# Attachment 11. Project Narrative

**Project Title:** Napa River Restoration Oakville to Oak Knoll Design (Group B & D)

**Applicant name:** Napa County Public Works

## Executive Summary/Abstract

The Napa River drains 426 square miles, and contains 1,400 miles of anadromous streams that drain into San Pablo Bay in the northern section of the San Francisco Bay Estuary. The watershed spans between 5 to 15 miles wide between the Mayacamas Mountain range to the west and the Vaca Mountains to the east. The mainstem Napa River flows 38 miles south through the center of the agricultural Napa Valley from Calistoga to the City of Napa, where it becomes estuarine, and then flows 17 miles through marshland flanked by urban development to the San Pablo Bay. In 1990, based on evidence of widespread erosion and concern regarding adverse impacts to fish habitat, the Water Board listed the Napa River as impaired by sedimentation. The primary impetus for listing was a concern regarding substantial decline since the 1940s in abundance and distribution of steelhead and salmon in the watershed (Napolitano et al, 2009). The Napa River watershed is estimated to have historically supported a spawning run of 6,000–8,000 steelhead and up to 2,000–4,000 coho salmon (USFWS 1968). By the late 1960s, coho salmon were extirpated from the watershed, and the steelhead run had declined to 1,200–1,900 adults (Anderson 1969). The Napa River watershed has been designated as "critical habitat" for the Central CA Coast steelhead distinct population segment (DPS) via the NMFS recovery planning process.

The purpose of the Napa River Oakville to Oak Knoll (OVOK) Restoration Project is to restore and enhance long-term river and floodplain function, improve the quality and resilience of aquatic and terrestrial riparian habitat, reduce property damage and sediment delivery associated with ongoing bank erosion processes, and achieve streambed sediment goals outlined in the Napa River Sediment TMDL (TMDL). The OVOK Project includes 4.8 miles of active channel restoration activities along 9 miles of the mainstem Napa River resulting in the restoration of up to 80 acres of riparian corridor and floodplain. The Project encompasses 108 acres in total. The Project includes removal of approximately 36 acres of vineyards (donated and rededicated by landowners), and restoration of 84 acres of transitional riparian and channel habitat. The OVOK Project includes four restoration groups (A-D) encompassing 23 sites. CEQA is complete and permit coordination is ongoing. The Project is being brought to final design in phases and is being constructed as implementation grant funding is secured. The OVOK Project includes several specific design elements that are intended to restore physical and biological processes to the Napa River including channel widening, floodplain restoration, biotechnical stabilization, in-stream habitat structures, managed retreat, and native riparian revegetation.

This grant proposal would fund technical studies necessary for design advancement of OVOK Group B and D. OVOK Group B includes Sites 15-20 and Group D includes Sites 1-10, the County has developed 30% and needs to advance these to final design and construction documents to support construction in 2019.

## Introduction and Purpose

The Napa River is one of the few large watersheds in the San Francisco Bay Area which has not been widely urbanized and supports a wide range of wildlife and habitats. The Napa River has been ranked as amongst the top five waterways in the immediate San Francisco Bay watershed as having

high potential for successful salmonid habitat restoration (CEMAR 2006). Prior to agriculture and development in the Napa Valley, the Napa River, its floodplain, and riparian corridor supported extensive upland forest and wetland habitats. Much of this habitat has been reduced over time. Prior to development, the Napa River was a broad, shallow river system with multiple channels. The Napa River is now generally confined to a single channel that is often deeply incised. Habitat quality and river function in the Project reach is degraded due to historic channel modifications, land use changes, and the influence of dams in the watershed that affect conditions both upstream and downstream. These processes have led to channel incision, bank destabilization, reduced functioning of in-channel features (riffles, bars, pools), a narrowed riparian corridor, and loss of floodplain connectivity within the mainstem Napa River and the six (6) tributaries within the project reach. Much of the river and riparian corridor is bounded by agricultural berms at the top of bank to protect neighboring properties from flooding. The constricted channel and confining berms disconnect the river from its adjacent floodplain terraces. This confinement keeps the channel zone fairly homogenous in terms of hydraulic conditions and instream complexity features such as bars, benches, pools, alcoves, etc. This lack of geomorphic complexity results in a less diverse riparian community and reduced quality and quantity of instream habitat for native aquatic species such as Chinook salmon (*Oncorhynchus tshawytshca*), steelhead trout (*Oncorhynchus mykiss*), and California freshwater shrimp (*Syncaris pacifica*).

