria Fire in 2019, between Santa Paula and Somis, became a full-scale conflagration, forcing mandatory evacuations of over 1,800 homes and 7,500 residences.

For flood risk, this community is also ranked in the 96th percentile. The flashy nature of the Santa Clara River has exacerbated the scour at the project site and flood threatens Creek side

homes and informal settlements alike. During the January 2023 flood events in Ventura County, Santa Paula Creek went from 200cfs to 7000cfs in a matter of hours before the USGS gage lost recording capability. The stream power, volume of water, and volume of sediment mobilized in this type of storm speaks to the complexity of the engineered designs required for remediation of this stream reach. For a majority of the year, water in the basin is overdrawn, resulting in saltwater intrusion into aquifers and degraded water quality for residents across the watershed.

Ranked in the 94th percentile nationally for proximity to Superfund sites, the community has two power plants and a Superfund site eating up their stretch of shoreline. In 2021 the Environmental Justice community of Oxnard successfully rejected SoCal Edison's plans for a Gas Peaker Plant that would pollute the coast for decades to come, in favor of a large-scale clean energy battery – the Oxnard Battery, modeling the way forward.

The communities ranking – at the 99th percentile - for wastewater discharge, based on toxic stream concentrations is also alarming. In 2022, CalTrout completed the Santa Paula Creek water quality assessment study. This study suggests that distributed non-point sources from recreational use, storm runoff, and agricultural operations are likely to be the primary causes of E. coli detections and elevated fecal matter throughout Santa Paula Creek.

As for metrics, this project will:

- Create 237 jobs for the local community
- Lead 2,000 students in the Santa Clara watershed in field-based and in-classroom lessons to learn about Southern steelhead and fish passage
- Protect 8,000 creek-side residents from exposure to flood risk
- Improve water quality for the 30,000 residents downstream of the project site through the instream improvements
- Reach 380,000 community members (200,000 residents in Oxnard, 150,000 residents in Ventura, and 30,000 residents in Santa Paula) through digital messaging focused on Southern steelhead and fish passage

Tribal Benefits

Human settlement has been documented along the banks of the Santa Clara Creek as far back as 5000 B.C.E. This area has gone through many changes, one of which being the massive disruption from Spanish colonization and European migration to this area. As traditional ways of life became untenable and Indigenous people were not able to steward the land, ecological balance was disrupted. Knowing the history of the Ventureño Chumash and Chumash people's connection to this land, the project team has a growing partnership with the Chumash Wishtoyo Foundation in the Southern Steelhead Coalition. We are committed to building that partnership and learning from our partners and hearing their watershed priorities. This project has set aside funds for tribal consultation and cultural monitoring – including a preconstruction project reach inventory of sacred sites - through construction as we work to mitigate this legacy of degradation.

Since the second half of the 1800's and the construction of a railway line, this area committed to agriculture as an industry. There is significant local labor history including the Oxnard Strike of 1903, which contributed to a legacy of community organizing and environmental justice. It

was in this area that United Farm Workers co-founder and human rights activist, Cesar Chavez, organized in 1958.

Knowing the history of activism in these communities, this project is committed to outreach that is inclusive and educational. This project seeks to address the linguistic isolation experienced in this area, in which “no one over age 14 speaks English very well.”, according to the CEJST. We will ensure that broad project communications are bilingual. With this proposal, we seek to bridge the gap between the conservation and environmental justice communities – a natural alliance that holds great promise. Toward that end, CalTrout will convene with local environmental justice groups to start building the relationship network between community champions, adaptation practitioners, and community stakeholders. We will collaborate on a list of priority messages for the watershed to build environmental health literacy

Performance Measures

Harvey Diversion Fish Passage Remediation Plan - Implementation Monitoring Plan

Implementation Plan Goal

The goal of this plan is to outline the methodology that the Project Team will use to assess and report metrics, primarily aimed at appraising the project's success in;

1. Achieving the ecologic objective - restoring fish passage and instream processes,
2. Achieving the complex engineering and technical design components unique to this project,
3. Reducing potential for severe stream bank failure in an urban environment.

Ecological Objectives

This project will complete essential technical research, engineering planning, and project implementation to remediate an approx. 35-ft. total barrier to fish passage on Santa Paula Creek, a tributary of the Santa Clara River located in Ventura County. By addressing this barrier and re-establishing the natural stream slope, we will reconnect access to over 12 miles of perennial stream habitat for the endangered Southern steelhead. This effort will promote the re-establishment of natural processes across the entire watershed, modernize failing agriculture infrastructure and address a severely degraded reach of stream in an urbanized area of Southern California.

