Draft Initial Study/
Mitigated Negative Declaration
for the
Meadow Way Bridge Replacement Project

TOWN OF FAIRFAX, MARIN COUNTY, CALIFORNIA

Prepared by:
WRA on behalf of the
Town of Fairfax
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Fairfax, California 94930

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November 2019

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LIST OF ACRONYMS AND ABBREVIATIONS

AAQS	ambient air quality standards
ABAG	Association of Bay Area Governments
APE	Area of Potential Effects
ASR	Archaeological Survey Report
BAAQMD	Bay Area Air Quality Management District
BMPs	Best Management Practices
CaTNAP	Caltrans Traffic Noise Analysis Protocol
CCC	Central California Coastal
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
CMA	Congestion Management Agency
CMP	Congestion Management Plan
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO_2	Carbon dioxide
CRHR	California Register of Historic Resources
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel scale
DOT	Department of Transportation
EFH	Essential Fish Habitat
EMS	Emergency Service Vehicles
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Federal Insurance Rate Maps
FPD	Fairfax Police Department

GHGs	Greenhouse Gases
HPSR	Historical Property Survey Report
HRER	Historical Resources Evaluation Report
LOS	Level of Service
MCE	Maximum Credible Earthquake
MCSTOPPP	Marin County Stormwater Pollution Prevention Program
MLD	Most Likely Descendant
MMWD	Marin Municipal Water District
MND	Mitigated Negative Declaration
NAHC	Native American Heritage Commission
NBI	National Bridge Inventory
NES	Natural Environment Study
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
N_2O	nitrous oxide
NO_x	Oxides of nitrogen
NSR	New Source Review
NRHP	National Register of Historic Places
O3	Ozone
OHW	Ordinary High Water
PM	Particulate matter
PRC	Public Resources Code
ROG	reactive organic gases
RVFD	Ross Valley Fire Department
RWQCB	Regional Water Quality Control Boards
SFBAAB	San Francisco Bay Area Air Basin
SIP	State Implementation Plan
SWPPP	Storm Water Prevention Program
SWQCB	State Water Quality Control Board
TPY	tons per year
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WDR	Waste Discharge Requirement
WUI	Wildland Urban Interface

1.0 INTRODUCTION AND PURPOSE

This Draft Initial Study/Proposed Mitigated Negative Declaration of environmental impacts is being prepared to conform to the requirements of the California Environmental Quality Act (CEQA) Statute and Guidelines (California Code of Regulations 15000 et. seq.). This Draft Initial Study/Proposed Mitigated Negative Declaration evaluates the potential environmental impacts which might reasonably be anticipated to result from implementation of the *Meadow Way Bridge Replacement Project* (proposed project). The Town of Fairfax (Town) is the Lead Agency as defined under CEQA Guidelines Section 15050.

The purpose of an Initial Study is to provide the Lead Agency with information to use as the basis for deciding whether to prepare an Environmental Impact Report or a Negative Declaration for the proposed project. A Negative Declaration briefly describes the reason that a proposed project would not result in a significant effect on the environment, and the basis of the decision not to prepare an EIR. This Initial Study describes the Town's efforts to ensure that all resources impacts are reduced to less-than-significant level with mitigation incorporated, qualifying for a Proposed Mitigated Negative Declaration.

This Draft Initial Study/Proposed Mitigated Negative Declaration provides the Town and the public with an understanding of the potential environmental impacts associated with the proposed project. The purpose of the proposed project is to replace the Meadow Way Bridge in the Town of Fairfax. The project will replace a dilapidated wooden bridge, which ensures the residents will continue to have public safety access and utility service to their neighborhood for the foreseeable future. The existing bridge continues to deteriorate, which has required the Town to incur significant costs to make interim repairs to maintain public access to the bridge.

2.0 PROJECT INFORMATION

2.1 Project Title

Meadow Way Bridge Replacement Project

2.2 Lead Agency Name and Address

Town of Fairfax
142 Bolinas Road
Fairfax, California 94930

2.3 Contact Person and Phone Number

Comments can be made via email to:

Garrett Toy
Town Manager
(415) 458-1584
gtoy@townoffairfax.org

Jonathan Hidalgo
WRA – Senior Environmental Planner
hidalgo@wra-ca.com

2.4 Project Location

The project site is located in a developed area of the Town of Fairfax in Marin County (Figure 1 and Figure 2). The project site consists of Meadow Way Bridge, California Department of Transportation (Caltrans) Bridge Number 27C-0008, which is located over San Anselmo Creek between Cascade Drive and Meadow Way within the western portion of the Town. The project site consists of Assessor's Parcel Numbers (APNs) 003-102-18 and 003-122-41.

The project site is located within a single-family residential neighborhood and is surrounded by single-family residential land uses. San Anselmo Creek and its channel are the only other land uses present within the immediate vicinity of the project site. Views of the project site and surrounding land uses are provided in Figures 3 and 4, below.

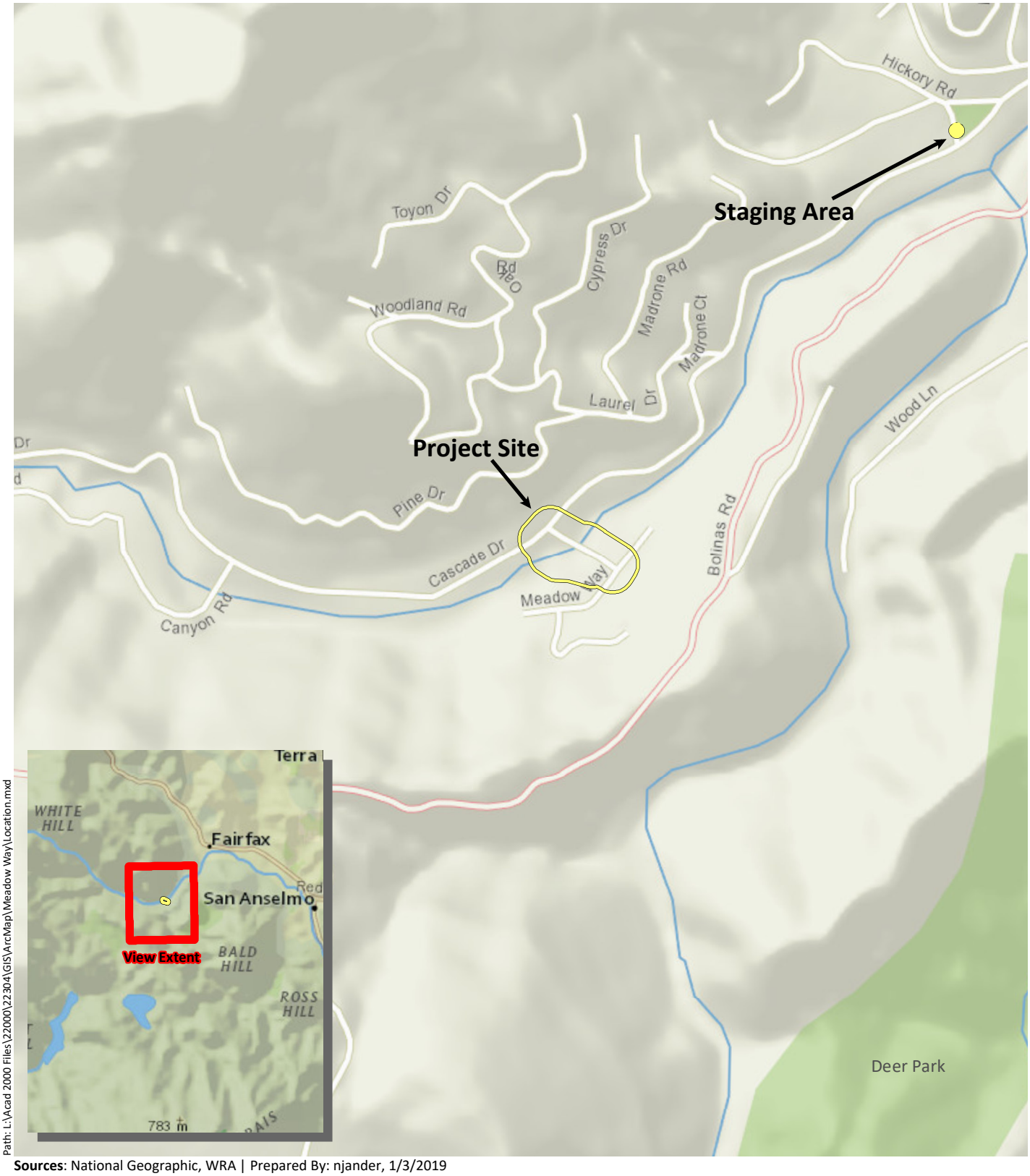
2.5 General Plan Designation and Zoning District

General Plan Designation

- Residential 1-6 dwelling units per acre

Zoning District

- RS -6 Single Family Residential



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Sources: National Geographic, WRA | Prepared By: njander, 1/3/2019

Figure 1. Project Location Map

Meadow Way Bridge
Town of Fairfax, Marin County, California

0 500 1,000 Feet

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Caltrans PQS	7-16-18 Date
Caltrans District Local Assistance Engineer	7-19-19 Date
Local Agency Representative	7/16/19 Date

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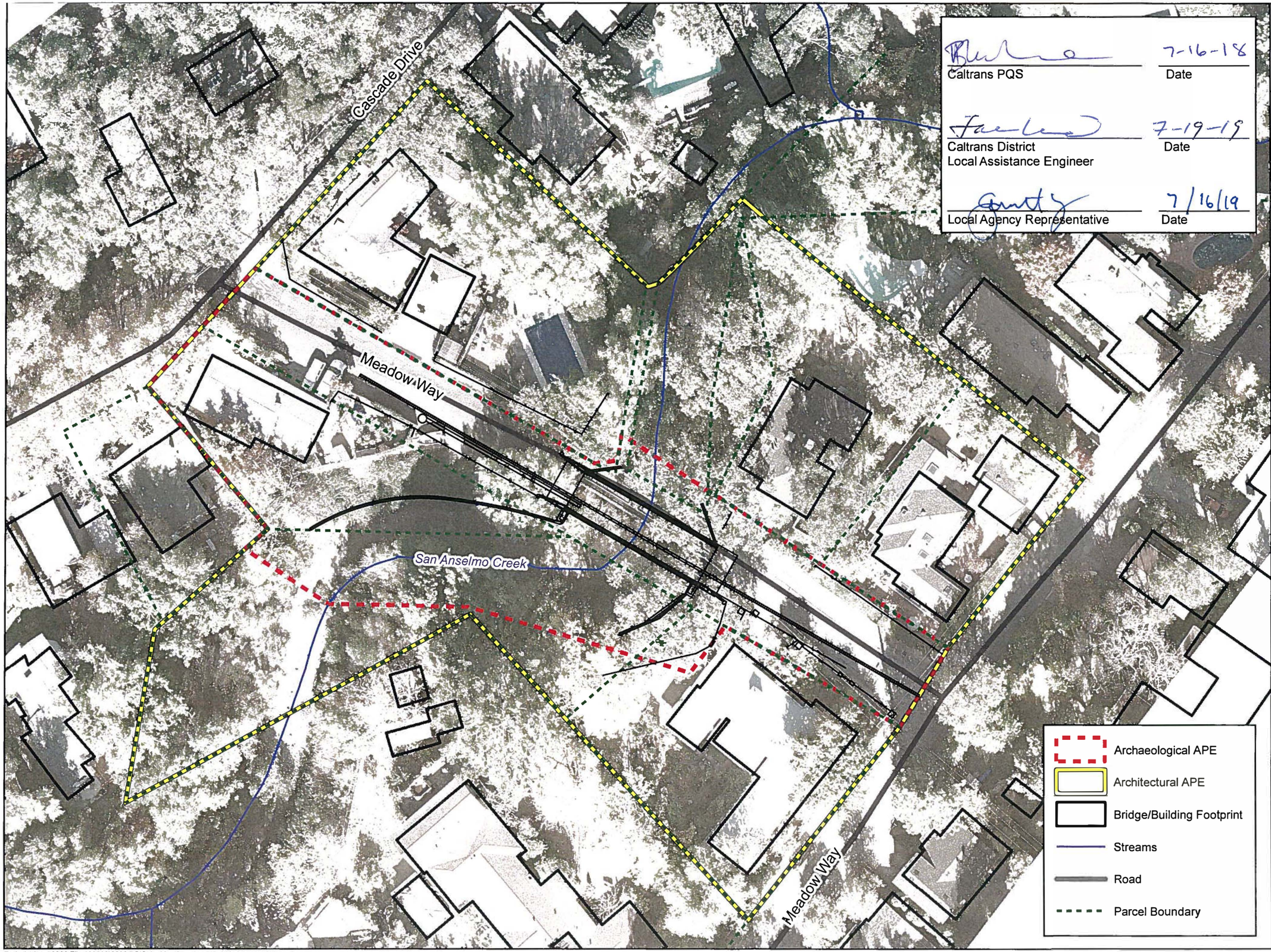
Meadow Way
Marin County, California

Figure 2. Area of Potential Effects Map
Meadow Way Bridge
Bridge: No 27C-0008
Town of Fairfax, California
BRLO-5277(025)



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Map Prepared Date: 7/18/2017
Map Prepared By: czumwalt
Base Source:
Data Source(s): WRA, Marin County

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Caltrans PQS — Date: 7-16-18

Caltrans District Local Assistance Engineer — Date: 7-19-19

Local Agency Representative — Date: 7/16/19

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Meadow Way
Marin County, California

Figure 2. Area of Potential Effects Map
Meadow Way Bridge
Bridge: No 27C-0008
Town of Fairfax, California
BRLO-5277(025)

Hickory Rd
Cypress Dr
Cypress Dr
Hickory Rd
Cascade Dr
Cascade Dr

Archaeological APE
Architectural APE
Bridge/Building Footprint
Streams
Road
Parcel Boundary

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Feet

Map Prepared Date: 7/16/2019
Map Prepared By: njander
Base Source:
Data Source(s): WRA, Marin County

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3.0 PROJECT DESCRIPTION

3.1 Project Description

The existing Meadow Way Bridge is reported to have been constructed in the 1950s over San Anselmo Creek in the Town of Fairfax by the U.S. Army Corps of Engineers (Corps). The existing, primarily wood, bridge has five spans with four bents in the creek, is approximately 70 feet long and 14 feet wide, and supports a narrow single travel lane and a narrow adjacent pedestrian path approximately 20 feet above the creek bed. The bridge runs in a northwest-southeast direction while the creek flows towards the northeast under it. The bridge serves as the only egress and ingress facility for nearly two dozen homes on Meadow Way across the creek from Cascade Drive. The bridge is supported at four locations within the creek banks, two of which are in the creekbed, and at each location, there are three 12-inch diameter wooden piles driven into the ground to an unknown depth. Some of the wooden bridge timbers have been preserved with creosote.

San Anselmo Creek runs through a relatively wide and deep section of the waterway and an S-bend at the bridge location. The bridge is labeled as Structurally Deficient (SD) by Caltrans and will be replaced with a similar, one-lane single-span bridge. The site/bridge configuration has caused historic bank erosion and bridge foundation scour at the site, which would also be corrected by the proposed project so that it would not affect the new bridge. The existing structure is not eligible for placement in the National Register of Historic Places (NRHP).

Construction Schedule

Construction would take two seasons and work in the creek would be performed only after June 1 and must end prior to October 15 in order to avoid the spawning and migration season for the protected California Central Coast (CCC) steelhead (Oncorhynchus mykiss). Work near or above the top of bank and at the roadway level may occur outside this work window. Therefore, the bridge would be installed in its temporary location during one season, and the project would be completed within the following season. In compliance with the Town's Noise Ordinance, construction activities would be limited to the hours of 8:00 a.m. to 5:00 p.m. on weekdays, and 9:00 a.m. to 5:00 p.m. on Saturdays, with no noise-generating construction on Sundays or Holidays. Placement of the new bridge in its permanent location would be the one exception regarding construction hours. As traffic would need to be shut down in order to move the bridge to its permanent location, this would occur in one evening after 5:00 p.m. in order to provide the least disruption for local residences that depend on this bridge for access.

View 1. View of Meadow Way Bridge upper driving structure, side rails, and road junction.

View 2. View of Meadow Way Bridge structure. The gaurd rail for the upper driving structure is visible in the photo.

View 3. View of Meadow Way Bridge lower wood beam connecting structure to foundation.

Figure 3. Views of the Project Site

Meadow Way Bridge Replacement Project, Fairfax, California

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P:\Projects\22000\22304\1.0_Meadow Way Bridge\Figures\PhotoPlates
Date: October 2015

View 1. View of surrounding residential land use looking southeast from Meadow Way Bridge.

View 2. View of surrounding residential land use looking northwest from Meadow Way Bridge.

View 3. View of San Anselmo Creek looking north from below Meadow Way Bridge.

Figure 4. Views of Surrounding Land Uses

Bridge Design

The new bridge would be designed to clear the greater of the 50-year flows and two feet of freeboard, or the 100-year design flows, the former controlling in this case. It would be a 70-foot long single-span concrete arch bridge supported on two new abutments and no additional supports in the creek. The abutments would connect with wingwalls and retaining walls of varying lengths and heights at its four corners. See Figure 5 (Site Plan) for the proposed bridge design. The existing bridge is only 14-feet wide and Caltrans has determined the bridge is currently too narrow for both automobiles and pedestrians to use the bridge safely. The replacement bridge would be 21.5-feet wide to allow safe passage for both automobiles and pedestrians. The proposed replacement bridge would also include raised reflective pavement markers at proper intervals to alert the drivers and pedestrians of the two separate travel zones. The new bridge would comply with federal and state design codes and weight limits and would do away with the deficiencies of the existing bridge.

Construction Phasing

Where the existing bridge sits tucked up against the northern boundary of the Town's right-of-way (ROW), the new bridge would be located in the middle of the ±40-foot-wide ROW. Despite this, the footprints of the existing and new bridge would overlap. For this reason, the new bridge would be built on the south side of the existing bridge while the existing bridge remains in service, and moved sideways to its permanent location after the existing bridge is removed. Thus, the existing bridge would be replaced in stages, as follows:

Stage 1 Construction

The first season of construction would be spent on Stage 1 of the improvements. During this stage, traffic would continue using the existing bridge. The southern halves of each of the two new cast-in-place concrete abutments would be constructed approximately in line with the existing bridge abutments. These are only portions of the permanent abutments, and are designed to support the new bridge in its temporary location adjacent to and south of the existing bridge during Stage 1.

For Stage 1 construction, an access ramp to the creek would be necessary. This earthen ramp would be used to transport of materials and heavy equipment, such as pile drilling rigs, dump trucks cranes, loaders, excavators, large containers, etc., to the creek bed elevation and back. The ramp would be located on the southwest quadrant of the bridge between two proposed retaining walls, one which connects with the bridge. These walls are needed to stop the historic erosion taking place here adjacent to Abutment 1 (western abutment), threatening to undermine the abutment and private properties on both north and south sides of the bridge. The lower wall will be a conventional concrete retaining wall, supported on piles, and upper wall will be a concrete tieback wall with tieback elements placed in drilled holes stretching 40-50 feet from the wall face under the private property.

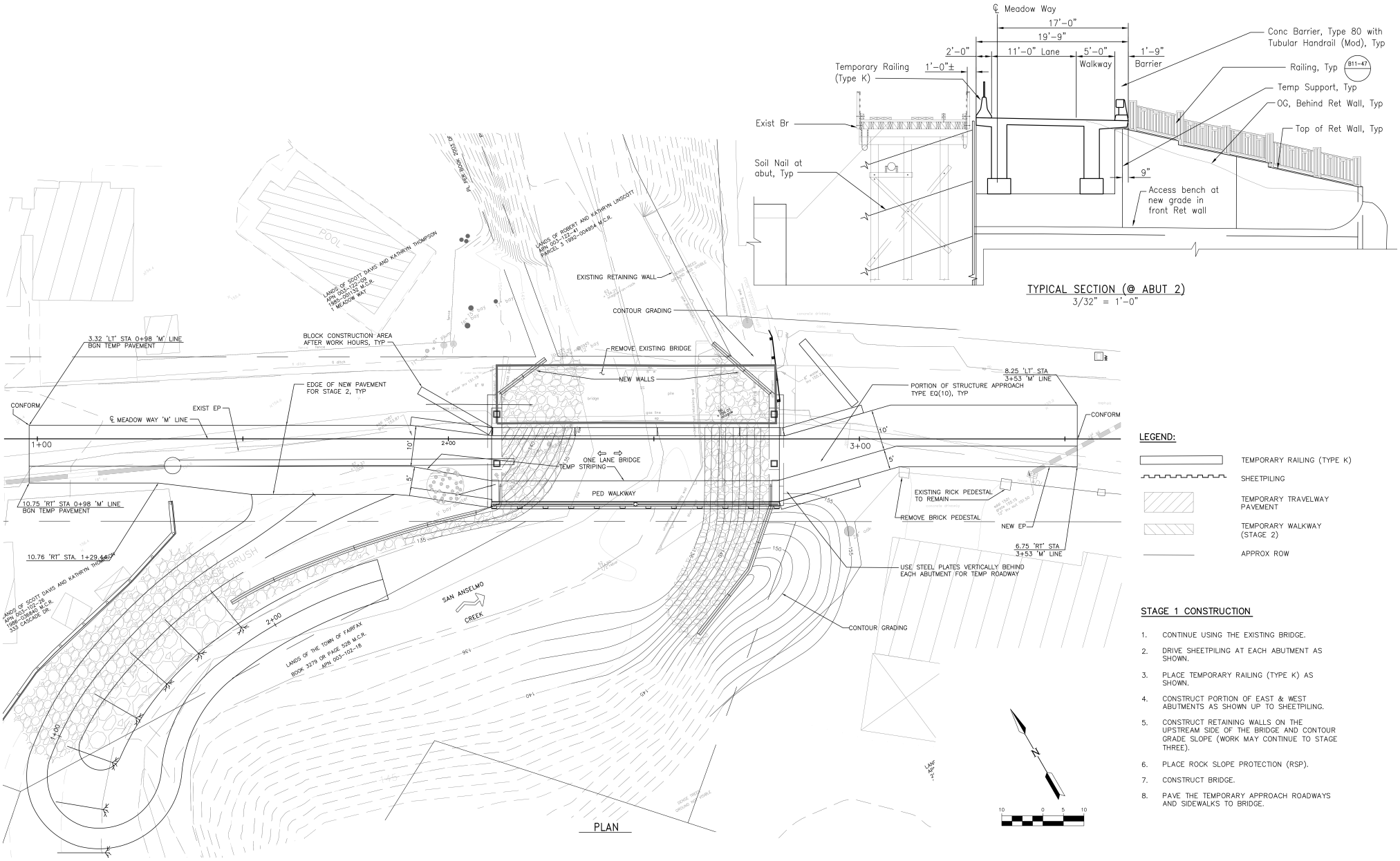

Figure 5. Project Site Plan

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Meadow Way Bridge
Town of Fairfax, Marin County, California

Source: CIC

The access road would be an approximately ±230-foot-long ramp at 10% grade, half of which would be behind the above-referenced lower retaining wall, the rest winding around the wall's lower end and doubling back on the creek bed in front of the wall. For the second half of the ramp, temporary fill on the creek bed would be necessary. This ramp would facilitate the equipment for wall and abutment foundation excavations on both sides of the creek. To build the ramp, temporary earth retention, using soil nails next to private property and the inside edge of the ramp, would be necessary.

Excavation spoils, required for backfilling later on, would be stored in containers placed on the creek bed temporarily due to lack of space above at the roadway level. The remainder of the spoils would be hauled away on a daily basis. Any creosote treated timber piles or surrounding contaminated soils will be disposed of at an appropriate facility permitted to handle hazardous waste.

Removal of a California bay tree (Umbellularia Californica) and invasive Himalayan blackberry (Rubus armeniacus) bushes on the southwest corner of the new bridge as well as pruning of other trees and removal of other vegetation in the construction zones would be necessary. According to the Town's Municipal Code Chapter 8.36 (Trees), a tree removal permit is required for the removal of any tree within the Town.

The creek bed in the Area of Potential Effect (APE) would be used by the construction operations. Very little to no creek flow is expected during the peak summer construction months. However, the contractor will be required to install a bypass pipe to convey certain minimum low-flow volumes through the construction site and release downstream of the bridge. This will be accomplished through installation of a low dam across the creek bed upstream of the bridge to collect the summer flows and guide it to the pipe. Turbidity and water quality tests will be performed regularly, as required by permits. Any water collected in excavation pits or pools on the creek bed will be run through sediment control tanks, such as a Baker Tank, before being released to the creek.

To construct the initial halves of the new abutments, the approach embankments in front, behind, and next to the current abutments would also need to be excavated. Approximately, half of the unreinforced concrete and wood fortification in front of the future Abutment 2 (eastern abutment) will be removed. The Abutment 2 location has a deeply undercut bank. The new abutment wall will be behind the removed fortification, protected by a course of sloping heavy rock riprap, topped with 3 feet of sloping native creek bed materials in front. In order to avoid undermining the approach roadways and abutments of the existing bridge while it is still in operation, the embankments behind and in front of the existing abutments will be retained temporarily with soil nails parallel and perpendicular to the roadway alignment. Traffic will be separated from the construction area with temporary concrete barrier railings (Type K) during this stage.

Since geotechnical borings and investigations have been conducted at the site, it is known that the bridge abutments and retaining walls attached to the abutments will need to be supported on piles. To minimize disturbance to the residents, 24-inch diameter cast-in-drilled-hole (CIDH) concrete piles, which are significantly quieter to install than driven piles, will be used to support the walls. For this, the creek bed would be excavated approximately eight feet deep to reach the approximate elevation of the concrete pile heads. After completing the excavations, drilling rigs would be called upon to drill the 24-inch-diameter CIDH piles supporting the future structural elements. The drilling auger would be mounted on a truck that can negotiate the access road and be capable of drilling deep holes with augers added on progressively. The drilling spoils would be spun loose from the auger, dumped in containers, and hauled away.

Due to the riverine environment of the operations, underground and surface water may seep into the drilled holes and excavations, potentially threatening their collapse and/or contamination of the concrete that would be poured later on. For this reason, the contractor would use various wet-drilling hole stabilization techniques, such as driving a steel pipe sleeve into the hole all the way to the bottom, simultaneous with drilling. In this case, the reinforcement cage is placed in the hole using a crane and the concrete is pumped from the bottom of the hole up using a tremie pipe. This way, any water in the hole is displaced to the top, and then vacuumed and collected in containers. At the same time of the concrete pour, the steel sleeve is extracted, leaving behind a deep hole filled with steel rebar and clean concrete. Another wet-drilling technique would be filling the hole with slurry, such as a drilling polymer, that displaces the water and provides hole wall stability through hydrostatic pressure before concrete is poured in. In the case of slurry displacement method, the steel cage is placed in the slurry, the heavier concrete is again pumped from the bottom up, pushing the lighter slurry up, which is then vacuumed into special tank trucks for disposal off-site. Again, as the clean concrete reaches the top and all of the slurry has been picked up, the result would be 24-inch diameter concrete piles. The piles are then ready to be capped with a concrete footing (or pile cap, as sometimes called).

Once the concrete pile caps are constructed, their top surface would be five to six feet below the creek bed. At this point, these foundations of the new walls and bridge abutments would be protected with filter fabric and a two- to two and a half--foot layer of rock riprap on top for scour control. Ultimately, the underground riprap would crawl up on the wall face to some height and be subsequently covered with three feet of creek bed materials, restoring the creek bed and embankment slopes to their original levels through the site. The net effect will be restoring the site to a deep and wide soil “trough” traversing through the bridge site for natural fish passage without any obstructions in the creekbed or anything other than creek materials and native plants.

Once the southern (upstream) halves of the abutments and the two upstream connecting retaining walls are constructed, the new concrete superstructure would be cast to span them immediately adjacent to and south of the existing bridge. The bridge abutments would be cantilevered walls, providing seats for the ends of the new bridge superstructure. This location of the new bridge superstructure would be temporary. The design concept would utilize two concrete arch ribs spanning the abutments and supporting vertical spandrel columns which, in turn, would support

a thin concrete deck slab and railings at the top. The bridge would be 21.5 feet wide from edge to edge and have a 12-foot lane, a one-foot buffer, a five-foot wide sidewalk, and barrier and hand railings on both edges of the deck. Due to space limitations, 1'-9" of the final deck width would be cast in Stage 2, described below. The arch ribs would be cast in place in wooden forms supported on a wooden or steel falsework system temporarily placed on the creek bed. The arch ribs would be connected to each other for stability with four transverse beams. Once the arch rib concrete has cured and gained sufficient strength, the falsework would be removed. The arch ribs and the transverse connecting beams would be timed to gain strength by the end of the first dry season so that they are self-supporting once the falsework is removed by October 15th. The remainder of formwork, if needed beyond the dry season, would be attached to the arch ribs themselves above the 100-year flows from that point forward.

At the conclusion of Stage 1, the southern halves of the abutment walls and the retaining walls connecting to them, as well as the new bridge superstructure, would be completed. Construction at the bridge deck level and the existing roadway may continue beyond October 15 if work remains to be done in order to complete Stage 1. The underground riprap fortifications in front of the completed abutments and walls would be in place, the access road into the creek terminated, and the creek bed in the area of the Stage 1 construction would be restored. The new bridge, in its temporary location, would be ready for service, and traffic would be conveyed away from the existing bridge to the new bridge. At the end of the season, the site would be cleaned up and debris removed, the equipment would be taken away, and the site winterized until the next season. No materials will remain in the creekbed after the first season of work, the surface of the creekbed will be returned to pre-project conditions prior to the start of the wet season. If the bridge is not ready for traffic, the existing bridge would remain in service during the following winter and early spring.

Stage 2 Construction

Stage 2 construction would take place during the second season of construction. By the end of the first season, the new bridge would be in its temporary location, the temporary approach roadways are constructed south of the existing bridge, and the vehicular and non-motorized traffic would be using the new bridge. Cars and pedestrians would be kept within the small detour area with temporary railing (Type K) and temporary fencing. Prior to the removal of the old bridge, the existing "wet" utility pipes (sewer, water and gas) would be placed on a shoofly north of the existing bridge and supported in place during construction. They would eventually be relocated and housed and hung under the existing bridge deck well above the 50- and 100-year flow elevations.

At this stage, the existing bridge would be removed piece by piece with a crane or two, starting with its superstructure members. To avoid dropping pieces of the bridge into the creek, special catchment containers and bridge removal methods would be specified. After the removal of the superstructure, the wooden pile extensions would be cut at least three feet below the creek bed elevations and the holes backfilled with existing creek materials. The creosote-laden wood timbers would be disposed by the contractor at an appropriate facility permitted to handle hazardous waste. The remaining half of the wood and unreinforced concrete fortification in front of the Abutment 2 will also be removed and the abutment wall protected similar to Stage 1 Construction.

After the bridge removal, the northern halves of each of the two abutments and the two downstream wingwalls connecting with the abutment corners would be constructed. Excavations, CIDH pile and rock riprap installations, and backfilling over the riprap would be completed similar to Stage 1 construction, and the same access route will be reopened and used. The slopes above the retaining walls and wingwalls would be contour-graded. This aspect of the work can continue into the Final Stage, described below. During this stage, the excavations for the north abutments and wingwalls would continue to be protected from traffic with Temporary Railing Type K. The areas behind the walls would be backfilled and approach slabs and the approach roadways would be constructed in line with the alignment of the bridge in its final position, which would be approximately in the middle of Meadow Way's ROW.

Final Stage Construction

Once the existing bridge has been removed and the abutments and bridge approaches have been constructed, the new bridge would be closed for a few hours during a one night operation when little or no traffic is expected. The new bridge superstructure would be either pushed hydraulically sideways to the north or lifted with a crane on each side and placed back on the abutment seats at its final location near the middle of Meadow Way. The remaining 1'-9" wide strip of the deck width would be cast after this move. Since this is the only access to the homes on the other side of the creek, emergency fire and paramedic crews would be stationed on both sides of the bridge to provide emergency services to surrounding residences. After the relocation of the new bridge to its final position, the bridge would be reopened to traffic. Approach railings at all four bridge corners, landscaping and vegetation restoration with native plants (trees, bushes and other ground cover) on all affected slopes, fencing, and other surface improvements around the bridge would continue until project completion.

A program of fish habitat restoration, using bio-engineering techniques, low earth berms and woody nooks, designed specifically for the site, will be implemented. The current proposed location of the large wood is the bank along the access route, immediately upstream of the new retaining wall on the north side. A layer of large logs will be laid in a grid at the bottom of the excavation and on the creek bed, to be incorporated in the log-root wad revetment structure. The logs will be rot-resistant species, such as eucalyptus and redwood, typically obtained as re-purposed salvage from local urban tree removal companies. The structure will be designed so that the log grid is made integral with large rock rip-rap pieces placed within it and stacked under

the new overtopping embankment slope. The ends of the logs perpendicular to the creek centerline will protrude out of the base of the embankment into the creek's edge flow, catching small woody drift. The base of the embankment will be planted with native plants and small trees to create near-shore overhanging vegetation. In conjunction with the revetment, the creek bed in front of the revetment structure will be re-contoured to create pools for fish. The net effect will be restoring the site to a deep and wide soil "trough" traversing the bridge site for natural fish passage without any obstructions in the creek other than creek materials and native plants.

The wet utilities would be rerouted under the new bridge and the smaller "dry" utilities may be placed inside the barrier railings, the deck, or the sidewalk. A Revegetation Plan for the site will be prepared.

Right-of-Way

Most of the bridge and approach roadway work would remain within the Town of Fairfax's ROW. During construction, fences, fence pillars and driveways encroaching onto the Town's ROW, but no homes and other structures, would be affected. Temporary easement from one neighbor for the temporary access ramp and a permanent easement from the same for the retaining wall on the southwest quadrant would be necessary. A small strip of the land adjacent and parallel to the bridge on the north edge, privately owned but not used for residence, would be acquired permanently or through easement by the Town. It appears that there have been encroachments on the Town ROW over the years, especially in the southeast quadrant, which would be used during construction and relinquished back to the neighbor afterwards through an easement process.

Contractor's Staging and Storage Areas

The project site offers very limited storage and staging areas for the contractor. The publicly owned last block of Hickory Road at Cascade Drive, about ½-mile from the project site, would be designated for the contractor's use for storing equipment and materials during construction (Figure 1). The contractor would use various pickups, dump trucks, cranes, drilling vehicles, water and other liquid-carrying trucks, loaders, tractor trailers, excavation machinery, generators and handheld equipment. The contractor's personnel would be able to access the creek areas on foot.

3.2 Project –Related Approvals, Agreements, and Permits

The information contained in this Initial Study will be used by the Town of Fairfax (the CEQA Lead Agency) as it considers whether or not to approve the proposed project. If the project is approved, the Initial Study, as well as the associated Mitigated Negative Declaration (MND) would be used by the Town and responsible and trustee agencies in conjunction with various approvals and permits. These actions include, but may not be limited to, the following approvals by the agencies indicated:

Army Corps of Engineers

- Clean Water Act Section 404 Form 4345, Application for Department of the Army Permit

California Department of Fish and Wildlife

- Section 1602 Lake and Streambed Alteration Agreement

Town of Fairfax

- Tree Removal Permit

Regional Water Quality Control Board

- Clean Water Act, Application for Section 401 Water Quality Certification
- Notice of Intent under the State Construction General NPDES Permit

4.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is potentially significant unless mitigation is incorporated, as indicated by the checklist on the following pages.