The Napa River OVOK Project is consistent with Funding Priorities to Protect and Restore Anadromous Fish Habitat and promotes the California Water Action Plan goal to Protect and Restore Important Ecosystems. The above-described watershed changes and hydromodifications have resulted in significant incision on the mainstem Napa River. The river channel is now 12-15 ft. deeper and much narrower than its pre-development state. Much of the river channel is trench-like with 20-25 ft. vertical banks and little connectivity to its floodplain. Many of the basic features needed to support salmonids—pools, riffles, gravel bars, off-channel refugia, floodplains and complex channel habitats—are missing from many reaches of the Napa River. The entrenched river channel has high velocity flows and bank erosion increasing fine sediment levels in the river that degrades instream habitat. Long, monotonous glides dominate many reaches; and some areas have no gravel on the streambed and little large wood. These habitats have low value to salmonids. The process of channel incision also causes a number of changes that affect tributaries and fish migration. The incision migrates up into the tributary channel eroding the bed and banks of the stream and entrenches the creek channel. When this process reaches a hard point, such as a culverted road crossing, it will deepen the channel downstream and often creates a migration barrier for salmonids. Additionally, the bedforms needed by steelhead trout—pools, riffles and large wood—are eroded out of tributaries.

The process of mainstem and tributary channel entrenchment has been occurring in the Napa River for many decades. Coho salmon were extirpated from the watershed in the 1960s. California's salmon and steelhead populations have experienced marked declines leading to listing of almost all of California's anadromous salmonids under the California Endangered Species Act (CESA) and Federal Endangered Species Act (ESA). Both CESA and ESA listings require recovery plans that call for monitoring to provide some measure of progress toward recovery (CDFW, 2011). Steelhead trout, part of the Central California Coast ESU, were listed as threatened in 2006 with the Napa River and its tributaries designated as critical habitat. Fall-run Chinook salmon are not listed in the Napa River. The California Department of Fish and Wildlife (formerly Department of Fish and Game) estimated the historic runs of steelhead trout in the Napa River at 6,000-8,000 adults (Anderson, 1972; USFWS and CDFG, 1968). The Center for Ecosystem management and Restoration (CEMAR) reviewed fish habitat and population surveys completed on the Napa River and its tributaries and found population declines occurred on all 46 creeks and the river.

The Regional Water Quality Control Board (RWQCB) listed the Napa River and its tributaries as impaired

by too much sediment under Section 303 (d) of the federal Clean Water Act in the 1990's. Designated beneficial uses of the Napa River include: Water supply; Recreation; Navigation; Fish migration/spawning; Cold and warm freshwater habitats; Wildlife habitat; and Preservation of rare and endangered species. Beneficial uses adversely affected by excess sediment are recreation, cold freshwater habitat, fish spawning, and preservation of rare species. Habitat stressors include excessive erosion from vineyard facilities, grazing operations, rural roads; incision in the main stem river and tributary creeks; reduced instream habitat complexity; altered steam flows; fish migration barriers; and water temperature. The Napa River Watershed Limiting Factors Analysis (Stillwater, 2002) was developed in response to the TMDL listing to help inform the RWQCB sediment TMDL process, to inform our understanding of existing conditions, and to make recommendations regarding planning and implementation. Recommendations of the report included implementation of reach scale restoration along the mainstem of the Napa River to enhance physical habitat for steelhead (federally threatened), Chinook salmon, and California freshwater shrimp (federally endangered), reduce sources of ongoing bank erosion, and conduct additional geomorphic stream monitoring (i.e. gravel permeability and streambed scour studies). A significant effort to understand the historical ecology of the Napa River valley has been undertaken by the San Francisco Estuary Institute (SFEI, 2012) and our work draws heavily on that effort.

The Napa River OVOK Restoration Project has several design elements that are intended to restore physical and biological processes to the Napa River, including channel widening, floodplain and wetland restoration, biotechnical stabilization, instream habitat structures, managed retreat, and native riparian vegetation enhancement. These enhancements would improve habitat for waterfowl and for threatened species such as steelhead, chinook, and fresh water shrimp. Secondary components of the project include biotechnical stabilization, vegetation management, and site revegetation. Secondary elements will be integrated at each site where structural restoration elements are proposed. As part of the OVOK Project design process the following technical studies inform site designs; detailed topographical surveys, hydraulic modeling and calculations, eco-hydrology, geomorphic assessments, habitat surveys, eroding bank surveys, geotechnical investigations and botanical surveys. The detailed assessment of existing conditions informs the exact positioning, orientation, and sizing of specific elements. Restoration design refinement is also coordinated with individual landowners and regulatory agencies.

The OVOK Project provides continuity with the recently completed Napa River Rutherford Reach Restoration Project (4.5 mile reach), located immediately upstream of the OVOK Project. The Rutherford Project is a public-private partnership intended to implement the Napa River Sediment TMDL through the establishment of floodplain and secondary channel features for improved sediment sorting and capture, widening of the channel, enhancement of the riparian corridor including restoration of native plant and tree assemblages, and installation of bank stabilization measures and instream habitat structures. In 2011 the County completed the Zinfandel Bridge Fish Passage Project which is immediately upstream from the Rutherford Project, the barrier removal opened up 57 miles of historic stream habitat essentially doubling the stream habitat for chinook salmon and steelhead trout within the Napa River Watershed. The Napa Resource Conservation District completed the Napa River Barrier Assessment Report in 2011 and has since been working with local agencies and private property owners to remove barriers along tributaries throughout the Napa River Watershed. Success of mainstem restoration within the Rutherford and OVOK Project Reaches has inspired landowner's within the Bale Slough Bear Creek Tributary to come together to begin developing tributary restoration plans. The Napa Resource Conservation District, Napa County Flood Control District and ESA are partnering on the development of the conceptual plan. Landowners within the study area are participating in a technical advisory committee to help guide restoration planning and have granted access for the studies to occur. The long-term goal is to expand restoration efforts up the migratory tributary reaches to provide steelhead and salmonids access to high quality spawning habitats within the upper reaches.