Implementation Monitoring Metrics

Site Passability

Method

Pre-construction surveys of the project reach using in-field measurement, drone photography and existing LiDAR data have been conducted in a previous phase. Extensive hydraulic models of the project reach were produced leading up to the current design level. This was done to support the restoration plan, engineering and hydraulic basis of design. These studies fully document the existing channel slopes, boulder configuration, channel width, jump heights, pool depths, bed material, sediment transport regime and flow characteristics (i.e., velocity and depth).

As a part of Task 2.1, NHC will update the survey data and secure 2023 LiDAR data for the project reach completed by Ventura County Department of Public Works following a significant flood event in the region.

As a part of Task 2.4, NHC will lead development of a comprehensive 1:25 scale model extending approximately 1000 feet both upstream and downstream of the diversion point. This model is designed to simulate flows up to the 100-year recurrence interval design flow, providing essential insights into channel behavior under various conditions. This will provide a deeper understanding in reach and watershed scale sediment transport behavior as changed by the project. The disruption of sediment transport at the location is the leading cause of downstream aquatic habitat degradation and reach scale management of connectivity to upstream habitat.

As a part of Task 2.4, NHC will produce a 1:6 scale representation, focusing on approximately 400 feet of the channel centering on the passage barrier. The model will offer highly detailed data on localized flow dynamics and passage conditions through the remediation barrier. For both models, NHC will deliver a Third-Party Review Memorandum, a Baseline Testing Memorandum, conduct two witness tests, and compile a comprehensive Physical Model Report. These deliverables are pivotal for evaluating and refining project designs to support the ecologic objectives. For simultaneous operation during the final testing phase. Computational Fluid Dynamics (CFD) modeling will be employed to assess up to five design variations of specific features, enhancing the project's precision and effectiveness. NHC will conduct a post-construction survey to produce as-built survey following completion of the implementation. Resulting channel slopes, channel width, jump heights, and flow characteristics will be determined from the as-built post-construction survey and compared to the design target values for these metrics. The outcome of the post-construction survey will be documented and submitted.

CalTrout will use drone photography and infield surveys to fully document the stream condition immediately following the completion of all construction activities.

Schedule

Updating of existing models with 2023 LiDAR data will be completed to support design and monitoring once the grant funds are awarded. Expected completion date for the pre-construction in field surveys is Spring 2025 and Spring 2026. In-channel work is expected to be completed by October 15, 2028. The post-construction as-built survey will be conducted within two weeks of completing in-channel work. Post-Implementation habitat and channel geometry surveys will occur immediately following this date as well.

Metric Target

Post-construction targets will be calculated from the results of the post-construction survey for channel slope, channel width, jump heights, pool depth, and flow characteristics.

Presence of Target Fish Species

Method:

Pre- and post-construction target fish snorkel surveys of the project area will be conducted by CalTrout. The presence, absence, and relative abundance of target species (*O. mykiss*) upstream/downstream of the barrier will be evaluated. CalTrout will conduct habitat mapping to establish macro level habitat units - run, riffle, pools, and cascades. Macro-habitat units will be documented for max depth, max span, and riparian habitat structure of each will be assessed. The surveys will cover a range of habitat types upstream and downstream of the barrier to encompass different habitat preferences by distinct life stages of the target species.

Pertinent size categories to allow for distinction between juvenile or adult individuals of each species observed will be recorded. The outcome of pre- and post-construction surveys will be documented and submitted.

Schedule:

Fish community surveys will be conducted once funding is awarded. Mapping will occur in Spring 2025 and Spring 2026. Pre-construction snorkel surveys will occur during Fall 2024, Spring 2025, Fall 2025, and Spring 2026.

Metric Target:

Presence/absence of target species.

Method, schedule and metric targets for objectives:

Objective 1: Achieving the complex engineering and technical design components unique to this project, and Objective 2: Reducing potential for severe stream bank failure in an urban environment.