X	Aesthetics		Greenhouse Gas Emissions		Public Services
	Agriculture and Forestry Resources	X	Hazards and Hazardous Materials		Recreation
X	Air Quality	X	Hydrology and Water Quality	X	Transportation
X	Biological Resources		Land Use/Planning	X	Tribal Cultural Resources
X	Cultural Resources		Mineral Resources		Utilities and Service Systems
	Energy	X	Noise	X	Wildfire
X	Geology and Soils		Population and Housing	X	Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

☐ I find that the project COULD NOT have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the project MAY have a "Potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Garrett T., TOWN MANAGER — 11/14/19

Signature — Date

Name and Title: Garrett Toy, Town Manager

Initial Study Checklist

This section describes the existing environmental conditions in and near the project site and evaluates environmental impacts associated with the proposed project. The environmental checklist, as recommended in the CEQA Guidelines (Appendix G), was used to identify environmental impacts that could occur if the proposed project is implemented. The right-hand column in the checklist lists the source(s) for the answer to each question. The cited sources are identified at the end of this section.

Each of the environmental categories was fully evaluated, and one of the following four determinations was made for each checklist question:

"No Impact" means that no impact to the resource would occur as a result of implementing the project.

"Less than Significant Impact" means that implementation of the project would not result in a substantial and/or adverse change to the resource, and no mitigation measures are required.

"Less than Significant with Mitigation Incorporated" means that the incorporation of one or more mitigation measures is necessary to reduce the impact from potentially significant to less than significant.

"Potentially Significant Impact" means that there is either substantial evidence that a project-related effect may be significant, or, due to a lack of existing information, could have the potential to be significant.

4.1 Aesthetics

AESTHETICS — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒	1, 2
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐	1
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐	1
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☒	☐	☐	1

Environmental Setting

The project site is located in a residential neighborhood within the southern portion of the Town of Fairfax, Marin County, California (see Figure 1, Regional Location Map). The project site consists of the existing bridge along Meadow Way that was built within and over San Anselmo Creek. Part of the project site also extends into the adjacent residential property's ROW.

The existing bridge is a one-lane bridge located on Meadow Way over a sharp left bend in the San Anselmo Creek channel, approximately 175 feet from the northwestern terminus of the road where it connects to Cascade Drive and is approximately 150 feet from the southwestern terminus of the road where it connects to the remainder of Meadow Way (where it forms a T-intersection with itself). Surrounding land uses are primarily residential. Views of the project site and surrounding land uses are provided in Figures 3 and 4 (see above).

The Town of Fairfax 2020 General Plan (General Plan) identifies Visually Significant Areas within the Town. According to the General Plan's Map of Visual Resources, the project site is not located within a Visually Significant Area. Furthermore, the project site is not visible from a view or vista point, scenic highway, or scenic ridgeline corridor. Bolinas Road is a Town-designated scenic highway that provides views looking towards the project; however, due to dense vegetation and elevation difference, the project site is not visible from Bolinas Road.

According to the California Department of Transportation (Caltrans) Scenic Highway Program, there are no scenic highways adjacent to the project site. The closest scenic highway is State Route 1 (SR-1) located approximately 5.75 miles west of the project site.

Discussion of Impacts

a) ***No Impact.*** For the purposes of this analysis, a scenic vista is defined as a vantage point with a broad and expansive view of a significant landscape feature (e.g., a mountain range, the Bay, lake, or coastline) or of a significant historical or architectural feature (e.g., views of a historic tower). Under this definition, there are no scenic vistas impacted by the proposed project. Views from the project site are limited, due to the dense existing vegetation and lack of accessible land use in the creek and surrounding private residences. Therefore, the project would have no impact on scenic vistas.

b) ***No Impact.*** As stated above, Meadow Way is not a designated state scenic highway, and there are no state scenic highways adjacent to the project site. The existing bridge and the approaches to the bridge have no heritage trees, unique geological features, or historic buildings within a state scenic highway. Therefore, the project would have no impact.

c) ***Less than Significant Impact.*** During the construction phase, views of material, construction equipment, and stockpiled soil would be available for brief periods. Storage of construction materials, tools, and vehicles will be limited to locations within the APE and a publicly-owned area on Hickory Road. The activities are typical of bridge replacement strategies approved by Caltrans in developed areas and would not substantially degrade views of the existing setting.

Public views of the bridge are only afforded from adjacent roadways, including Cascade Drive and Meadow Way, due to dense vegetation along San Anselmo and the close proximity of private residences. There are no publicly accessible views of the side of the bridge due to existing vegetation. Construction of the new bridge may necessitate Creek the removal of vegetation, but this would be temporary as replanting would over time return the views to existing conditions. The new concrete deck would eliminate the older design of the wooden bridge. The scale and size of the bridge would not substantially change, and the removed vegetation would be replanted, keeping the existing visual character of the site largely the same. Furthermore, as the existing bridge is in disrepair, the replacement bridge would enhance the visual quality of the site through its graceful arch construction, the architectural treatment of new concrete abutments and wall surfaces, as well as included amenities such as special lighting, open barriers, and native vegetation plantings. Therefore, impacts to the visual character of the project site would be less than significant.

d) ***Less than Significant with Mitigation Incorporated.*** The proposed project would require the installation of new downcast and waist-level LED lighting fixtures, placed at certain intervals on the concrete barriers on both sides of the replacement bridge. The immediate vicinity of the project site currently contains street lighting and residential lighting. The only other existing source of nighttime lighting in the immediate vicinity is from motor vehicle headlights. The proposed project would also include raised reflective pavement markers at proper intervals to alert the drivers and pedestrians of the two separate travel zones.

The installation of new sources of light and glare from the proposed project could be a potentially significant impact. However, most homes and the surrounding street lighting emit some light and glare during daytime and evening hours, as is typical in residential areas and the project's proposed lighting would be similar to what exists throughout the surrounding residential area. The proposed project would also require nighttime construction for a couple of hours, on one night for the movement of the staged bridge into its permanent location. Implementation of Mitigation Measure AES-1 would ensure both construction and operational lighting would be designed to minimize glare and spillover to surrounding properties and that all applicable lighting guidelines are integrated into the proposed project.

Mitigation Measure AES-1

Prior to issuance of the building permit, an exterior lighting plan shall be submitted for review and approval by Town staff. The lighting plan shall include but not necessarily be limited to the following:

- The exterior lighting plan shall show all potential light sources with the types of lighting and their locations.
- Exterior lighting shall include low mounted, downward casting, and shielded lights that do not cause spillover onto adjacent properties.
- Floodlights shall not be used
- Lighting shall not "wash out" structures or any portions of the site.
- Low intensity, indirect light sources shall be required.
- Mercury, sodium vapor, and similar intense and bright lights shall not be permitted except where their need is specifically approved, and their source of light is restricted.
- All light sources shall be fully shielded from off-site view.
- All lighting shall be installed in accordance with building codes and the approved lighting plan during construction.

4.2 Agriculture and Forestry Resources

AGRICULTURE AND FORESTRY RESOURCES[1] — Would the project:		*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒	1, 5
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒	1, 2, 3
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒	1, 3, 5
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒	1
e)	Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒	1

[1] In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Environmental Setting

The project site does not contain any farmland or forestry land and is not designated for agricultural or forestry uses or Prime, Statewide, or Locally Important Farmland (California Department of Conservation 2016). The proposed project is located in a semi-developed area and follows existing roads, easements, and rights-of-way. Surrounding land is developed with residential and open space uses.

Discussion of Impacts

a) ***No Impact.*** According to the California Department of Conservation (CDC) 2014 Marin County Important Farmland Map, the project site is located in an area that is designated as urban and built-up land. Therefore, the proposed project would have no impact on agricultural uses.

b) ***No Impact.*** The project site is zoned for residential uses and not for agricultural use. Furthermore, according to the CDC, the project site is not under a Williamson Act contract. Therefore, no impact would occur.

c) ***No Impact.*** As stated above, the project site is urban land zoned for residential uses and is not zoned for forest land or Timberland Production. Furthermore, the proposed project involves the replacement of an existing bridge and does not include the rezoning of forest land or timberland. Therefore, no impact would occur.

d) ***No Impact.*** As stated above, the project is site is designated urban and built-up land and does not contain any forest land. Therefore, the proposed project would not result in the conversion or loss of forest land to non-forest land, and no impact would occur.

e) ***No Impact.*** The proposed project involves the construction and maintenance of existing infrastructure within an already developed area that does not include any farmland. Therefore, the proposed project would not result in the conversion of forest land or farmland to a non-forest use or a non-agricultural use, and would thus have no impact on forestry or agricultural resources.

4.3 Air Quality

AIR QUALITY— Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:	***Potentially Significant Impact***	***Less than Significant with Mitigation Incorporated***	***Less than Significant Impact***	***No Impact***	***Source***
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐	1, 9
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☒	☐	☐	1, 9
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐	1, 9
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☒	☐	☐	1, 9

Environmental Setting

The proposed project is located in Town of Fairfax, Marin County within the San Francisco Bay Area Air Basin (SFBAAB). Air quality in this area is determined by such natural factors as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions. The potential for high pollutant concentrations developing at a given location depends upon the number of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the contaminated air. The project site is located in the eastern portion of Marin County, which is bounded on the west by the Pacific Ocean, on the east by San Pablo Bay, on the south by the Golden Gate, which connects San Francisco Bay to the Pacific Ocean, and on the north by the Petaluma Gap, which is a geographical region in Sonoma County which extends in a band from the Pacific Ocean to San Pablo Bay. Air pollution potential is highest in eastern Marin County, where most of the population is located in semi-sheltered valleys. In the southeast, the influence of marine air keeps pollution levels low. As development moves further north, there is greater potential for air pollution to build up because the valleys are more sheltered from the sea breeze.

While Marin County does not have many polluting industries, the air quality on its eastern side - especially along the U.S. 101 corridor - may be affected by emissions from increasing motor vehicle use within and through the county. Sources of air pollutants in the nearby vicinity of the

project site include vehicle emissions and other residential activities (cooking, wood burning, and/or charcoal grilling; emissions associated with lawn and garden maintenance; emissions associated with the application of paints and coatings; etc.) The primary sensitive receptors in the vicinity are residents, which may include children, elderly people, or people with respiratory illnesses.

Both US EPA and California have developed several ambient air quality standards (AAQS) which have become increasingly stringent over the last several decades. Although emissions and air pollution concentrations have decreased considerably, the SFBAAB is still classified as "nonattainment" with respect to standards for ozone—most of which is formed in the atmosphere by chemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_x) rather than being emitted directly—and particulate matter (PM). The Basin is considered "non-attainment" for the O_3 (8-hour), and is considered "non-attainment" for the O_3 (1-hour and 8-hour), PM_{10} (24-hour and AAM) and $PM_{2.5}$ (AAM) state standards.

For the proposed project, the only sources of emissions are those associated with construction; i.e., the proposed project does not involve the construction of a new air emissions source, or of developments which would attract motor vehicles with their associated air emissions. New construction equipment has been subject to increasingly stringent emissions requirements at the Federal level (e.g., 40 CFR 89 and 1039), designated "Tier 1", "Tier 2", "Tier 3", etc.; older construction equipment is subject to potential retrofit requirements required by the State of California (13 CCR 2449, 13 CCR 2450-2466, and 17 CCR 93116).

There are multiple definitions of what emissions level would be considered "significant." If a large ("major") stationary source of air pollution were proposing to locate at the project site, Federal New Source Review (NSR) regulations would define "significant" emissions as being 100 tons per year (TPY) of CO or 40 TPY of ROG or NO_x.[2] For temporary activities at the project site such as construction, if the project required Federal support or approvals, General Conformity regulations would require a quantitative, formal determination of General Conformity with State Implementation Plans (SIPs) if emissions of NO_x, ROG, or CO were in excess of 100 tons per year (referred to as Federal de minimis levels).[3]

In 2017, the Bay Area Air Quality Management District (BAAQMD) adopted quantitative thresholds of significance for construction activities and identified Best Management Practices for controlling PM associated with fugitive dust. The quantitative thresholds were 82 lb/day for exhaust PM_{10} and 54 lb/day for exhaust $PM_{2.5}$, NO_x, and ROG (these thresholds correspond to 15 TPY and 10 TPY, respectively, if construction were to last for 365 days). However, BAAQMD "is no longer recommending that [those] Thresholds be used as a generally applicable measure

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[2] *40 CFR 51.165(a)(1)(x)(A); 51.166(b)(23)(i); 52.21(b)(23).*

[3] *Separately, Federal regulations for General Conformity identify "routine maintenance and repair activities, including repair and maintenance of administrative sites, roads, trails, and facilities" as "actions which would result in an increase in emissions that is clearly de minimis" [40 CFR 93.153(c)(2)(iv)]*

of a project's significant air quality impacts.[4] In the previous version of the BAAQMD CEQA Guidelines,[5] determination of significance is based only upon whether or not Best Management Practices for controlling fugitive dust (which are very similar to those identified in 2010) are implemented.

Discussion of Impacts

a) ***Less than Significant Impact.*** For projects proposed within the Bay Area, the applicable plan is BAAQMD's Air Quality Management Plan (AQMP). In working towards air quality management, BAAQMD works with the Association of Bay Area Governments (ABAG), county transportation commissions, local governments, and cooperates actively with all State and federal government agencies. BAAQMD develops rules and regulations, establishes permitting requirements, inspects emissions sources, and enforces such measures through educational programs or fines, when necessary.

Projects that are consistent with the projections of employment and population forecasts identified by ABAG are considered consistent with the Plan's growth projections since the Growth Management Chapter forms the basis of the land use and transportation control portions of the Plan. The Plan also assumes that general development projects will include feasible strategies (i.e., mitigation measures) to reduce emissions generated during construction and operation.

The proposed project does not include the development of habitable structures or commercial development, nor does it expand the roadway to accommodate an increase in vehicle trips. Because the proposed project would not exceed the Town's population projections, the operation of the project will not conflict or obstruction implementation of the applicable air quality plan. In addition, construction equipment is mobile (dispersing and diluting pollutants over a wider area than sources that are fixed in place), and the construction phases would be temporary. Therefore, construction and operation emissions would have a less than significant impact related to applicable air quality plans.

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[4] *BAAQMD, "Updated CEQA Guidelines", available from http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx.*

[5] *BAAQMD, "BAAQMD CEQA Guidelines", December 1999, pp. 13-15.*

b) ***Less than Significant with Mitigation Incorporated.*** The area is non-attainment of AAQS for ozone and particulate matter. The BAAQMD 2010 Clean Air Plan addresses these AAQS and evaluates cumulative impacts by considering emissions from all sources and projecting future activity.

During the construction phase of the proposed project, on-site stationary sources, heavy-duty construction vehicles, construction worker vehicles, and energy use would generate emissions. In addition to construction vehicle emissions, fugitive dust would be generated during grading and construction activities. Construction equipment operations and fugitive dust generation could emit ozone and PM, resulting in a cumulatively considerable net increase of criteria pollutants for which the basin is in non-attainment.

Fugitive dust and diesel emissions would be controlled by the implementation of BAAQMD-recommended mitigation measures and EPA Tier 2 standards (Mitigation Measure AIR-1, below). As the proposed project would include a replacement bridge with the same number of lanes as the existing bridge (one), the operation of the proposed project would not result in an increase in vehicle trips or traffic emissions. Therefore, the operation of the proposed project would have a less than significant contribution to cumulative pollutant levels in the region.

Mitigation Measure AIR–1

The contractor shall be responsible for implementing the following basic measures:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas) shall be watered two times per day, as appropriate; pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking area and staging areas.
- All paved access roads, parking areas and staging areas at the construction site shall be swept daily with water sweepers. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with the manufacturer‘s specifications, and all equipment shall be checked by a certified visible emissions evaluator.
- A publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints shall be posted in or near the project site. The contact person shall respond to complaints and take corrective action within 48

hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

- All diesel engines used during construction shall meet EPA "Tier 2" engine standards identified in 40 CFR 89, or more stringent standards.

c) ***Less than Significant with Mitigation Incorporated.*** The primary sensitive receptors in the vicinity are residents, which may include children, elderly people, or people with respiratory illnesses. Sensitive receptors are located in close proximity to several locations along the construction area, which would result in a potentially significant impact. However, fugitive dust would be minimized by the measures listed in Mitigation Measures AIR-1, construction equipment is mobile (dispersing and diluting pollutants over a wider area than if they were fixed in place) and the proponent is also committing to use equipment that meets EPA Tier 2 standards or better (per Mitigation Measure AIR–1 above). As a result, sensitive receptors in the vicinity of the proposed project would not be exposed to substantial pollutant concentrations, and impacts would be less than significant.

d) ***Less than Significant with Mitigation Incorporated.*** BAAQMD's CEQA Guidelines identify the following as potential sources of objectionable odors: wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, and chemical plants. The proposed project does not involve the construction of any of those types of facilities. Construction activities would involve the use of diesel-powered equipment that emits exhaust gases and particulate matter, which can have objectionable odors, and would result in a potentially significant impact. However, construction equipment is mobile (dispersing and diluting pollutants over a wider area than if they were fixed in place) and the proponent is also committing to use equipment that meets EPA Tier 2 standards or better (per Mitigation Measure AIR–1 above). Furthermore, the project would not result in any other emissions adversely affecting a substantial number of people. Thus, with implementation of Mitigation Measure AIR-1, the proposed project would result in less-than-significant impacts.

4.4 Biological Resources

	BIOLOGICAL RESOURCES — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐	1, 7
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐	1, 7
c)	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐	1, 7
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐	1, 7
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐	1, 7, 4
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒	1, 7

Environmental Setting

WRA, Inc. (WRA) and Kelly Biological Consulting conducted biological resources studies at the project site. Studies included a biological resources assessment, special-status plant surveys, and a delineation of jurisdictional waters. Their findings were synthesized into a Natural Environment Study (NES; Appendix A) which is the foundation of this discussion of impacts to biological resources and covers such topics as vegetation communities present within the Study Area, the suitability of existing habitat conditions for special-status plant and wildlife species, and the presence of jurisdictional waters and other waters. These topics were evaluated by a review of available publications and databases followed by five on-foot site visits that occurred in the winter and spring of 2016 and 2017, and winter of 2018. Studies included a biological resources assessment, special-status plant surveys, and a delineation of Section 404 jurisdictional areas within the proposed Biological Study Area (BSA).

Biological Study Area

The BSA is located on and around the Meadow Way Bridge over San Anselmo Creek in the Town of Fairfax, Marin County, California. Meadow Way is a local residential road. The BSA covers the areas encompassed by the proposed project-related direct and indirect actions such as ground-disturbing, construction, staging, or anywhere access activities would occur and goes beyond that to ensure that key biological issues are addressed. Meadow Way is a local road in a developed suburban area. The adjacent land use is residential (single-family homes). The BSA extends up and downstream from the bridge along the stream corridor covering the primary natural area.

Site elevations range from approximately 100 to 200 feet NAVD88. Surrounding land use is residential. The bridge is located on the San Rafael USGS 7.5-minute quadrangle map at latitude W37.583366, longitude N122.36085.

Natural Communities

Riparian Woodland

The BSA contains 0.26-acre of open canopy Riparian Woodland similar to California Bay (Umbellularia Californica) Forest Alliance (G4, S3) (Sawyer, J.O., T. Keeler-Wolf, and J. Evens. 2009) (Figure 3a). The sparse overstory includes native tree species such as California bay, buckeye (Aesculus californica), oaks (Quercus kelloggii, Q, garryana, and Q. agrifolia var. agrifolia), and a multi-stem arroyo willow (Salix lasiolepis). The understory is comprised mainly of California blackberry (Rubus ursinus), Himalayan blackberry, English ivy (Hedera helix), and various grasses including panic veldtgrass (Ehrharta erecta). There are cement and wood retaining walls along portions of the lower banks.

Intermittent Stream (Other Waters)

At this location, San Anselmo Creek is an intermittent creek with flows that vary with the rainfall patterns of a given season. The watershed that supports it is local, generally the western part of the Town of Fairfax and adjacent open space lands. Flows within the creek during a January 11, 2017 site visit extended to the edges of the creek bed. During a site visit at a similar time of year (February 1, 2018) flows were much lower. In addition to slope change at the bed and bank junction, wrack observed at the edge of the creek bed was used as an indication of OHW mark. The creek substrate is a mix of small gravel to larger cobble. The channel width at the OHW mark was used to determine the intermittent stream ("other waters") boundary shown on Figure 3a. The creek is not included on the National System of Wild and Scenic Rivers published by the U.S. Department of the Interior. There are no wetlands in the BSA. Within portions of the BSA, there are wooden or cement retaining walls along the lower banks. The rest of the bank areas are natural substrate.

Ruderal Disturbed/Developed

The Ruderal Disturbed/Developed portion of the project site includes pavement (Meadow Way Road and driveways), the gravel and bare dirt roadsides, structures (homes and outbuildings), backyards, and landscaping or bare areas. In the areas that are not landscaped, the vegetation is predominately non-native species commonly found in the region, this plant community is predominately landscaping cultivars and non-native herbaceous species commonly found in the region, such as American vetch (Vicia americana), various clovers (Trifolium spp.), oats (Avena barbata), bromes (Bromus spp.), and hedge-hog dogtail (Cynosurus echinatus). The dominant vegetation along the middle to upper part of the creek bank is Himalayan blackberry and English ivy.

Special-Status Species

Based on pre-survey database searches, it was determined that 75 special-status plant species and 91 special-status wildlife species have been documented from or have a range that occurs in the San Rafael, Bolinas, San Geronimo, Novato, Petaluma Point, San Quentin, San Francisco North, or Point Bonita 7.5-minute USGS quadrangles. Of these species, 23 special-status plant species and seven special-status wildlife species have documented occurrences within 5 kilometers (3 miles) of the BSA.

Special-Status Plant Species

Due to a lack of appropriate habitat elements (such as coastal salt marsh) and the presence of residential development in the surrounding landscape, it was determined that the BSA has the potential to support only four of the special-status plant species identified below. No special-status plants were observed in the BSA during rare plant surveys conducted for this report. Given that surveys were conducted during the appropriate blooming periods but no special-status plant species were observed, no special-status plant species are likely present within the project site. Nonetheless, special-status plant species with suitable habitat within the project site are discussed below:

Napa false indigo (*Amorpha californica* var. *napensis,* Rare, threatened or endangered in CA or elsewhere; Moderately threatened in CA). Habitat Present. Broadleaf upland forest, chaparral, cismontane woodland; openings in forest, woodland, and chaparral. 120-2,000 m. Flowers April-July. Woodland habitat within the project site could support this species, however, this woody perennial was not observed during the field surveys, which were conducted when this species would be identifiable. No further actions are recommended for this species.

Western leatherwood (*Dirca occidentalis,* Rare, threatened or endangered in CA or elsewhere; Moderately threatened in CA). Habitat Present. Mesic sites, broadleafed upland forest, closed-cone conifer forest, chaparral, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland. 25-425 m. Flowers January- April. Woodland habitat within the project site may support this species. This perennial woody shrub species was not observed during the field surveys, which were conducted when this species would be identifiable. No further actions are recommended for this species.

Minute pocket moss (*Fissidens pauperculus,* US Forest Service Sensitive Species; Rare, threatened, or endangered in CA but more common elsewhere; Moderately threatened in CA). Habitat Present. North coast coniferous forest. On damp soil on the coast and in dry streambeds and banks on soil in humus comprised of heavily decayed wood. 10-100 m. Flowers N/A (best observed during the wet season). Mesic substrates within the project site may have the potential to support this species. This species was not observed during the field surveys, which occurred during the wet season when this species is identifiable, though common member of the same genus was found (*Fissidens crispus*). No further actions are recommended for this species.

Tamalpais oak (*Quercus parvula* var. *tamalpaisensis,* Rare, threated, or endangered in CA and elsewhere; Not very threatened in CA). Habitat Present. Lower montane coniferous forest. 100-750 m. Flowers March-April. Suitable habitat for this species may be present in the project site. This species is a woody shrub, which if present, would have been observed during the field surveys. No further actions are recommended for this species.

Special-Status Wildlife Species

The BSA is designated Critical Habitat for steelhead (*Oncorhynchus mykiss*), and the species is presumed present within this section of San Anselmo Creek. The BSA is also listed as designated Critical Habitat for Coho salmon (*O. kisutch*), although this species is considered extirpated from the tributaries and waters of San Francisco Bay. Additionally, the BSA contains essential fish habitat (EFH) for Pacific salmonids. Steelhead and coho salmon are discussed below, as the project site is critical habitat for both species. However, based on habitat and conditions within the BSA and documented occurrences nearby, it was determined that the BSA has potential to support CCC steelhead, NSO, and two other special-status wildlife species: Allen's hummingbird (Selasphorus sasin) and olive-sided flycatcher (Contopus cooperi).

Steelhead - central California coast DPS *(Oncorhynchus mykiss,* Federal threatened)*.* Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean. San Anselmo Creek is designated as critical habitat for the central California coastal DPS of this species. Though two barriers to anadromy exist downstream of the project site, the species is considered present within the creek.

Coho salmon - central California coast (*Oncorhynchus kisutch*, Federal Endangered, State Endangered). State listing is limited to Coho south of San Francisco Bay. Federal listing is limited to naturally spawning populations in streams between Humboldt County and Santa Cruz County. Spawn in coastal streams 4-14C. Prefer beds of loose, silt-free, coarse gravel and cover nearby. San Anselmo Creek is designated as critical habitat for the species. However, the species is considered extirpated from the tributaries of San Francisco Bay.

In addition to CCC steelhead, the project site has the potential to support three special-status bird species. These species and their preferred habitats are discussed below:

Northern spotted owl (*Strix occidentalis caurina*, Federal threatened, State threatened, CDFW species of special concern). Habitat consists of old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees. Prefers high, multistory canopy dominated by big trees, trees with cavities or broken tops, woody debris and space under canopy. The project site and immediately surrounding area are low-density residential developments and riparian woodland; however, riparian redwood forest community is in proximity to the project site. This species has been documented to nest in dense forest approximately 0.28 miles southwest of the project site. No nesting habitat is present in the project site.

Olive-sided flycatcher (*Contopus cooperi*, CDFW species of special concern, USFWS bird of conservation concern). Typical breeding habitat is montane coniferous forests. At lower elevations, also occurs in wooded canyons and mixed forests and woodlands. Often associated with forest edges. Arboreal nest sites located well off the ground. This species is known to inhabit the area, particularly in the summer. Riparian redwood forest is present in the project site and may contain suitable nesting habitat for the species.

Allen's hummingbird (*Selaphorus sasin*, USFWS Birds of Conservation Concern). Breeds along the California coastline in habitats including mixed evergreen, Douglas fir, redwood and Bishop pine forests, riparian woodlands, nonnative eucalyptus and planted cypress groves, and occasionally live oak woodlands and coastal scrub with at least a scattering of trees, such as on north-facing slopes. The project site contains riparian woodlands that may provide suitable nest trees and foraging habitat which may support this species.

Regulatory Setting

Federal Regulations

Federal Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.), was enacted to provide a means to identify and protect endangered and threatened species. Under Section 9 of the ESA, it is unlawful to take any listed species. "Take" is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting a listed species. "Harass" is defined as an intentional or negligent act or omission, which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering. "Harm" is defined as an act which actually kills or injures fish or wildlife and may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering.

Actions that may result in "take" of a federal-listed species are subject to USFWS or National Marine Fisheries Service (NMFS) permit issuance and monitoring. Section 7 of ESA requires federal agencies to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat for such species. Any action authorized, funded, or carried out by a federal agency or designated proxy (e.g., Caltrans) which has potential to affect listed species requires consultation with the USFWS or the NMFS under Section 7 of the ESA.

Clean Water Act (CWA)

The CWA provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 404 identifies the Corps' jurisdiction over fill materials in essentially all water bodies, including wetlands. All federal agencies are required to avoid impacts to wetlands whenever there is a practicable alternative. Section 404 established a permit program administered by the Corps regulating the discharge of dredged or fill material into Waters of the US (including wetlands). Section 401 of the CWA requires that an applicant for a federal license or permit that allows discharge to Waters of the U.S. obtain a state certification that the discharge complies with the CWA. The Regional Water Quality Boards (RWQCB) administer the certification program in California. The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Executive Order 11990 – Protection of Wetlands

This order established a national policy to avoid adverse impacts to wetlands whenever there is a practicable alternative. The U. S. Department of Transportation (DOT) promulgated DOT Order 5660.1A in 1978 to comply with this direction. On federally funded projects, impacts to wetlands must be identified. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding. An additional requirement is to provide early public involvement in projects affecting wetlands. FHWA provides technical assistance (Technical Advisory 6640.8A) and reviews environmental documents for compliance.

Migratory Bird Treaty Act

This treaty with Canada, Mexico, and Japan makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season. California Fish and Game Code (Sec 3500) also prohibits the destruction of any nest, egg, or nestling.

State Regulations

California Porter-Cologne Water Quality Control Act

This regulatory law is becoming more prominent on projects involving impacts to isolated Waters of the State (non-404/401 waters). The RWQCB is increasingly requiring Waste Discharge Requirement (WDR) permits for impacts to Waters of the State.

Streams, Lakes, and Riparian Habitat in California

Streams and lakes, as habitat for fish and wildlife species, are subject to the jurisdiction of California Department of Fish and Wildlife (CDFW) under Sections 1600-1616 of California Fish and Game Code. Alterations to, or work within or adjacent to streambeds or lakes generally require a 1600 series Lake and Streambed Alteration Agreement. The term "stream", which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72).

In addition, the term "stream" can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). "Riparian" is defined as "on, or pertaining to, the banks of a stream." Riparian vegetation is defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CDFG 1994). Removal of riparian vegetation also requires a Lake and Streambed Alteration Agreement from CDFW.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

California Endangered Species Act

CDFW is responsible for administering California Endangered Species Act (CESA, CDFG Code §§2050, et seq.), which prohibits take of species that have been listed, or are considered for listing (candidate species) as threatened or endangered species within the State of California. CESA allows for incidental take of state listed species through issuance of an Incidental Take Permit, or through a Consistency Determination in coordination with a Biological Opinion issued by the USFWS (CDFW Code Section 2081). In contrast with federal law, the definition of "take" under CESA involves actual harm to one or more members of a listed species and does not extend to modification of habitat not involving direct take.

Special-Status Species

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal Endangered Species Act (FESA) or California Endangered Species Act (CESA). These acts

afford protection to both listed and proposed species. In addition, CDFW Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern, and CDFW special-status invertebrates are all considered special-status species.

Although CDFW Species of Special Concern generally have no special legal status, they are given special consideration under CEQA. In addition to regulations for special-status species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, or young is illegal. Plant species on the CNPS Rare and Endangered Plant Inventory with California Rare Plant Rank of 1 or 2 are also considered special-status plant species and must be considered under CEQA. Rank 3 and Rank 4 species are afforded little or no protection under CEQA.

Other Sensitive Biological Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2015). Sensitive plant communities are also identified by CDFW. CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2010) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or USFWS must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances.

Local Regulations

Tree Protection Ordinance

In 1973, the Town of Fairfax approved Ordinance No. 387 for trees. The purpose of the ordinance is to preserve the wide variety of local native trees and to protect the benefits they provide the citizens. Chapter 8.36.020 of the Town Code defines "altering" and "tree." A Tree Permit is required for removal or significant trimming of any tree, which has a circumference of 24 inches or more measured at 24 inches above the ground. In effect, this is a little less than an 8-inch diameter tree trunk.

Discussion of Impacts

a) ***Less than Significant with Mitigation Incorporated***. The project site was determined to have potential habitat for four special-status plant species. None of these were observed during field surveys conducted during the appropriate flowering periods. It is therefore unlikely that any of these species are present within the project site and consequently, unlikely that impacts to special-status plant species would occur.

The segment of the San Anselmo Creek that contains the project site is essential fish habitat for Pacific Salmonids and critical habitat for Coho Salmon and CCC Steelhead. Although, Coho salmon are considered extirpated in the vicinity of the project site, and are therefore very unlikely to occur. With implementation of Mitigation Measure BIO-1, impacts to critical habitat, EFH, and steelhead would be less than significant.

In addition to fish species, the project site has potential habitat for two special-status bird species, Allen's hummingbird and olive-sided flycatcher. Additionally, although the project site itself does not contain suitable habitat for nesting northern spotted owl, the nearby vicinity does, and noise impacts at the project site could adversely affect the northern spotted owl. With implementation of Mitigation Measure BIO-2, impacts to nesting avian species would be less than significant.

Given impacts to birds and fish species would be mitigated to less-than-significant levels and there are no other special-status species within or near the project site, impacts would be less than significant with mitigation incorporated.

Mitigation Measure BIO-1 – Special-Status Fish Species

Prior to the issuance of construction permits, consultation with NMFS shall be conducted to ensure proposed project design will not result in permanent adverse effects to steelhead, critical habitat, or EFH. The project shall adopt measures as mandated by NMFS, which may include, but is not limited to, the following:

- Work shall be conducted in isolation from flowing water. If water is present, prior to the start of in-water activities, the work area will be isolated using temporary cofferdams, and flowing water shall be temporarily diverted around the isolated area.
- A fish salvage will be completed if water remains in the project site after the start of construction. A fish rescue and relocation plan shall be developed prior to the onset of any in-water work. The plan shall be implemented by a qualified biologist during dewatering activities in San Anselmo Creek. The fish rescue and relocation plan shall include an overview of the proposed methods for dewatering, expected location and duration of dewatering activities, and methods for conducting fish rescue and relocation during dewatering activities.
- If de-watering is necessary, pumps with 0.2-inch mesh will be used to remove standing water from the work area within the coffer dams to a filtration basin to

prevent direct discharge into the creek. If a filtration basin is not available, filter bags will be placed surrounding the hose-release and the hose-release end will be placed on a level area outside of the wetted creek channel to allow water to settle prior to returning to the creek. No pumped water will be directly discharged into the creek. Allowing the pumped water to settle in a filtration basin or release through filter bags will prevent increase in turbidity or sediment loads during the de-watering process.

- Concrete, dust, and other debris from concrete removal activities will be captured and removed from the work site so as not to enter the creek channel.
- Where disturbed, the creek bed and channel shall be restored to pre-project conditions following the completion of work.