The vast majority of the Napa River and its tributaries are on private land. The success of the continuation of restoration work is validating this model of public private resource conservation and stewardship among the local community. Participating landowners within the Rutherford and OVOK Project Reaches have partnered with the Napa County Flood Control and Water Conservation District to create assessment districts to fund long-term monitoring and maintenance of the restoration work. The majority of agricultural landowners are also participating in programs to enhance conservation practices that minimize fine sediment input into waterways and promote resource stewardship.

## Project History / Need for CDFW Funds

In 2002 the Napa River was listed as impaired for salmonids, and a Limiting Factors Report was prepared by Stillwater Sciences (Stillwater Sciences and Dietrich, 2002). The Limiting Factors Report provides a helpful summary of the causes of degradation on the river, and points to potential actions to reverse in-stream habitat degradation and is used as a basis for the restoration design work. In 2007, the California Land Stewardship Institute (CLSI) received funding from the California State Water Resources Control Board (State Water Board) and Napa County (Measure A) to prepare an enhancement plan for the Oakville to Oak Knoll reach of the Napa River. The *Napa River Restoration: Oakville to Oak Knoll Final Concept Plan* (Concept Plan) was completed in 2011 and is available online http://www.napawatersheds.org/app_pages/view/5859. In 2012, Napa County hired a team led by ESA PWA to advance the conceptual design to the 30% stage to support development of the CEQA analysis and document. The design team considered the result of the Concept Plan's Project ranking and alternatives analysis and developed a Basis of Design (BOD) document to guide design work for 23 restoration sites. The BOD provides the rationale, assumptions, and performance criteria for the proposed OVOK Project restoration elements (channel widening, floodplain restoration, biotechnical restoration, in-stream habitat features, gravel enhancement, etc). It provides a series of hypotheses for how the design elements will function and meet the OVOK Project goals, and a series of tests to measure whether this has occurred. In developing potential restoration actions the historic trajectory of the Napa River was evaluated to look at how it has evolved from historic to existing conditions and to assess the likely future conditions under a no-action and a restoration scenario.

Ahead of project implementation the Napa County Flood Control and Water Conservation District (District) collaborated with riverfront landowners in the OVOK Project reach to form a Community Facilities District (CFD) in 2014 that taxes individual landowners to fund long-term monitoring and maintenance of the OVOK Restoration Project. Landowners are also rededicating over 36 acres of vineyard valued at approximately $8,000,000, which is necessary to facilitate implementation. The OVOK Project has divided the 23 sites into four construction group (A-D). The County fully funded design and permitting for Construction Group A and C through local Measure A ($2,476,000). Implementation of the OVOK Project began in Group A (Sites 21-23) in 2015 and was funded by a grant from the EPA San Francisco Bay Water Quality Improvement Fund ($1,200,000) and County Measure A ($1,200,000). OVOK Group C includes Sites 11-14 and is being implemented over three construction seasons. Construction at Site 14 began in 2016 and was funded by a grant from the San Francisco Bay Water Quality Improvement Fund ($897,000) and County Measure A ($897,000). Sites 11-13 will begin implementation in July 2017 with funding from California Coastal Conservancy ($850,000), State Water Resource Control Board ($750,000), California Department of Fish and Wildlife Prop 1 ($1,000,000), and County Measure A ($1,000,000).

The County is requesting funding support for design advancement of the second construction phase Group B and D of the OVOK Project. The County has completed the 30% design for these sites and is

preparing to begin the technical studies necessary to advance designs to the 100% level, apply for implementation permits and develop construction documents. The County anticipates moving forward with construction of Group B in 2019 and Group D in 2020-2021. The engineers estimate for construction Group B and D is estimated to be $7,500,000. The County has Measure A funding to support 25% of the implementation costs and will need to seek grant funding for the remaining 75% of implementation costs. The County's Hazard Mitigation Plan includes erosion control and river restoration projects, so the County has applied to the California Governor's Office of Emergency Services (Cal OES) for implementation funding under the Hazard Mitigation Grant Program (HMGP) for construction of Group B and D. The County will continue to seek out other funding opportunities as they become available.

In the absences of funding from CDFW the design advancement for OVOK Project Group B and D would not move beyond the 65% level and implementation would be delayed until funding is secured. This delay may result in some landowners dropping out of the project implementation phase. Funding constraints and delays could also impact landowner's confidence in the County's ability to continue restoration planning work within the tributaries of the Napa River Watershed and they may be less likely to participate in these public-private partnerships in the future.