The cost of the tasks reflects the level of technical skills and expertise that will be required to implement this project. For instance, the grade control structures have been designed to absorb the sheer energy that Santa Paula Creek can produce during flood events. We will need highly technical construction contractors, operators, constant in-field inspection, day-to-day engineering review, biologic monitoring, cultural monitoring, and project management working effectively for 2 years in a constrained, dynamic location to fully implement this project. This has its cost. But the potential in this project is boundless. As a part of the monitoring plan, photo documentation of all project components will be maintained for five years after implementation to ensure that all work is successful. Another component of our monitoring program is to document the riparian plant community regrowth post-implementation and monitor for any locations where bank failure may be occurring. All of these photos will be analyzed and compared to existing conditions to highlight areas where significant bank stabilization has occurred as a result of this project.

Harvey Diversion Fish Passage Remediation Project - Data Management Plan

Project Work Scope:

This project will complete essential technical research, engineering planning, and project implementation to remediate a significant barrier to fish passage on Santa Paula Creek, a tributary of the Santa Clara River located in Ventura County. By addressing this barrier and re-establishing the natural stream slope, we will reconnect access to over 12 miles of perennial stream habitat for the endangered Southern steelhead. This effort will promote the re-establishment of natural processes across the ensure watershed, modernize failing agriculture infrastructure and address a severely degraded reach of stream in an urbanized area of Southern California.

- Time Frame: Aug 2024 – December 2028
- Tasks: Project and Grant Management, Engineering, Modeling and Technical Specifications, Natural Resource Planning and Environmental Documents, Biologic and

Cultural Resource Monitoring, Construction Management, Construction, and Stakeholder Engagement

Types of data:

The project will generate a wide range of data and reports encompassing construction, engineering studies, technical documentation, project site attributes, permitting and MOU tasks, environmental assessments, and stakeholder communications. All this data will be organized within a centralized project database. It will consist of a combination of externally sourced data that has been compiled and analyzed, along with newly created data, analyses, and project-specific reports. The archived data will encompass various elements such as reports, logs, inspection findings, RFIs, bid tables, and other documents, as outlined in the Supplemental Doc Package Statement of Work, Deliverables, and CM/GC role descriptions. The data will take various formats, including raw data (e.g., spreadsheets), tables, figures, charts, maps, diagrams, CAD designs, photographs, videos, Word documents, and PowerPoint presentations. All forms of data will adhere to a standardized naming convention, become part of a searchable database, comply with QA/QC standards and version control, and have designated access and read/write permissions.

The management of data and the central project database will be under the supervision of the CalTrout Project Lead, working in collaboration with project personnel, the Construction Manager, and the General Contractor.

Data and metadata standards

Data and documents introduced into the centralized project database will adhere to a standardized naming convention and will be categorized into the appropriate Level 1 File Types: Engineering, Site Characterization, Permitting, or Stakeholder Communications, as well as Major Milestone Reports. Upon inclusion, each file will be automatically indexed in the File Index. Every document will include information about its origin, date of creation, and version. The database will have search capabilities based on file names and keywords. Metadata accompanying the data will contain details such as the date and time of collection or report generation, geographical coordinates (latitude and longitude in decimal degrees NAD83), and descriptions like the type of sample. These metadata will enable users to pinpoint the location and history of sample collection and provide the necessary tools for mapping these data points.

Policies for access and sharing:

Data and information related to the environment, gathered or produced through grants and cooperative agreements from CDFW and NOAA, will be promptly presented in a clear, accessible, and understandable manner to the general public, users, and agencies. This will be the standard practice, except in cases where legal, regulatory, policy, or security constraints impose limitations.

SANTA PAULA CREEK FISH LADDER AUTHORITY

JOINT POWERS AGENCY

January 11, 2024

Barney Caudill
Manager
Santa Paula Creek Fish Ladder Authority, Joint Powers Agency
133 N. 10th Street
Santa Paula, CA 93060
barney@farmersirrigation.org
805-525-5993

Ms. Avra Morgan
Bureau of Reclamation
Water Resources and Planning Office
Mail Code: 86-63000
P.O. Box 25007
Denver, CO 80225-0007

Dear Ms. Morgan,

I am pleased to extend this letter of partnership on behalf of the Santa Paula Creek Fish Ladder Authority, JPA (JPA) in strong support of California Trout's (CalTrout) funding proposal aimed at securing final designs, all necessary permitting, and construction funding for the implementation of the Harvey Diversion Fish Passage Remediation Project. The elimination of barriers to migration within the Santa Clara River basin is crucial to the recovery and resilience of Southern California steelhead. This proposal seeks to establish a comprehensive, process-based watershed restoration action at a site consistently identified as central to the species' recovery in the Santa Clara Watershed. The Harvey Diversion Fish Passage Remediation Project will partially remove the diversion, restore a more natural stream slope profile and modernize the diversion facility. This will restore natural processes at scale, introduce efficiencies in labor and energy to diversion operations, and fully restore volitional passage for all life-stages of Southern steelhead at this location.