Mitigation Measure BIO-2 – Nesting Birds

Prior to the issuance of construction permits, final avoidance and minimization measures shall be determined in consultation with the USFWS to ensure project design including avoidance and minimization measures do not result in adverse effects to NSO. The project shall adopt measures as mandated by USFWS, which may include, but is not limited to, the following:

- Work within the project site will be conducted outside the nesting season (September 1 through January 31) to avoid disrupting nesting NSO within and adjacent to the site. Work outside of this period during the nesting season will require protocol-level surveys to determine nesting status and location and consultation with the USFWS and CDFW.
    - If protocol-level surveys indicate that NSOs are nesting within the potential acoustic impact distance to be determined in consultation with the USFWS, project work may not commence until the end of the nesting season, i.e. September 1, or be limited to work within certain acoustic levels based upon distance from the nest and in consultation with the USFWS.
    - If protocol-level surveys determine that NSO are not nesting or not nesting within the potential acoustic impact zone during the year of the surveys, project work may commence June 1. June 1 is the earliest date non-nesting status can be confirmed.
- If project work begins in the non-nesting season and is to continue into the nesting season, project work will cease January 31 and will not recommence until protocol-level surveys as described above determine the nesting status of the survey area.

b) ***Less than Significant with Mitigation Incorporated.*** Impacts to sensitive natural communities can be divided into two classes—permanent and temporary. Permanent impacts may occur upon conversion of a natural community to infrastructure such as bridge, support, or engineered slope stabilization. Temporary impacts are transient disturbances resulting from construction. Two natural communities of special concern were found to be present in the BSA, Riparian Woodland and Intermittent Stream.

The proposed Project would temporarily impact 0.07 acre of Riparian Woodland as a result of access routes, removal of existing retaining walls, excavations for footings and riprap, and contour grading on the creek banks. A total of 113 square feet of Riparian Woodland would be permanently impacted by the proposed Project through placement of new retaining walls and abutments. The proposed project avoids the Riparian Woodland community to the maximum extent feasible, and only one California bay tree cluster is to be removed.

The project would not create any permanent impacts to intermittent streams, 0.13-acre temporary impacts, and no permanent direct impacts on Intermittent Stream are anticipated as a result of proposed project construction. Removal of existing wooden piles from within the creek bed will result in a gain of 12.6 square feet (<0.01 acre) of Intermittent Stream habitat. Construction in the creek will be limited to areas that must be accessed for construction activities and creek bank excavations. With implementation of Mitigation Measure BIO-3, these impacts would be less than significant. Given the project would result in no impacts to riparian redwood forest and impacts to other waters would be mitigated to less-than-significant levels, impacts are considered less than significant with mitigation incorporated.

Mitigation Measure BIO-3 –Intermittent Streams

The project shall implement the following measures to avoid and/or minimize and restore potential impacts to creek habitat resulting from the use of mechanical equipment in the creek bed.

- The primary construction in the creekbed will be completed between June 1 and October 15, and work within the creek bed and banks will occur when the work area is dry or dewatered.
- Final grading in the creek bed will conform to the existing creek channel both downstream and upstream (except in the areas of permanent fill), and existing bed materials will be replaced with similar sized materials.
- Regulatory approval will be obtained for all work within potential jurisdictional areas, including the USACE, RWQCB, CDFW, and NMFS. All work within these areas will conform to any conditions imposed by the regulating agencies.
- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction will be fenced with temporary high-visibility construction fencing to protect

environmentally sensitive areas and to prevent any equipment from unnecessarily extending the work area or entering the creekbed. In addition, silt fencing will be installed where appropriate to prevent debris from entering the creek. All fencing will be removed upon project completion.

- Prior to construction, the contractor will be required to prepare an Accidental Spill Prevention and Cleanup Plan.
- To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment spill control absorbent material will be in place underneath this equipment at all times to capture potential leaks. All refueling and maintenance of equipment, other than stationary equipment, will occur outside the creek's top-of-bank. Any hazardous chemical spills will be cleaned immediately.
- If there are drilling activities related to construction of the proposed project the contractor will be required to use a drilling mud and slurry seal that is non-toxic to aquatic life. All drilling muds and fluid will be contained on-site in tanks and disposed of in a permitted manner. Fluids from saw cutting and other activities will be collected and not allowed to flow into the creek.
- No equipment, including concrete trucks, will be washed within the channel of the creek, or where wash water could flow into the channel. Prior to proposed project construction, the contractor will establish a concrete washout area for concrete trucks in a location where wash water will not enter the creek or adjacent areas. The washout area will follow the practices outlined in the San Francisco Bay Regional Water Quality Control Board Erosion and Sediment Control Field Manual (page 107-108, July 1999) or more recent guidelines. Substitution of the designated concrete washout area or methods will require prior approval of the Town of Fairfax.
- All water that comes in contact with wet concrete will be pumped directly into tanks and disposed of at a permitted location.
- When working on the roadway and bridge approaches during the October 15 to June 1 period, all drainage inlets within the proposed project site will be protected from receiving polluted stormwater through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs.
- Water encountered during construction of the bridge foundations will be managed in accordance with an approved dewatering plan.
- All workers will ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the BSA are deposited in covered or closed trash containers. The trash containers will not be left open and unattended overnight.
- At the end of construction, the Town of Fairfax will require that seed and certified weed-free straw will be placed on disturbed areas in the proposed project site (with the exception of the lower creek banks, creek bed, and areas below the OHW mark). A

jute mesh type or equivalent matting will be placed over the straw, installed per the manufacturer's instructions. This matting will have no plastic incorporated into it. Substitution of materials or erosion control methods will require prior approval of the Town of Fairfax.

- After construction, the proposed project site will be inspected following the first heavy rain, during the middle of the rainy season and at the end of the rainy season. During each visit areas of significant erosion or erosion control device failure will be noted and appropriate remedial actions taken.

c) ***Less than Significant with Mitigation Incorporated*.** A delineation of jurisdictional waters was performed at the project site and found that there were no wetlands present. However, 0.18-acre of intermittent stream is present. Intermittent stream is considered "other waters" under the CWA and is considered a Water of the United States subject to RWQCB and Corps regulations. As discussed in response to question b, no permanent impacts to intermittent stream would occur; and temporary impacts would be reduced to less-than-significant levels with the implementation of Mitigation Measure BIO-3. Given there are no wetlands and impacts to other waters would be mitigated to less-than-significant levels, impacts to protected waters are less than significant with mitigation incorporated.

d) ***Less than Significant Impact.*** No migratory corridors or nursery sites are anticipated to be affected by the project. The only migratory route which lies within the project impact footprint would be the steelhead spawning migration habitat within San Anselmo Creek. However, because project activities have been designed to only occur outside of the spawning and migratory season (June 30 – October 15), no impediments to fish passage are anticipated as a result of project activities and impacts would be less than significant.

e) ***Less than Significant with Mitigation Incorporated.*** As stated in the project Description above, the proposed project would include the removal of a bay tree and invasive blackberry bushes on the southwest corner of the new bridge, and pruning and removal of other vegetation in the construction zones. The Town's Tree Ordinance requires a permit for the removal or relocation of any tree with a circumference of 24-inches or more measures at 24 inches above the ground. The removal of the bay tree on-site would result in a potentially significant impact. However, implementation of Mitigation Measure BIO-4 would require the Applicant to submit an application for a tree removal permit, comply with all conditions of approval listed within the permit, and prepare a Tree Protection Plan for the other surrounding trees. A Planting Plan will be prepared for revegetation of the site, which includes native riparian trees, shrubs, vines, groundcover, and willows. The planting plan will consider native blackberry bushes in its development. Implementation of Mitigation Measures BIO-4 would reduce this potentially significant impact to a less-than-significant level. The proposed project would not conflict with any other applicable policies for the purpose of protecting biological resources.

Mitigation Measure BIO-4

Prior to issuance of a grading permit, the Town shall apply in writing to the Director for a tree removal permit, mark each tree to be considered for removal, and provide public notice per the Town's requirements.

- The Tree Committee may require the Applicant to submit his or her application to a Qualified Arborist designated by the town for a report and recommendation, for which the Applicant shall bear all expenses.
- Reasonable conditions of approval may be attached to any tree removal permit including, but not limited to, the replacement of removed trees.
- The project shall replace any removed trees shall at a minimum ratio of 1:1.
- A Qualified Arborist shall prepare a Tree Protection Plan in order to protect trees during construction of the proposed project and to maximize their chances for survival.

f) ***No Impact.*** No state, regional, or federal habitat conservation plans or Natural Community Conservation Plans have been adopted for the project site.

4.5 Cultural Resources

CULTURAL RESOURCES — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☐	☒	☐	1, 12
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐	1, 12
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐	1, 12

Environmental Setting

Far Western Anthropological Research Group, Inc. and JRP on behalf of the Town of Fairfax conducted a Historic Properties Survey Report (HPSR) and Archaeological Survey Report (ASR) in support of the Meadow Way Bridge (Bridge No. 27C- 0008) improvement project. The studies conducted for this project were consistent with Caltrans responsibilities under the January 1, 2014 First Amended Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California for compliance with Section 106 of the NHPA.

The bridge itself has been determined not eligible for listing in the National Register of Historic Places (National Register). No archaeological sites were identified within one-quarter mile of the project APE during a pre-field literature search at the Northwest Information Center. The Native American Heritage Commission (Commission) and members of the Federated Indians of Graton Rancheria listed by the Commission as interested parties were contacted regarding the project. The Rancheria responded with a request for copies of the report findings and recommendations. A buried site sensitivity assessment identifies the APE as having very low sensitivity for buried prehistoric resources owing to the age of the landform (Pleistocene) and erosional topography. As a result, subsurface testing was not recommended. A pedestrian survey of the APE was conducted on January 28, 2015. No resources were identified in or around the creek or bridge.

Native American Consultation

Contact with Native American tribes is described in further detail in Section 4.18 Tribal Cultural Resources.

Discussion of Impacts

a) ***Less than Significant Impact.*** Pursuant to State CEQA guideline 15064.5, record searches, field surveys, and research were conducted to determine the potential presence of historic resources. The project site does not contain any resource listed in, or determined to be eligible by the State Historical Resource Commission and does not contain a resource included in a local register of historic resources or identified as significant in a historic resource survey. Furthermore, the bridge itself is not eligible for placement in the National Register of Historic Places. Additionally, the project site does not contain any object, building, structure, site, area, place, record, or manuscript that a lead agency determined to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Therefore, no impact would occur.

b) ***Less than Significant with Mitigation Incorporated.*** No archaeological resources are known in the vicinity of the project site, and most of the project site has already been disturbed by past construction. Although unlikely, an accidental discovery of archaeological resources remains possible. With the implementation of Mitigation Measure CULT-1, which requires a work stoppage in the vicinity of unearthed archaeological resources, impacts related to accidental discoveries would be less than significant. The project would therefore not have a substantial adverse impact on the significance of an archaeological resource, and impacts would be less than significant with mitigation incorporated.

Mitigation Measure CULT-1

Pursuant to CEQA Guidelines Section 15064(f), the Town shall make provisions for the discovery of historical or unique archaeological resources during construction. These provisions shall include an immediate evaluation by a qualified archaeologist. If the find is determined to be a historical or unique archaeological resource, the Town shall implement at least one of the following: contingency funding and time allotment will be allocated to allow the implementation of avoidance measures, or appropriate mitigation will be available.

c) ***Less than Significant with Mitigation Incorporated.*** Human remains are not known to occur on the project site. However, the potential for unanticipated discovery of human remains is still present. With the implementation of state-mandated stop work procedures delineated in Mitigation Measure CULT-2, any potential impacts from the accidental discovery of human remains would be less than significant.

Mitigation Measure CULT-2

Pursuant to CEQA Guidelines Section 15064(e), upon accidental discovery of human remains during project construction, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the county coroner is contacted to determine that no investigation of the cause of death is required.

If the coroner determines the remains are Native American, the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC shall subsequently identify the most likely living descendant, who may make recommendations to the landowner or person responsible for excavation for means of treating or disposing of the remains and any associated grave items.

If the NAHC is unable to identify the most likely descendant, the descendent fails to make a recommendation within 24 hours of notification, or the landowner rejects the recommendation and mediation by NAHC fails to yield a mutually agreeable recommendation, the landowner or representative shall rebury the remains and associated items with appropriate dignity on the property in a location not subject to further subsurface disturbance.

4.6 Energy

ENERGY — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	☐	☐	☒	☐	1
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐	1

Discussion of Impacts

a) ***Less than Significant Impact.*** Construction of the new bridge would require the use of energy resources to power equipment and move workers and supplies to and from the site. Machinery idling would be limited per California law and equipment would be staged on and near the project site, minimizing the use of energy resources for equipment use and transportation. Following construction, energy use would be comparable to baseline levels. Operations of the bridge would not change and capacity would not be expanded, so energy consumption by cars using the bridge would be more or less unchanged. As there would be a temporary, minimal increase in energy use during construction and energy use would return to baseline levels during operation, the project would result in less than significant impacts related to the wasteful, inefficient, and unnecessary consumption of energy resources.

b) ***No Impact.*** The Town of Fairfax's Climate Action Plan contains energy efficiency goals for the Town. Although it does not provide any mandatory policies for energy efficiency or renewable energy, it provides 18 recommended actions for businesses, residents, and government entities to improve energy efficiency and the use of renewables. Most of these recommended policies are tailored to buildings and are not applicable to the proposed project.

Similarly, there are few requirements of state-wide plans and policies such as Title 24 that apply to open space projects. As few local and state energy renewability and efficiency programs and policies apply to the project, there would be no conflict with any such programs and policies; and no impact would occur.

4.7 Geology and Soils

GEOLOGY AND SOILS — Would the project:	***Potentially Significant Impact***	***Less than Significant with Mitigation Incorporated***	***Less than Significant Impact***	***No Impact***	***Source***
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	☐	☒	1, 8
ii) Strong seismic ground shaking?	☐	☐	☒	☐	1, 8
iii) Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐	1, 8
iv) Landslides?	☐	☐	☒	☐	1, 8
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐	1, 8
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☒	☐	☐	1, 8
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐	1, 8
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒	1, 8
f) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☒	☐	☐	1, 8

Environmental Setting

Soils

The soil type found in the project site is Tocaloma-McMullin-Urban land complex, 30 to 50 percent slope. The Tocaloma-McMullin series consists of moderately deep or deep and moderately or well-drained soils that formed from weathered sandstone and shale. Urban land soils are found in heavily developed areas and contain a mixture of soil components from the native soils in the area as well as imported soils that may have been introduced during development activities. Their characteristics vary, and in the project site, the soils are well-drained with a medium runoff class due to the sloping on site. The creekbed is approximately 20-feet below the road surface, with steeply sloping banks.

Seismicity

The San Francisco Bay area is one of the most seismically active areas in the country. While seismologists cannot predict earthquake events, the U.S. Geological Survey's Working Group on California Earthquake Probabilities (2003) estimates there is a 62 percent chance of at least one magnitude 6.7 earthquake occurring in the Bay Area region between 2003 and 2032. As seen with damage in San Francisco and Oakland due to the 1989 Loma Prieta earthquake that was centered about 50 miles south, significant damage can occur at considerable distances. Higher levels of shaking and damage would be expected for earthquakes occurring at closer distances. The faults considered capable of generating significant earthquakes in the area are generally associated with the well-defined areas of crustal movement, which trend northwesterly. Faults considered active by the State of California and located closest to the site include the San Andreas (6.9 miles, west of the site), and Hayward (13.2 miles, east of the site). The project site is not located within a State-designated Alquist-Priolo Earthquake fault rupture zone.[6]

Liquefaction and Lateral Spreading

Soil liquefaction is a condition where saturated granular soils near the ground surface undergo a substantial loss of strength during seismic events. Loose, water-saturated soils are transformed from a solid to a liquid state during ground shaking. Liquefaction can result in significant deformations and ground rupture or sand boils. Soils most susceptible to liquefaction are loose, uniformly graded, saturated, fine-grained sands that lie close to the ground surface. Lateral spreading is a type of ground failure related to liquefaction. It consists of the horizontal displacement of flat-lying alluvial material toward an open area, such as a steep bank of a stream channel. According to the Association of Bay Area Governments (ABAG), the project site is located in a moderate liquefaction hazard zones.[7]

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[6] *California Geological Survey Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm. Accessed: November 21, 2014.*

[7] *ABAG Geographic Information Systems: Hazard Maps. Available at: http://gis3.abag.ca.gov/Website/liq_scenario_maps/viewer.htm. Accessed November 21, 2014.*

Landslide

The project site is classified as flatland by ABAG and would not be susceptible to earthquake-induced landslides or rainfall-induced landslides.[8] However, the creek banks may experience sliding due to liquefaction.

Discussion of Impacts

a-i) ***No Impact.*** The project site is not included in an earthquake fault zone designated by the California Geological Survey pursuant to the Alquist-Priolo Act because there are no known faults in the project site or surrounding area. Because the project is not located near a known fault, the project would not cause potential substantial adverse effects involving the rupture of a known earthquake fault, and no impact would occur.

a-ii) ***Less than Significant Impact.*** Seismic activity associated with faults outside of the immediate vicinity of the project site could cause ground shaking at the project site and could create a risk for construction workers if an earthquake happens during construction. Occasional ground shaking is common in the Bay Area, and construction workers would take the necessary precautions to maintain worker safety in the event of an earthquake.

Conclusions from the most recent Uniform California Earthquake Rupture Forecast (UCERF) indicate the highest probability of an earthquake of magnitude 6.7 or higher in the region by 2045 is assigned to the San Andreas Fault. The purpose of the proposed project is the replacement of the existing bridge structure in order to address vulnerabilities and prevent failure resulting in collapse or loss of life during the Maximum Credible Earthquake. Therefore, the impacts associated with seismic ground shaking would be less than significant.

a-iii) ***Less than Significant with Mitigation Incorporated.*** Liquefaction associated with ground shaking is possible given ABAG's hazard map and the results of the site-specific geotechnical investigation. The potential for liquefaction on the site is a potentially significant impact. However, the construction phase of the proposed project is temporary, and the operation of the proposed project would be similar to existing conditions. In addition, the design of project components would adhere to California Building Code requirements specific to the area to minimize the potential for damage from earthquake activity in the future. Furthermore, Mitigation Measure GEO-1 would require the proposed project to be designed in accordance with the recommendations provided in the site-specific geotechnical investigation. With the implementation of Mitigation Measure GEO-1, impacts associated with liquefaction would be less than significant.

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[8] *ABAG Geographic Information Systems: Hazard Maps. Available at: http://gis.abag.ca.gov/website/LandslideDebrisFlow/index.html. Accessed November 21, 2014.*

Mitigation Measure GEO-1

The foundations of the bridge abutments and the conventional retaining walls shall be placed on pilings that penetrate beyond the 30-foot deep liquefiable layer into stiff soils or rock. The Upper retaining wall at the southwestern project quadrant, supporting a private residential property impacted by the project, will be held against landslide with tieback elements. The retaining walls at the bridge will protect the bank slopes adjacent to the bridge against sliding and lateral spreading due to ground liquefaction. Since the soils under the approach roadways would remain liquefiable, a ten-foot-long seismic approach slab at each end of the bridge shall be included to maintain the drive to and from the bridge after a major event.

a-iv) ***Less than Significant Impact.*** The term landslide includes a wide range of ground movements, such as rockfalls, deep failure of slopes, and shallow debris flows. Gravity acting on an over-steepened slope is the primary reason for a landslide. Slope material that becomes saturated with water may develop a debris flow or mudflow. The resulting slurry of rock and mud may pick up trees, houses, and cars, thus blocking bridges and tributaries causing flooding along its path. Any area composed of very weak or fractured materials resting on a steep slope can and will likely experience landslides. Although the physical cause of many landslides cannot be removed, geologic investigations, good engineering practices, and effective enforcement of land-use management regulations can reduce landslide hazards. The potential for landslides or liquefaction from seismic activity is considered low in the project site based on the geologic units and relatively flat topography. The project site is not located in an ABAG-designated earthquake-induced landslide area or within an existing rainfall-induced landslide or debris flow area. Furthermore, implementation of Mitigation Measure GEO-1, impacts associated with landslides would be less than significant.

b) ***Less than Significant with Mitigation Incorporated.*** The project proposes to excavate sediments along the sides of San Anselmo Creek for construction of the access road, the temporary staged bridge, and the permanent abutments and wingwalls. Soils excavated from this work would be stored in containers on the creek bed and used later for backfill. The remainder of excavated soils would be hauled away on a daily basis to an appropriate disposal facility. This excavation would have the potential for soil erosion and loss of topsoil and would, therefore, result in a potentially significant impact. Mitigation Measure BIO-4 addresses erosion and siltation impacts to the Perennial Stream ("Other Waters" and Wetlands) by listing avoidance and minimization measures. These measures include BMPs such as silt fencing, jute mesh, straw wattles, compliance with the RWQCB's Erosion and Sediment Control Field Manual, and post-construction erosion monitoring. Implementation of Mitigation Measure BIO-4 would reduce potentially significant impacts related to soil erosion to a less-than-significant level. Furthermore, the project addresses historic erosion at the project site by proposing to install retaining walls, an upper and a

lower wall, in the southwest quadrant of the site. Placement of riprap and native vegetation along the creek bed would also address future erosion.

The project shall also comply with terms of the Marin County Stormwater Pollution Prevention Program and any additional measures required by the Regional Water Quality Control Board (RWQCB). BMPs associated with the project's Stormwater Pollution Prevention Program (SWPPP) prepared for its NPDES permit shall be implemented to minimize the potential for erosion and indirect effects associated with soil erosion (i.e., water quality impacts, fugitive dust). Implementation of Mitigation Measure BIO-4 and Mitigation Measure HYDRO-2 would reduce potentially significant impacts related to soil erosion to a less-than-significant level.

c) ***Less than Significant with Mitigation Incorporated.*** As discussed in 4.6a-iii above, the project site is located in an area with soils susceptible to liquefaction, which is a potentially significant impact. However, the purpose of the proposed project is the replacement of the existing bridge structure in order to address vulnerabilities and prevent failure resulting in collapse or loss of life during the Maximum Credible Earthquake. Implementation of Mitigation Measure GEO-1 above requires compliance with all recommendations listed in the site-specific geotechnical report, including those design elements specific to preventing bridge failure from liquefaction. Implementation of Mitigation Measure GEO-1 would reduce impacts related to soil failure to a less-than-significant level.

d) ***Less than Significant Impact.*** The potential for geologic and soil hazards from unstable or expansive soils in the project site is considered low based on data from the County of Marin: Marin Map Data Viewer. However, as described in Section 3.0 (Project Description) above, the riverine environment presents the potential for the collapse of the drilled holes and excavation required for bridge installation. As the contractor would utilize a variety of wet-drilling hole stabilization techniques, the potential for collapse would be minimized. Therefore, impacts would be less than significant.

e) ***No Impact.*** The project does not involve the construction of septic tanks or wastewater disposal systems. As such, project site soils would not prove inadequate for the construction of septic tanks or wastewater disposal systems, and no impact would occur.

f) ***Less than Significant with Mitigation Incorporated.*** While no paleontological resources are known to occur within the project site, three prehistoric sites are present within one-quarter miles of the proposed project site. Impacts related to potential accidental discovery of paleontological resources or unique geologic features would be minimized by implementation of mitigation measure GEO-2. Thus, the project would not destroy a unique paleontological resource or site or unique geological feature; and impacts would be less than significant with mitigation incorporated.

Mitigation Measure GEO-2

If buried paleontological resources or unique geologic features are discovered during ground-disturbing activities, work shall stop in that area and within 100 feet of the find until a qualified paleontologist or geologist can assess the significance of the find and, if necessary, develop appropriate treatment measures in consultation with the Town of Corte Madera and other appropriate agencies.

4.8 Greenhouse Gas Emissions

GREENHOUSE GAS EMISSIONS — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐	1, 9
b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒	1, 9

Environmental Setting

Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of greenhouse gases (GHGs) that contribute to global warming or global climate change have a broader, global impact. Global warming is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the earth's atmosphere. The principal GHGs contributing to global warming are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds. These gases allow visible and ultraviolet light from the sun to pass through the atmosphere, but they prevent heat from escaping back out into space.

Among the potential implications of global warming are rising sea levels, and adverse impacts on water supply, water quality, agriculture, forestry, and habitats. In addition, global warming may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health. Like most criteria and toxic air pollutants, much of the GHG production comes from motor vehicles. GHG emissions can be reduced to some degree by improved coordination of land use and transportation planning on the city, county, and subregional levels, and other measures to reduce automobile use.

In 2010, BAAQMD adopted quantitative thresholds of significance for construction activities, but only identified GHG thresholds of significance for operational emissions; the Town identified no GHG thresholds for construction-related activities.

Discussion of Impacts

a) ***Less than Significant Impact.*** GHG emissions from the proposed project would be produced from construction-related equipment emissions. The proposed project would not result in the generation of emissions after construction is complete. Given the nature of the proposed project and short duration of construction, GHG emissions resulting from construction activities would be minor. While the proposed project would have an incremental contribution to GHG emissions within the context of the Town and region, the individual impact is considered less than significant.

b) ***No Impact.*** The project would not generate significant emissions of GHG and, therefore, would not conflict with any applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

4.9 Hazards and Hazardous Materials

HAZARDS AND HAZARDOUS MATERIALS — Would the project:		*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐	1
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐	1
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒	1
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☒	☐	☐	1, 11
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the Project Area?	☐	☐	☐	☒	1
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐	1
g)	Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐	1

Environmental Setting

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined in Title 22 of the California Code of Regulations as follows:

> A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed. (California Code of Regulations, Title 22, Section 66261.10)

Chemical and physical properties cause a substance to be considered hazardous. Such properties include toxicity, ignitability, corrosivity, and reactivity (as defined in California Code of Regulations, Title 22, Sections 66261.20-66261.24). The release of hazardous materials into the environment could potentially contaminate soils, surface water, and groundwater supplies. Under Government Code Section 65962.5, the California Department of Toxic Substances Control (DTSC) maintains a list of hazardous substance sites. This list, referred to as the Cortese List, includes hazardous material sites, sites with leaking underground storage tanks, and landfills with evidence of groundwater contamination.

Discussion of Impacts

a) ***Less than Significant with Mitigation Incorporated.*** Small amounts of hazardous materials would be used during construction for equipment maintenance (e.g., fuel and solvents) and creosote-soaked timber would be removed from the existing bridge. The use of hazardous materials would be limited to the construction phase and would comply with applicable local, state, and federal standards on the handling and storage of hazardous materials. Hazardous materials would not be stored or used where they could affect nearby residences. No transport, use, or storage of hazardous materials would be required for bridge operation. However, the transport and use of hazardous materials during construction within San Anselmo Creek and near surrounding residences would result in a potentially significant impact. Implementation of Mitigation Measures HAZ-1 and HYDRO-2 would reduce impacts related to the transport, use, and disposal of hazardous materials to a less-than-significant level.

Mitigation Measure HAZ-1

The contractor shall use catchment containers and bridge removal methods to avoid dropping pieces of the creosote-soaked timber from the existing bridge into the creek. The creosote-laden wood members shall be disposed of by the contractor at an appropriate landfill.

b) ***Less than Significant with Mitigation Incorporated.*** As mentioned above, small amounts of hazardous materials would be used during construction activities for equipment maintenance and creosote-soaked timber would be removed from the existing bridge. Standard construction measures would be implemented to contain any accidental spills of oil and other hazardous materials, and the contractor would be required to ensure that adequate materials are on hand to clean up any accidental spill that may occur. Spills would be cleaned up immediately, and all wastes and used spill control materials would be properly disposed of at approved disposal facilities. Accidental release of these hazardous materials for construction or contaminated soils into San Anselmo Creek or near the surrounding residences would result in a potentially significant impact. Implementation of Mitigation Measure HYDRO-1 and HYDRO-2 would reduce this impact to a less than significant level.

c) ***Less than Significant Impact***. The project site is not within ¼ mile from an existing or proposed school. The nearest school, Deer Park Elementary, is located approximately 1.0-miles east of the project site. Additionally, operation and maintenance of the project would not emit hazardous emissions or utilize hazardous substances. Waste utilities will be temporarily relocated during construction to prevent accidental releases. Therefore, the project would have a less than significant impact with respect to emitting hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d) ***No Impact.*** The proposed project site is not included on the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5; therefore, no impact would occur under this criterion.

e) ***No Impact.*** The project site is not within the vicinity or approach/departure flight path of a public airport or private airstrip, nor is it within an airport land use plan. Therefore, the project would not have an impact related to aeronautical safety hazards or excessive noise for people working or residing in the project site.

f) ***Less than Significant with Mitigation Incorporated.*** While no formal emergency evacuation or response plans have been adopted for the Town of Fairfax, the project site provides the only access point for residents located on the southern stretch of Meadow Way. Emergency access to or evacuation from surrounding areas would be restricted during construction because traffic would be detoured to a temporary bridge. During the temporary road closure, emergency fire and paramedic crews would be stationed on both sides of the bridge. Furthermore, implementation of Mitigation Measures TRANS-1 would require best management practices for noticing and operating the detour and road closure. Implementation of Mitigation Measure TRANS-1 would reduce impacts related to emergency response plans and emergency evacuations plans to a less-than-significant level.

g) ***Less than Significant Impact.*** The project site is located within and adjacent to an area subject to moderate threats of wildland fires.[9] Short-term construction of the proposed project may expose people to increased risk from wildland fires due to the temporary road closure and temporary bridge detour. However, as described in the Project Description, emergency personnel, including fire crews, would be stationed on both sides of the bridge during the short-term road closure. Emergency vehicle access would be provided via the temporary bridge during all other construction activities. San Anselmo Creek will remain as a fire escape corridor for evacuation of the residents on foot. The long-term operation of the proposed project would not increase the risk of wildfire. Therefore, impacts related to the risk of wildland fires would be less than significant.

[9] *ABAG. ABAG Geographical Information Systems - Wildland Urban Interface (WUI) Fire Threat. Accessed March 16, 2019. Available at: http://quake.abag.ca.gov/wildfires/. .*

4.10 Hydrology and Water Quality

HYDROLOGY AND WATER QUALITY — Would the project:	***Potentially Significant Impact***	***Less than Significant with Mitigation Incorporated***	***Less than Significant Impact***	***No Impact***	***Source***
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☒	☐	☐	1, 2, 4
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒	1, 2, 4
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:					
i. Result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒	1, 2, 4
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒	1, 2, 4
iii. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒	1, 2, 4
iv. Impede or redirect flood flows?	☐	☐	☐	☒	1, 2, 4
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☒	☐	☐	1, 2, 4
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☒	☐	☐	1, 2, 4

Environmental Setting

The 28-square mile Corte Madera watershed extends from Mt. Tamalpais and White's Hill through the communities of Fairfax, Sleepy Hollow, San Anselmo, Ross, Kentfield, Greenbrae, Larkspur, and Corte Madera to San Francisco Bay. The watershed includes 44 miles of stream channels. Ross Creek drains the northern slope of Mt. Tamalpais; San Anselmo Creek and its tributaries drain the northwestern portion of the watershed. The two channels join to form Corte Madera Creek, which continues through more than a mile of concrete-lined channel past the confluences of Larkspur and Tamalpais Creeks and into the salt marsh at the mouth.

Protection of water quality in California is primarily the responsibility of the State Water Quality Control Board (SWQCB), and, on a regional basis, the nine California Regional Water Quality Control Boards. Water quality within the project site is primarily under the jurisdiction of the RWQCB, San Francisco Bay Region (Region 2). The Town of Fairfax is responsible for overseeing the requirements of its water quality codes and ordinances.

The principal natural hydrological sources for the project site are creek flows, direct precipitation and surface run-off from adjacent lands. San Anselmo Creek flows through the project site towards the north/northeast.

According to the Federal Emergency Management Agency (FEMA) Federal Insurance Rate Maps (FIRM), the project site is located in Zone X "Other Flood Areas" and is described as "0.2% chance annual flood discharge contained within channel". According to ABAG's Resilience Program Hazard Maps, the project site is not subject to seiches and is not within a Tsunami Inundation Area.

Discussion of Impacts

a) ***Less than Significant with Mitigation Incorporated.*** The proposed project would require the use of hazardous materials such as vehicle fuels during the construction phase of the project. The primary risk to water quality and resources would result from construction-related sediment and other pollutants entering the during a rain event. As described in Section 3.0 (Project Description) above, very little to no flow is expected during the peak summer construction months and a bypass pipe would be installed to convey low-flow volumes downstream of the bridge.

Construction impacts could potentially include increased sediment at the project site. As construction equipment would be located directly within San Anselmo Creek, this is a potentially significant impact. Construction activities would be required to comply with the NPDES general permit for construction activities. In compliance with Mitigation Measure HYDRO-2, a SWPPP would be prepared with a list of BMPs to minimize erosion and sedimentation.

In addition to the above permit conditions, Mitigation Measure HYDRO-1 would require the preparation of a Spill Prevention and Control Plan and an Equipment Staging Plan to address the potential for hazardous materials such as vehicle fuels to enter San Anselmo Creek. Implementation of Mitigation Measures HYDRO-1 and HYDRO-2 would reduce impacts to water quality to a less than significant level.

Mitigation Measure HYDRO–1

Prior to the issuance of construction permits, a spill prevention and control plan shall be developed to minimize the chance of toxic spills. Spill kits shall be present for any work within San Anselmo Creek. All spills of oil and other hazardous materials shall be immediately cleaned up and contained. Any hazardous materials cleaned up or used on-site shall be properly disposed of at an approved disposal facility.

Additionally, the Town of Fairfax shall require the construction contractor to submit an equipment staging plan and proposed staging locations prior to the start of construction. The specifications shall include at minimum, the following requirements:

- The staging area shall be located on existing asphalt or concrete surface area. No staffing shall be permitted on undeveloped lots. The Contractor shall notify the Town whether or not a suitable area is available.
- The staging area shall be included in the SWPPP.
- The staging area shall not be located in an environmentally or culturally sensitive area and / or impact water resources (rivers, streams, bays, inlet, lakes, drainage sloughs).
- The staging area shall not be located in a regulatory floodway within the base floodplain (100-year).

Mitigation Measure HYDRO-2

Prior to the issuance of a construction permit, the contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the NPDES General Construction Permit. Best Management Practices shall be identified in the SWPPP to reduce or eliminate pollutants from the construction site entering stormwater discharges. Implementation of BMPs shall control erosion and ensure that dirt, construction materials, pollutants, or other human-associated materials are not discharged from the project area into surface waters or into areas that would eventually drain to storm drain systems.

b) ***No Impact.*** The project would not require the use of groundwater supplies or affect groundwater recharge in the area. Therefore, the project would not impede sustainable groundwater management, and no impact would occur.

c-i) ***Less than Significant with Mitigation Incorporated.*** The site and the configuration of the existing bridge have resulted in historic bank erosion and bridge foundation scour. Operation of the proposed replacement bridge would alter the drainage San Anselmo Creek, but the placement of a proposed retaining wall on the southwest quadrant of the site, as well as riprap and native vegetation along the creek bed, would reduce potential future erosion. Construction of the proposed replacement of the Meadow Way Bridge would include excavation within the creek bed, which has the potential to result in erosion and siltation impacts. As described in Section 3.0 (Project Description), any water collected in excavation pits or pools on the creek bed would be run through sediment control tanks before being released in the creek to prevent potential sedimentation impacts. Implementation of Mitigation Measures BIO-3 and HYDRO-2 would reduce impacts to a less than significant level.

c-ii) ***Less than Significant Impact.*** The proposed project would not substantially alter the existing drainage pattern of the area. The bridge would be designed so that its soffit (underside) clears the 100-year flood flow and passes the 50-year flood flow with two feet of freeboard. As the 100-year-flood is predicted to be 141.8-feet, and the bridge deck elevation would be 155-feet, over 11-feet would be available for structure depth.