## Goals and Objectives

The Objectives of the OVOK Restoration Project are to restore and enhance long-term river and floodplain function, improve the quality and resilience of aquatic and terrestrial riparian habitat, and reduce sediment delivery associated with ongoing bank erosion processes to comply with the sediment TMDL goals. Specifically, the goals of the OVOK BMPs are to reduce sediment discharges through bank and bed stabilization, and beneficially alter sediment transport promoting sediment capture on floodplain surfaces, pool/riffle formation and gravel deposition, and reducing redd scour. Long-term streambank stability is being achieved through extensive native plant restoration making for a more resilient and complex riparian corridor reducing future input of fine sediments that have degraded beneficial uses within the Napa River. The long-term outcome of project design elements are already being realized and documented in the upstream Rutherford Project Monitoring reports where there has been a reduction in streambank failure and streambed erosion, increase in channel complexity and aquatic habitat, expansion of riparian corridor and increase in shade cover, enhancement of pool/riffle formation and gravel deposition. The positive trends being monitored upstream speak to the future outcomes associated with OVOK Project design advancement and implementation.

## Site Description

Design advancement for the second phase of the OVOK Restoration Project is within construction Group B and D. These sites are all adjacent to the Napa River and project boundaries extend from the stream channel into upland agricultural areas. The below table provides specifics regarding the existing conditions of each site, proposed restoration actions, and notes the sites that are not being advanced forward as part of the project.

Table 1: Site and Restoration Descriptions

| Site Number | Existing Conditions | Restoration Actions |
|---|---|---|
| Group B | | |
| 20 | Located on a small bend, the site extends onto the east and west banks of river. On the west bank there is historic rock and concrete debris, mature oak trees line the top of bank with limited native understory on the streambanks. The east bank has moderate erosion and a complex assemblage of native plants with some | Grading on the east bank will establish an alcove feature to provide off channel refugia. Native revegetation along the west bank and minor grading to remove debris where feasible without impacting existing oak trees. Non-native invasive management throughout the project site to enhance existing native species assemblage. |

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| | invasive vegetation mixed throughout the corridor. | |
| 19 | An actively eroding streambank is nearly vertical and range between 20 and 25 feet high. No successional native vegetation along streambank due to vertical conditions. | Grading to create a secondary high flow channel and laying streambanks back to a stable slope geometry. LWD habitat structures and boulder cluster would be installed, willow baffles, revegetation and invasive management. |
| 18 | An actively eroding streambank is nearly vertical and range between 20 and 25 feet high. Existing rip-rap along the toe provides minimal protection due to the lack of trees along the top of a bank. | Channel widening activities would lay back the bank through minor grading, installation of biotechnical stabilization elements, native revegetation, and invasive management. |
| 16 & 17 | Existing house along top of bank is at risk of flooding and bank erosion threatens infrastructure. Limited mature trees along the top of bank, understory dominated by non-native vegetation, and riparian canopy is sparse. | Two restoration concepts for the site. Scenario 16 includes installation of biotechnical stabilization elements and riparian enhancement. Scenario 17 includes the relocation of the house, channel widening, creation of a secondary channel, willow baffles, LWD habitat structures, boulder clusters, and riparian revegetation. |
| 15 | The area encompasses approximately 9 acres the majority of which is vineyards. The adjacent riparian area has a mature stand of native oak trees with a variety of non-native invasive plants such as blackberry, vinca, and wild plum. The boundary encompasses Sites 20, 19, and 18. | Managed retreat and riparian corridor expansion along the east bank by 100-150 feet along 3,750 linear feet of the river. Managed retreat will entail the removal of vineyard from production, minor grading to lower elevation of managed retreat zone, extensive riparian planting and invasive management. |
| Group D | | |
| 10 | Restoration Site 10 includes a setback berm that was created in the 1960's to provide a buffer between the managed vineyard and Napa River. The western edge of the berm is lined with native oaks and walnuts to be preserved. The area between the existing berm and the river is dominated by young seedlings, ruderal grasses, and limited stands of large walnut and oaks. | Between Station 169+00 and Station 175+00 the existing channel will be set back and integrated with an extensive flood plain bench and tree-island complex. The floodplain feature will become inundated at approximately a 1.5-yr event to provide off-channel refugia. The high degree of channel widening will help recruit coarse gravels and the express riffle-pool morphology at the site. Channel widening activities at Site 10 will extend downstream and connect to proposed improvements at Site 9 |
| 9 | Restoration Site 9 is located upstream of a significant channel bend next to an existing fruit orchard and is immediately downstream of Site 10. Channel banks at Site 9 are nearly vertical and range between 20 and 25 feet high. In-channel habitat is dominated by a continuous glide feature and a single point bar located at the lower extent of the project site. A single line of mature oaks and native walnuts line the top of bank while the understory is dominated by poison oak, non-native grasses, and Himalayan blackberry. Downstream portion to be removed from project due to cultural resource concerns. | At the upstream end of Site 9, an existing berm will be removed and a large (500 foot) floodplain bench would be created that connects to Site 10. Floodplain would be graded to provide off-channel refugia and promote the deposition of spawning gravels in the channel. The floodplain bench would include a tree island along the existing bank toe to preserve existing trees, willow baffles for floodplain roughness, roughness boulders, and large wood structures. Installation of biotechnical bank stabilization elements, native revegetation and invasive management. |
| 8 | Currently not proposing to advance design. | |
| 7 | Located on the outside of a bend in the river where existing bank slopes are approximately 1:1 and protected by rip rap. The top of bank is lined with a series of old growth oaks, bays, and walnuts that would be protected. A water supply reservoir and associated infrastructure abuts the channel and is oriented perpendicular to the riparian corridor. During previous high flow events erosion has been documented at the base of the water supply reservoir. | The left bank will be set back to provide additional flow area, existing vineyard access road will be realigned to the top of the irrigation reservoir berm to provide the necessary area for floodplain restoration. A wetland depression will be graded in the left overbank area, biotechnical bank stabilization, native revegetation and invasive management. |
| 5 & 6 | Currently not proposing to advance design because landowner decided they didn't want to move forward with the project unless the County could purchase the area of interest. | |
| 4 | Located on the left bank upstream of where the Napa River splits to a historic slough or bypass channel. Adjacent to an existing wetland feature that has been disconnected from the Napa River due to past agricultural development. | Expand and enhance existing wetland to re-connect it to the river increasing inundation frequency and extent, realign existing drainage channel to integrate with expanded wetland, upland habitat structures, revegetation, and invasive management. |
| 3 | Adjacent to upstream bypass channel of the Napa River. Offers a location/opportunity for active widening and expansion of the riparian corridor. Currently dominated by non-native grasses, with limited tree cover. | Channel widening to create alcove that provides off-channel refugia, upland wetland complex, biotechnical bank stabilization, instream LWD habitat structures, native plant revegetation, and invasive management. |
| 2 | This reach is confined but contains the most diverse habitat conditions in the project reach, with a tightly spaced riffle-pool form. There is abundant utilization by spawning salmon, however a preliminary sediment transport assessment showed that spawning gravel is | Channel widening, biotechnical bank stabilization, instream LWD habitat structures, native plant revegetation, and invasive management. |