The Harvey Diversion Fish Passage Remediation Project is a pivotal initiative addressing a significant obstacle to the migration of endangered Southern California steelhead in Santa Paula Creek. Santa Paula Creek, as a primary tributary to the Santa Clara River, is recognized as watershed for priority restoration actions that support species recovery in the National Marine Fisheries Service (NMFS) – Southern California Steelhead Recovery Plan 2012. Furthermore, Harvey Diversion stands out as a 1A barrier, signifying the highest level of need and priority at the federal level for fish passage remediation and restoration.

In addition to its core objective of remediating a total fish passage barrier, this project holds the promise of modernizing failing infrastructure. The proposed updates to the diversion facility, coupled with the installation of an infiltration gallery. Updates to the diversion facility addresses a critical need for the restoring migration pathways for endangered species but also enhances operational flexibility and water management efficiency for the owner/operator.

SANTA PAULA CREEK FISH LADDER AUTHORITY

JOINT POWERS AGENCY

CalTrout, with its distinguished track record of sustained efforts to support and advance the recovery of Southern steelhead across the native range. They are well-positioned to lead this transformative initiative. We have full confidence that CalTrout will foster and direct a collaborative process involving all relevant agencies and stakeholders to navigate and resolve the complex and dynamic issues presented by the Harvey Diversion.

Southern steelhead are a key indicator of healthy watersheds. When they are thriving, we are also improving community, economic, and ecological health across our entire region. The broad partnership that is imperative to success of this project will serve as a model in California, nationally, and globally for how we can apply nature-based solutions with public benefits to support thriving ecosystems.

The JPA is enthusiastic about the prospect of partnering with CalTrout on this vital project. We believe that our combined efforts will contribute significantly to the restoration of the Santa Clara River basin, the recovery of the Southern steelhead population and the resiliency of community water infrastructure in Southern California. We look forward to the opportunity to work together and make a lasting impact on the conservation and sustainability of California.

Thank you for considering this partnership, and we eagerly await the opportunity to discuss this collaboration further.

Sincerely,



Barney Caudill

Manager

Santa Paula Creek Fish Ladder Authority, Joint Powers Agency



Jan 17, 2024

M. Camille Calimlim Touton, Commissioner
Bureau of Reclamation
1849 C Street NW
Washington, D.C. 20240

RE: Harvey Diversion Fish Passage Remediation Project: Final Designs and Construction

Dear Ms. Touton:

I am writing to express my support for the funding proposal submitted by California Trout (CalTrout), which will provide final designs, all required permitting, and construction costs to support the implementation of the Harvey Diversion Fish Passage Remediation Project in Santa Paula Creek, a tributary of the Santa Clara River.

The Santa Clara River is identified as a Core 1 basin with the greatest significance for species recovery in the National Marine Fisheries Service – Southern California Steelhead Recovery Plan 2012. Additionally, Harvey Diversion is ranked as a 1A barrier, which indicates the greatest level of need and highest priority for fish passage remediation and restoration. Barriers to migration within the Santa Clara River basin are identified as a critical limiting factor to the recovery and resilience of Southern steelhead. This proposal will put in place comprehensive process-based watershed restoration action at a critical site for species recovery in the Santa Clara Watershed.

This proposal will additionally modernize failing infrastructure, which will bring the diversion a significant reduction in total energy consumption by securing year-round instream flow and installing an infiltration gallery. This component will provide the owner/operator greater operational flexibility and increased efficiency in water management while simultaneously resulting in long-term benefits for many native species.

CalTrout has demonstrated significant effort and commitment to advancing the recovery of Southern steelhead throughout the entire native range. I therefore request full and fair consideration of this application. CalTrout has committed to a collaborative and inclusive process with agencies and local stakeholders to achieve a resolution to the complex issues presented by Harvey Diversion. Thank you for your consideration.

Please do not hesitate to reach out with any questions.

Sincerely,

A handwritten signature in black ink that reads "Monique Limón". The signature is written in a cursive style with a large, looped initial "M".