The existing bridge is only 14-feet wide and Caltrans has determined the bridge is too narrow for both automobiles and pedestrians to use the bridge safely. Therefore, the replacement bridge would include a 21-foot and 6-inch wide deck, increasing the number of impervious surfaces on the site. However, due to the design elevation of the bridge and predicted flow elevations, the creek would have the capacity for the minimal increase in runoff that would result from this increase in impervious surface. No flooding on- or off-site would be expected as a result of the replacement bridge. Therefore, impacts related to drainage and flooding would be less than significant.

c-iii) ***Less than Significant Impact.*** As described above, the proposed replacement bridge would increase the amount of impervious surface within the project site and would, therefore, result in increased stormwater runoff. No changes to the existing stormwater drainage pipes are included in the proposed project. The minimal increase in runoff from the wider deck would discharge directly into the creek and would not impact the existing stormwater drainage facilities. Therefore, impacts related to drainage and stormwater system capacity would be less than significant.

g) ***Less than Significant Impact.*** The proposed replacement bridge would be designed so that its soffit (underside) clears the 100-year flood flow and passes the 50-year flood flow with two feet of freeboard. Thus, the project would not impede or redirect flood flows, and a less than significant impact would occur.

i) ***Less than Significant with Mitigation Incorporated.*** According to the ABAG Hazard Mapping Program, the project site is not located within an area subject to tsunamis or seiches. The project is not located within a 100-year flood zone, but flooding is possible during very high-flow events. If such an event were to occur during construction, pollutants from construction equipment could be released. However, Mitigation Measure HYDRO-1 requires preparation of a Spill Prevention Plan and equipment staging in an area where pollutants would not enter San Anselmo Creek. As such, the project would not risk the release of pollutants due to project inundation by flood, tsunami, or seiche, and impacts would be less than significant with mitigation incorporated.

e) ***Less than Significant Impact.*** The project would not interfere with groundwater management, as no groundwater would be used, and minimal impervious surfaces would be introduced. However, soil erosion and accidental spills during construction could conflict with water quality control plans, including Total Maximum Daily Loads (TMDLs) for the San Francisco Bay and Corte Madera Creek. Implementation of Mitigation Measures HYDRO-1 and HYDRO-2 would minimize the risk of conflict with water quality control plans. Thus, there would be no conflict with groundwater management or water quality control plans, and impacts would be less than significant with mitigation incorporated.

4.11 Land Use and Planning

LAND USE AND PLANNING – Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Physically divide an established community?	☐	☒	☐	☐	1
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐	2, 3

Environmental Setting

The Town of Fairfax General Plan provides policies and implementation strategies for management of the resources and land uses in the Town, and the Town Codes provide restrictions and requirements to protect resources and comply with local, state, and federal laws. No habitat conservation plans have been adopted for the area.

Town of Fairfax General Plan

The proposed project is subject to the following General Plan policies:

Land Use Element

Policy LU-4.1.2: New and renewed development shall comply with all federal, state, and local regulations pertaining to development in flood zones.

Policy LU-4.1.3: New and renewed development shall comply with all regulations encompassed in the California and Uniform Building Codes intended to reduce potential damage and threats to the public's health, safety, and welfare in the event of an earthquake.

Policy LU-7.2.2: To the extent feasible natural features including the existing grade, mature trees, and vegetation shall be preserved for new and renewed development.

Circulation Element

Policy C-2.2: Maintain the street, sidewalk and pathway network through a regular maintenance program.

Conservation Element

Policy Con-2.1.2: All planning decisions shall require application of existing air quality guidelines and best practices to minimize air quality impact.

Policy Con-3.1.1: Maintain floodwater capacity and promote creek restoration.

Policy Con-3.1.2: The Town of Fairfax shall protect and restore riparian habitat and ensure natural channel process in the San Anselmo Creek and Fairfax Creek watersheds.

Policy Con-5.2.1: Maintain and restore native vegetation where appropriate for habitat value, aesthetics, reference habitat, and riparian cover.

Policy Con-6.1.2: Protect special-status species and resident and migrant wildlife, and their habitats, within the Fairfax Planning Area

Policy Con-8.2.1: Protect, maintain, rehabilitate, and enhance historical and cultural resources within the Fairfax Planning Area.

Policy Con-8.2.3: Ensure that development respects and complements the patterns, character, and scale of the Town's traditional communities and natural landscape.

Health and Safety Element

Policy S-1.1.3: The Town shall identify, evaluate, and encourage the seismic retrofit of public and private buildings that pose a risk of death or injury in a geohazard event.

Policy S-3.1.3: Maximize access and egress for emergency response vehicles.

Noise Element

Policy N-1.1.1: All new development must include an analysis of potential noise impacts.

Municipal Code

8.36 Trees

In 1973, the Town of Fairfax approved Ordinance No. 387 for trees. The purpose of the ordinance is to preserve the wide variety of local native trees and to protect the benefits they provide the citizens. Chapter 8.36.020 of the Town Code defines "altering" and "tree." A Tree Permit is required for removal or significant trimming of any tree, which has a circumference of 24 inches or more measured at 24 inches above the ground. In effect, this is a little less than an 8-inch diameter tree trunk.

Discussion of Impacts

a) ***Less than Significant with Mitigation Incorporated.*** The proposed project involves the replacement of an existing bridge within the Town of Fairfax. Upon completion of construction, the project site would function similarly to existing conditions. The replacement bridge would be a one-lane single-span bridge and would not result in an increased capacity for vehicle trips. While the deck of the replacement bridge would be wider than the existing bridge, this is to allow for a safe, designated pedestrian lane. During construction, a temporary bridge would be staged to allow pedestrian, bicycle, and vehicle access through the project site to the residential neighborhood. Construction traffic and this temporary bridge would result in a potentially significant impact, as Meadow Way is the only exit route for the residences located on the southwest side of the bridge.

As traffic would need to be shut down in order to move the bridge to its permanent location, this would occur in one evening after 5:00 p.m. in order to provide the least disruption for local residences that depend on this bridge for access. Mitigation Measure TRANS-1 would require best management practices for noticing and operating the temporary bridge detour and road closure. Implementation of Mitigation Measure TRANS-1 would reduce impacts related to the division of an established community to a less than significant level.

b) ***Less than Significant Impact.*** Land use plans, policies, and regulations applicable to the proposed project are outlined above. The project would improve safety and reduce hazards. These actions would not conflict with the Town of Fairfax General Plan or other applicable plans or policies. As the proposed project would include the removal of trees, the Applicant would be required to comply with the Town's municipal code requirements and would be required to apply for a tree removal permit. Furthermore, as described in the Project Description, the Applicant will be responsible for preparing a Tree Protection Plan to ensure the survival of adjacent and remaining trees through the development process. Therefore, the proposed project would not conflict with applicable Town plans or policies, and no impact would occur.

4.12 Mineral Resources

MINERAL RESOURCES — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒	2
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land-use plan?	☐	☐	☐	☒	2

Environmental Setting

The project site is located within an urbanized area of the Town of Fairfax. According to the Town's General Plan, no known mineral resources have been identified within the vicinity of the project site. According to the California Department of Conservation Division of Mines and Geology, the project site is located within a Mineral Resource Zone 1 (MRZ-1), which is classified as an area where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.

Discussion of Impacts

a) ***No Impact.*** As stated above, the project site is not located in or adjacent to any important mineral resource zones. Therefore, the proposed project would not result in the loss of availability of a known resource, and no impact would occur.

b) ***No Impact.*** As stated above, the project site is not located within an important mineral resource zone. Furthermore, the Town's General Plan does not identify the project site as within a locally important mineral resource recovery site. Therefore, the proposed project would not result in the loss of a locally important mineral resource, and no impact would occur.

4.13 Noise

NOISE — Would the project result in:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐	1 ,2
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐	1
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport of public use airport, would the project expose people residing or working in the Project Area to excessive noise levels?	☐	☐	☐	☒	1

Environmental Setting

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise, in accordance with the Caltrans Environmental Handbook, is typically defined as unwanted sound. A typical noise environment consists of a base of steady “background” noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway.

Several rating scales have been developed to analyze the adverse effect of community noise on

people. Since environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Those that are applicable to this analysis are as follows:

- L_{eq} – An L_{eq}, or equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- L_{max} – The maximum instantaneous noise level experienced during a given period of time.
- L_{min} – The minimum instantaneous noise level experienced during a given period of time.
- CNEL – The Community Noise Equivalent Level is a 24-hour average Leq with a 5 dBA "weighting" during the hours of 7:00 P.M. to 10:00 P.M. and a 10 dBA "weighting" added to noise during the hours of 10:00 P.M. to 7:00 A.M. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day, night, or over a 24-hour period. For residential uses, environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60–70 dBA range, and high above 70 dBA.[10] Noise levels greater than 85 dBA can cause temporary or permanent hearing loss. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet suburban residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate level noise environments are urban residential or semi-commercial areas (typically 55–60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60–75 dBA) or dense urban or industrial areas (65–80 dBA).

It is widely accepted that in the community noise environment, the average healthy ear can barely perceive CNEL noise level changes of 3 dBA. CNEL changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. A 5 dBA CNEL increase is readily noticeable, while the human ear perceives a 10 dBA CNEL increase as a doubling of sound.

Noise levels from a particular source generally decline as the distance to the receptor increases. Other factors, such as the weather and reflecting or barriers, also help intensify or reduce the noise level at any given location. A commonly used rule of thumb for roadway noise is that for

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[10] *Office of Planning and Research, State of California General Plan Guidelines, October 2003 (in coordination with the California Department of Health Services).*

every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically "hard" locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically "soft" locations (i.e., the area between the source and receptor is normal earth or has vegetation, including grass). Noise from stationary or point sources is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels are also generally reduced by 1 dBA for each 1,000 feet of distance due to air absorption. Noise levels may also be reduced by intervening structures – generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The normal noise attenuation within residential structures with open windows is about 17 dBA, while the noise attenuation with closed windows is about 25 dBA.[11]

Under the Caltrans Traffic Noise Analysis Protocol (CaTNAP) 1998, projects that are not Type I only require an evaluation of predicted construction noise. The project is not a Type I project as defined in 23 CFR 772.5(h); "construction on new location or the physical alteration of an existing highway, which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes." The proposed project is the replacement of the existing Meadow Way Bridge within the Town of Fairfax.

The project would take place within existing right-of-way in a residential neighborhood. The nearest residential properties to the project are situated within 10 feet of the APE for the project. Noise sources that contribute to ambient noise levels in and adjacent to the project site include traffic from local streets and noise from residential activities. Table 1 summarizes typical ambient noise levels based on population density. The vicinity of the project area is most similar to that of a "quiet suburban residential or small town" setting with an expected typical noise level of 45-50 dBA.

[11] *National Cooperative Highway Research Program Report 117, Highway Noise: A Design Guide for Highway Engineers, 1971.*

Table 1. Population Density and Associated Ambient Noise Levels

Population Density Type	dBA, Ldn
Rural Suburban	40–50
Quiet suburban residential or small town	45–50
Normal suburban residential urban	50–55
Normal urban residential	60
Noisy urban residential	65
Very noisy urban residential	70
Downtown, major metropolis	75–80
Under flight path at major airport, 0.5 to 1 mile from runway	78–85
Adjoining freeway or near a major airport	80–90
Sources: Cowan 1984, Hoover and Keith 1996	

Discussion of Impacts

a) ***Less than Significant with Mitigation Incorporated.*** The proposed project would not include major permanent noise-generating facilities. The proposed replacement bridge would include a wider road. However, it would remain a one-lane road. Therefore, the replacement bridge would not expand capacity or increase traffic volumes. Noise from operation of the proposed project would be similar to existing ambient conditions. Therefore, the proposed project would not result in a permanent increase in ambient noise levels.

Noise generated by project-related construction activities would be a function of the noise levels generated by individual pieces of construction equipment, the type and amount of equipment operating at any given time, the timing and duration of construction activities, the proximity of nearby sensitive land uses, and the presence or lack of shielding at these sensitive land uses. Construction noise levels would vary on a day-to-day basis during each phase of construction, depending on the specific task being completed. Each construction phase would require a different combination of construction equipment necessary to complete the task and differing usage factors for such equipment. Construction noise would primarily result from the operation of heavy construction equipment and the arrival and departure of heavy-duty trucks.

Activities associated with the earthwork and replacement phases of the project would generate hourly average noise levels up to 86 dBA Leq at a distance of 50 feet. Maximum instantaneous noise levels would reach 86 dBA Lmax at 50 feet. This replacement project does not include pile driving activities. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor; therefore, the noise levels calculated at 50 feet would be about 6 dBA less at 100 feet and 12 dBA less at 205 feet. Shielding provided by buildings or terrain would result in even lower construction noise levels at distant receptors.

Construction-related vehicles traveling to and from the project site would generate worst-hour noise levels of approximately 57 dBA Leq at a distance of 50 feet from the center of Meadow Way, assuming that the highest levels of noise are achieved.

During Construction Stages 1 and 2, no nighttime construction is anticipated for the proposed project. During the Final Construction Stage, on one evening, a few hours of construction would occur in order to move the replacement bridge into its final location. This evening construction is necessary as Meadow Way serves as the only ingress/egress for residences across the creek from Cascade Drive and access would be completely closed off during this time. Therefore, it is necessary this construction work take place when little to no traffic would be impacted by this closure.

Although the construction of the proposed project would elevate noise levels at nearby noise-sensitive land uses by 25 dBA or more above ambient daytime conditions, the duration of the project is expected to be approximately 6 months. Construction activities for the proposed project should include the following best management practices, as suggested in the Town's General Plan, to reduce noise from construction activities nearby sensitive land uses

Mitigation Measure NOISE-1

In order to comply with Policy N-3.1.4, the Town of Fairfax has developed a list of Standard Controls. The project shall comply with the following measures:

- Limit construction to the hours of 8:00 a.m. to 5:00 p.m. on weekdays, and 9:00 a.m. to 5:00 p.m. on Saturdays, with no noise-generating construction on Sundays or Holidays.
- Control Noise from construction workers' radios to the point where they are not audible at existing residences that border the project site.
- Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment.
- Utilize quite models of air compressors and other stationary noise sources where technology exists.
- Locate stationary noise-generating equipment as far as possible from sensitive

receptors when sensitive receptors adjoin or are near a construction project area.

- Prohibit unnecessary idling of internal combustion engines.
- Equipment to the extent feasible shall be stage off-site.
- Notify residents adjacent to the project site of the construction schedule in writing.
- Designate a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (e.g. starting too early, bad mufflers) and institute reasonable measures warranted to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site.

In addition, the project shall follow the standard construction noise requirements regulated by Caltrans Sections 7-1.01I and 14-8.02 of the Standard Specifications, which states the following:

- Do not exceed 86 dBA at 50 feet from the job site activities from 9 p.m. to 6 a.m.
- Equip an internal combustion engine with the manufacturer-recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.

b) ***Less than Significant Impact.*** The construction of the proposed project may generate perceptible vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Construction activities would include site preparation work, dewatering, excavation, bridge staging, bridge replacement, and paving. The proposed project would include abutments that need to be supported with piles. However, as described in the Project Description, 24-inch diameter CIDH piles would be used rather than driven piles, to minimize disturbance to surrounding residences.

For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec Peak Particle Velocity (PPV) for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.08 in/sec PPV for ancient buildings or buildings that are documented to be structurally weakened. All buildings in the project vicinity are assumed to be structurally sound, but these buildings may or may not have been designed to modern engineering standards. No ancient buildings or buildings that are documented to be structurally weakened are known to exist in the area. Therefore, ground-borne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in a significant vibration impact.

Table 2 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock

equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Jackhammers typically generate vibration levels of 0.035 in/sec PPV, and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. The single-family residences in the immediate project vicinity range from 50 to 205 feet; at these distances, vibration levels would be expected to be 0.1 in/sec PPV or less, below the 0.3 in/sec PPV significance threshold. This would be a less-than-significant impact and would not require mitigation.

Table 2. Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Approximate L_V at 25 ft. (VdB)
Pile Driver (Impact)	upper range	1.158	112
	typical	0.644	104
Pile Driver (Sonic)	upper range	0.734	105
	typical	0.170	93
Clam shovel drop		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.

c) ***No Impact.*** The project site is not within the vicinity of a public airport or private airstrip, nor is it within the jurisdiction of an airport land-use plan. Therefore, no impacts associated with excessive airplane noise are expected.

4.14 Population and Housing

POPULATION AND HOUSING — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒	1
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒	1

Environmental Setting

The project site is located in a residential neighborhood community of the Town of Fairfax. The General Plan land use designations surrounding the project site include low-density residential and medium density residential. Surrounding land uses include San Anselmo Creek and residential homes.

Discussion of Impacts

a) ***No Impact.*** The proposed project includes the replacement of an existing bridge. The proposed project is consistent with the existing uses for the site and there is no housing located on-site. The proposed project does not include the construction of any homes or infrastructure that would induce population growth. Upon completion of the replacement bridge, the operation of the site would function in a similar manner as under existing conditions. Therefore, the project would not induce substantially unplanned population growth, and no impact would occur.

b) ***No Impact.*** The proposed project includes the replacement of an existing bridge and would not displace any existing people or housing. Thus, no replacement housing would be required, and no impact would occur.

4.15 Public Services

PUBLIC SERVICES — Would the project:	***Potentially Significant Impact***	***Less than Significant with Mitigation Incorporated***	***Less than Significant Impact***	***No Impact***	***Source***
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:					
Fire protection?	☐	☐	☒	☐	1
Police protection?	☐	☐	☒	☐	1
Schools?	☐	☐	☐	☒	1
Parks?	☐	☐	☐	☒	1
Other public facilities?	☐	☐	☐	☒	1

Environmental Setting

The Ross Valley Fire Department (RVFD) currently provides fire protection and emergency response services to the communities of Ross, San Anselmo, Sleepy Hollow and Fairfax. The RVFD operates four fire stations. RVFD Station 21 provides fire protection and paramedic services to the project site. Station 21 is located at 10 Park Road. The project site is within approximately one mile of the station.

The Town of Fairfax Police Department (FPD) provides police protection services to the project sites. The FPD employs 11 full-time Police Officers, two Reserve Police Officers, four full-time Police Dispatchers, one Community Services Technician and four part-time Police Dispatchers. The FPD station is located at 44 Bolinas Road. All project site is within approximately one mile of the station.

There is only a single school in the immediate vicinity of the project site. Deer Park Elementary is approximately 1/2 mile east of the project site.

The recreational parks within the general vicinity of the project site are the Contratti Park Baseball Field and Doc Edgar Park.

Discussion of Impact

a) The proposed project would not rely on the addition or alteration of any public services. No residential or commercial construction is proposed. The project would not lead to a population increase that could result in additional demand for public services, and would not require the construction of new public service facilities or the expansion of existing public service facilities. As such, the project would not result in significant physical impacts associated with the provision of new or physically altered governmental facilities.

a-i) ***Less Than Significant Impact.*** The RVFD would continue to provide fire protection services to the project site upon development. As discussed in Impact 4.14(a), the project would not include construction of any residential structures or result in an increase in residential population. Emergency fire and paramedic crews would be stationed on both sides of the bridge to provide emergency services to surrounding residences during any closure. It is not anticipated that the project would necessitate the expansion of existing or construction of new fire protection facilities. Furthermore, the replacement bridge would allow for a heavier vehicle load than under existing conditions, allowing for both fire vehicles at the Fairfax Fire Station (Station 21) to access the residences located on the east side of the bridge. Therefore, project impacts related to fire protection services would be less than significant

a-ii) ***Less Than Significant Impact.*** During construction, a minor demand for additional FPD services may occur during the project's construction phase. Such services include, but may not be limited to, consultation during plan check, routine surveillance of the construction site by regular patrol units, potential investigations of theft of or vandalism to construction equipment and materials, and enforcement of local speed limits near the construction site. However, the operational phase of the proposed project not result in increased service call responses from the FPD due to the lack of residential or commercial development. It is not anticipated that the project would necessitate the expansion of existing or construction of new police protection facilities. Therefore, project impacts related to police protection services would be less than significant

a-iii) ***No Impact.*** As discussed in Impact 4.14(a), the proposed project would not include construction of any residential structures. The project would not result in an increase of population that would require additional school facilities. Therefore, no impact would occur.

a-iv) ***No Impact.*** As discussed in Impact 4.14(a), the proposed project would not include construction of any residential structures. As the project would not induce population growth, the project would not create a need for additional park or recreational services. Therefore, no impact would occur.

a-v) ***No Impact.*** As discussed in Impact 4.14(a), the proposed project would not include construction of any residential structures. The project would not induce population growth, the project would not create a need for other public facilities. No impact would occur.

4.16 Recreation

RECREATION — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒	1
b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒	1

Environmental Setting

The recreational parks within the general vicinity of the project site are the Contratti Park Baseball Field and Doc Edgar Park.

Discussion of Impacts

a) ***No Impact.*** The purpose of the proposed project is to replace an existing bridge and the project would not involve the construction of any additional housing or businesses that could increase residents and/or employees in the project site. The proposed project would not increase the use of nearby recreational facilities. Therefore, no impact would occur.

b) ***No Impact.*** The purpose of the proposed project is to replace an existing bridge and the project site does not include any recreational facilities. The proposed project would not require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment. Therefore, no impact would occur.

4.18 Transportation

TRANSPORTATION — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, and bicycle and pedestrian facilities?	☐	☒	☐	☐	1, 4, 6
b) Conflict with or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	☐	☐	☒	☐	1, 4, 6
c) Substantially increase hazards to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒	1, 4, 6
d) Result in inadequate emergency access?	☐	☐	☒	☐	1, 4, 6

Environmental Setting

The General Plan provides classification of major streets in Fairfax (arterial and local). Arterials carry regional trips and traffic between areas of the town while providing access to major traffic generators. Collector streets link neighborhoods to arterial streets and carry through traffic for short segments in residential and commercial areas, while local streets provide direct access to parcels and residences. *The project site is located along Meadow Way, which is classified as a local street.* There are no Principal Arterial Roadways, as designated by the Congestion Management Program, in or adjacent to the project site.

Regulatory Setting

Local Regulations

General Plan

Program S-1.1.5.1: Seek funding through Caltrans Local Highway Bridge Program and explore other funding sources to retrofit bridges identified by Caltrans or other technical evaluations as seismically deficient. Determine the seismic stability of Meadow Way, Marin Road (adjacent to Manor Circle) and Creek Road bridges.

Marin County Congestion Management Plan (CMP)

The Transportation Authority of Marin established the CMP roadway network in 1991. The designated CMP roadway system includes all state highways and principal arterial roadways in Marin County. The CMP roadway system is a network that allows performance monitoring in terms of established Level of Service (LOS) standards. The project site is not located within the vicinity of any CMP-designated roadways.

Pedestrian and Bicycle Master Plan

The Town's Pedestrian and Bicycle Master Plan provide for a town-wide network of bicycle paths, lanes and routes, along with bicycle-related programs and support facilities, intended to ensure bicycling becomes a viable transportation option. Meadow Way is not included in this plan as a designated or proposed bicycle or pedestrian facility.

Discussion of Impacts

a) ***Less than Significant with Mitigation Incorporated.*** The proposed project would replace the existing bridge. While the replacement bridge would have a wider deck, it would continue only to have one travel lane and would not increase the bridge's current capacity. The additional width of the bridge would provide for safe pedestrian and bicycle access, as the existing bridge is currently too narrow for both pedestrians and motorized traffic to travel safely. Although the project would positively impact the pedestrian network, the temporary bridge detour and temporary road closure during the final construction stage would result in potentially significant impacts related to the performance of the intersection and roadway. Mitigation Measure TRANS–1 includes control measures to alert travelers to potential delays and would ensure construction-related impacts are less than significant.

Mitigation Measure TRANS–1

The Town shall require that no work or traffic control be allowed before 8:00 a.m. weekdays and 9:00 a.m. Saturdays and Sundays. No work shall be allowed after 5:00 p.m., unless otherwise noted. At least one week prior to the commencement of work, the Town shall require the contractor to provide project information signs to notify drivers of the upcoming project and potential delays.

Lane closure and traffic control shall conform to the California Manual on Uniform Traffic Control Devices, Caltrans standard plans and specifications. Car and pedestrians shall be kept within the small detour area with temporary railing (Type K) and temporary fencing. The contractor will install advance warning signs to alert bicyclists and motorists of the work zone and lane closures. Advance warning signs may be reflective signs, changeable message boards, cones, and barricades. Flagging and other means of traffic control shall be required to allow for the safe movement of traffic through the work zone. The contractor shall provide flaggers to temporarily hold traffic for staging equipment or construction. Work shall be performed in a manner that is least disruptive to the public. The contractor shall consult and coordinate with the property owner if access is affected.

b) ***Less than Significant Impact.*** According to CEQA Guidelines Section 15064.3, Subdivision (b), a project's effects on automobile delay do not constitute significant environmental impacts. Instead, vehicle miles traveled (VMT) is the most appropriate measure of the project's impact on transportation; and projects that would reduce VMT in their vicinity should be considered to have a less-than-significant transportation impact.

The project would lead to a small, minimal increase in VMT due to the transportation of construction equipment and personnel, as well as a very brief, small increase in VMT due to the temporary road closure and detour. Construction equipment would be staged just a half-mile away from the site at the end of Hickory Road at Cascade Road, minimizing construction VMT and making this increase less than significant. The detour would only last a few hours and would impact a minimal quantity of people, making this increase in VMT negligible.

In the long-term, the project would not lead to an increase in VMT. The replacement bridge would not contain a new path or additional features that might accommodate increased vehicles. As no substantial increases in VMT are anticipated to result from the project, the project would be consistent with CEQA Guidelines Section 15064.3, subdivision (b); and a less than significant impact would occur.

c) ***No Impact.*** The project would replace the existing bridge and would not include any new features that could increase hazards due to a design feature or incompatible uses. Adequate sight distance would be available for motorists to access and depart the replacement bridge as ingress and egress at the bridge would remain the same as under existing conditions. Therefore, no impact would occur.

d) ***Less than Significant with Mitigation Incorporated.*** Emergency access to or evacuation from surrounding areas would be restricted during construction because traffic would be detoured to a temporary bridge during the construction phase of the bridge replacement. The detour and temporary road closure would result in a potentially significant impact related to emergency response and emergency evacuation. During the temporary road closure, emergency fire and paramedic crews would be stationed on both sides of the bridge. Furthermore, implementation of Mitigation Measures TRANS-1 would require best management practices for noticing and operating the temporary bridge detour and road closure. Implementation of Mitigation Measure TRANS-1 would reduce impacts related to emergency response plans and emergency evacuations plans to a less-than-significant level.

Mitigation Measure TRANS–1

The Town shall require that no work or traffic control be allowed before 8:00 a.m. weekdays and 9:00 a.m. Saturdays and Sundays. No work shall be allowed after 5:00 p.m., unless otherwise noted. At least one week prior to the commencement of work, the Town shall require the contractor to provide project information signs to notify drivers of the upcoming project and potential delays.

Lane closure and traffic control shall conform to the California Manual on Uniform Traffic Control Devices (CAMUTCD), Caltrans standard plans and specifications. Car and pedestrians shall be kept within the small detour area with temporary railing (Type K) and temporary fencing. The contractor will install advance warning signs to alert bicyclists and motorists of the work zone and lane closures. Advance warning signs may be reflective signs, changeable message boards, cones, and barricades. Flagging and other means of traffic control shall be required to allow for the safe movement of traffic through the work zone. The contractor shall provide flaggers to temporarily hold traffic for staging equipment or construction. Work shall be performed in a manner that is least disruptive to the public. The contractor shall consult and coordinate with the property owner if access is affected.

4.17 Tribal Cultural Resources

TRIBAL CULTURAL RESOURCES — Would the project:		***Potentially Significant Impact***	***Less than Significant with Mitigation Incorporated***	***Less than Significant Impact***	***No Impact***	***Source***
a)	Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
i)	Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	☐	☒	☐	☐	1, 12
ii)	A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐	1, 12

Environmental Setting

The Town of Fairfax retained Far Western Anthropological Research Group (Far Western) to survey the potential for cultural and archaeological resources, including tribal resources, to occur within the area of potential effect. Far Western contacted the Native American Heritage Commission (NAHC) in August 2017 to request a review of the Sacred Lands file for information on Native American cultural resources in the study area and to request a list of Native American contacts in the vicinity of the project site. In a response dated August 31, 2017, the NAHC stated that there are no known Native American cultural resources in the immediate vicinity of the project.

Additionally, letters were sent to Gene Buvelot and Greg Sarris of the Federated Indians of Graton Rancheria (FIGR). FIGR has previously requested consultation under AB52 on other bridge replacement and repair projects nearby. FIGR requested an update with findings of the archaeological study of the project site and a copy of the final report. No further response was received.

Far Western conducted a literature search at the Northwest Information Center and found that there were no known archaeological sites within a quarter-mile of the area of potential effect. Further, there are no known historic resources in or near the project site, and the bridge itself has been deemed not eligible for listing in the National Register of Historic Places. Far Western subsequently assessed the site's sensitivity for buried resources. They determined that the site has very low sensitivity for buried prehistoric resources due to the erosional topography and age of the landform. A pedestrian survey of the area of potential effect occurred on January 28, 2015; and no resources were identified.

Regulatory Setting

In September 2014, the California Legislature passed Assembly Bill (AB) 52, which added provisions to the Public Resources Code (PRC) concerning the evaluation of impacts on tribal cultural resources under CEQA, and consultation requirements with California Native American tribes. In particular, AB 52 now requires lead agencies to analyze a project's impacts on "tribal cultural resources," separately from archaeological resources (PRC Section 21074; 21083.09). Under AB 52, tribal cultural resources include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either (1) listed, or determined to be eligible for listing, on the state or local register of historic resources; or (2) a resource that the lead agency chooses, in its discretion, to treat as a tribal cultural resource (PRC Section 21074).

AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC Sections 21080.3.1, 21080.3.2, 21082.3). If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document must discuss (1) whether the proposed project has a significant impact on an identified tribal cultural resource and (2) whether feasible alternatives or mitigation measures avoid or substantially lessen the impact on the identified tribal cultural resource (PRC Section 21082.3(b)). Finally, AB 52 required the Office of Planning and Research to update Appendix G of the CEQA Guidelines by July 1, 2016 to provide sample questions regarding impacts to tribal cultural resources (PRC Section 21083.09). AB 52's provisions apply to projects that have a notice of preparation filed on or after July 1, 2015.

Discussion of Impacts

a-i, a-ii) ***Less than Significant with Mitigation Incorporated.*** The project's area of potential effect has low sensitivity for buried archaeological resources, and there are no known tribal cultural resources present. This includes tribal cultural resources listed or eligible for listing in the California Register of Historic Places or a local register of historic places as well as a resource determined by the lead agency to be significant pursuant to PRC 5024.1. Contact of the NAHC and consultation with FIGR did not reveal any known tribal cultural resources that may be affected by the project. Further, the landscape's eroded nature and the age of landforms underlying the project site make the discovery of tribal cultural resources unlikely.

Although unlikely, accidental discovery remains possible; and the contractor would be required to stop work upon discovery of any potentially significant archaeological or historical resources or human remains. Procedures are delineated in the PRC and the CEQA guidelines and are discussed below. As tribal cultural resources are unlikely to be present and state-mandated procedures would be implemented upon any accidental discoveries in keeping with Mitigation Measures CULT-1 and CULT-2, the project would not adversely affect the significance of any tribal cultural resources.

4.19 Utilities and Service Systems

UTILITIES AND SERVICE SYSTEMS — Would the project:		***Potentially Significant Impact***	***Less than Significant with Mitigation Incorporated***	***Less than Significant Impact***	***No Impact***	***Source***
a)	Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐	1
b)	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☒	☐	1
c)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒	1
d)	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐	1
e)	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐	1

Environmental Setting

The project site is located adjacent to a developed area of the Town of Fairfax. Existing utility lines including telecommunication, electrical, sewer, water, and gas exist along the existing bridge and within the project site. Water needs for the project site are served by the Marin Municipal Water District. Sewer needs within the project site are served by the Ross Valley Sanitation District. Gas and electrical utilities within the project site are served by Pacific Gas & Electric (PG&E). Comcast services telecommunication. The Landfill that serves the Town is the Redwood Landfill located in Novato, Marin County, California. This Landfill is permitted to accept 2,310 tons of material daily and has an anticipated closure date of 2025.

Local waste reduction efforts are overseen by Zero Waste Marin, a joint powers authority comprised of representatives of Marin County and each of the County's constituent cities. Zero Waste Marin works with businesses and residents to reduce solid waste and move towards Marin County's goal of zero waste by 2025. Among these efforts, Zero Waste Marin encourages the use of certified disposal facilities during demolition and construction projects to ensure that materials are recycled to the fullest extent feasible, in keeping with state requirements that most construction and demolition projects divert 65% of waste.

Discussion of Impacts

a) ***Less than Significant Impact.*** The proposed project would not require or result in the construction or expansion of water, wastewater treatment, natural gas, energy, or telecommunications facilities. Operations of the project would be similar to current operations, as the existing bridge would be replaced without expansion of service. There would therefore be no need for new or expanded public services. During construction, some water and energy use would be required for dust control and equipment power and a temporary bypass pipe would be installed to convey low-flow stormwater past the project site. Increased use of water and energy during construction would be temporary and insufficient as to necessitate new or expanded facilities. The stormwater diversion pipe would be removed following construction, and during construction, water quality would be sampled regularly to assure adverse impacts to turbidity and water quality do not occur.

Prior to removal of the existing bridge, existing water, gas, and wastewater utility lines within the project site would be placed on a shoofly north and supported in place during construction. These wet utility lines would then be rerouted under the replacement bridge during the final stage of construction. Relocation of these utilities would be temporary, and they would be moved close to their current location. Upon completion, they would return to near their original location in or on the new bridge. As gas, water, and wastewater lines would only temporarily be relocated and the relocation would be minor, this would not result in a significant environmental impact. As utilities would only need to be temporarily introduced or relocation, significant environmental effects would not occur. Impacts related to relocation, expansion, or construction of public utilities would, therefore, be less than significant.

b) ***Less than Significant Impact.*** The proposed project would replace an existing bridge and operation of the project would not require new or expanded water supplies. Construction of the project would require minimal water supply for dust and erosion control. The water supply needed for dust control would be provided by existing service providers and would not exceed allotted limits. Further, water would be required in sufficiently small quantities that supplies would be adequate during normal, dry, and multiple dry years. Therefore, impacts related to water supply would be less than significant.

c) ***No Impact.*** The proposed project would replace an existing bridge. Neither construction nor operation of the project would result in an increase in wastewater. Therefore, the proposed project would not exceed the capacity of the local wastewater treatment provider and no impact would occur.

d) ***Less than Significant Impact.*** The project would generate a small quantity of solid waste during construction, but all generated waste would be properly disposed or recycled in an approved landfill or disposal facility with capacity to receive the waste. Non-hazardous waste would be disposed of at the Redwood Landfill, a certified landfill that serves the Town. Redwood Landfill is anticipated to have capacity through 2025; so the project's solid waste would be insufficient to exceed remaining capacity. Further, Zero Waste Marin encourages disposal at certified facilities to assure that materials are recycled to the greatest extent feasible. By recycling at Redwood Landfill, the project would maximize its potential for recycling, in keeping with local waste reduction efforts.