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| | very vulnerable to erosion. | |
| 1 | Immediately downstream of the confluence of the split flow region of the Napa River. The site is highly entrenched, actively widening and has an extremely narrow riparian corridor. | Channel widening, biotechnical bank stabilization, instream LWD habitat structures, native plant revegetation, and invasive management. |

## Background and Conceptual Models

The Napa River Restoration – Oakville to Oak Knoll project utilizes a range of innovative technical analyses and the latest developments in geomorphic science to reinstate physical and hydraulic processes that are linked to aquatic habitat complexity. The process begins with the development of a 2-Dimensional (2D) hydraulic model to capture existing flow dynamics relative to existing geomorphic features such as riffle crests, pools, floodplain benches, and side channels. The analysis evaluates the existing system relative to the latest geomorphic science relating channel width and the maintenance of riffle pool habitat units responsible for aquatic habitat complexity (MacWilliams et al, 2006, Caamano et al 2012, Pasternack & Brown, 2013, Sawyer et al, 2010). The results of hydraulic modeling and geomorphic analyses are used to identify opportunities for restoration actions that integrate existing channel and floodplain structure (riffle, pools, etc) and accentuate their influence on channel form. Results from the existing conditions geomorphic and hydraulic analysis are combined with additional field data (trees, infrastructure, etc.) and historical flow data to develop recommended channel restoration action that reinstate a channel and floodplain template that reactivates the physical processes controlling channel form. For instance, proposed widening and floodplain restoration at existing riffles will reinstate riffle pool velocity reversals that have been diminished by channel incision. Channel widening will initate deposition on riffle crests, scour in pools and maintenance of complex geomorphic structure integral to fish habitat. As part of the OVOK Project design process the following technical studies inform site designs; detailed topographical surveys, hydraulic modeling and calculations, eco-hydrology, geomorphic assessments, habitat surveys, eroding bank surveys, geotechnical investigations and botanical surveys. The detailed assessment of existing conditions informs the exact positioning, orientation, and sizing of specific elements.

## Climate Change Adaptation

The implementation of OVOK Project is consistent with the biodiversity and habitat enhancement principles described in Safeguarding California: Reducing Climate Risk. The OVOK Project is also in line with climate adaption planning, biodiversity conservation and enhancement of ecosystem function as discussed in the 2009 California Climate Adaption Strategy and California Water Action Plan. Napa County developed a Climate Action Plan in 2012 and is currently participating in a regional climate vulnerability assessment that is being funded in part by a Coastal Conservancy Grant. The County has been using local Measure A funds to support projects aimed at flood management and watershed enhancements in an effort to create a more resilient watershed that will adapt better to future climate fluctuations, and is integrating the findings of the climate study into restoration designs and monitoring efforts.