MONIQUE LIMÓN
Senator, 19th District

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COMMITTEES
CHAIR: BUDGET SUBCOMMITTEE NO. 4 ON
CLIMATE CRISIS, RESOURCES, ENERGY,
AND TRANSPORTATION
BUDGET
ELECTIONS
EMERGENCY MANAGEMENT
WATER, PARKS AND WILDLIFE

January 16, 2024

M. Camille Calimlim Touton
Commissioner
Bureau of Reclamation
Via email

RE: Harvey Diversion Fish Passage Remediation Project: Final Designs and Construction

Dear Ms. Touton,

I am writing in support of California Trout's (CalTrout) funding proposal that will secure final designs, all required permitting and construction funding to support implement of the Harvey Diversion Fish Passage Remediation Project. This project will remediate a significant barrier to the migration of endangered southern steelhead in Santa Paula Creek, a tributary of the Santa Clara River.

The Santa Clara River is identified as a Core 1 basin with the greatest significance for species recovery in the National Marine Fisheries Service (NMFS) – Southern California Steelhead Recovery Plan 2012. Harvey Diversion is ranked as a 1A barrier which indicates the greatest level of need and highest priority for fish passage remediation and restoration. Barriers to migration within the Santa Clara River basin are identified as a critical limiting factor to the recovery and resiliency of southern steelhead. This proposal will put in place comprehensive process-based watershed restoration action at a site that is routinely identified as central to the recovery of the species in the Santa Clara Watershed.

In addition to remediating a total fish passage barrier, this project will modernize failing infrastructure with energy and labor efficiencies. We will secure year-round instream flow through updating the diversion facility and with installation of an infiltration gallery as part of this project. This component will provide the owner/operator greater operational flexibility and increased efficiency in water management.

CalTrout has a demonstrated history of a sustained effort to support and advance the recovery of Southern steelhead throughout the entire native range. I have full confidence that CalTrout will foster and direct a collaborative process with all agencies and stakeholders to achieve a resolution for the complex and dynamic issues presented by Harvey Diversion.

If you have any questions or require additional information, please do not hesitate to reach out to my Legislative Aid, Candace Cotton at candace.cotton@asm.ca.gov.

Sincerely,

Steve Bennett

Assemblymember Steve Bennett

January 22, 2024

Ms. Avra Morgan
Bureau of Reclamation
Water Resources and Planning Office
Mail Code: 86-63000
P.O. Box 25007
Denver, CO 80225-0007

RE: Harvey Diversion Fish Passage Remediation Project: Final Designs and Construction

Ms. Morgan,

I am writing on behalf of The Nature Conservancy in support of California Trout's (CalTrout) proposal for the Harvey Diversion Fish Passage Remediation Project. This project will restore access to high-quality spawning, rearing, and foraging habitat for dual-listed Southern California steelhead. This proposal will remediate a significant barrier to the migration of endangered Southern steelhead in Santa Paula Creek, a major tributary of the Santa Clara River.

The Santa Clara River is identified as a Core 1 basin with the greatest opportunity for species recovery in the National Marine Fisheries Service— Southern California Steelhead Recovery Plan 2012. Harvey Diversion is ranked as a 1A barrier, which indicates the greatest level of need and highest priority for fish passage remediation and restoration. Barriers to migration within the Santa Clara River basin are identified as a critical limiting factor to the recovery and resiliency of Southern steelhead. The Nature Conservancy has conserved over 4,707 acres, about 21 river miles, within the Santa Clara River floodplain through fee acquisitions and conservation easements. Nearly 1500 acres of the floodplain are being actively restored within the lower watershed. These multi-benefit restoration investments aimed at improving instream flows and habitat resiliency to climate change, only work for steelhead if barriers can be removed. This proposal will put in place comprehensive process-based watershed restoration action at a site that is routinely identified as central to the recovery of the species in the Santa Clara Watershed.

In addition to remediating the total fish passage barrier, this project will modernize failing infrastructure. By updating the facilities, the diversion will see significant reduction in total energy consumption. As part of this project, we have the opportunity to secure year-round instream flow by updating the diversion facility and installing an infiltration gallery. This component will provide the operator greater operational flexibility and increased efficiency in water management while also resulting in long-term benefit for many native species.

CalTrout has demonstrated significant effort and commitment to advancing the recovery of Southern steelhead throughout the entire native range. I have full confidence that CalTrout will foster a collaborative and inclusive process with agencies and local stakeholders to achieve a resolution to the complex issues presented by Harvey Diversion.