The minimal quantity of hazardous creosote-contaminated timber and soils would be disposed of at an appropriate facility permitted to handle hazardous materials. As the project would only temporarily generate solid waste, quantities would not overwhelm existing local infrastructure, and the project would not conflict with local waste reduction statutes, impacts would be less than significant.

e) ***Less than Significant Impact.*** Marin County has a goal of zero waste by 2025. The joint powers authority overseeing zero waste efforts, Zero Waste Marin, encourages disposal at a certified facility during construction and demolition to comply with state waste reduction requirements. The project would dispose of solid waste at Redwood Landfill, a certified landfill. The project would therefore comply with local and state requirements for solid waste reduction. No federal solid waste reduction requirements applicable to the project were identified. As the project would comply with local and state requirements and no federal requirements were identified, a less than significant impact would occur.

4.20 Wildfire

WILDFIRE — If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:		***Potentially Significant Impact***	***Less than Significant with Mitigation Incorporated***	***Less than Significant Impact***	***No Impact***	***Source***
a)	Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐	1
b)	Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐	1
c)	Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒	1
d)	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐	1

Environmental Setting

Pursuant to Government Code Section 51175-89, the California Department of Fire and Forestry (CalFire) recommends Very High Fire Hazard Severity Zones throughout the state. These are mapped taking relevant factors such as fuels, terrain, and weather into account. Fire hazard severity zones are described based on their potential to cause building ignition. Areas assessed for fire hazards throughout the state are categorized as local responsibility areas and state responsibility areas depending on the entity responsible for fire protection.

The Ross Valley Fire Department (RVFD) currently provides fire protection and emergency response services to the communities of Ross, San Anselmo, Sleepy Hollow and Fairfax. The RVFD operates four fire stations. RVFD Station 21 provides fire protection and paramedic services to the project site. Station 21 is located at 10 Park Road. The project site is within approximately one mile of the station.

CalFire classifies the site and its surroundings as being within the local responsibility area. The nearest state responsibility area is less than 0.2 miles from the project site on the southern border of Fairfax. The project site is classified as a non-very high fire hazard severity zone, with the nearest very high fire hazard severity zone residing less than two miles north of the project.

Discussion of Impacts

a) ***Less than Significant with Mitigation Incorporated.*** While no formal emergency evacuation or response plans have been adopted for the Town of Fairfax, the project site provides the only access point for residents located on the southern stretch of Meadow Way. Emergency access to or evacuation from surrounding areas would be restricted during construction because traffic would be detoured to a temporary bridge. During the temporary road closure, emergency fire and paramedic crews would be stationed on both sides of the bridge. Furthermore, implementation of Mitigation Measures TRANS-1 would require best management practices for noticing and operating the detour and road closure. Implementation of Mitigation Measure TRANS-1 would reduce impacts related to emergency response plans and emergency evacuations plans to a less-than-significant level.

b) ***Less than Significant Impact.*** During construction, there would be a slight increase in wildfire risk due to the presence and use of gas-powered construction equipment. This would be temporary and minimal, with a return to baseline risk level following project completion. The operational project would not alter the area's fire risk, as the bridge would continue to operate similarly to its current status quo and no additional traffic is anticipated. In fact, the materials used on the new bridge would reduce the risk of increased pollutant concentration during a wildfire because creosote-soaked wood would be removed from the existing bridge and the new concrete bridge would be generally far more fire-resistant than the existing bridge.. As there would be a temporary, minimal increase in on-site wildfire risk and the project would remove toxic, flammable materials from the existing bridge, the project would not exacerbate wildfire risks and expose project occupants to pollutant concentrations from wildfire. Thus, impacts would be less than significant.

c) ***No Impact.*** The project would replace existing infrastructure and would not require the installation of new infrastructure such as emergency water supplies and fuel breaks. As such, the installation or maintenance of infrastructure would not exacerbate fir risk or result in temporary or ongoing impacts to the environment. Thus, no impact would occur.

d) ***Less than Significant Impact.*** Downstream areas roughly two miles south of the project site are considered very high fire hazard severity zones. These areas could be vulnerable to slope instability following a fire. However, the project would not alter drainage patterns or result in runoff in these areas. The bridge has been designed to clear the high water mark, even during high flow events. Although there are areas prone to wildfire downstream, the project would not alter the chance of downstream flooding or landslides. Thus, a less than significant impact would occur.

4.21 Mandatory Findings of Significance

MANDATORY FINDINGS OF SIGNIFICANCE		*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Source*
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐	1
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐	1
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐	1

Discussion

a) ***Less than Significant with Mitigation Incorporated.*** The project would not affect natural habitats or federally or state-listed species. Impacts on wildlife would be less than significant after implementation of avoidance, minimization, and mitigation measures. The project would not affect known historical resources and has a low potential to affect buried cultural deposits or human remains. Impacts on cultural resources would be mitigated to a less than significant levels by mitigation measures CULT-1 and CULT-2

b) ***Less than Significant with Mitigation Incorporated.*** Section 15130 of the CEQA *Guidelines* requires an evaluation of potential environmental impacts when the project's incremental effect is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. These impacts can result from a combination of the proposed project together with other projects causing related impacts. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

At the time of preparation of this Initial Study, other cumulative projects that are projected to be constructed or implemented within the next year in the vicinity of the project site include other bridge projects in the Town. These projects include the rehabilitation of bridges over San Anselmo Creek and Fairfax Creek along Creek Road, Marin Road, Spruce Road, and Canyon Road.

The proposed project includes mitigation measures to minimize the temporary impacts of construction activities, and no long-term adverse impacts are anticipated. With these measures, the project would result in individually minor impacts and would not contribute substantially to cumulative impacts in conjunction with the implementation of other projects in the area. The Town would coordinate project construction activities to avoid overlap of construction timing for cumulative impacts to traffic. Given the project does not result in any significant impacts that cannot be completely mitigated to less-than-significant levels, and construction scheduling would be coordinated to avoid simultaneous construction with other cumulative projects, the proposed project would not result in impacts that are cumulative considerable.

c) ***Less than Significant with Mitigation Incorporated.*** The project, particularly during the construction phase, could result in a variety of temporary impacts to human beings. The project's construction phase would result in potentially significant impacts related to air quality, biological resources, cultural resources, geology and soils, hazardous materials, and hydrology and water quality, noise and traffic; however, all impacts would be mitigated to less-than-significant levels via the mitigation measures included in this Initial Study.

5.0 REFERENCES

Checklist Information Sources

1. Professional judgment and expertise of the environmental/technical specialists evaluating the project, based on a review of existing conditions and project details, including standard construction measures
2. Town of Fairfax General Plan
3. Town of Fairfax Zoning Map
4. City of Fairfax Municipal Code
5. California Department of Conservation, 2010
6. California Department of Transportation, 2012
7. WRA, Inc., Natural Environment Study and Biological Assessment, 2019
8. ABAG Hazards Mapping, 2014
9. Bay Area Air Quality Management District, 2010
10. Federal Emergency Management Agency, 2011
11. Department of Toxic Substances Control, 2011, and State Water Resources Control Board, 2011
12. Far Western and JRP Cultural Resource Reports, 2019

APPENDIX A

Biological Reports

Proposed Meadow Way Bridge Project

Natural Environment Study

Meadow Way Bridge

Town of Fairfax, Marin County

Bridge Number: 27C-0008

Project Number: BRLO 5277 (025)

Locator: [District 4]-[MRN]-[0]-[FRFX]

August 2019

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Proposed Meadow Way Bridge Project
Natural Environment Study

STATE OF CALIFORNIA
Department of Transportation
Town of Fairfax
BRLO 5277 (025)

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Summary

Purpose and Need.

Caltrans has determined that Meadow Way Bridge over San Anselmo Creek, in the Town of Fairfax in Marin County, needs full replacement. The bridge is labeled as Structurally Deficient (SD) by Caltrans. The purpose of this project is to replace it with a similar one-lane single span bridge.

Project Description

Meadow Way Bridge is primarily wooden, approximately 20 feet above the creek bed, 70 feet long, and 14 feet wide. The bridge has five spans and four bents. It has a narrow single travel lane and adjacent pedestrian path. The bridge runs in a northwest-southeast direction, while the creek flows towards the northeast under it. The site is in a residential area of the Town of Fairfax. It serves as the only egress and ingress facility for nearly two dozen homes on Meadow Way.

The bridge is supported at four locations within the creek banks, two of which are in the creekbed. Each location consists of three 12-inch diameter wooden piles driven into the ground to an unknown depth. Some of the wooden bridge timbers have been preserved with creosote. The existing structure is not eligible for placement in the National Register of Historic Places (NRHP).

The new bridge would be designed to clear the greater of the 50-year flows and two feet of freeboard, or the 100-year design flows, the former controlling in this case. It would be a 70 foot long single-span concrete arch bridge, supported on two new abutments, with no additional supports in the creek. The abutments would connect with wingwalls and retaining walls of varying lengths and heights at its four corners. The existing bridge is only 14 feet wide. Caltrans has determined this too narrow for both automobiles and pedestrians to use the bridge safely. The replacement bridge would be 21.5 feet wide to allow safe passage for both automobiles and pedestrians.

Construction would take two seasons and work in the creek would be performed between June 1 and October 15 in order to avoid the spawning and migration season for protected California Central Coast steelhead.

The existing bridge sits tucked up against the northern boundary of the Town's right-of-way (ROW); the new bridge would be located in the middle of the ±40-foot-wide ROW. The footprints of the existing and new bridge would overlap. The new bridge would be built on the south side of the existing bridge while the existing bridge remains in service, and moved sideways to its permanent location after the existing bridge is removed. The existing bridge would be replaced in stages, as follows:

Stage 1 Construction

The first season of construction would be spent on Stage 1 of the improvements. During this stage, traffic would continue using the existing bridge. The southern halves of each of the two new cast-in-place concrete abutments would be constructed roughly in line with the existing bridge abutments. These are only portions of the permanent abutments, and are designed to support the new bridge in its temporary location adjacent to and south of the existing bridge during Stage 1.

For this stage, an access ramp to the creek would be necessary. This earthen ramp would be used to transport materials and heavy equipment to the creek bed and back to

the road. The ramp would be located on the southwest quadrant of the bridge behind a proposed retaining wall connecting with the bridge. This wall would also stop the erosion currently occurring adjacent to the bridge abutment that's threatening to undermine the abutment and private property.

At the conclusion of Stage 1, the southern halves of the abutment walls and the retaining walls connecting to them, as well as the new bridge superstructure, would be completed. Construction at the bridge deck level and the existing roadway may continue beyond October 15 if work remains to be done in order to complete Stage 1. The underground riprap fortifications in front of the completed abutments and walls would be in place, the access road into the creek terminated, and the creekbed in the area of the Stage 1 construction would be restored. The new bridge, in its temporary location, would be ready for service, and traffic would be conveyed away from the existing bridge to the new bridge. At the end of the season, the site would be cleaned up, debris removed; equipment taken away; and the site winterized until the next season. If the bridge is not ready for traffic, the existing bridge would remain in service during the following winter and early spring.

Stage 2 Construction

Stage 2 construction would take place during the second season of construction. By the end of the first season, the new bridge would be in its temporary location, the temporary approach roadways constructed south of the existing bridge, and the vehicular and non-motorized traffic would be using the new bridge. Cars and pedestrians would be kept within the small detour area with Temporary Railing (Type K) and temporary fencing. Prior to the removal of the old bridge, the existing "wet" utility pipes (sewer, water and gas) would be placed on a shoofly north of the existing bridge and supported in place during construction. They would eventually be relocated, housed and hung under the existing bridge deck well above the 50- and 100-year design hydraulic flow elevations.

At this stage, the existing bridge would be removed piece by piece with a crane, starting with its superstructure members. After the bridge removal, the northern halves of the two abutments and the two downstream wingwalls connecting with the abutment corners would be constructed. The areas behind the walls would be backfilled; and approach slabs and the approach roadways would be constructed in line with the alignment of the bridge in its final position, which would be approximately in the middle of Meadow Way's ROW.

Final Stage Construction

The new bridge would be closed for a few hours during one night operation when little or no traffic is expected. The new bridge superstructure would be either pushed hydraulically sideways to the north or lifted with a crane on each side and placed back on the abutment seats at its final location near the middle of Meadow Way. After the relocation of the new bridge to its final position, the bridge would be reopened to traffic. The remaining 1'-9" wide strip of the deck width would be cast after this move. Approach railings at all four bridge corners, landscaping and vegetation restoration with native plants on all affected slopes, fencing, and other surface improvements around the bridge would continue until project completion. The creek bed throughout the project site would be restored to a trough-like flow conveyance environment. The wet utilities would be rerouted under the new bridge and the smaller "dry" utilities may be placed inside the barrier railings, the deck or the sidewalk.

Contractor Staging and Storage Areas

The project site offers very limited storage and staging areas for the contractor. The publically-owned last block of Hickory Road at Cascade Drive, about ½-mile from the project site, would be designated for the contractor's use for storing equipment and materials during construction.

Habitat Impacts

The proposed project would temporarily impact 0.13 acre of Intermittent Stream ("other waters"), 362 square feet (0.01 acre) of Unvegetated Banks, 0.07 acre of Riparian Woodland, and 0.12 acre of Ruderal Disturbed/Developed lands. It would permanently impact 113 square feet (<0.01 acre) of Riparian Woodland, 4 square feet (<0.01 acre) of Unvegetated Bank, and 379 square feet (0.01 acre) of Ruderal Disturbed/Developed lands. No permanent loss to Intermittent Stream will occur, but a gain of 18.8 square feet (<0.01 acre, approximately 6 linear feet) through the removal of six wooden piles in the creek bed.

Special-Status Species

The project would not adversely affect special-status plants, most breeding birds, or other non-fish wildlife species. However, it **may affect, not likely to adversely affect** northern spotted owl (NSO), Central California Coast (CCC) steelhead designated critical habitat and designated critical habitat for Coho salmon, and Pacific Salmonid Essential Fish Habitat (EFH). The project **may affect, may adversely affect** CCC steelhead if steelhead are present during work within the creekbed. Both NSO and CCC steelhead are federally threatened species, and NSO is also state listed as threatened. Consultation with United States Fish and Wildlife Service (USFWS) would be required to assess impacts of the project and avoidance and minimization measures, such as work windows, to be implemented to reduce impacts to NSO. Consultation with National Marine Fisheries Service (NMFS) would be required to assess impacts of the project as well as avoidance and minimization measures to be implemented to reduce impacts on steelhead, designated critical habitat for steelhead and Coho salmon, and Pacific Salmonid EFH. Work would be conducted when flows are expected to be lowest in this segment of San Anselmo Creek. Any flow would be run through bypass pipes around the work area. If any pools are present in the work area before the start of construction, a fish rescue will be conducted to relocate native species.

No nesting habitat is present for NSO within the Biological Study Area (BSA) or within 0.2 mile; however, NSO is known to nest within 0.3 mile of the BSA. One California bay tree would be removed from the southwest corner of the new bridge and several others may need to be trimmed or removed; however, these trees do not constitute suitable nesting habitat for NSO, thus no direct effects are anticipated from the proposed Project. A conservative disturbance buffer, based on estimated sound levels under 100 decibels (dB) during construction and USFWS guidance, is 825 feet, and the nearest nesting habitat is over 1,000 feet from the BSA. Therefore acoustic disturbances are unlikely to occur to nesting NSO. If construction activities may generate sound levels above 100 dB and result in a disturbance buffer up to 1,320 feet (0.25 mile), these activities are recommended to occur outside of the NSO nesting season (February 1 through August 31) to avoid acoustic disturbances to nesting NSO. If work generating sound levels above 100 dB within the nesting season cannot be avoided, protocol-level surveys will be conducted to determine nesting status, and if nesting is confirmed within 0.25 mile of project activities, no work generating sound over 100 dB will be conducted until after August 31. The proposed Project is not anticipated to result in adverse effects to NSO

due to implementation of work windows or avoidance and minimization measures determined through consultation with USFWS. Therefore, the proposed Project **may affect, not likely to adversely affect** NSO.

Project construction would result in temporary impacts to critical habitat for steelhead and Pacific salmonid EFH; however, no permanent adverse impacts are anticipated to critical habitat or EFH. Work within the creek bed and banks would occur during the dry season (June 1 through October 31). Based on site visits, deeper segments of the creek within the BSA may retain water through the dry season. If so, the work area would be dewatered and a fish salvage would be performed to relocate any native fish species in the pools. The bridge work would involve the construction of two new wingwalls, retaining walls, and abutments; removal of six wooden piles from within the creek bed; and construction of a temporary bridge for residential access during construction, but would not decrease the amount of creekbed, create a barrier across the channel, decrease flows, or change substrate size. The stream channel and banks will be restored to near pre-project conditions following the completion of bridge work including restoring the current gradient. Restoration efforts will use the excavated cobble and gravel substrate to mimic the channel conditions prior to excavation, including pre-excavation creek gradient conditions. The replacement bridge is a free spanning structure, and fish passage may be improved after wooden pilings supporting the existing bridge are removed from the creek. Construction would take two seasons and work in the creek will be performed only after June 1 and end prior to October 15 in each year order to avoid the spawning and migration season for the protected CCC steelhead. Very little to no creek flow is expected during the peak summer construction months. However, the contractor will be required to install a bypass pipe to convey certain minimum low-flow volumes through the construction site and released downstream of the bridge. This will be accomplished through installation of a low dam across the creek bed upstream of the bridge to collect the summer flows and guide it to the pipe. Any water in the creek that exists prior to the start of construction will be salvaged for native fish, therefore, no fish will be present during construction, and no direct or temporary impacts to steelhead are anticipated following relocation away from the construction area. Although temporary impacts would occur to critical habitat and EFH, the proposed Project will not adversely affect critical habitat or EFH because fish passage conditions would remain unchanged and the BSA does not contain spawning or rearing habitat.

Invasive Species

The invasive plant species found in the BSA that Cal-IPC lists as High are English ivy (*Hedera helix*), French broom (*Genista monspessulana*), Himalayan blackberry (*Rubus armeniacus),* fennel (*Foeniculum vulgare*), and hedgehog dogtail (*Cynosurus echinatus*). Several species with moderate rating were also observed, including hedge parsley (*Torilis arvensis* ssp. *purpurea*), periwinkle (*Vinca major*), sheep sorrel (*Rumex acetosella*), slender wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), rattail fescue (*Festuca myuros*), perennial ryegrass (*Festuca perennis*), wall barely (*Hordeum murinum* sp. *murinum*), and panic grass (*Ehrharta erecta*).

During construction, the French broom, Himalayan blackberry, and fennel plants within the BSA and in or adjacent to the work area will be removed. The English ivy, Himalayan blackberry, hedge parsley, periwinkle, sheep sorrel, and grasses will be more difficult to eradicate, given that they are common outside the BSA in nearby areas and upstream. The proposed project will remove individuals of those species in areas where the vegetation is removed for construction activities, and stabilize the soil with appropriate erosion control measures as needed.

New Zealand mud snail (NZMS; *Potamopyrgus antipodarum*) are documented within San Anselmo Creek. Measures such a washing equipment are included here to avoid the spread of the mud snail. With implementation of the avoidance and minimization efforts discussed in this text, the proposed project would not result in the spread of invasive species.

Resource Permits

There will be impacts to the Intermittent Stream (i.e. “other waters” or ‘Waters’). A preliminary Jurisdictional Determination will be submitted to the United States Army Corps of Engineers (USACE) for verification. Permits that will be required include a California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement (CFGC 1602), Regional Water Quality Control Board (RWQCB) Clean Water Act (CWA) 401 certification, and USACE CWA 404 nationwide permit.

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Chapter 1 – Introduction

Purpose and Need

Caltrans determined that Meadow Way Bridge, in the Town of Fairfax (Town) over San Anselmo Creek needs replacement (discussed below). The bridge has been determined functionally obsolete and needs replacement.

Meadow Way Bridge Project - Detailed Project Description

The project site is located in a developed area of the Town of Fairfax in Marin County (Figure 1). The project site consists of Meadow Way Bridge, California Department of Transportation (Caltrans) Bridge Number 27C-0008, which is located over San Anselmo Creek between Cascade Drive and Meadow Way within the western portion of the Town. The project site consists of Assessor's Parcel Numbers (APNs) 003-102-18 and 003-122-41. The Meadow Way Bridge Biological Study Area (BSA) is shown in Figure 1. The project plans are provided in Figure 2.

The project site is located within a residential neighborhood zoned for single-family residential land use. San Anselmo Creek bisects the project site.

The existing Meadow Way Bridge is reported to have been constructed in the 1950s over San Anselmo Creek in the Town of Fairfax by the U.S. Army Corps of Engineers (Corps). The existing, primarily wood, bridge has five spans with four bents in the creek, is approximately 70 feet long and 14 feet wide, and supports a narrow single travel lane and a narrow adjacent pedestrian path approximately 20 feet above the creek bed. The bridge runs in a northwest-southeast direction while the creek flows towards the northeast under it. The bridge serves as the only egress and ingress facility for nearly two dozen homes on Meadow Way across the creek from Cascade Drive. The bridge is supported at four locations within the creek banks, two of which are in the creekbed, and at each location there are three 12-inch diameter wooden piles driven into the ground to an unknown depth. Some of the wooden bridge timbers have been preserved with creosote.

San Anselmo Creek runs through a relatively wide and deep section of the waterway and an S-bend at the bridge location. The bridge is labeled as Structurally Deficient (SD) by Caltrans and will be replaced with a similar, one-lane single span bridge. The site/bridge configuration has caused historic bank erosion and bridge foundation scour at the site, which would also be corrected by the proposed project so that it would not affect the new bridge. The existing structure is not eligible for placement in the National Register of Historic Places (NRHP).

Construction Schedule

Construction would take two seasons and work in the creek would be performed only after June 1 and must end prior to October 15 in order to avoid the spawning and migration season for the protected California Central Coast (CCC) steelhead (*Oncorhynchus mykiss*). Work near or above the top of bank and at the roadway level may occur outside this work window. Therefore, the bridge would be installed in its temporary location during one season, and the project would be completed within the following season. In compliance with the Town's Noise Ordinance, construction activities would be limited to the hours of 8:00 a.m. to 5:00 p.m. on weekdays, and 9:00 a.m. to 5:00 p.m. on Saturdays, with no noise-generating construction on Sundays or Holidays. Placement of the new bridge in its permanent location would be the one exception regarding construction hours. As traffic would need to be shut down in order to move the bridge to its permanent location, this would occur in one evening after 5:00

p.m. in order to provide the least disruption for local residences that depend on this bridge for access.

Bridge Design

The new bridge would be designed to clear the greater of the 50-year flows and two feet of freeboard, or the 100-year design flows, the former controlling in this case. It would be a 70-foot long single-span concrete arch bridge supported on two new abutments and no additional supports in the creek. The abutments would connect with wingwalls and retaining walls of varying lengths and heights at its four corners. See Figure 5 (Site Plan) for the proposed bridge design. The existing bridge is only 14-feet wide and Caltrans has determined the bridge is currently too narrow for both automobiles and pedestrians to use the bridge safely. The replacement bridge would be 21.5-feet wide to allow safe passage for both automobiles and pedestrians. The proposed replacement bridge would also include raised reflective pavement markers at proper intervals to alert the drivers and pedestrians of the two separate travel zones. The new bridge would comply with federal and state design codes and weight limits and would do away with the deficiencies of the existing bridge.

Construction Phasing

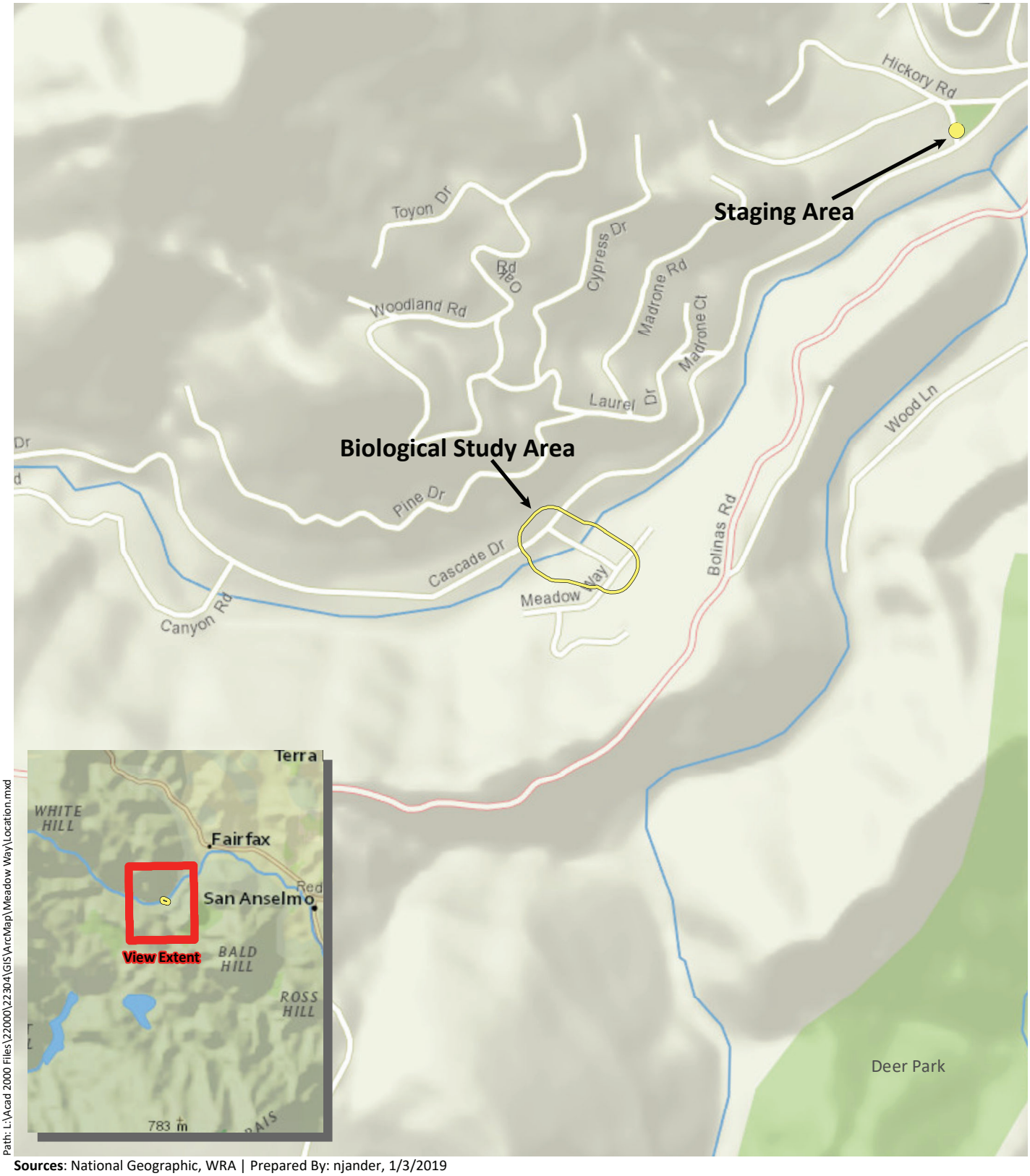
Where the existing bridge sits tucked up against the northern boundary of the Town's right-of-way (ROW), the new bridge would be located in the middle of the ±40-foot-wide ROW. Despite this, the footprints of the existing and new bridge would overlap. For this reason, the new bridge would be built on the south side of the existing bridge while the existing bridge remains in service, and moved sideways to its permanent location after the existing bridge is removed. Thus, the existing bridge would be replaced in stages, as follows:

<u>Stage 1 Construction</u>

The first season of construction would be spent on Stage 1 of the improvements. During this stage, traffic would continue using the existing bridge. The southern halves of each of the two new cast-in-place concrete abutments would be constructed approximately in line with the existing bridge abutments. These are only portions of the permanent abutments, and are designed to support the new bridge in its temporary location adjacent to and south of the existing bridge during Stage 1.

For Stage 1 construction, an access ramp to the creek would be necessary. This earthen ramp would be used to transport of materials and heavy equipment, such as pile drilling rigs, dump trucks cranes, loaders, excavators, large containers, etc., to the creek bed elevation and back. The ramp would be located on the southwest quadrant of the bridge between two proposed retaining walls, one which connects with the bridge. These walls are needed to stop the historic erosion taking place here adjacent to Abutment 1 (western abutment), threatening to undermine the abutment and private properties on both north and south sides of the bridge. The lower wall will be a conventional concrete retaining wall, supported on piles, and upper wall will be a concrete tieback wall with tieback elements placed in drilled holes stretching 40-50 feet from the wall face under the private property.

The access road would be an approximately ±230-foot-long ramp at 10% grade, half of which would be behind the above-referenced lower retaining wall, the rest winding around the wall's lower end and doubling back on the creek bed in front of the wall. For the second half of the ramp, temporary fill on the creek bed would be necessary. This ramp would facilitate the equipment for wall and abutment foundation excavations on both sides of the creek. To build the ramp, temporary earth retention, using soil nails next to private property and the inside edge of the ramp, would be necessary.



Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Meadow Way\Location.mxd

Sources: National Geographic, WRA | Prepared By: njander, 1/3/2019

Figure 1. Biological Study Area Location

Meadow Way Bridge
Town of Fairfax, Marin County, California

0 500 1,000 Feet

N

wra
ENVIRONMENTAL CONSULTANTS

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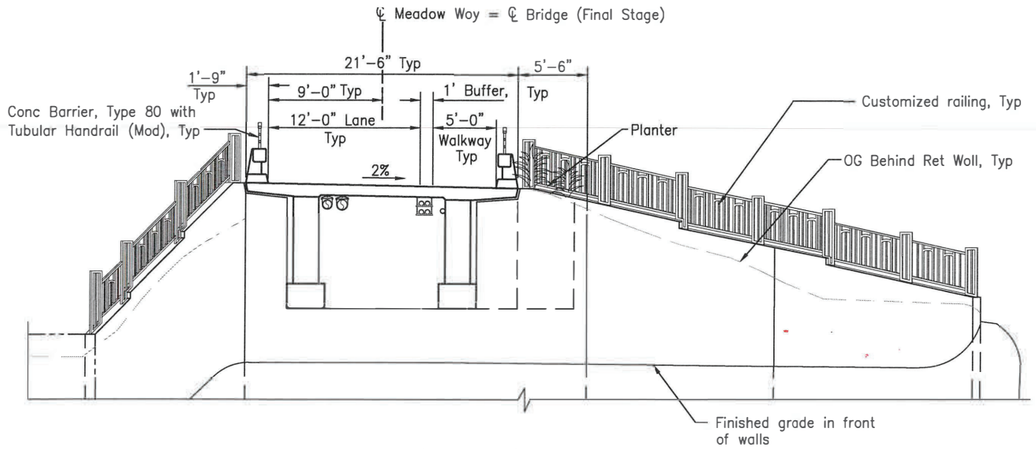
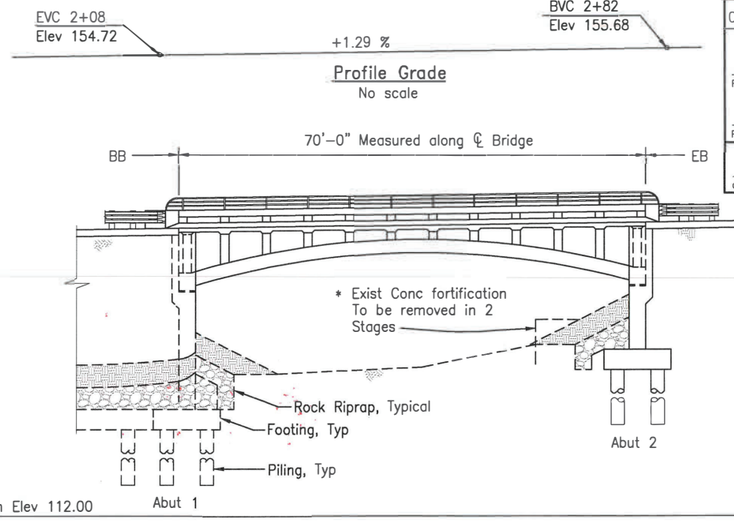
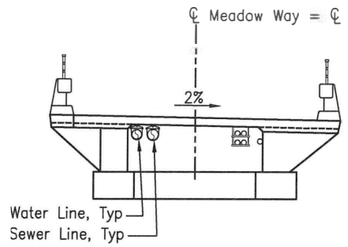
Figure 2A. Proposed Bridge General Plan



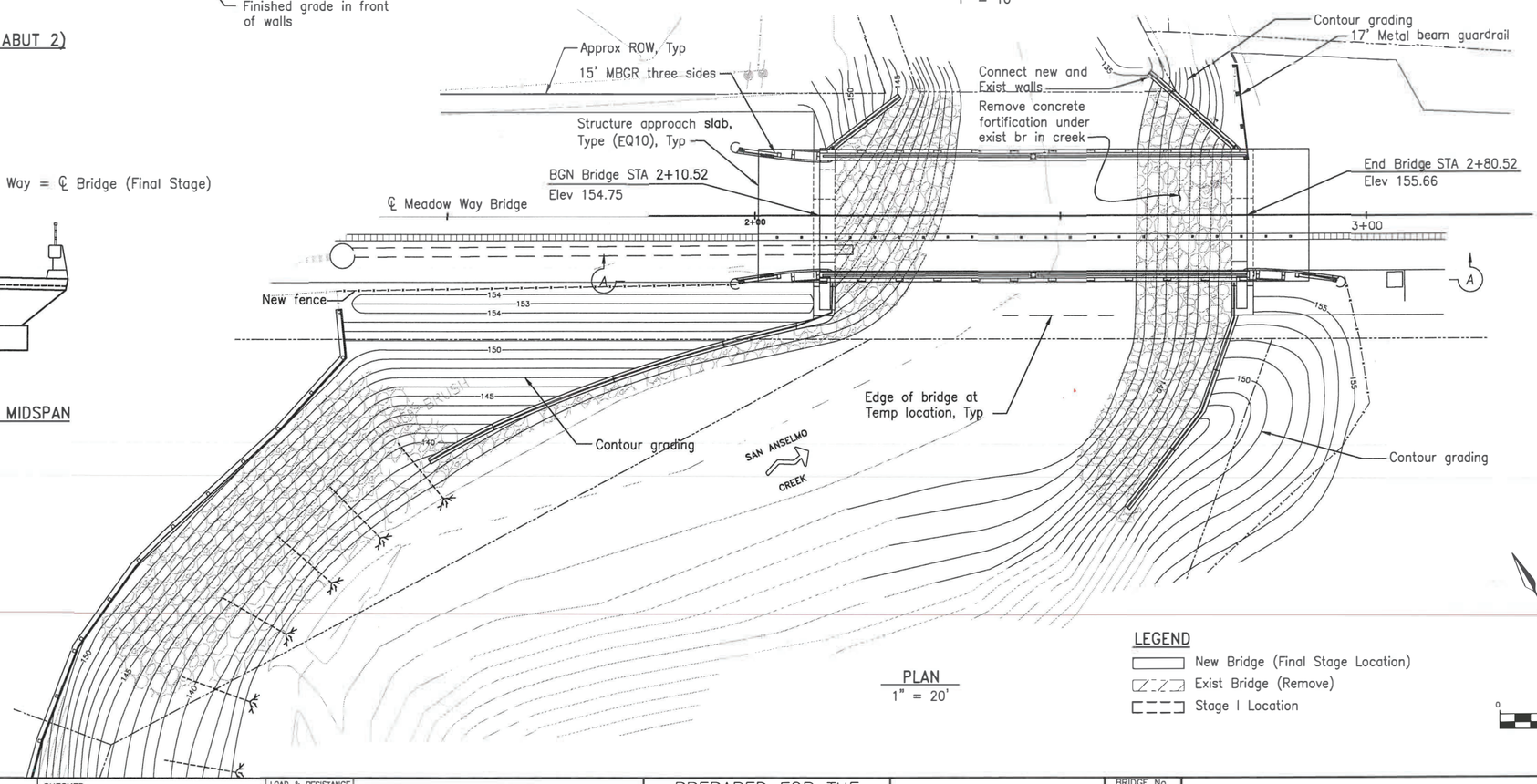
TYPICAL SECTION (@ ABUT 2)
1" = 5'



ELEVATION A–A
1" = 10'



TYPICAL SECTION NEAR MIDSPAN
1" = 5'



PLAN
1" = 20'

LEGEND
- New Bridge (Final Stage Location)
- Exist Bridge (Remove)
- Stage I Location

0 10 20

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Mrn				

REGISTERED CIVIL ENGINEER
PLANS APPROVAL DATE
REGISTERED PROFESSIONAL ENGINEER — NADER TAMANNAIE — NO. 37289 — EXP. 6/30/20 — CIVIL — STATE OF CALIFORNIA
930 ALHAMBRA BLVD. SUITE 220
SACRAMENTO, CA 95816

DESIGN OVERSIGHT	DESIGN	BY D. Vang	CHECKED	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 AND PERMIT DESIGN VEHICLE		
	DETAILS	BY J. Caravalho	CHECKED	LAYOUT	BY N. Tamannaie	CHECKED	
SIGNOFF DATE	QUANTITIES	BY	CHECKED	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED	

PREPARED FOR THE TOWN OF FAIRFAX DEPARTMENT OF PUBLIC WORKS

Nader Tamannaie, PE
PROJECT ENGINEER

BRIDGE No. 27C–0008
POST MILE –

MEADOW WAY BRIDGE OVER SAN ANSELMO CREEK
GENERAL PLAN

DS OSD 2138 (CADD 4/89)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU
EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 1 OF

CONTRACT NO.