The implementation of OVOK Group B & D will expand the riparian corridor and enhance native species diversity (grasses, sedges, shrubs and trees) that will be more adaptive and sustainable under a range of future conditions. This is anticipated to improve terrestrial and aquatic habitats, as well as overall ecosystem function. The expansion of the riparian forest and restoration of wetland features will enhance the ability of the restoration area to function as a greenhouse gas sink and make the riparian

corridor more resilient to hydrological and temperature variations. The District's adaptive maintenance strategy is designed to promote successional riparian plant development and would be able to reduce such vulnerabilities through an ongoing phased planting approach.

## Community Support and Collaboration

The OVOK Project and Rutherford Project cover 15 miles of the Napa River between St. Helena and Oak Knoll, constituting 27% of the mainstem habitat. In the two Projects combined, more than 40 landowners have committed to converting nearly 56 acres of farmland to wildlife habitat. In the Rutherford Reach, completed in 2014, 28 landowners converted approximately 20 acres of vineyard to riparian habitat. In the OVOK Reach, 13 landowners have committed to convert approximately 36 acres of vineyard to riparian habitat. Additionally, the RCD working in coordination with the District and County received a grant from the 319 H Program in 2015 to support a conceptual study to evaluate sediment reduction and habitat enhancement opportunities within Bale Slough/Bear Canyon Creek. This Project will extend the benefit of the restoration partnership upstream into the connected vital tributaries of Bale Slough and Bear Creek that support steelhead spawning and rearing. Bear Canyon Creek is a perennial stream which contains critical steelhead rearing habitat – even during periods of drought. Securing essential spawning and rearing habitats of the tributary source watersheds (e.g., Bale Slough/Bear Canyon) is key for realizing the many potential benefits of prior restoration work. A total of 30 landowners are expected to be involved in this Project and the watershed area is located within the boundaries of the OVOK CFD which will provide a funding mechanism for landowners to support implementation, maintenance and monitoring.

To enhance coordination between stakeholders and regulatory agencies on the OVOK Project, the Project Team participates in Napa River Technical Advisory Group meetings and conducts field tours for resource agency representatives, funders, and landowners. Landowner outreach is achieved through frequent personal communication between the Project Team and landowner representatives and through bi-annual meetings of the Landowner Advisory Committee (LAC). During the LAC landowners have an opportunity to suggest adaptive management needs for their respective properties/Project sites. The County is working with the Napa RCD on the long-term monitoring to evaluate overall project benefits to fisheries, aquatic habitat, riparian vegetation and streambank stability. The OVOK Project maintenance and monitoring is being funded by participating landowners through the OVOK Community Facilities District that is managed by the Napa County Flood Control and Water Conservation District.

## Approach and Statement of Work

Task 1 Project Management and Administration- completed by County Staff funded by local Measure A Funds

- Project Logistics-landowner coordination, resource agency coordination, grant reporting.
- Project Budget-sub-contracts, consultant invoices and payments, implementation grant writing.
- Project Schedule-Reporting and monitoring project tasks.

Task 2 Group B and D Technical Surveys-completed by Design Consultant ESA funded by CDFW Prop 1 and Measure A Funds

- Topographic Survey, project boundary staking and cross sectional surveys,

- Geotechnical Analysis-site reconnaissance, subsurface borings, laboratory analysis and testing, geotechnical and geological characterization, geotechnical engineering analyses, geotechnical report.
- Hydraulic Modeling-hydraulic analysis, floodplain compliance modeling,
- Biological surveys-avian surveys, fisheries, freshwater shrimp, wetland delineation, and other as need surveys,
- Construction surveys and support-pre project surveys, construction oversight,

Task 3 Group B and D Restoration Design-completed by ESA funded by CDFW Prop 1 and Measure A Funds

- 65% Design
- 100% Design and Construction Specifications
- Revegetation Project Design
- Landowner and resource agency design review meeting

Task 4 Group B and D Permitting- completed by ESA funded by CDFW Prop1 and Measure A Funds

- USACE Permit
- CDFW 1600 Permit
- RWQCB Permit
- Resource agency coordination

## Schedule & Deliverables

| Task No. | Task Title | Deliverables and Key Project Milestones | Estimated Completion Dates |
|---|---|---|---|
| 1 | Project Management and Administration | 1.1 Quarterly Progress Reports<br>1.2 Quarterly Invoices<br>1.3 Executed Subcontracts<br>1.4 Project Data<br>1.5 Draft Final Report<br>1.6 Final Report<br>1.7 Project Close-Out Report<br>1.8 Final Invoice | 1.1 Due within thirty (30) days following each quarterly month for the duration of the agreement.<br>1.2 Due within thirty (30) days following each month (or) quarterly month (or) semi-annual.<br>1.3 Due with Quarterly Progress Reports<br>1.4 All data due with Final Report<br>1.5 Due sixty (60) days prior to end of grant term<br>1.6 Due at least thirty (30) days prior to end of grant term<br>1.7 November 15, 2020<br>1.8 December 15, 2020 |
| 2 | Technical Studies | 2.1 Topographic Surveys<br>2.2 Geotechnical Analysis<br>2.3 Hydraulic Analysis<br>2.4 Biological Surveys<br>2.5 Construction Surveys | 2.1-2.5 December 15, 2019 |
| 3 | Designs | 3.1 65% Designs<br>3.2 100% Designs and Construction Documents<br>3.4 Revegetation Designs<br>3.5 Landowner Review Meeting | 3.1 March 15, 2018<br>3.2 December 15, 2018<br>3.3 March 15, 2019<br>3.4 October 15, 2018 |
| 4 | Permits | 4.1 USACE<br>4.2 CDFW<br>4.3 RWQCB<br>4.4 Agency Review Meetings | 4.1-4.3 March 15, 2019<br>4.4 November 15, 2019 |