Sincerely,



Peter Dixon
Restoration Project Manager,
Santa Clara River and Coast Project, California Chapter
The Nature Conservancy



Jan 22, 2024

Ms. Avra Morgan
Bureau of Reclamation
Water Resources and Planning Office
Mail Code: 86-63000
P.O. Box 25007
Denver, CO 80225-0007

RE: Harvey Diversion Fish Passage Remediation Project: Final Designs and Construction

Ms. Morgan,

I am writing on behalf of the Wishtooyo Chumash Foundation in support of California Trout's (CalTrout) funding proposal that will secure final designs, all required permitting and construction funding to support implement of the Harvey Diversion Fish Passage Remediation Project. This project will remediate a significant barrier to the migration of endangered southern steelhead in Santa Paula Creek, a tributary of the Santa Clara River.

The Santa Clara River is identified as a Core 1 basin with the greatest significance for species recovery in the National Marine Fisheries Service (NMFS) – Southern California Steelhead Recovery Plan 2012. Harvey Diversion is ranked as a 1A barrier which indicates the greatest level of need and highest priority for fish passage remediation and restoration. Barriers to migration within the Santa Clara River basin are identified as a critical limiting factor to the recovery and resiliency of southern steelhead. The Harvey Diversion Fish Passage Remediation Project is necessary for steelhead to access high-quality spawning habitats of the upper reaches of Santa Paula Creek and Sisar Creek. This proposal will put in place comprehensive process-based watershed restoration action at a site that is routinely identified as central to the recovery of the species in the Santa Clara Watershed.

Southern steelhead, known as "isha'kowoch", are a cultural keystone species for Chumash peoples. The restoration of fish passage, natural hydrology, and migration for steelhead promises the restoration of the entire rainbow trout fishery in the Santa Clara River (Utom) watershed, and the restoration of a vital lifeway for the indigenous peoples of Utom.

In addition to remediating a total fish passage barrier, this project will modernize failing infrastructure and introduce energy and labor efficiencies. This project will secure year-round instream flow through updating the diversion facility and installation of an infiltration gallery. This component will provide the owner and operator greater operational flexibility and increased efficiency in water management.

CalTrout has a demonstrated history of a sustained effort to support and advance the recovery of Southern steelhead throughout the entire native range. I have full confidence that CalTrout will foster and direct a collaborative process with all agencies and stakeholders to achieve a resolution for the complex and dynamic issues presented by Harvey Diversion.

Thank you for your time and consideration.

Sincerely,

Tevin Schmitt
Watershed Scientist
Wishtooyo Chumash Foundation



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MATT LAVERE
First District

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Ms. Avra Morgan
Bureau of Reclamation
Water Resources and Planning Office
Mail Code: 86-63000
P.O. Box 25007
Denver, CO 80225-0007

RE: Harvey Diversion Fish Passage Remediation Project: Final Designs and Construction

Ms. Morgan, I am writing in support of California Trout's (CalTrout) proposal for the Harvey Diversion Fish Passage Remediation Project. This project will restore access to high-quality spawning, rearing, and foraging habitat for dual-listed Southern California steelhead. This proposal will secure final designs, all required permitting, and construction funding to remediate a significant barrier to the migration of endangered Southern steelhead in Santa Paula Creek, a major tributary of the Santa Clara River.

The Santa Clara River is identified as a Core 1 basin with the greatest opportunity for species recovery in the National Marine Fisheries Service– Southern California Steelhead Recovery Plan 2012. Harvey Diversion is ranked as a 1A barrier, which indicates the greatest level of need and highest priority for fish passage remediation and restoration. Barriers to migration within the Santa Clara River basin are identified as a critical limiting factor to the recovery and resiliency of Southern steelhead. This proposal will put in place comprehensive process-based watershed restoration action at a site that is routinely identified as central to the recovery of the species in the Santa Clara Watershed.

In addition to remediating the total fish passage barrier, this project will modernize failing infrastructure. By updating the facilities, the diversion will see significant reduction in total energy consumption. As part of this project, we have the opportunity to secure year-round instream flow by updating the diversion facility and installing an infiltration gallery. This component will provide the operator greater operational flexibility and increased efficiency in water management while also resulting in long-term benefit for many native species.

CalTrout has demonstrated significant effort and commitment to advancing the recovery of Southern steelhead throughout the entire native range. I have full confidence that CalTrout will foster a collaborative and inclusive process with agencies and local stakeholders to achieve a resolution to the complex issues presented by Harvey Diversion.

Thank you for your time and consideration.

Matt LaVere
District 1 Supervisor
County of Ventura