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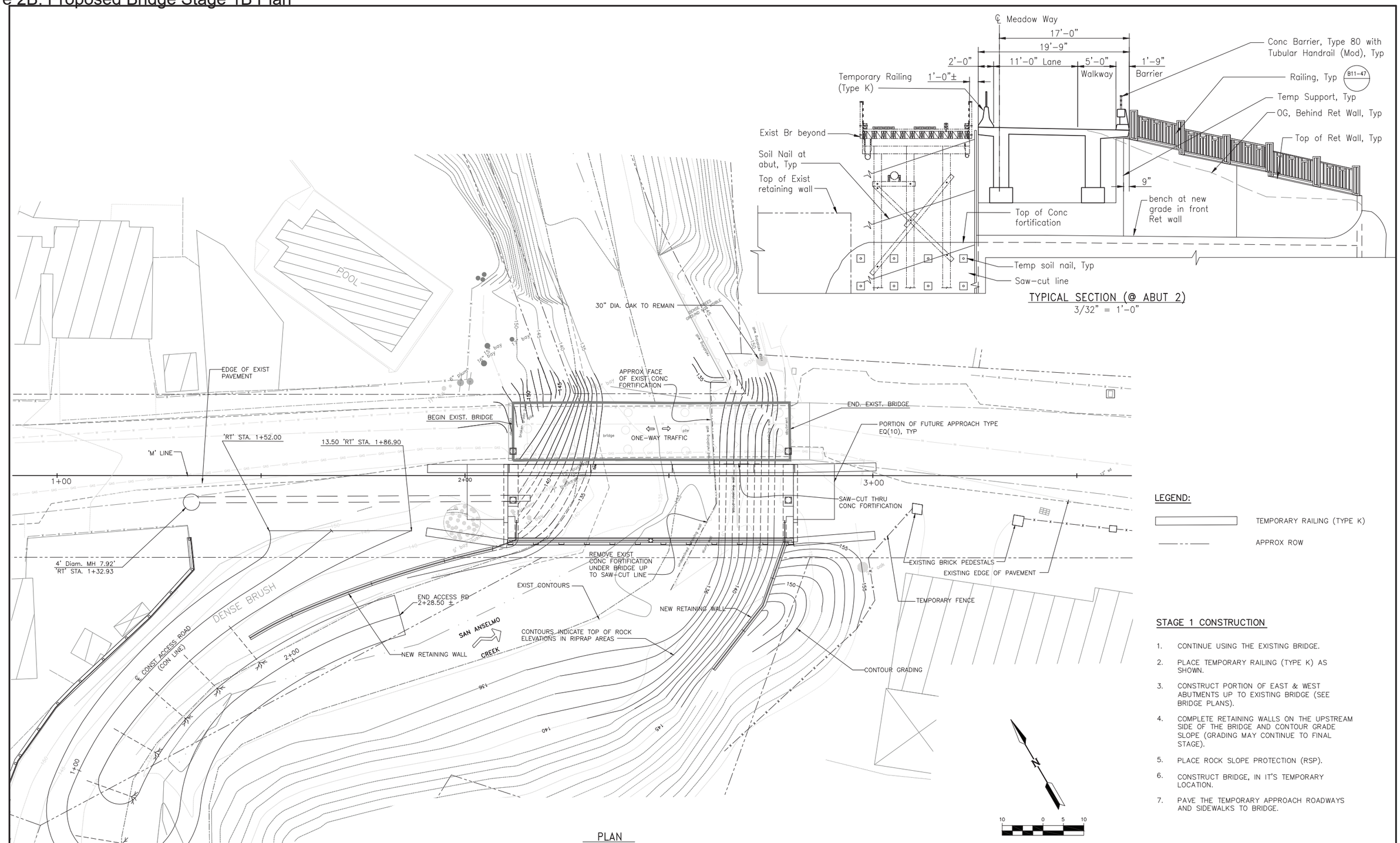
Figure 2B. Proposed Bridge Stage 1B Plan



LEGEND:

TEMPORARY RAILING (TYPE K)

APPROX ROW

STAGE 1 CONSTRUCTION

1. CONTINUE USING THE EXISTING BRIDGE.
2. PLACE TEMPORARY RAILING (TYPE K) AS SHOWN.
3. CONSTRUCT PORTION OF EAST & WEST ABUTMENTS UP TO EXISTING BRIDGE (SEE BRIDGE PLANS).
4. COMPLETE RETAINING WALLS ON THE UPSTREAM SIDE OF THE BRIDGE AND CONTOUR GRADE SLOPE (GRADING MAY CONTINUE TO FINAL STAGE).
5. PLACE ROCK SLOPE PROTECTION (RSP).
6. CONSTRUCT BRIDGE, IN IT'S TEMPORARY LOCATION.
7. PAVE THE TEMPORARY APPROACH ROADWAYS AND SIDEWALKS TO BRIDGE.

NO.	REVISIONS	BY	DATE
△			
△			
△			
△			
△			
△			

DESIGN BY :
DRAWN BY :
CHECKED BY :
SCALE : AS NOTED
DATE :
BRIDGE NO. :
PROJ NO. :

California Infrastructure Consultancy
930 ALHAMBRA BLVD. SUITE 220
SACRAMENTO, CA 95816

TOWN OF FAIRFAX
142 BOLINAS ROAD.
FAIRFAX, CA 94930

MEADOW WAY BRIDGE

CONSTRUCTION DETAILS - STAGE 1B

BRIDGE NO

SHEET

OF

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Excavation spoils, required for backfilling later on, would be stored in containers placed on the creek bed temporarily due to lack of space above at the roadway level. The remainder of the spoils would be hauled away on a daily basis. Any creosote treated timber piles or surrounding contaminated soils will be disposed of at an appropriate facility permitted to handle hazardous waste.

Removal of a California bay tree (*Umbellularia Californica*) and invasive Himalayan blackberry (*Rubus armeniacus)* bushes on the southwest corner of the new bridge as well as pruning of other trees and removal of other vegetation in the construction zones would be necessary. According to the Town's Municipal Code Chapter 8.36 (Trees), a tree removal permit is required for the removal of any tree within the Town.

The creek bed in the Area of Potential Effect (APE) would be used by the construction operations. Very little to no creek flow is expected during the peak summer construction months. However, the contractor will be required to install a bypass pipe to convey certain minimum low-flow volumes through the construction site and release downstream of the bridge. This will be accomplished through installation of a low dam across the creek bed upstream of the bridge to collect the summer flows and guide it to the pipe. Turbidity and water quality tests will be performed regularly, as required by permits. Any water collected in excavation pits or pools on the creek bed will be run through sediment control tanks, such as a Baker Tank, before being released to the creek.
To construct the initial halves of the new abutments, the approach embankments in front, behind, and next to the current abutments would also need to be excavated. Approximately, half of the unreinforced concrete and wood fortification in front of the future Abutment 2 (eastern abutment) will be removed. The Abutment 2 location has a deeply undercut bank. The new abutment wall will be behind the removed fortification, protected by a course of sloping heavy rock riprap, topped with 3 feet of sloping native creek bed materials in front. In order to avoid undermining the approach roadways and abutments of the existing bridge while it is still in operation, the embankments behind and in front of the existing abutments will be retained temporarily with soil nails parallel and perpendicular to the roadway alignment. Traffic will be separated from the construction area with temporary concrete barrier railings (Type K) during this stage.

Since geotechnical borings and investigations have been conducted at the site, it is known that the bridge abutments and retaining walls attached to the abutments will need to be supported on piles. To minimize disturbance to the residents, 24-inch diameter cast-in-drilled-hole (CIDH) concrete piles, which are significantly quieter to install than driven piles, will be used to support the walls. For this, the creek bed would be excavated approximately eight feet deep to reach the approximate elevation of the concrete pile heads. After completing the excavations, drilling rigs would be called upon to drill the 24-inch-diameter CIDH piles supporting the future structural elements. The drilling auger would be mounted on a truck that can negotiate the access road and be capable of drilling deep holes with augers added on progressively. The drilling spoils would be spun loose from the auger, dumped in containers, and hauled away.

Due to the riverine environment of the operations, underground and surface water may seep into the drilled holes and excavations, potentially threatening their collapse and/or contamination of the concrete that would be poured later on. For this reason, the contractor would use various wet-drilling hole stabilization techniques, such as driving a steel pipe sleeve into the hole all the way to the bottom, simultaneous with drilling. In this case, the reinforcement cage is placed in the hole using a crane and the concrete is pumped from the bottom of the hole up using a tremie pipe. This way, any water in the hole is displaced to the top, and then vacuumed and collected in containers. At the

same time of the concrete pour, the steel sleeve is extracted, leaving behind a deep hole filled with steel rebar and clean concrete. Another wet-drilling technique would be filling the hole with slurry, such as a drilling polymer, that displaces the water and provides hole wall stability through hydrostatic pressure before concrete is poured in. In the case of slurry displacement method, the steel cage is placed in the slurry, the heavier concrete is again pumped from the bottom up, pushing the lighter slurry up, which is then vacuumed into special tank trucks for disposal off-site. Again, as the clean concrete reaches the top and all of the slurry has been picked up, the result would be 24-inch diameter concrete piles. The piles are then ready to be capped with a concrete footing (or pile cap, as sometimes called).

Once the concrete pile caps are constructed, their top surface would be five to six feet below the creek bed. At this point, these foundations of the new walls and bridge abutments would be protected with filter fabric and a two- to two and a half--foot layer of rock riprap on top for scour control. Ultimately, the underground riprap would crawl up on the wall face to some height and be subsequently covered with three feet of creek bed materials, restoring the creek bed and embankment slopes to their original levels through the site. The net effect will be restoring the site to a deep and wide soil “trough” traversing through the bridge site for natural fish passage without any obstructions in the creekbed or anything other than creek materials and native plants.

Once the southern (upstream) halves of the abutments and the two upstream connecting retaining walls are constructed, the new concrete superstructure would be cast to span them immediately adjacent to and south of the existing bridge. The bridge abutments would be cantilevered walls, providing seats for the ends of the new bridge superstructure. This location of the new bridge superstructure would be temporary. The design concept would utilize two concrete arch ribs spanning the abutments and supporting vertical spandrel columns which, in turn, would support a thin concrete deck slab and railings at the top. The bridge would be 21.5 feet wide from edge to edge and have a 12-foot lane, a one-foot buffer, a five-foot wide sidewalk, and barrier and hand railings on both edges of the deck. Due to space limitations, 1’-9” of the final deck width would be cast in Stage 2, described below. The arch ribs would be cast in place in wooden forms supported on a wooden or steel falsework system temporarily placed on the creek bed. The arch ribs would be connected to each other for stability with four transverse beams. Once the arch rib concrete has cured and gained sufficient strength, the falsework would be removed. The arch ribs and the transverse connecting beams would be timed to gain strength by the end of the first dry season so that they are self-supporting once the falsework is removed by October 15th. The remainder of formwork, if needed beyond the dry season, would be attached to the arch ribs themselves above the 100-year flows from that point forward.

At the conclusion of Stage 1, the southern halves of the abutment walls and the retaining walls connecting to them, as well as the new bridge superstructure, would be completed. Construction at the bridge deck level and the existing roadway may continue beyond October 15 if work remains to be done in order to complete Stage 1. The underground riprap fortifications in front of the completed abutments and walls would be in place, the access road into the creek terminated, and the creek bed in the area of the Stage 1 construction would be restored. The new bridge, in its temporary location, would be ready for service, and traffic would be conveyed away from the existing bridge to the new bridge. At the end of the season, the site would be cleaned up and debris removed, the equipment would be taken away, and the site winterized until the next season. No materials will remain in the creekbed after the first season of work, the surface of the creekbed will be returned to pre-project conditions prior to the start of the wet season. If

the bridge is not ready for traffic, the existing bridge would remain in service during the following winter and early spring.

Stage 2 Construction

Stage 2 construction would take place during the second season of construction. By the end of the first season, the new bridge would be in its temporary location, the temporary approach roadways are constructed south of the existing bridge, and the vehicular and non-motorized traffic would be using the new bridge. Cars and pedestrians would be kept within the small detour area with temporary railing (Type K) and temporary fencing. Prior to the removal of the old bridge, the existing "wet" utility pipes (sewer, water and gas) would be placed on a shoofly north of the existing bridge and supported in place during construction. They would eventually be relocated and housed and hung under the existing bridge deck well above the 50- and 100-year flow elevations.

At this stage, the existing bridge would be removed piece by piece with a crane or two, starting with its superstructure members. To avoid dropping pieces of the bridge into the creek, special catchment containers and bridge removal methods would be specified. After the removal of the superstructure, the wooden pile extensions would be cut at least three feet below the creek bed elevations and the holes backfilled with existing creek materials. The creosote-laden wood timbers would be disposed by the contractor at an appropriate facility permitted to handle hazardous waste. The remaining half of the wood and unreinforced concrete fortification in front of the Abutment 2 will also be removed and the abutment wall protected similar to Stage 1 Construction.

After the bridge removal, the northern halves of each of the two abutments and the two downstream wingwalls connecting with the abutment corners would be constructed. Excavations, CIDH pile and rock riprap installations, and backfilling over the riprap would be completed similar to Stage 1 construction, and the same access route will be reopened and used. The slopes above the retaining walls and wingwalls would be contour-graded. This aspect of the work can continue into the Final Stage, described below. During this stage, the excavations for the north abutments and wingwalls would continue to be protected from traffic with Temporary Railing Type K. The areas behind the walls would be backfilled and approach slabs and the approach roadways would be constructed in line with the alignment of the bridge in its final position, which would be approximately in the middle of Meadow Way's ROW.

Final Stage Construction

Once the existing bridge has been removed and the abutments and bridge approaches have been constructed, the new bridge would be closed for a few hours during a one night operation when little or no traffic is expected. The new bridge superstructure would be either pushed hydraulically sideways to the north or lifted with a crane on each side and placed back on the abutment seats at its final location near the middle of Meadow Way. The remaining 1'-9" wide strip of the deck width would be cast after this move. Since this is the only access to the homes on the other side of the creek, emergency fire and paramedic crews would be stationed on both sides of the bridge to provide emergency services to surrounding residences. After the relocation of the new bridge to its final position, the bridge would be reopened to traffic. Approach railings at all four bridge corners, landscaping and vegetation restoration with native plants (trees, bushes and other ground cover) on all affected slopes, fencing, and other surface improvements around the bridge would continue until project completion.

A program of fish habitat restoration, using bio-engineering techniques, low earth berms and woody nooks, designed specifically for the site, will be implemented. The current proposed location of the large wood is the bank along the access route, immediately upstream of the new retaining wall on the north side. A layer of large logs will be laid in a grid at the bottom of the excavation and on the creek bed, to be incorporated in the log-root wad revetment structure. The logs will be rot-resistant species, such as eucalyptus and redwood, typically obtained as re-purposed salvage from local urban tree removal companies. The structure will be designed so that the log grid is made integral with large rock rip-rap pieces placed within it and stacked under the new overtopping embankment slope. The ends of the logs perpendicular to the creek centerline will protrude out of the base of the embankment into the creek's edge flow, catching small woody drift. The base of the embankment will be planted with native plants and small trees to create near-shore overhanging vegetation. In conjunction with the revetment, the creek bed in front of the revetment structure will be re-contoured to create pools for fish. The net effect will be restoring the site to a deep and wide soil "trough" traversing the bridge site for natural fish passage without any obstructions in the creek other than creek materials and native plants.

The wet utilities would be rerouted under the new bridge and the smaller "dry" utilities may be placed inside the barrier railings, the deck, or the sidewalk. A Revegetation Plan for the site will be prepared.

Right-of-Way

Most of the bridge and approach roadway work would remain within the Town of Fairfax's ROW. During construction, fences, fence pillars and driveways encroaching onto the Town's ROW, but no homes and other structures, would be affected. Temporary easement from one neighbor for the temporary access ramp and a permanent easement from the same for the retaining wall on the southwest quadrant would be necessary. A small strip of the land adjacent and parallel to the bridge on the north edge, privately owned but not used for residence, would be acquired permanently or through easement by the Town. It appears that there have been encroachments on the Town ROW over the years, especially in the southeast quadrant, which would be used during construction and relinquished back to the neighbor afterwards through an easement process.

Contractor's Staging and Storage Areas

The project site offers very limited storage and staging areas for the contractor. The publically-owned last block of Hickory Road at Cascade Drive, about ½-mile from the project site, would be designated for the contractor's use for storing equipment and materials during construction (Figure 1). The contractor would use various pickups, dump trucks, cranes, drilling vehicles, water and other liquid-carrying trucks, loaders, tractor trailers, excavation machinery, generators and handheld equipment. The contractor's personnel would be able to access the creek areas on foot.

Chapter 2 – Study Methods

The Town's consultants, Micki Kelly, PWS, plant ecologist of Kelly Biological Consulting and WRA fish and wildlife biologist Nick Brinton conducted biological resources studies in the Winter and Spring of 2016 and 2017, and Winter of 2018. Studies included a biological resources assessment, special-status plant surveys, and a delineation of Section 404 jurisdictional areas within the proposed Meadow Way Bridge Project Biological Study Area (BSA) in the Town of Fairfax, Marin County, California (Figure 1). The BSA was examined on foot to determine (1) vegetation communities present, (2) if existing conditions provide suitable habitat for any special-status plant or wildlife species that have a potential to occur within the vicinity of the BSA, and (3) the presence of potential jurisdictional wetlands and "other waters" within the BSA. The BSA and impact areas are shown in Figures 3a and 3b. The special-status species that are known to occur in the vicinity of the BSA are listed in Table 1 and mapped in Figures 4 and 5 (CDFW 2018a). The regulatory framework under which the assessment was conducted and the methods used to conduct the assessment are described in the following section.

Regulatory Requirements

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 provides a framework which federal agencies must follow in evaluating environmental impacts of their actions. Actions by federal agencies must "use all practicable means and measures" to avoid or lessen impacts to the environment. In 2007, formal guidance for the continuation of a pilot program was issued which allows Caltrans to assume all of the Federal Highway Administration (FHWA) environmental responsibilities under NEPA and other environmental laws (NEPA Delegation). This delegation authority is limited to highway projects, including Local Assistance Federal Aid projects, and specific projects within the State or a programmatic delegation. Therefore, Caltrans must ensure joint projects with FHWA or projects funded with Federal Aid are in compliance with NEPA.

WETLAND AND WATERS

Section 10 of Rivers and Harbors Act of 1899

The Rivers and Harbors Act requires permits in navigable waters of the U.S. for all structures such as riprap and activities such as dredging. The term navigable waters of the United States and all other terms relating to the geographic scope of jurisdiction are defined at 33 CFR part 329. Generally, they are those waters of the United States that are subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. The United States Army Corps of Engineers (USACE) grants or denies permits based on the effects on navigation. San Anselmo Creek is a tributary to Corte Madera Creek, which is only considered navigable below the College of Marin, approximately 4 miles downstream of the site. (http://www.spn.usace.army.mil). Therefore, this creek is not considered a navigable water subject to the Rivers and Harbors Act.

Clean Water Act (CWA)

The CWA provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 404 identifies the United

States Army Corps of Engineers (USACE) jurisdiction over fill materials in essentially all water bodies, including wetlands. All federal agencies are required to avoid impacts to wetlands whenever there is a practicable alternative. Section 404 established a permit program administered by USACE regulating the discharge of dredged or fill material into Waters of the US (including wetlands).

Section 401of the CWA requires that an applicant for a federal license or permit that allows activities resulting in a discharge to Waters of the U.S., obtain a state certification that the discharge complies with other provisions of CWA. The Regional Water Quality Boards (RWQCB) administers the certification program in California. The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Executive Order 11990 – Protection of Wetlands

This order established a national policy to avoid adverse impacts to wetlands whenever there is a practicable alternative. The U. S. Department of Transportation (DOT) promulgated DOT Order 5660.1A in 1978 to comply with this direction. On federally funded projects, impacts to wetlands must be identified. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding. An additional requirement is to provide early public involvement in projects affecting wetlands. FHWA provides technical assistance (Technical Advisory 6640.8A) and reviews environmental documents for compliance.

California Porter-Cologne Water Quality Control Act

This regulatory law is becoming more prominent on projects involving impacts to isolated Waters of the State (non-404/401 waters). The RWQCB is increasingly requiring Waste Discharge Requirement (WDR) permits for impacts to Waters of the State.

Streams, Lakes, and Riparian Habitat in California

Streams and lakes, as habitat for fish and wildlife species, are subject to the jurisdiction of California Department of Fish and Wildlife (CDFW) under Sections 1600-1616 of California Fish and Game Code. Alterations to, or work within or adjacent to streambeds or lakes, generally require a 1600 series Lake and Streambed Alteration Agreement. The term “stream”, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term “stream” can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). “Riparian” is defined as “on, or pertaining to, the banks of a stream.” Riparian vegetation is defined as “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself” (CDFG 1994). Removal of riparian vegetation also requires a Lake and Streambed Alteration Agreement from CDFW.

INVASIVE SPECIES

Executive Order 13112 – Invasive Species

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State’s invasive species list, maintained by the California Invasive Species Council (Cal-IPC 2018) to define the invasive plants that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project. Under the EO, federal agencies cannot authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless all reasonable measures to minimize risk of harm have been analyzed and considered.

PROTECTED SPECIES

Special-Status Species

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal Endangered Species Act or California Endangered Species Act. These acts afford protection to both listed and proposed species. In addition, California Department of Fish and Wildlife Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern are considered special-status species. Although CDFW Species of Special Concern generally have no special legal status, they are given special consideration under the California Environmental Quality Act (CEQA). Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory with California Rare Plant Rank of 1 or 2 are also considered special-status plant species and must be considered under CEQA. Rank 3 and Rank 4 species are afforded little or no protection under CEQA.

Federal Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.), was enacted to provide a means to identify and protect endangered and threatened species. Under Section 9 of the ESA, it is unlawful to take any listed species. “Take” is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting a listed species. “Harass” is defined as an intentional or negligent act or omission, which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering. “Harm” is defined as an act which actually kills or injures fish or wildlife and may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Actions that may result in “take” of a federal-listed species are subject to USFWS or National Marine Fisheries Service (NMFS) permit issuance and monitoring. Section 7 of ESA requires federal agencies to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any

endangered or threatened species or result in the destruction or adverse modification of designated critical habitat for such species. Any action authorized, funded, or carried out by a federal agency or designated proxy (e.g., Caltrans) which has potential to affect listed species requires consultation with the USFWS or the NMFS under Section 7 of the ESA.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

California Endangered Species Act

CDFW is responsible for administering California Endangered Species Act (CESA, CDFG Code §§2050, et seq.), which prohibits take of species that have been listed, or are considered for listing (candidate species) as threatened or endangered species within the State of California. CESA allows for incidental take of state listed species through issuance of an Incidental Take Permit, or through a Consistency Determination in coordination with a Biological Opinion issued by the USFWS (CDFW Code Section 2081). In contrast with federal law, the definition of “take” under CESA involves actual harm to one or more members of a listed species and does not extend to modification of habitat not involving direct take.

Migratory Bird Treaty Act

This treaty with Canada, Mexico and Japan that makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season. California Fish and Game Code (Sec 3500) also prohibits the destruction of any nest, egg, or nestling.

Other Sensitive Biological Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2018a). Sensitive plant communities are also identified by CDFW. CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2010) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or USFWS must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances.

LOCAL POLICIES AND ORDINANCES

Tree Protection Ordinance

In 1973, the Town of Fairfax approved Ordinance No. 387 for trees. The purpose of the ordinance is to preserve the wide variety of local native trees and to protect the benefits they provide the citizens. Chapter 8.36.020 of the Town Code defines "altering" and "tree." A Tree Permit is required for removal or significant trimming of any tree, which has a circumference of 24 inches or more measured at 24 inches above the ground. In effect, this is a little less than an 8-inch diameter tree trunk.

Studies Required

The Town's consultants, Kelly Biological Consulting and WRA, conducted field studies in the entire BSA to determine the presence of wetlands and "other waters", and to evaluate the presence or potential presence of special-status species and sensitive habitats. Methods used during the site visits to make determinations for this NES are described below.

Special-Status Species

Prior to the field visits to the BSA, the following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of the BSA:

- California Natural Diversity Database (CNDDB) records for the Bolinas, Novato, Petaluma Point, Point Bonita, San Francisco North, San Geronimo, San Rafael, San Quentin U.S. Geological Service 7.5' Quadrangles (CDFW 2018a)
- USFWS Information for Planning and Conservation Resource List (USFWS 2018)
- CNPS Inventory of Rare, Threatened, and Endangered Plants of California records for the Bolinas, Novato, Petaluma Point, Point Bonita, San Francisco North, San Geronimo, San Rafael, San Quentin U.S. Geological Service 7.5' Quadrangles (CNPS 2018)
- CDFW Spotted Owl Database (CDFW 2018b)
- CDFW California Wildlife Habitat Relationships Online Database (CDFW 2018c)
- CDFW Passage Assessment Database (CDFW 2018d)
- CDFW publication "California Amphibians and Reptile Species of Special Concern" (Thomson et al. 2016)
- CDFG publication "California Bird Species of Special Concern" (Shuford and Gardali 2008).
- University of California at Davis, Center for Watershed Sciences. Pisces: California Fish Data and Management Software (UC Davis 2018)
- NMFS Species List and Essential Fish Habitat Maps of California (NMFS 2018)
- The Marin County Breeding Bird Atlas (Shuford 1993)
- eBird online database (eBird 2018)
- Western Bat Working Group (WBWG) online species accounts (WBWG 2018)

Special-Status Species. During the April 12 and June 23, 2016, January 11 and May 2, 2017, and February 1, 2018 site visits, the Town's consultant (Kelly Biological Consulting) completed floristic surveys for special-status plant species with flowering periods that overlapped with the timing of the visits. All habitats with potential to support special-status plant species were traversed on foot, and all plant species observed and identifiable were recorded. During the February 1, 2018 site visit, WRA biologist Nick Brinton completed a survey to determine the potential for the BSA to support special-status wildlife species. The studies did not constitute protocol-level surveys. Habitat conditions observed in the BSA during the site visits were used to evaluate the potential for presence of special-status species based on these literature searches and the professional expertise of the investigating biologists. Table 1 presents the evaluation of habitat potential for each special-status plant and wildlife species documented to occur in the vicinity of the BSA based on the literature database search. A list of all plant and wildlife species observed during the site visit is provided in Appendix A. The USFWS official listing of special-status species with a potential to occur in the proposed project vicinity is provided in Appendix B.

Section 404 "Waters of the U.S." During the site visit, the BSA was evaluated for the presence of indicators of wetlands and "other waters". Section 328.3 of the Federal Code of Regulations defines wetlands as:

> *"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*" EPA, 40 CFR 230.3 and CE, 33 CFR 328.3 (b)

The methods used to delineate potential jurisdictional wetlands and waters are based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* ("Arid West Supplement"; USACE 2008). The routine method for wetland delineation described in the Corps Manual was used to identify areas potentially subject to USACE Section 404 jurisdiction within the BSA.

The BSA was evaluated for the presence or absence of indicators of the three wetland parameters described in the Corps Manual and Arid West Supplement. The three parameters are the presence of: (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils. According to the Corps Manual, for areas not considered "problem areas" or "atypical situations":

> *"... [E]vidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination."*

This study also evaluated the presence of unvegetated "other waters" potentially subject to USACE jurisdiction under Section 404 of the Clean Water Act. Besides wetlands, other areas subject to Corps jurisdiction include lakes, rivers and streams in addition to all areas below the high tide line (HTL) in areas subject to tidal influence. No tidally influenced areas are present in the BSA. Jurisdiction in non-tidal areas extends to the ordinary high water (OHW) mark defined as:

> "*...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank,*

shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." Federal Register Vol. 51, No. 219, Part 328.3 (e). November 13, 1986.

Identification of the ordinary high water mark at this site followed the USACE Regulatory Guidance Letter No. 05-05, *Ordinary High Water Mark Identification* (USACE 2005), which provides a list of indicators, such as shelving, natural lines impressed on the bank, wrack lines, scour, and sediment deposition. These indicators were used to map the location of the ordinary high water mark for "other waters" in the BSA.

Vegetation Communities and Sensitive Habitats. Vegetation communities present in the BSA were classified based on existing plant community descriptions described in *A Manual of California Vegetation, 2nd Edition* (Sawyer, J., T. Keeler-Wolf and J. Evens. 2009). However, in some cases it was necessary to identify variants of community types or to describe non-vegetated areas that are not described in the literature.

Biological communities were classified as sensitive or non-sensitive as defined by CEQA. Sensitive plant communities include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by CDFW. CDFW ranks sensitive communities as 'threatened' or 'very threatened' and keeps records of their occurrences in its CNDDB. Also, vegetation alliances are ranked 1 through 5 (Sawyer, J., T. Keeler-Wolf and J. Evens. 2009). Alliances ranked globally (G) or statewide (S) as 1 through 3 are considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, regulations, or by CDFW or USFWS must be considered and evaluated under CEQA.

Personnel and Survey Dates

The Town's consultant, Micki Kelly, Certified Professional Wetland Scientist and plant ecologist with 25 years of experience, conducted the wetland delineation on June 23, 2016, and May 2, 2017 and sensitive plant surveys on April 12 and June 23, 2016, January 11 and May 2, 2017, and February 1, 2018. WRA biologist Nicholas Brinton conducted the biological resource site visit on February 1, 2018. Their qualifications are provided in Appendix C.

Agency Coordination and Professional Contacts

The Town and Caltrans have involved NMFS in early coordination for the proposed project and two other bridge repair projects in the Town of Fairfax. Early coordination has included a phone call on February 28, 2019, a site meeting on April 2, 2019, and emails to help clarify the project description. The February 28 phone meeting and April 2 site meeting included Keevan Harding and Hugo Ahumada of Caltrans; Garrett Toy of the Town of Fairfax; Nader Tamannaie, Micki Kelly, Nicholas Brinton, and Patricia Valcarcel of the Town's consultants; Gwen Santos and Darren Howe of NMFS. The coordination resulted in a request from NMFS to combine the three Town of Fairfax bridge repair projects (including Meadow Way) into a single Biological Opinion. No other agencies or agency meetings have occurred for the proposed project.

Limitations That May Influence Results

The site visits were conducted during daylight hours and consisted of an assessment of likely habitats for special-status plants and wildlife; they did not conform to specific USFWS or NMFS protocols for any species. No northern spotted owl (NSO; *Strix occidentalis caurina*) surveys or detailed fish studies were completed to identify and enumerate fish species present. Due to variable water levels in the region, water levels at the time of the site visit don't necessarily represent those that will exist during construction. Data and documents from previous studies in the area were relied upon to evaluate potential presence of fish species.

Chapter 3 – Results: Environmental Setting

This section describes the region in which the proposed project would occur. It is intended to explain context and the level of intensity of impacts. It includes a brief description of the area's topography, soils, habitat, watercourses, and level of human or natural disturbance.

Existing Biological and Physical Conditions

BIOLOGICAL STUDY AREA

The BSA is located on and around the Meadow Way Bridge over San Anselmo Creek in the Town of Fairfax, Marin County, California. Meadow Way is a local residential road. The BSA covers the areas encompassed by the proposed project-related direct and indirect actions such as ground-disturbing, construction, staging, or anywhere access activities would occur and goes beyond that to ensure that key biological issues are addressed. Meadow Way is a local road in a suburban developed area. The adjacent land use is residential (single family homes). The BSA extends up and downstream from the bridge along the stream corridor covering the primary natural area.

Site elevations range from approximately 100 to 200 feet NAVD88. Surrounding land use is residential. The bridge is located on the San Rafael USGS 7.5-minute quadrangle map at latitude W37.583366, longitude N122.36085.

PHYSICAL CONDITIONS

Topography

Within the BSA, the creek flows to the northeast. The steep banks are approximately 20 vertical feet (top of bank to channel). Adjacent to the top of bank, lands are relatively flat. There is a hill to the northwest and a ridge to the south and east of the BSA.

Hydrology

The principal natural hydrological sources for the BSA are creek flow, direct precipitation, and surface run-off from adjacent lands. San Anselmo Creek begins in the hills west of the site. Downstream of BSA, it flows to the northeast. In roughly 1 mile, it joins Fairfax Creek and turns east/southeast, eventually flowing into Corte Madera Creek, then San Francisco Bay, and the Pacific Ocean. At the Meadow Way Bridge the flow is intermittent, though some pools may persist well into the dry season. Flows vary substantially, depending on the season and the recent rainfall pattern.

Soils

The soils that occur in the BSA are Tocaloma-McMullin-Urban land complex (30 to 50 percent slopes) (USDA NRCS 2018). The Tocaloma-McMullin-Urban land complex is a fine-loamy, mixed, mesic Typic Haploxeroll. Its drainage class is well drained.