## Feasibility

Ongoing implementation of the public-private river restoration work along the Napa River is feasible through continuous coordination between the County, landowners, and resource agency staff. The County has facilitated eight continuous years of restoration work along the Napa River in the Rutherford and OVOK Project reaches. An iterative design process makes this possible and begins with early project design review from CDFG, NOAA, USACE and the RWQCB at the 30% design stage, which has already been completed for the entire project. Prior to permit application submittals the resource agency staff and participating landowners will review and approve the 65% design plans. This review process ensures that permit issues are addressed during design advancement and that all landowner concerns are incorporated into the design documents.

The County has a small team of environmental scientists and engineers overseeing the design process, managing construction, and conducting ongoing adaptive management and monitoring of the OVOK Project. Staff time is fully funded through Measure A and the OVOK Community Facilities District. The OVOK Project Design firm ESA was selected through a competitive bidding process and contracted to develop restoration designs for the entire 9 mile reach. Design advancement has been done incrementally as construction funding is secured. The OVOK Project is scalable and construction phases are tailored to the amount of funding that the County secures prior to each construction season. The County is kicking off a two year construction effort in the Group C complex and anticipates implementation of Group B in 2019. This construction schedule was designed to allow the County and ESA time to advance Group B and D designs concurrently and fits within the CDFW three grant timeframe.

## Data Management and Access

All project monitoring documents and the associated data is available through the Napa County Watershed Information Conservancy Center. This website includes pertinent project documents and is intended to provide the general public with the results of the annual monitoring report and is designed to track progress towards meeting the TMDL. Engineering best management practices are followed for all survey and technical work and all final documents are available to the general public upon request.

The effectiveness of the OVOK Project will be monitored by the District in collaboration with the RCD and outside consultants as needed. Implementation monitoring will consist of pre- and post-Project topographic surveys annotated with habitat measurements and a detailed review of as-built drawings and field inspections with photo documentation to ensure all construction specifications were met upon conclusion of construction. Long term restoration effectiveness monitoring began with baseline surveys in 2013, and will continue with periodic channel surveys, cross section and thalweg surveys. To support the long-term monitoring, the District developed a Monitoring Plan that is consistent with the upstream Rutherford Project and is designed to evaluate Project outcomes and evaluate if the OVOK Project goals are achieved. Each desired outcome has performance indicators and performance standards. The Project will be evaluated by quantifying progress towards meeting performance standards over the life of the Project. A Before/After Control/Impact (BACI) approach is being applied to assess status and trends of physical and biological responses to restoration actions (Gerstein & Harris, 2005). Monitoring methods have also been chosen to balance the frequency and resolution of data collection in as meaningful and yet cost-effective manner as possible while ultimately evaluating the success of each restoration site within the Project reach. Monitoring methods are designed to provide data on the structural and physical characteristics of each restoration site over the life of the Project. Both pre- and post-restoration monitoring will be completed to document changes and examine trends that result from the restoration actions.