BIOLOGICAL CONDITIONS IN THE BSA

Riparian Woodland

The BSA contains 0.26-acre of an open canopy Riparian Woodland similar to California Bay (*Umbellularia Californica*) Forest Alliance (G4, S3) (Sawyer, J.O., T. Keeler-Wolf, and J. Evens. 2009) (Figure 3a). The sparse overstory includes native tree species such as California bay, buckeye (*Aesculus californica)*, oaks (*Quercus kelloggii, Q, garryana*, and *Q. agrifolia var. agrifolia*), and a multi-stem arroyo willow (*Salix lasiolepis*). The understory is comprised mainly of California blackberry *(Rubus ursinus)*, Himalayan blackberry, English ivy (*Hedera helix*), and various grasses including panic veldtgrass (*Ehrharta erecta*). There are cement and wood retaining walls along portions of the lower banks.

Ruderal Disturbed/Developed

The Ruderal Disturbed/Developed portion of the BSA includes paved areas, structures, roadsides, landscaping, and gravel or bare dirt areas. Within the BSA, this plant community is predominately landscaping cultivars and non-native herbaceous species commonly found in the region, such as American vetch (*Vicia americana*), various clovers (*Trifolium* spp.), oats (*Avena barbata*), bromes (*Bromus* spp.), and hedge-hog dogtail (*Cynosurus echinatus*). The dominant vegetation along the middle to upper part of the creek bank is Himalayan blackberry and English ivy.

Intermittent Stream ("Other Waters")

At this location, San Anselmo Creek is an intermittent creek with flows that vary with the rainfall patterns of a given season. The watershed that supports it is local, generally the western part of the Town of Fairfax and adjacent open space lands. Flows within the creek during a January 11, 2017 site visit extended to the edges of the creek bed. During a site visit at a similar time of year (February 1, 2018) flows were much lower. In addition to slope change at the bed and bank junction, wrack observed at the edge of the creek bed was used as an indication of OHW mark. The creek substrate is a mix of small gravel to larger cobble. The channel width at the OHW mark was used to determine the intermittent stream ("other waters") boundary shown on Figure 3a. The creek is not included on the National System of Wild and Scenic Rivers published by the U.S. Department of the Interior. There are no wetlands in the BSA. Within portions of the BSA, there are wooden or cement retaining walls along the lower banks. The rest of the bank areas are natural substrate.

Wildlife Species in the BSA

The BSA is situated within riparian woodland, and wildlife species known to occur in the vicinity include Stellar's jay (*Cyanocitta stelleri*), western gray squirrel (*Sciurus griseus*), and chestnut-backed chickadee (*Poecile rufescens*).

The portion of San Anselmo Creek within the BSA is located above two partial fish passage barriers at Saunders Avenue and a flood control channel where Corte Madera Creek feeds into a larger slough. Despite these barriers, San Anselmo Creek is considered anadromous because the barriers only deter passage during low flow portions of the year. CCC steelhead is considered present within the watershed (UC Davis 2017, Leidy et al. 2005).

INVASIVE SPECIES

Federal Highway Administration guidance issued August 10, 1999, states that the State's invasive species list, maintained by the California Invasive Species Council (Cal-IPC) be used to define the invasive plants. The Cal-IPC list categorizes invasive plants as High, Moderate, or Limited, reflecting the level of each species' negative ecological impact in California. Cal-IPC defines High as "Species that have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically." (Cal-IPC 2018). The species found in the BSA that Cal-IPC lists as High are English ivy (*Hedera helix*), French broom (*Genista monspessulana*), Himalayan blackberry (*Rubus armeniacus*), fennel (*Foeniculum vulgare*), and hedgehog dogtail (*Cynosurus echinatus*). Several species with moderate rating were also observed, including hedge parsley (*Torilis arvensis* ssp. *purpurea*), periwinkle (*Vinca major*), sheep sorrel (*Rumex acetosella*), slender wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), rattail fescue (*Festuca myuros*), perennial ryegrass (*Festuca perennis*), wall barely (*Hordeum murinum* sp. *murinum*), and panic grass (*Ehrharta erecta*).

During construction the French broom and fennel plants within the BSA and in or adjacent to the work area will be removed. The English ivy, Himalayan blackberry, big-leaf periwinkle, hedge parsley, sheep sorrel, and grasses will be more difficult to eradicate, given that they are common outside the BSA in nearby areas and upstream. The proposed project will remove individuals of those species in areas where the vegetation is removed for construction activities, and stabilize the soil with appropriate erosion control measures, as needed.

New Zealand mud snail (NZMS; *Potamopyrgus antipodarum*) is documented within San Anselmo Creek. Construction equipment such as pumps, tanks, or heavy equipment which operate within an infested aquatic environment is at risk for spreading NZMS. Snails survive in pooled water in pumps and tanks or in mud which remains attached to equipment. To prevent the spread of NZMS, all construction equipment that comes into contact with a wetted channel will be thoroughly cleaned to remove all attached soil and all water within the compartments will be dried up. Pumps and tanks will be cleaned and must remain fully dried for 72 hours following cleaning before equipment may be used on another aquatic project. In addition, any measures required by federal or state agencies will be implemented.

Regional Species and Habitats and Natural Communities of Concern

The species listed in the CDFW (2018a), CNPS (2018), NMFS (2018), and USFWS (2018) records search results are discussed in Table 1. The printout of the USFWS list can be found in Appendix B. Figures 4 and 5 show the documented occurrences for special-status plant and wildlife species (respectively) in the vicinity of the BSA based on the CNDDB (CDFW 2018a). A description of habitat requirements is provided for each special-status plant or wildlife species along with an evaluation of its potential to occur within the BSA. Potential for special-status species to occur in the BSA was determined according to the following criteria:

- Absent [A] - No habitat present and no further work needed.
- Habitat Present [HP] - Habitat is, or may be present. The species may be present.
- Present [P] - Species is present

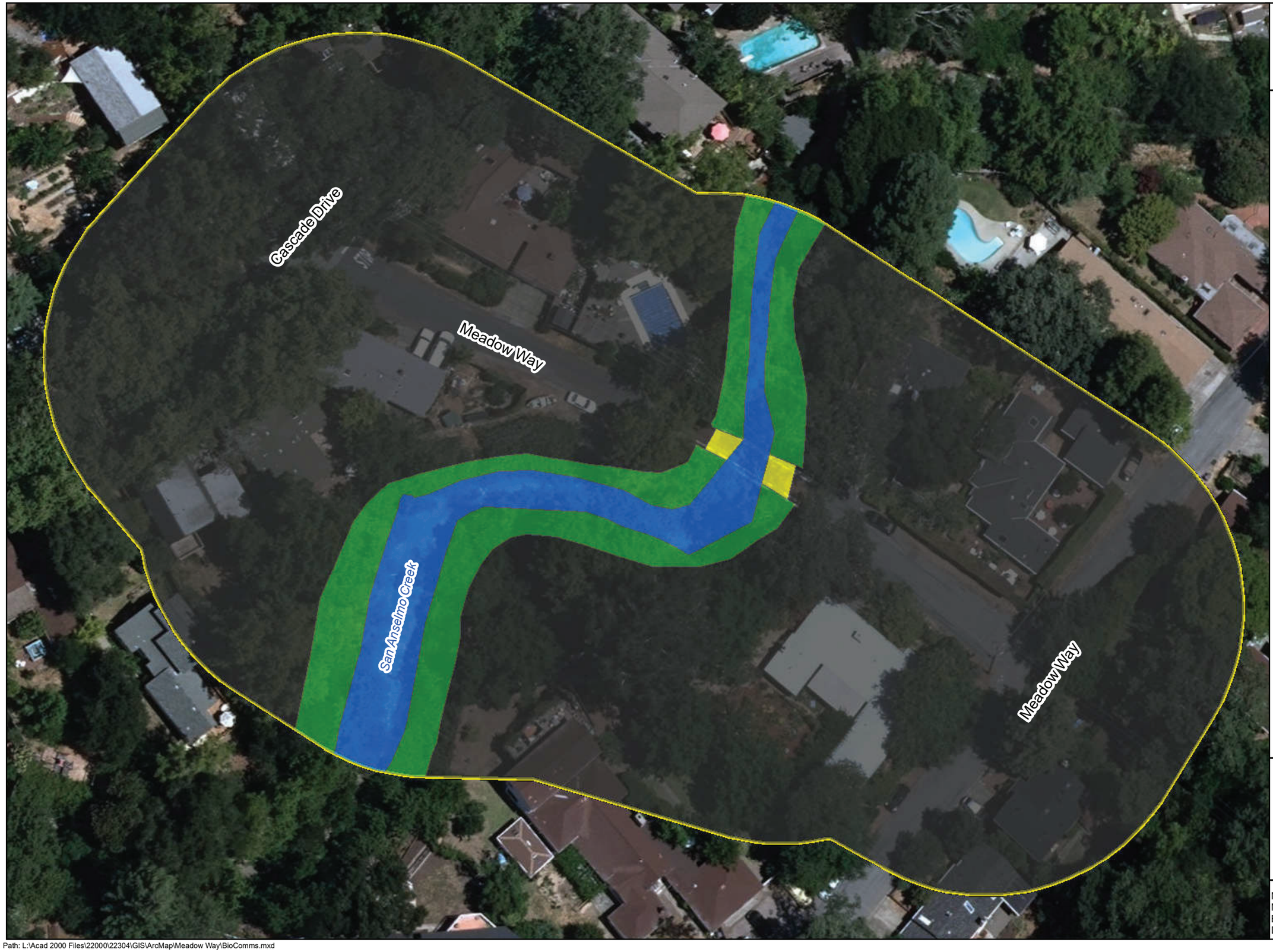
- Critical Habitat [CH] - Proposed project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present.

Based on these results, it was determined that 75 special-status plant species and 91 special-status wildlife species have been documented from or have a range that occurs in the San Rafael, Bolinas, San Geronimo, Novato, Petaluma Point, San Quentin, San Francisco North, or Point Bonita 7.5-minute USGS quadrangles. Of these species, 23 special-status plant species and seven special-status wildlife species have documented occurrences within 5 kilometers (3 miles) of the BSA.

Due to a lack of appropriate habitat elements (such as coastal salt marsh) and the presence of residential development in the surrounding landscape, it was determined that the BSA has the potential to support only four of the special-status plant species identified in Table 1. No special-status plants were observed in the BSA during rare plant surveys conducted for this report.

The BSA is designated Critical Habitat for steelhead, and the species is presumed present within this section of San Anselmo Creek (UC Davis 2018, Leidy et al. 2005). The BSA is also listed as designated Critical Habitat for Coho salmon (*O. kisutch*), although this species is considered extirpated from the tributaries and waters of San Francisco Bay (NMFS 2012, Brown and Moyle 1991). Additionally, the BSA contains EFH for Pacific salmonids. Based on habitat and conditions within the BSA and documented occurrences nearby, it was determined that the BSA has potential to support CCC steelhead, NSO, and two other special-status wildlife species identified in Table 1.

The proposed project primarily involves temporary impacts and would not disrupt connectivity in the region. San Anselmo creek is expected to have very little to no flow during construction within the BSA; however, deep pools with standing water may be present. After construction is completed, the creek channel will be restored to more natural conditions with a trough-like flow and no obstructions within the creek bed. During the construction, six wooden pilings (two bents) would be removed from the creek bed; therefore, fish passage may in fact be improved following the completion of work. Sensitive habitat within the BSA is limited to San Anselmo Creek which is an intermittent waterway in this reach. San Anselmo Creek is subject to USACE, RWQCB, and the CDFW jurisdiction.



wra
ENVIRONMENTAL CONSULTANTS

Meadow Way Bridge
Bridge: No 27C-0008
Town of Fairfax
Marin County, California

Figure 3a.
Biological Communities within the Biological Study Area

Biological Study Area (3.49 ac.)

Biological Communities:

- Intermittent Stream (0.18 ac.)
- Riparian Woodland (0.26 ac.)
- Ruderal Disturbed (3.04 ac.)
- Unvegetated Banks (0.01 ac.)

N
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0 20 40 60
Feet

Map Prepared Date: 2/14/2018
Map Prepared By: smortensen
Base Source:
Data Source(s): WRA, Marin County

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Meadow Way\BioComms.mxd

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Table 1: Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Birds					
northern spotted owl	*Strix occidentalis caurina*	FT, ST, SSC	Old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees. Prefers high, multistory canopy dominated by big trees, trees with cavities or broken tops, woody debris and space under canopy.	HP	The BSA and immediately surrounding area are low-density residential developments and riparian woodland; however, riparian redwood forest community is in proximity to the BSA. This species has been documented to nest in dense forest approximately 0.28 miles southwest of the BSA (CDFW 2018b). No nesting habitat is present in the BSA.
short-eared owl	*Asio flammeus*	SSC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	A	The BSA and immediately surrounding area are low-density residential developments and riparian woodland which do not provide nesting habitat for the species. Lowland marshes, tule patches or tall grasslands that typically support nesting by the species do not occur in the BSA.
long-eared owl	*Asio otus*	SSC	Primarily a year-round resident. Inhabits riparian bottomlands to tall willows and cottonwoods; also, belts of live oak paralleling stream courses. Requires dense foliage cover within occupied tree stands, adjacent open land productive of mice for foraging, and the presence of old nests of other birds for nesting.	A	This species is a very rare breeder in Marin County (Shuford 1993). The only recorded nesting occurrences of the species are near Bolinas and Drake's Bay. Both locations are greater than 5 miles from the BSA (Shuford 1993). Areas within the BSA and immediately surrounding do not contain riparian communities suitable for nesting by this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
burrowing owl	*Athene cunicularia*	SSC, BCC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel	A	The BSA and immediately surrounding area are low-density residential developments and largely forested landscape. The BSA does not contain short grasslands or other open areas suitable for nesting or foraging by this species.
golden eagle	*Aquila chrysaetos*	EPA, CFP, BCC	Resident in rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large trees in open areas.	A	The BSA and immediately surrounding area are low-density residential developments and riparian woodland, which do not provide suitable nesting habitat for the species. The BSA also does not support habitat for the preferred prey species of golden eagle.
bald eagle	*Haliaeetus leucocephalus*	FD, SE, EPA, CFP, BCC	Primarily a winter visitor in the region; small numbers are present year-round and breed. Favors areas near larger bodies of water with abundant fish: lakes and reservoirs, rivers, and the ocean. Nests in large, old-growth, or dominant live tree with open branchwork. Often roosts communally in winter.	A	Although the BSA is within this species' historic breeding range, bald eagles are no longer known to breed in Marin County (Shuford 1993). The BSA and the vicinity do not provide larger open bodies of water to support foraging or nesting.
northern harrier	*Circus hudsonius (cyaneus)*	SSC	(Nesting) Nests and forages in grassland habitats, usually in association with coastal salt and freshwater marshes. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	A	The BSA and immediately surrounding area are low-density residential developments and largely forested landscape which do not provide nesting habitat for the species. Suitable mesic grasslands or marsh habitat are absent from the BSA and the immediate surrounding areas.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
white-tailed kite	*Elanus leucurus*	CFP	(Nesting) Year-long resident of open grasslands and agricultural areas. Preys on small diurnal mammals and occasional birds, insects, reptiles, and amphibians. Nests in tree-tops.	A	The BSA and immediately surrounding area are low-density residential developments in a largely forested landscape and do not provide nesting habitat for the species. The BSA does not contain open areas such as agricultural fields, grasslands or marsh that are typically used by this species.
American peregrine falcon	*Falco peregrinus anatum*	FD, SD,CFP, BCC	Year-round resident and winter visitor in the region. Habitat variable, though usually associated with coasts, bays, marshes and other bodies of water. Nests on sheer, protected cliffs and also on manmade structures including buildings and bridges. Preys on birds, especially waterbirds. Forages widely.	A	High cliffs and tall buildings typically used for nesting by this species are absent from the BSA and immediate surrounding area. Large water-bodies which provide foraging habitat are absent from the BSA and vicinity.
prairie falcon	*Falco mexicanus*	BCC	Year-round resident in areas of California and winter visitor. Inhabits dry, open terrains, including foothills and valleys. Breeding sites located on steep cliffs. Forages widely.	A	Although this species winters in Marin County, it does not nest there (Shuford 1993). Additionally, the BSA does not contain xeric open areas such as grasslands that are typically used by this species. This species could occasionally be observed flying over the BSA during migration.
ferruginous hawk	*Buteo regalis*	BCC	Winter visitor to open habitats, including grasslands, sagebrush flats, scrub, and low foothills surrounding valleys. Preys on mammals. Does not breed in California.	A	Although this species winters in Marin County, it does not nest there (Shuford 1993). Additionally, the BSA does not contain xeric open areas such as grasslands that are typically used by this species. This species could occasionally be observed flying over the BSA during migration.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
American white pelican	*Pelecanus erythrorhynchos*	SSC	Colonial nester on large interior lakes. Nests on large lakes, providing safe roosting and breeding places in the form of well-sequestered islets. Winter visitor to the San Francisco Bay Area.	A	American white pelican does not nest in Marin County (Shuford 1993). Additionally, suitable foraging habitat does not occur within 2 miles of the BSA.
California brown pelican	*Pelecanus occidentalis californicus*	FD, SD, CFP	Colonial nester on coastal islands just outside the surf line. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators.	A	California brown pelican does not nest in Marin County (Shuford 1993). Additionally, suitable foraging habitat does not occur within 2 miles of the BSA.
marbled murrelet	*Brachyramphus marmoratus*	FT, SE	Feeds near shore; nests inland along the Pacific coast, from Eureka to Oregon border, and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland. Nests often built in Douglas-fir or redwood stands containing platform-like branches.	A	Despite the presence of riparian redwood forest in proximity to the BSA and the designated critical habitat 3.5 miles south of the BSA, marbled murrelet is not known to breed within Marin County (Shuford 1993, McShane et al. 2004, USFWS 2009).
short-tailed albatross	*Phoebastria albatrus*	FE, SSC	Highly pelagic; comes to land only when breeding. Nests on remote Pacific islands. A rare non-breeding visitor to the eastern Pacific.	A	Short-tailed albatross does not nest in Marin County. Additionally, suitable marine foraging habitat does not occur within 5 miles of the BSA.
black oystercatcher	*Haematopus bachmani*	BCC	Resident on rocky shores of marine habitats along almost the entire California coast and adjacent islands. Breeds on undisturbed, rocky, open shores and cliffs.	A	The BSA is not within the known breeding distribution of this species. Rocky shoreline and marine habitats which support nesting and foraging by the species are absent from the BSA and vicinity.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Caspian tern	*Hydroprogne caspia*	BCC	Nests in small colonies inland and along the coast on sandy estuarine shores, levees, and salt ponds. Found in inland fresh-water lakes and marshes; also, brackish or salt waters of estuaries and bays.	A	The BSA is not within the known breeding distribution of this species. Islands, shores, levees or salt ponds that support nesting by this species are absent. The BSA does not occur near marine environments to support foraging.
California least tern	*Sternula antillarum browni*	FE, SE, CFP	Colonial breeder on barren or sparsely vegetated, flat substrates near water. Breeding colonies in San Francisco Bay along estuarine shores and in abandoned salt ponds.	A	The BSA is not within the known breeding distribution of this species. Islands, shores, levees or salt ponds that support nesting by this species are absent. The BSA does not occur near marine environments to support foraging.
black skimmer	*Rynchops niger*	SSC, BCC	Found primarily in southern California; South San Francisco Bay has a small resident population. Nests colonially on gravel bars, low islets, and sandy beaches	A	The BSA is not within the known breeding distribution of this species. Islands, shores, levees or salt ponds that support nesting by this species are absent. The BSA does not occur near marine environments to support foraging.
western snowy plover	*Charadrius alexandrinus nivosus*	FT, SSC, BCC	Federal listing applies only to the Pacific coastal population. Found on sandy beaches, salt pond levees and shores of large alkali lakes. Requires sandy, gravelly or friable soils for nesting.	A	The BSA and immediately surrounding area are low-density residential developments within a largely forested landscape. Sandy beaches, salt flats or alkali lake flats that this species inhabits are absent from the BSA and vicinity.
California Ridgway's rail	*Rallus obsoletus*	FE, SE, CFP	Resident in tidal marshes of the San Francisco Bay Estuary. Requires tidal sloughs and mud flats for foraging, and dense vegetation for nesting. Associated with abundant growth of cordgrass and pickleweed. Largest populations in south San Francisco Bay.	A	The BSA is not within the known breeding distribution of this species. The BSA lacks any salt marsh habitat which this species requires for nesting and foraging.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
California black rail	*Laterallus jamaicensis coturniculus*	ST, CFP, BCC	Resident in marshes (saline to freshwater) with dense vegetation below four inches in height. Prefers larger, undisturbed marshes close to a major water source.	A	The BSA is not within the known breeding distribution of this species. The BSA lacks any marsh habitat that this species requires for nesting and foraging.
great egret	*Ardea alba*	None	(Rookeries tracked by CDFW) Colonial nester in large trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	A	Suitable rookery trees are absent from the BSA and vicinity; however, this species may occasionally fly over or forage within the BSA.
snowy egret	*Egretta thula*	None	(Rookeries tracked by CDFW) Colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	A	Suitable rookery trees are absent from the BSA and vicinity; however, this species may occasionally fly over or forage within the BSA.
great blue heron	*Ardea herodias*	None	(Rookeries tracked by CDFW) Colonial nester in tall trees, cliffs, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	A	Suitable rookery trees are absent from the BSA and vicinity; however, this species may occasionally fly over or forage within the BSA.
black-crowned night heron	*Nycticorax nycticorax*	None	(Rookeries tracked by CDFW) Colonial nester, usually in trees, occasionally in tule patches. Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.	A	Suitable rookery trees are absent from the BSA and vicinity; however, this species may occasionally fly over or forage within the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
double-crested cormorant	*Phalacrocorax auritus*	None	(Rookeries tracked by CDFW) Colonial nester on coastal cliffs, offshore islands, and along lake margins in the interior of the state. Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.	A	Suitable rookery cliffs or other structures are absent from the BSA and vicinity; however, this species may occasionally fly over the BSA.
black swift	*Cypseloides niger*	SSC, BCC	Summer resident with a fragmented breeding distribution; most occupied areas in California either montane or coastal. Breeds in small colonies on cliffs behind or adjacent to waterfalls, in deep canyons, and sea-bluffs above surf. Forages aerially over wide areas.	A	Marin County is not within the documented breeding range of this species (Shuford 1993). Additionally, the BSA does not contain cliffs or deep canyons capable of providing nesting habitat for this species.
Vaux's swift	*Chaetura vauxi*	SSC	Summer resident, primarily in forested areas. Nests in tree cavities, favoring those with a large vertical extent. Also uses chimneys and other manmade substrates. Forages widely for aerial insects, often over or near rivers and lakes.	A	Trees within the BSA did not contain cavities typical of this species, and no snags are present. This species is documented as an infrequent nester in Marin County (Shuford 1993).
purple martin	*Progne subis*	SSC	Summer resident. In northwestern California, typically breeds in coniferous forest and woodlands. Nest in tree cavities, usually high off the ground, and in the cavities of manmade structures (e.g. bridges, utility poles). Forages for aerial insects.	A	No cavities suitable for use by this species were observed within the BSA. The bridge did not contain cavities suitable for use and trees adjacent to the BSA weren't large enough to provide nesting habitat for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
bank swallow	*Riparia riparia*	ST	Migrant in riparian and other lowland habitats in western California. Colonial nester in riparian areas with vertical cliffs and bands with fine-textured or fine-textured sandy soils near streams, rivers, lakes or the ocean.	A	Bank swallow does not nest in Marin County. The BSA lacks any cliff habitat which this species requires for nesting. The species may pass through the BSA during migration.
olive-sided flycatcher	*Contopus cooperi*	SSC, BCC	Summer resident. Typical breeding habitat is montane coniferous forests. At lower elevations, also occurs in wooded canyons and mixed forests and woodlands. Often associated with forest edges. Arboreal nest sites located well off the ground.	HP	This species is known to the area, and riparian forest is in the BSA, which may contain suitable nesting habitat for the species. (Shuford 1993, eBird 2018).
Nuttall's woodpecker	*Picoides nuttallii*	BCC	Resident in lowland woodlands throughout much of California west of the Sierra Nevada. Typical habitat is dominated by oaks.	A	Oak woodland typical of this species is not present within the BSA. Bay trees are dominant within the BSA and don't provide nesting habitat for this species.
oak titmouse	*Baeolophus inornatus*	BCC	Oak woodland and savannah, open broad-leaved evergreen forests containing oaks, and riparian woodlands. Associated with oak and pine-oak woodland and arborescent chaparral	A	Oak woodland typical of this species is not present within the BSA. Bay trees are dominant within the BSA and don't provide nesting habitat for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Allen's hummingbird	*Selaphorus sasin*	BCC	Breeds along the California coastline in habitats including mixed evergreen, Douglas fir, redwood and Bishop pine forests, riparian woodlands, nonnative eucalyptus and planted cypress groves, and occasionally live oak woodlands and coastal scrub with at least a scattering of trees, such as on north-facing slopes	HP	The BSA contains riparian woodland that may provide suitable nest trees and foraging habitat which may support this species.
rufous hummingbird	*Selasphorus rufus*	BCC	Spring migrant; does not breed in California. Favors habitats rich in nectar-producing flowers. Nests in berry tangles, shrubs, deciduous forests and conifers. Favors habitats rich in nectar-producing flowers.	A	The BSA is outside of the known breeding range for this species, but rufous hummingbird may be observed during migration seasons.
loggerhead shrike	*Lanius ludovicianus*	SSC, BCC	Primarily a year-round resident in open habitats including woodland, grassland, savannah and agricultural areas. Prefers areas with sparse shrubs, trees, posts, and other suitable perches for foraging. Preys upon large insects and small vertebrates. Nests are well-concealed in a densely-foliaged shrub or tree.	A	The BSA and immediately surrounding area are low-density residential developments and largely comprised of riparian woodland which does not provide nesting habitat for the species. The BSA does not contain open areas such as agricultural fields, grasslands or marsh that are typically used by this species.
yellow warbler	*Setophaga (Dendroica) petechia brewsteri*	SSC, BCC	Summer resident throughout much of California. Breeds in riparian vegetation close to water, including streams and wet meadows. Microhabitat used for nesting variable, but dense willow growth is typical. Occurs widely on migration.	A	The BSA and immediately surrounding area are low-density residential developments in a forested landscape and open understory. The BSA lacks the dense riparian understory that this species requires for nesting. This species may occur within the BSA during migration.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
saltmarsh common yellowthroat	*Geothlypis trichas sinuosa*	SSC, BCC	Resident of the San Francisco Bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	A	The BSA is not within the known breeding distribution of this species. Suitable salt marsh habitat which is required for nesting and foraging is absent from the BSA and vicinity.
yellow-breasted chat	*Icteria virens*	SSC	Summer resident, utilizing riparian areas with an open canopy, very dense understory, and trees for song perches. Nests in thickets of willow, blackberry, and wild grape.	A	The BSA and immediately surrounding area are low-density residential developments in a forested landscape and open understory. The BSA lacks the dense riparian understory that this species requires for nesting.
grasshopper sparrow	*Ammodramus savannarum*	SSC	Summer resident. Nests in open grassland habitats, generally with low- to moderate-height grasses and scattered shrubs. Nest typically placed on the ground and well-hidden. Secretive.	A	The BSA does not contain annual grassland that could support nesting or foraging by the species. Additionally the BSA is located within riparian woodland, which is not suitable for this species.
Alameda song sparrow	*Melospiza melodia pusillula*	SSC, BCC	Year-round resident of salt marshes bordering the south arm of San Francisco Bay. Inhabits primarily pickleweed marshes; nests placed in marsh vegetation, typically shrubs such as gumplant.	A	The BSA is not within the known breeding distribution of this species. The BSA lacks any marsh habitat that this subspecies requires for nesting and foraging.
Samuel's (San Pablo) song sparrow	*Melospiza melodia samuelis*	SSC, BCC	Resident of salt marshes along the north side of San Francisco and San Pablo Bays. Inhabits tidal sloughs in the *Salicornia* marshes; nests in *Grindelia* bordering slough channels.	A	The BSA is not within the known breeding distribution of this species. The BSA lacks any marsh habitat that this subspecies requires for nesting and foraging.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Bryant's savannah sparrow	*Passerculus sandwichensis alaudinus*	SSC	Year-round resident subspecies, associated with the coastal fog belt. Occupies upper tidally-influenced habitats and moist grasslands, often occurring where wetland communities merge into grassland. Nests in vegetation on or near the ground.	A	The BSA lacks the tidally influenced habitats and grasslands that this subspecies requires. The BSA is within low-density residential development and forested landscape.
Lawrence's goldfinch	*Carduelis lawrencei*	BCC	Resident to nomadic; inhabits oak woodlands, chaparral, riparian woodlands and other areas, often near water. Not known to breed in the vicinity of San Francisco Bay.	A	The BSA is within low-density residential development and forested landscape. This species is a very rare breeder in Marin County and typically inhabits the dry southern portions of the county, and the BSA does not contain chaparral or other xeric landscapes to support this species (Shuford 1993).
tricolored blackbird	*Agelaius tricolor*	ST, BCC, SSC	(Nesting colony) highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	A	The BSA does not contain any open waters such as ponds, lakes or marsh habitat that supports foraging or nesting by the colony. No tall emergent vegetation is present to support nesting by this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Mammals					
pallid bat	*Antrozous pallidus*	SSC, WBWG	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, forages along river channels. Roost sites include old ranch buildings, rocky outcrops and caves within sandstone outcroppings. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	A	The BSA and immediately surrounding area are low-density residential developments with no rock outcroppings or ranch type buildings to provide roosting sites. Trees did not contain cavities suitable for this species. The bridge has no exposed cracks or seams and is regularly disturbed by vehicles and pedestrians, making the structure and the surrounding area unsuitable for the species.
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC, WBWG	This species is associated with a wide variety of habitats from deserts to mid-elevation mixed coniferous-deciduous forest. Females form maternity colonies in buildings, caves and mines and males roost singly or in small groups. Foraging occurs in open forest habitats where they glean moths from vegetation.	A	The BSA and immediately surrounding area are low-density residential developments. Buildings in the area are maintained and do not provide suitable roosting habitat. Additionally, there are no caves, mines or suitable openings in the bridge structure to support roosting by the species within the BSA.
western red bat	*Lasiurus blossevillii*	SSC, WBWG	This species is typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (willows, cottonwoods, and sycamore).	A	The complexity of edge habitats required by the species is not present within the BSA, and the BSA does not contain broadleaf tree species generally favored for roosting by this species. This species may occasionally fly over the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
hoary bat	*Lasiurus cinereus*	WBWG	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	A	The BSA does not provide suitable open foraging habitat mosaics which are required by the species, and the BSA does not contain densely foliated trees and shrubs to support roosting.
fringed myotis	*Myotis thysanodes*	WBWG	Associated with a wide variety of habitats including mixed coniferous-deciduous forest and redwoods/sequoia groves. Buildings, mines, and large snags are important day and night roosts.	A	The BSA does not contain snags or trees large enough to contain cavities to provide roosting habitat. One tree is proposed to be removed by the project, but it does not constitute, The bridge structure has no suitable seams, cracks or crevices that might provide roosting habitat for the species. This species may occasionally fly through or forage over the BSA.
long-eared myotis	*Myotis evotis*	WBWG	Occurs in semiarid shrublands, sage, chaparral, and agricultural areas, but is usually associated with coniferous forests from seal level to 9000 feet. Individuals roost under exfoliating tree bark, and in hollow trees, caves, mines, cliff crevices, and rocky outcrops on the ground. They also sometimes roost in buildings and under bridges.	A	The BSA does not contain snags or trees large enough to contain cavities to provide roosting habitat. One bay tree is proposed to be removed during construction, but it isn't large enough to contain roosting habitat. The bridge structure has no suitable seams, cracks or crevices that might provide roosting habitat for the species. This species may occasionally fly through or forage over the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
long-legged myotis	*Myotis volans*	WBWG	Typically occupies mountainous or relatively rugged areas, dry coniferous forests, and sometimes oak or streamside woodlands, and deserts. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	A	The BSA does not contain snags or trees large enough to contain cavities to provide roosting habitat. One bay tree is proposed to be removed during construction, but it isn't large enough to contain roosting habitat. The bridge structure has no suitable seams, cracks or crevices that might provide roosting habitat for the species. This species may occasionally fly through or forage over the BSA.
silver-haired bat	*Lasionycteris noctivagans.*	WBWG	Summer habitats include coastal and montane coniferous forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitats. This species is primarily a forest dweller, feeding over streams, ponds, and open brushy areas. It roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark.	A	The BSA does not contain snags or trees large enough to contain cavities to provide roosting habitat. One bay tree is proposed to be removed during construction, but it isn't large enough to contain roosting habitat. The bridge structure has no suitable seams, cracks or crevices that might provide roosting habitat for the species. This species may occasionally fly through or forage over the BSA.
salt-marsh harvest mouse	*Reithrodontomys raviventris*	FE, SE, CFP	Found only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat. Do not burrow, build loosely organized nests. Require higher areas for flood escape.	A	The BSA and immediately surrounding area are low-density residential developments and riparian redwood forest. Marshes and tidal marine environments that are required to support this species do not occur within or near the BSA.
Suisun shrew	*Sorex ornatus sinuosus*	SSC	Tidal marshes of the northern shores of San Pablo and Suisun Bays. Require dense low-lying cover and driftweed and other litter above the mean high tide line for nesting and foraging.	A	The BSA and immediately surrounding area are low-density residential developments and riparian redwood forest. Marshes and tidal marine environments that are required to support this species do not occur within or near the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
salt-marsh wandering shrew	*Sorex vagrans halicoetes*	SSC	Confined to small remnant stands of salt marsh found around the southern arm of the San Francisco Bay in San Mateo, Santa Clara, Alameda and Contra Costa counties. Inhabits salt marshes that provide dense cover with driftwood and other debris.	A	The BSA and immediately surrounding area are low-density residential developments and riparian woodland habitat. Marshes and tidal marine environments that are required to support this species do not occur within or near the BSA.
San Pablo vole	*Microtus californicus sanpabloensis*	SSC	Saltmarshes of San Pablo Creek, on the south shore of San Pablo Bay. Constructs burrow in soft soil. Feeds on grasses, sedges and herbs. Forms a network of runways leading from the burrow	A	The BSA and immediately surrounding area are low-density residential developments and riparian woodland habitat. Marshes and tidal marine environments that are required to support this species do not occur within or near the BSA.
American badger	*Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	A	The BSA and immediately surrounding area are low-density residential developments and riparian redwood forest. Open areas with friable soils which support the preferred prey for badgers and badger dens do not occur within the BSA.
Point Reyes jumping mouse	*Zapus trinotatus orarius*	SSC	Bunch grass marshes on the uplands of Point Reyes in areas safe from continuous inundation. Builds grassy nests on ground under vegetation, burrows in winter.	A	The BSA and immediately surrounding area are low-density residential developments and riparian redwood forest. The BSA lacks marsh or grasslands that this subspecies requires for nesting and foraging, and the BSA is outside the known range of this subspecies.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Point Reyes mountain beaver	*Aplodontia rufa phaea*	SSC	The Point Reyes mountain beaver is only known to occur in western Marin County, almost entirely within Point Reyes National Seashore. It occurs on cool, moist, north-facing slopes in moderately dense coastal scrub. Burrows are typically constructed in dense thickets or in forest openings.	A	The BSA is not within the known distribution of this species. The BSA and immediately surrounding area are low-density residential developments and primarily comprised of riparian woodland habitat. The BSA does not contain any coastal scrub habitat which is required by the species.
ringtail (ring-tailed cat)	*Bassariscus astutus*	CFP	Is widely distributed throughout most of California, but absent from some portions of the Central Valley and northeastern California. The species is nocturnal, primarily carnivorous and is associated with a mixture of dry forest and shrubland in close association with rocky areas and riparian habitat, using hollow trees and cavities for shelter.	A	The BSA and immediately surrounding area are low-density residential developments and riparian woodland habitat. Anthropogenic disturbances in the area and an absence of suitable trees to provide cavities make the species unlikely to occur.
southern sea otter	*Enhydra lutris nereis*	FT, MMPA: SSC, CFP	Nearshore marine environments from about Año Nuevo, San Mateo County to Point Sal, Santa Barbara County.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.
Amphibians and Reptiles					
western pond turtle	*Actinemys marmorata*	SSC	Associated with permanent or nearly permanent water in a wide variety of habitats. Requires basking sites. Nests sites may be found up to 0.5 kilometers from water.	A	There are no known occurrences of this species in the watershed or vicinity. The BSA is over 1 mile from the nearest documented occurrence in a different watershed (CDFW 2018a). The BSA is canopied and does not provide suitable basking areas to support the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
California giant salamander	*Dicamptodon ensatus*	SSC	Occurs in the north-central Coast Ranges. Moist coniferous and mixed forests are typical habitat; also uses woodland and chaparral. Adults are terrestrial and fossorial, breeding in cold, permanent or semi-permanent streams. Larvae usually remain aquatic for over a year.	A	There are no known occurrences of this species in San Anselmo Creek (CDFW 2018a); and this section of San Anselmo Creek is not perennial. The banks are developed within the BSA; therefore, no upland habitat is present.
foothill yellow-legged frog	*Rana boylii*	SSC	Found in or near rocky streams in a variety of habitats. Prefers partly-shaded, willow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.	A	This species has not been documented within the watershed, and the closest documented occurrence is 2.9 miles east of the BSA in a different watershed (CDFW 2018a). This section of San Anselmo Creek is not perennial.
California red-legged frog	*Rana draytonii*	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of inundation for larval development. Must have access to estivation habitat.	A	No ponds or lakes exist nearby that could provide adequate still water habitat to support breeding by this species. Additionally, this species has not been documented in this portion of Marin County; the nearest documented occurrences are over 6 miles from the BSA (CDFW 2018a).