## References

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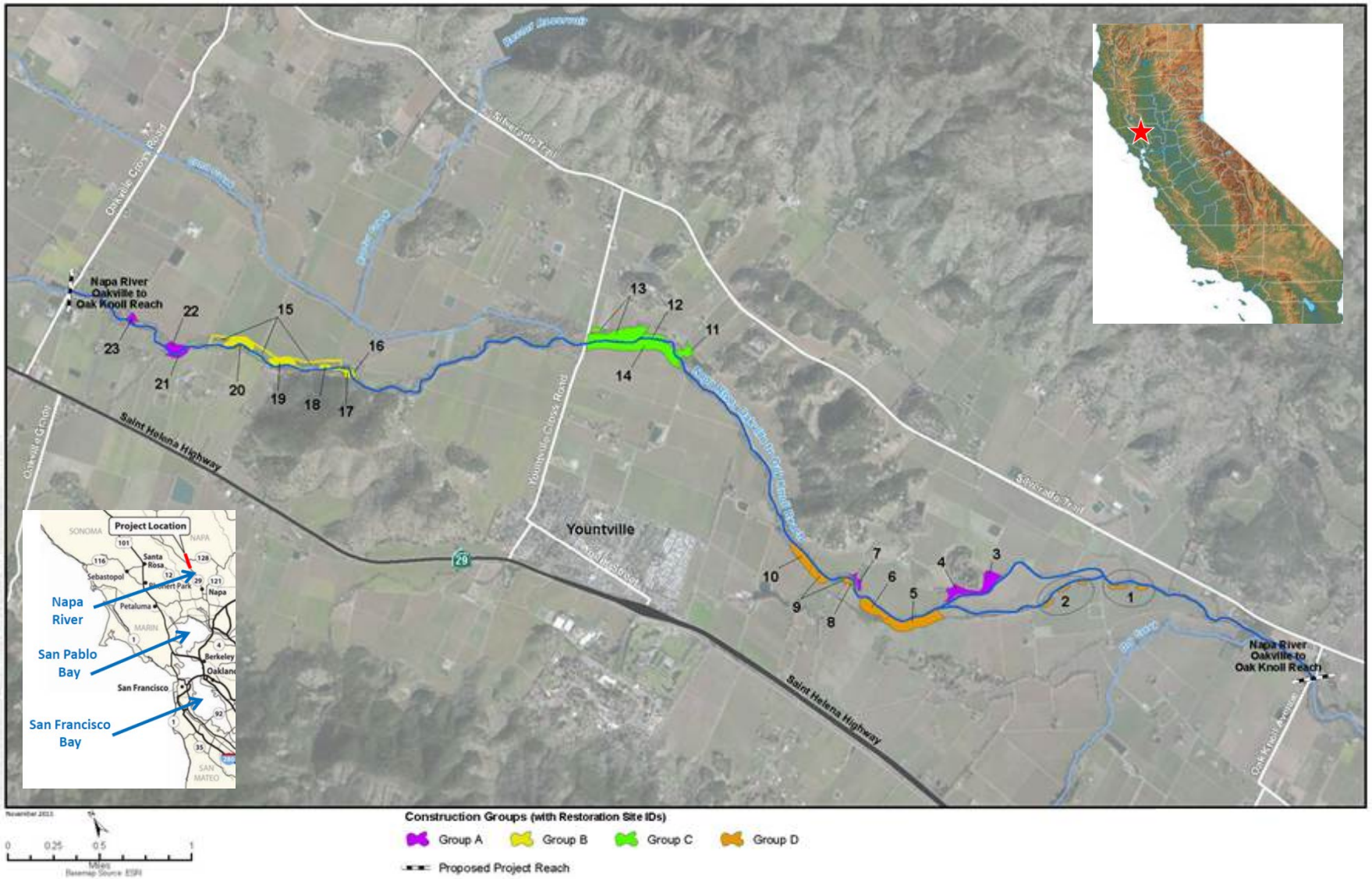
Pasternack et al. 2013. Ecohydraulic design of riffle-pool relive and morphological-unit geometry in support of regulated gravel-bed river rehabilitation. In: Ecohydraulics: an integrated approach. John Wiley & Sons, Ltd. Chichester, UK., pp. 337-355

| **Project Conservation Targets: Ecosystem Categories** | **CDFW Prop 1 Project Acreage / length** | **Overall Project Acreage /length**<br><br>**(Note: include here additional areas for which you are not requesting CDFW Prop 1 funding)** |
|---|---|---|
| **Total Project Acreage** | **0** | **0** |
| **Total number of non-contiguous sites** | 0 | 0 |
| **Fluvial / Riparian Ecosystems** | | |
| Riparian and Riparian Wetlands: Riparian Forest, Riparian scrub/shrub, Willow thicket, shaded riverine aquatic, open water, and floodplain (*acres*) | Estimated 15 acres/ 4,000 linear Feet | 9 miles/86 acres |
| Stream or River (*length in miles*) | 0 | 0 |
| **Lake or Pond** | | |
| Open water, emergent wetland (*acres*) | 0 | 0 |
| **Non-Tidal Wetland Ecosystems** | | |
| Perennial Non-tidal Wetland (*acres*) | 0 | 0 |
| Seasonal Wetland: vernal pools, alkali wetlands, wet meadows, mountain meadows (*acres*) | 0 | 0 |
| Managed Wetland (*acres*) | 0 | 0 |
| **Tidal Wetland Ecosystems** | | |
| Tidal Emergent Wetland, Tidal Perennial Aquatic, tidal marsh, tidal channels, mudflats, shallow intertidal or subtidal, flooded island, open water, Channel margin habitat, and Tidal/upland transition zone (*acres*) | 0 | 0 |
| **Upland Ecosystems** | | |
| Forest or woodland (*acres*) | 0 | 0 |
| Grassland (*acres*) | 0 | 0 |
| **Others ecosystems (*acres*)** | | |
| Wildlife friendly agriculture (*acres*) | 0 | 0 |
| ☐ Not applicable.<br>If not applicable, check box and provide justification below: | | |


Napa River
Oakville to
Oak Knoll Reach
Saint Helena Highway
Yountville
Silverado Trail
Oakville Cross Road
Yountville Cross Road
Oakville Grade
Napa River
Oakville to
Oak Knoll Reach
Project Location
Napa River
San Pablo Bay
San Francisco Bay
Construction Groups (with Restoration Site IDs)
Group A
Group B
Group C
Group D
Proposed Project Reach
Miles