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Fishes					
pacific lamprey	*Entosphenus (=Lampetra) tridentatus*	SSC	Spawn between March and July in gravel bottomed streams in riffle habitat. Larvae drift downstream to areas of low velocity and fine substrates and are relatively immobile in the stream substrates.	A	Two barriers to anadromy exist downstream of the BSA; however, San Anselmo Creek is considered anadromous (CDFW 2018d). The BSA does not contain suitable spawning or larval habitat for this species based upon gradient and substrate and this species has not been documented within San Anselmo Creek.
river lamprey	*Lampetra ayresi*	SSC	Lower Sacramento River, San Joaquin River and Russian River. May occur in coastal streams north of San Francisco Bay. Adults need clean, gravelly riffles, Ammocoetes need sandy backwaters or stream edges, good water quality and temps < 25 degrees C.	A	Two barriers to anadromy exist downstream of the BSA; however, San Anselmo Creek is considered anadromous (CDFW 2018d). The BSA is not within the known distribution of this species (UC Davis 2018).
white sturgeon	*Acipenser transmontanus*	SSC	Found in most estuaries along the Pacific coast. Adults in the San Francisco Bay Estuary system spawn in the Sacramento River and are not known to enter freshwater or non-tidal reaches of Estuary streams. Spawn May through June.	A	The BSA is not within the known distribution of this species (UC Davis 2018). Additionally, The BSA lacks any estuarine/river habitat which is required by this species for breeding.
green sturgeon	*Acipenser medirostris*	FT, SSC	Spawn in the Sacramento River and the Klamath River. Spawn at temperatures between 8-14 degrees C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	A	The BSA is not within the known distribution of this species (UC Davis 2018). Additionally, The BSA lacks any marine habitat which is required by this species for foraging.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
tidewater goby	*Eucyclogobius newberryi*	FE, SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in willow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	A	The BSA is not within the known distribution of this species (UC Davis 2018). Additionally, The BSA lacks any lagoon habitat which is required by this species.
delta smelt	*Hypomesus transpacificus*	FT, SE, RP	Lives in the Sacramento-San Joaquin estuary in areas where salt and freshwater systems meet. Occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay.	A	The BSA is not within the known distribution of this species (UC Davis 2018). Additionally, the BSA lacks any brackish water habitat which is required by this species.
Tomales roach	*Lavinia symmetricus* ssp. *symmetricus*	SSC	Habitat generalists. Tolerant of relatively high temperatures and low oxygen levels, however unable to tolerate very saline water. Tributaries to Tomales Bay.	A	The BSA is not within the known distribution of this species (UC Davis 2018).
Coho salmon - central California coast	*Oncorhynchus kisutch*	FE, SE	State listing is limited to Coho south of San Francisco Bay. Federal listing is limited to naturally spawning populations in streams between Humboldt County and Santa Cruz County. Spawn in coastal streams 4-14C. Prefer beds of loose, silt-free, coarse gravel and cover nearby.	A, CH	San Anselmo Creek is designated as critical habitat for the species. However, the species is considered extirpated from the tributaries of San Francisco Bay (NMFS 2012, Brown and Moyle 1991).

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
steelhead - central California coast DPS	*Oncorhynchus mykiss*	FT	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	P, CH	San Anselmo Creek is designated as critical habitat for the central California coastal DPS of this species. Though two barriers to anadromy exist downstream of the BSA, the species is considered present within the creek.
chinook salmon – Central Valley fall/late fall-run ESU	*Oncorhynchus tshawytscha*	SSC	Populations spawning in the Central Valley, Napa and Petaluma Rivers and their tributaries. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean	A	The BSA is not within the known distribution of this species (UC Davis 2018). This ESU only spawns in and in tributaries of the Sacramento and San Joaquin Rivers. Additionally, the BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
chinook salmon - California coastal ESU	*Oncorhynchus tshawytscha*	FT, RP	California Coastal Chinook Salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel.	A	The BSA is not within the known breeding distribution of this species (UC Davis 2018). This ESU is only known to spawn in tributaries along coastal California that lead directly to the ocean without going through San Francisco Bay. Additionally, the BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
Sacramento splittail	*Pogonichthys macrolepidotus*	SSC	Endemic to California's Central Valley and the Sacramento-San Joaquin Delta. Primarily freshwater fish, but are tolerant of moderate salinity. Spawn on submerged vegetation in temporarily flooded upland and riparian habitat.	A	The BSA is not within the known distribution of this species. The BSA does not contain any flooded upland or slow slough like habitat which this species requires for spawning.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
longfin smelt	*Spirinchus thaleichthys*	FC, ST, SSC	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	A	The BSA is not within the known distribution of this species. Additionally, the BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
eulachon	*Thaleichthys pacificus*	FT, SSC	Occur in nearshore ocean waters and to 1,000 feet (300 m) in depth, except for the brief spawning runs into their natal (birth) streams. Ranges from northern California to southwest Alaska and southeastern Bering Sea.	A	The BSA is not within the known distribution of this species. Additionally, the BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
Invertebrates					
Tomales isopod	*Caecidotea tomalensis*	none	Inhabits localized fresh-water ponds or streams with still or near-still water in several San Francisco Bay Area counties.	A	San Anselmo Creek which flows through the BSA is a flowing creek which does not provide the still water or pond habitat required by the species.
Marin blind harvestman	*Calicina diminua*	none	Known only from the type locality. Taken under serpentine on a grassland hillside on San Marin Drive, Novato, Marin County. They occur in mesic habitats, but are absent from situations where soils are saturated or periodically inundated. Most species occur under medium to large undisturbed rocks that are in contact with the soil.	A	Soils within San Anselmo Creek are periodically inundated and would thus preclude this species' presence. This species has only been documented at the type locality in Novato, approximately 10 miles north of the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Bay checkerspot butterfly	*Euphydryas editha bayensis*	FT	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. Plantago erecta is the primary host plant; Orthocarpus densiflorus and O. purpurscens are the secondary host plants.	A	The BSA is not within the known distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of coniferous forest. The BSA contains no serpentine soils that may support the host plants required by the species.
San Bruno elfin butterfly	*Callophrys mossii bayensis*	FE	Inhabits coastal mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium.*	A	The BSA is not within the known distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of coniferous forest. The BSA contains no grassland that may support the host plants required by the species.
monarch butterfly	*Danaus plexippus*	none	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, Monterey cypress), with nectar and water sources nearby.	A	Roost sites for monarchs in the areas surrounding the BSA are primarily in groves along the coast. No groves used as roost sites have been recorded within 5.5 miles of the BSA. The species may migrate through the area.
Ricksecker's water scavenger beetle	*Hydrochara rickseckeri*	none	Aquatic; known only from pond habitats scattered around the San Francisco Bay area.	A	San Anselmo Creek within the BSA does not provide pond habitat which is required to support the species.
mission blue butterfly	*Icaricia icarioides missionensis*	FE, RP	Inhabits grasslands of the San Francisco peninsula. Three larval host plants: *Lupinus albifrons, L. variicolor*, and *L. formosus*, of which *L. albifrons* is favored.	A	The BSA is not within the known distribution of this species. The BSA does not contain grassland required to support the host plants of the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Callippe silverspot butterfly	*Speyeria callippe*	FE	Restricted to the northern coastal scrub of the San Francisco peninsula. Host plant is Viola pedunculata. Most adults found on east-facing slopes; males congregate on hilltops in search of females.	A	The BSA is not within the known distribution of this species. The BSA is in a low-density residential and forested habitat which does not contain scrub required to support the host plants of the species.
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	FE, RP	Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County. Larval food plant thought to be Viola adunca.	A	The BSA is not within the known distribution of this species. The BSA is in a low-density residential and forested habitat. No dune or grassland habitat is present to support the host plants or foraging by the species.
California freshwater shrimp	*Syncaris pacifica*	FE, SE, RP	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy, willow pools away from main stream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	A	The BSA is not within the known distribution of this species. Suitable habitat for the species is primarily found within northern Marin County along the border with Sonoma County. This species has not been documented in San Anselmo Creek.
Plants and Sensitive Natural Communities					
Sensitive Natural Communities					
Coastal Brackish Marsh, Coastal Terrace Prairie, Northern Coastal Salt Marsh, Serpentine Bunchgrass	NA	NA	NA	A	The BSA does not contain any of these habitats. No further actions are recommended for these Sensitive Natural Communities.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Sensitive Plants					
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*	FE, CNPS 1B.1	Freshwater marsh and swamp, and riparian scrub. 5-360 m. Flowers May-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal freshwater marsh, swamp, or riparian scrub. The BSA lacks suitable habitat. No further actions are recommended for this species.
Napa false indigo	*Amorpha californica* var. *napensis*	CNPS 1B.2	Broadleaf upland forest, chaparral, cismontane woodland; openings in forest, woodland, and chaparral. 120-2,000 m. Flowers April-July.	HP	Woodland habitat within the BSA is densely vegetated with blackberry and ivy. This woody perennial was not observed during the field surveys, which were conducted when this species would be identifiable. No further actions are recommended for this species.
Bent-flowered fiddleneck	*Amsinckia lunaris*	CNPS 1B.2	Cismontane woodland, valley and foothill grassland. 5-500 m. Flowers March-June.	A	The natural areas within the BSA are densely vegetated with blackberry and ivy. This perennial species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Franciscan manzanita	*Arctostaphylos franciscana*	FE, CNPS 1B.1	Serpentinite outcrops in chaparral. 60-300 m. Flowers January-April.	A	The BSA lacks suitable serpentine soils and chaparral habitat. No manzanitas (a woody perennial) were observed in the BSA. No further actions are recommended for this species.
Mt. Tamalpais manzanita	*Arctostaphylos montana* ssp. *montana*	CNPS 1B.3	Generally, serpentinite soil, valley and foothill grassland. 160-760 m. Flowers February-April.	A	The BSA lacks suitable serpentine soils; and no manzanitas (a woody perennial) were observed in the BSA. No further actions are recommended for this species.
Presidio manzanita	*Arctostaphylos montana* ssp. *ravenii*	FE,SE, CNPS 1B.1	Serpentinite soil, chaparral, coastal prairie, coastal scrub. 20-215 m. Flowers February-April.	A	The BSA lacks suitable serpentine soils and chaparral habitat. No manzanitas (a woody perennial) were observed in the BSA. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Marin manzanita	*Arctostaphylos virgata*	CNPS 1B.2	Broad-leaved upland forest, closed cone coniferous forest, chaparral, north coast coniferous forest, generally on sandstone or granitic soil. 160-760 m. Flowers December-March.	A	Limited, low quality, habitat occurs in the BSA. No manzanitas (a woody perennial) were observed. No further actions are recommended for this species.
Marsh sandwort	*Arenaria paludicola*	FE, SE, CNPS 1B.1	Freshwater marsh. 10-170 m. Flowers May-August.	A	No suitable habitat. No further actions are recommended for this species.
Coastal marsh milk-vetch	*Astragalus pycnostachyus* var. *pycnostachyus*	CNPS 1B.2	Coastal salt marshes, coastal dunes, coastal scrub, stream sides. 0-30 m. Flowers April-October.	A	No suitable habitat. No further actions are recommended for this species.
Alkali milk-vetch	*Astragalus tener* var. *tener*	CNPS 1B.2	Alkali playa, valley and foothill grassland, vernal pools. 1-170 m. Flowers March-June.	A	No suitable habitat. No further actions are recommended for this species.
Tiburon mariposa lily	*Calochortus tiburonensis*	FT, ST, CNPS 1B.1	Serpentinite soil, valley and foothill grassland. Open rocky, serpentine. 50-150 m. Flowers March-June.	A	No suitable habitat. No further actions are recommended for this species.
coastal bluff morning-glory	*Calystegia purpurata ssp. saxicola*	CNPS 2B.1	Coastal salt marshes, coastal dunes, coastal scrub, north coast coniferous forest. 4-165m. Flowers (March) April-Sep.	A	No suitable habitat. No further actions are recommended for this species.
Seaside bittercress	*Cardamine angulata*	CNPS 2B.1	North coast coniferous forest, lower montane coniferous forest, wet places. 65-951 m. Flowers April-June.	A	This perennial species was not observed during the field surveys, which were conducted during the flowering period. The closest known occurrence of this species is a 1915 observation near the Town of Lagunitas, over 5 miles away. No further actions are recommended for this species.
Bristly sedge	*Carex comosa*	CNPS 2B.2	Marshes and swamps, lake margins, wet places.5-1,005 m. Flowers July-September.	A	Closest known occurrence was in 1866 in the Delta. No suitable habitat. No further actions are recommended for this species.
Lyngbye's sedge	*Carex lyngbyei*	CNPS 1B.1	Brackish or freshwater marshes. 0-10 m. Flowers May-August.	A	No suitable habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Northern meadow sedge	*Carex praticola*	CNPS 2B.2	Meadows and seeps (mesic). -5-1620 m. Flowers May-August.	A	No suitable habitat. No further actions are recommended for this species.
Tiburon Indian paintbrush	*Castilleja affinis* ssp. *neglecta*	FE, ST, CNPS 1B.2	Rocky serpentinite soil, valley and foothill grassland. 75-400 m. Flowers April-June.	A	No suitable habitat. No further actions are recommended for this species.
Nicasio ceanothus	*Ceanothus decornutus*	CNPS 1B.2	Maritime chaparral; serpentinite, rocky, sometimes clay. 235-290 m. m. Flowers March-May.	A	No suitable habitat. No further actions are recommended for this species.
Mason's ceanothus	*Ceanothus masonii*	CNPS 1B.2	Dry rocky areas, chaparral. 230-500 m. Flowers March-April.	A	No suitable habitat. No further actions are recommended for this species.
Point Reyes bird's beak	*Chloropyron maritimum* ssp. *palustre*	CNPS 1B.2	Coastal salt marsh. 0-10 m. Flowers June-October.	A	No suitable habitat. No further actions are recommended for this species.
San Francisco Bay spineflower	*Chorizanthe cuspidata* var. *cuspidata*	CNPS 1B.2	Sandy soil, coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. 3-250 m. Flowers April-August.	A	No suitable habitat. No further actions are recommended for this species.
Sonoma spineflower	*Chorizanthe valida*	FE, SE, Rank 1B.1	Sandy coastal prairie. 10-305 m. Flowers June-August.	A	The BSA lacks suitable sandy coastal prairie habitat. No further actions are recommended for this species.
Franciscan thistle	*Cirsium andrewsii*	CNPS 1B.2	Moist places in broadleafed upland forest on the coast, coastal bluff scrub, coastal prairie, and coastal scrub. 0-150 m. Flowers March-July.	A	No suitable habitat. No further actions are recommended for this species.
Mt. Tamalpais thistle	*Cirsium hydrophilum* var. *vaseyi*	CNPS 1B.2	Moist places in broadleafed upland forest, chaparral, meadows and seeps. Serpentine streams. 240-620 m Flowers May-August.	A	No suitable serpentine habitat. No further actions are recommended for this species.
Presidio clarkia	*Clarkia franciscana*	FE, SE, CNPS 1B.1	Serpentinite soil, valley and foothill grassland. 25-335 m. Flowers May-July.	A	No suitable serpentine habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Round-headed Chinese houses	*Collinsia corymbosa*	CNPS 1B.2	Coastal dunes.0-20 m. Flowers April-June.	A	No suitable dune habitat. No further actions are recommended for this species.
San Francisco collinsia	*Collinsia multicolor*	CNPS 1B.2	Closed-cone coniferous forest, coastal scrub, on decomposed shale in humus. 30-250m. Flowers March-May.	A	No suitable habitat. No further actions are recommended for this species.
Western leatherwood	*Dirca occidentalis*	CNPS 1B.2	Broadleafed upland forest, closed-cone conifer forest, chaparral, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland, mesic sites. 25-425 m. Flowers January- April.	HP	Woodland habitat within the BSA is densely vegetated with blackberry and ivy. This perennial woody shrub species was not observed during the field surveys, which were conducted when this species would be identifiable. No further actions are recommended for this species.
Koch's cord moss	*Entosthodon kochii*	CNPS 1B.3	Cismontane woodland and valley foothill grassland. Know from Plumas NF on serpentine river bank. 500-1,000 m. Flowers N/A.	A	No suitable serpentine habitat. No further actions are recommended for this species.
Tiburon buckwheat	*Eriogonum luteolum* var. *caninum*	CNPS 1B.2	Serpentinite soil, chaparral, coastal prairie, valley and foothill grassland. 0-700 m. Flowers June-September.	A	No suitable habitat. No buckwheats were observed during surveys. No further actions are recommended for this species.
Minute pocket moss	*Fissidens pauperculus*	CNPS 1B.2	North coast coniferous forest. On damp soil on the coast and in dry streambeds and banks on soil in humus comprised of heavily decayed wood. 10-100 m. Flowers N/A (best observed during the wet season).	HP	Mesic substrates within the BSA may have the potential to support this species. This species was not observed during the field surveys, which occurred during the wet season when this species is identifiable, though common member of the same genus was found (*Fissidens crispus*). No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Marin checker lily	*Fritillaria lanceolata* var. *tristulis*	CNPS 1B.1	Coastal bluff scrub, coastal prairie, coastal scrub. Canyons and riparian areas and rocky outcrops. 15-150 m. Flowers February-April.	A	Though not coastal, there is canyon like habitat adjacent to the creek. However, the dense blackberry and ivy would preclude this species. No *Fritillaria* were observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Fragrant fritillary	*Fritillaria liliacea*	CNPS 1B.2	Coastal scrub, valley and foothill grassland, coastal prairie. Usually on clay soils, often on serpentine in grassland.3-410 m. Flowers February- April.	A	The BSA lacks suitable habitat. No further actions are recommended for this species.
Blue coast gilia	*Gilia capitata* ssp. *chamissonis*	CNPS 1B.1	Coastal dunes, coastal scrub. 2-180 m. Flowers April-July.	A	The BSA lacks suitable habitat. No further actions are recommended for this species.
Woolly-headed gilia	*Gilia capitata* ssp. *tomentosa*	CNPS 1B.1	Rocky serpentine outcrops in coastal bluff scrub and valley and foothill grassland. 10-220 m. Flowers May-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentine soils in coastal bluff scrub and valley and foothill grassland. The BSA lacks suitable habitat. No further actions are recommended for this species.
Dark-eyed gilia	*Gilia millefoliata*	CNPS 1B.2	Coastal dunes. 2-30 m. Flowers April-July.	A	The BSA lacks suitable coastal dune habitat. No further actions are recommended for this species.
Diablo helianthella	*Helianthella castanea*	CNPS 1B.2	Broadleaved upland forest, chaparral, coastal scrub, cismontane woodland, riparian woodland, valley and foothill grassland. 25-1150 m. Flowers April to June.	A	This species typically requires more sun than is found in the BSA. No *Helianthella* were observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Congested headed hayfield tarplant	*Hemizonia congesta* ssp. *congesta*	CNPS 1B.2	Coastal scrub, valley and foothill grassland; located in grassy valleys, hills, and fallow fields. 20-550 m. Flowers April-November.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal scrub and valley and foothill grassland. Surveys were conducted during the flowering period. The BSA lacks suitable habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Marin western flax	*Hesperolinon congestum*	FT, ST, CNPS 1B.1	Serpentinite soil, chaparral, valley and foothill grassland. Known only from Marin, San Francisco, and San Mateo counties. In serpentine barrens and in serpentine grassland chaparral. 5-370 m. Flowers April-July.	A	No suitable habitat. No further actions are recommended for this species.
Water star-grass	*Heteranthera dubia*	CNPS 2B.2	Requires a pH of 7 or higher, usually in slightly eutrophic waters. Marshes and swamps (alkaline, still or slow-moving water). 30-1495 m. Flowers July-October.	A	No suitable habitat. No further actions are recommended for this species.
Santa Cruz tarplant	*Holocarpha macradenia*	FT, CE, CNPS 1B.1	Coastal prairie, coastal scrub, Valley and foothill grassland, often clay. 10-20 m. Flowers June-October.	A	No suitable habitat. No further actions are recommended for this species.
Kellogg's horkelia	*Horkelia cuneata* var. *sericea*	CNPS 1B.2	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub, openings, sandy/gravelly. 10-200 m. Flowers April-Sept.	A	No suitable habitat. No further actions are recommended for this species.
Pt. Reyes horkelia	*Horkelia marinensis*	CNPS 1B.2	Coastal dunes, Coastal prairie, Coastal scrub, sandy flats & dunes near coast; in grassland or scrub. 2-775 m. 10-200 m. Flowers May-Sept.	A	No suitable habitat. No further actions are recommended for this species.
Thin-lobed horkelia	*Horkelia tenuiloba*	CNPS 1B.2	Broadleaf upland forest, chaparral, valley and foothill grassland/mesic openings, sandy. 50-500 m. Flowers April-July.	A	There are mesic soils within the lower part of the creek bank, however the site is densely vegetated with ivy and blackberry. No *Horkelia* were observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Small groundcone	*Kopsiopsis hookeri*	CNPS 2.3	North coast coniferous forest, generally on salal (*Gaultheria shallon*) and *Vaccinium*. 90-885 m. Flowers April-August.	A	The BSA lacks suitable habitat for this species. No salal present. No further actions are recommended for this species.
Contra costa goldfields	*Lasthenia conjugens*	FE, CNPS 1B.2	Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools. 0-470 m. Flowers March-April.	A	The BSA does not provide suitable habitat. This species was not observed during the surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Beach layia	*Layia carnosa*	FE, SE, CNPS 1B.1	Sandy soil, coastal dunes, coastal scrub. 0-60 m. Flowers March-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal scrub and dunes. The BSA lacks suitable habitat. No further actions are recommended for this species.
Coast yellow leptosiphon	*Leptosiphon croceus*	CNPS 1B.1	Coastal bluff scrub and prairie. 10-100 m. Flowers April-June.	A	The BSA lacks suitable habitat. No further actions are recommended for this species.
Rose leptosiphon	*Leptosiphon rosaceus*	CNPS 1B.1	Coastal bluff scrub. 0-100 m. Flowers April-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal bluff scrub. The BSA lacks suitable habitat. No further actions are recommended for this species.
San Francisco lessingia	*Lessingia germanorum*	FE, SE, CNPS 1B.1	Coastal scrub (remnant dunes) 25-110 m. Flowers June-November.	A	The BSA lacks suitable habitat. No further actions are recommended for this species.
Tamalpais lessingia	*Lessingia micradenia var. micradenia*	CNPS 1B.2	Chaparral, valley and foothill grassland; usually located on serpentine substrate, often roadsides. 10-500 m. Flowers June-October.	A	The BSA lacks serpentine and suitable habitat. Chaparral is not present; and the heavily disturbed roadside is not serpentine. No further actions are recommended for this species.
Marsh microseris	*Microseris paludosa*	CNPS 1B.2	Moist places, closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland, (Moist grassland or open woodland). 5-300 m. Flowers April-June.	A	Moist areas in this site are densely covered with blackberry and ivy. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Elongate copper moss	*Mielichhoferia elongata*	CNPS 2B.2	Cismontane woodland/ metamorphic, rock typically with high levels of heavy metals, usually vernally mesic. 500-1300 m.	A	This species is typically found along road cuts in the foothills. It was not observed during the field surveys. No further actions are recommended for this species.
Marin County navarretia	*Navarretia rosulata*	CNPS 1B.2	Rocky serpentinite soil, closed-cone coniferous forest, chaparral. 200-635 m. Flowers May-July.	A	The BSA lacks suitable habitat. No further actions are recommended for this species.
White-rayed pentachaeta	*Pentachaeta bellidiflora*	FE, SE, CNPS 1B.1	Valley and foothill grassland, coastal scrub, coastal prairie, open dry rocky areas, often serpentine. 35-620 m. Flowers March-May.	A	The BSA lacks suitable open dry rocky habit. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Choris' popcorn-flower	*Plagiobothrys chorisianus* var. *chorisianus*	CNPS 1B.1	Moist places, coastal prairie, coastal scrub, chaparral, seasonal marsh. Known only from San Francisco southward. 60-485 m. Flowers March-June	A	The BSA lacks suitable habit. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
San Francisco popcorn-flower	*Plagiobothrys diffusus*	SE, CNPS 1B	Seasonally moist places, coastal prairie, valley and foothill grassland. Known only from San Francisco southward. 0-100 m. Flowers April-June.	A	The BSA lacks suitable habit. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Hairless popcorn-flower	*Plagiobothrys glaber*	CNPS 1A	Alkaline meadows and seeps, coastal salt marshes.0-100 m. Flowers March-May	A	Historically occurred on grassy slopes with marine influence. The BSA lacks suitable habit. This species was not observed during the field surveys. No further actions are recommended for this species.
North coast semaphore grass	*Pleuropogon hooverianus*	ST, CNPS 1B.1	Moist, open to shaded areas, broadleafed upland forest, meadows and seeps, north coast coniferous forest. Marshy areas.10-1,150 m. Flowers May-August.	A	The BSA lacks suitable habit. The creekbed is not vegetated and the banks are too dry. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Oregon polemonium	*Polemonium carneum*	CNPS 2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. 0-1,830m. Flowers April-September.	A	The BSA lacks suitable habitat. This species was not observed during the field surveys, which was conducted during the flowering period. No further actions are recommended for this species.
Tamalpais oak	*Quercus parvula* var. *tamalpaisensis*	CNPS 1B.3	Lower montane coniferous forest. 100-750 m. Flowers March-April.	HP	Marginal habitat for this species is present in the BSA. This species is a woody shrub, which if present, would have been observed during the field surveys. No further actions are recommended for this species.
Adobe sanicle	*Sanicula maritima*	SR, CNPS 1B.1	Chaparral, coastal prairie, meadows and seeps, valley and foothill grassland, often clay and serpentine. 30-240 m. Flowers February-May.	A	Suitable clay and serpentine habitat for this species is not present in the BSA. The closest known occurrence was a population south of San Francisco, believed to be extinct. No further actions are recommended for this species.
Point Reyes checkerbloom	*Sidalcea calycosa* ssp. *rhizomata*	CNPS 1B.2	Freshwater marshes and swamps near the coast. 3-75 m. Flowers April-September.	A	All known occurrences of this species in the vicinity of the BSA are associated with marsh habitat. The BSA lacks suitable habitat. No further actions are recommended for this species.
Marin checkerbloom	*Sidalcea hickmanii* ssp. *viridis*	CNPS 1B.1	Chaparral; located on serpentine or volcanic substrate; often observed following burns. 50-425 m. Flowers May-June.	A	The BSA lacks suitable serpentine, or chaparral habitat. No further actions are recommended for this species.
San Francisco campion	*Silene verecunda* ssp. *verecunda*	CNPS 1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland, often mudstone, one on serpentine. 30-645 m. Flowers March-August.	A	All known occurrences of this species in the vicinity of the BSA are associated with mudstone or serpentine in coastal scrub or bluff scrub, chaparral, coastal prairie or valley and foothill grassland. The BSA lacks suitable habitat. No further actions are recommended for this species.
Long-styled sand-spurrey	*Spergularia macrotheca var. longistyla*	CNPS 1B.2	Meadows and seeps, Marshes and swamps. Alkaline. Flowers February-May. 0-255 m.	A	The BSA lacks suitable habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Santa Cruz microseris	*Stebbinsoseris decipiens*	CNPS 1B.2	Open areas in broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. 30-645 m. Flowers April-May.	A	The upland areas in the BSA are heavily disturbed. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Tamalpais jewel-flower	*Streptanthus batrachopus*	CNPS 1B.3	Serpentinite soil, chaparral, closed-cone coniferous forest. 305-650 m. Flowers April-June.	A	The BSA lacks suitable habitat. No further actions are recommended for this species.
Tiburon jewel-flower	*Streptanthus glandulosus* ssp. *niger (previously Streptanthus niger)*	FE, SE, CNPS 1B.1	Serpentinite soil, valley and foothill grassland. 30-150 m. Flowers May-June.	A	All known occurrences of this species in the vicinity of the BSA are associated with rocky serpentine soil. The BSA lacks suitable habitat. No further actions are recommended for this species.
Mt. Tamalpais bristly jewel-flower	*Streptanthus glandulosus* ssp. *pulchellus*	CNPS 1B.2	Serpentinite soil/talus, chaparral, valley and foothill grassland. 150-800 m. Flowers May-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentine outcrops or openings. The BSA lacks suitable habitat. No further actions are recommended for this species.
Suisun Marsh aster	*Symphyotrichum lentum*	CNPS 1B.2	Brackish and freshwater marshes and swamps.0-3 m. Flowers May-November.	A	All known occurrences of this species in the vicinity of the BSA are found along seasonally wet sloughs and marshes. The BSA lacks suitable habitat. No further actions are recommended for this species.
Two fork clover	*Trifolium amoenum*	FE, CNPS 1B.1	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite), open sunny sites.5-415 m. Flowers April-June.	A	All known occurrences of this species in the vicinity of the BSA are found in open sunny sites in chaparral and grassland. The BSA does not have suitable habitat. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Saline clover	*Trifolium hydrophilum (*syn. *Trifolium depauperatum var. hydrophilum)*	CNPS 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. 0-300 m. Flowers April-June.	A	All known occurrences of this species in the vicinity of the BSA are associated with alkaline or saline wetlands. The BSA lacks suitable habitat. No further actions are recommended for this species.
San Francisco owl's-clover	*Triphysaria floribunda*	CNPS 1B.2	Coastal prairie, coastal scrub, valley and foothill grassland, generally serpentinite soil.10-160 m. Flowers April-June.	A	The BSA does not provide suitable habitat. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Coastal triquetrella	*Triquetrella californica*	CNPS 1B.2	Coastal prairie, coastal scrub. Grows within 30 meters of the coast on gravelly rocky soil. 30-150 m. Flowers May-June.	A	The BSA does not provide suitable habitat. No further actions are recommended for this species

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale

* Key to status codes:

FE	Federal Endangered
FT	Federal Threatened
FD	Federal Delisted
FC	Federal Candidate
BCC	USFWS Birds of Conservation Concern
MMPA	Species protected under the Marine Mammal Protection Act
SE	State Endangered
ST	State Threatened
SR	State Rare
SSC	CDFW Species of Special Concern
CFP	CDFW Fully Protected Animal
WBWG	Western Bat Working Group (High or Medium) Priority species
CNPS 1A	CNPS Rare Plant Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
CNPS 1B	CNPS Rare Plant Rank 1B: Plants rare, threatened, or endangered in California and elsewhere
CNPS 2A	CNPS Rare Plant Rank 2A: Plants presumed extirpated in California, but more common elsewhere
CNPS 2B	CNPS Rare Plant Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
CNPS 3	CNPS are Plant Rank 3: Plants about which more information is needed – a review list
CNPS 4	CNPS Rare Plant Rank 4: Plants of limited distribution – a watch list

CNPS Rare Plant Threat Ranks

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3-Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

*Presence:
Absent [A] - no habitat present and no further work needed.
Habitat Present [HP] -habitat is, or may be present. The species may be present.
Present [P] - the species is present.
Critical Habitat [CH] - proposed project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is *present.*

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Chapter 4 – Results: Biological Resources, Discussion of Impacts and Mitigation

Habitats and Natural Communities of Special Concern

Habitats are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special-status plants or animals occurring on site. Two natural communities of special concern were found to be present in the BSA, Riparian Woodland and Intermittent Stream (CWA "Other Waters"). These communities are summarized in Table 2 and discussed below, and shown on the Biological Communities Map Figure 3a. The "Other Waters" is also considered sensitive by federal and state agencies, due to the regulatory aspects discussed in more detail in Chapter 2, above and in the Jurisdictional Delineation Report.

Figure 3b shows the proposed project's impact areas. The following sections present a discussion of the impacts and mitigation for each natural community of special concern. Permanent impacts are a conversion of a natural community to structures such as, bridge support or to an area of engineered slope stabilization. Temporary impacts are disturbances to existing natural communities that would be restored to the same natural community type following construction.

Table 2: Direct Impacts of the Proposed Project to Natural Communities of Special Concern.

Natural Community	Permanent Impacts[1]	Temporary Impacts
Riparian Woodland	113.0 ft^2 (<0.01 acre)	0.07 acre
Unvegetated banks	-15.7 ft^2 (<0.01 acre)	362 ft^2 (0.01 acre)
Intermittent Stream "Other Waters"	-12.6 ft^2 (<0.01 acre)/ 4 linear feet	0.13 acre/ 270 linear feet
Total (and Total for Critical Habitat for CCC steelhead and Coho salmon)	84.7 ft^2 (<0.01 acre)	0.21 acre (9,150 ft^2)

[1] Positive numbers represent a loss of habitat and negative represent a gain of habitat.

Table 3: Direct Impacts of the Proposed Project to Jurisdictional Areas by Agency.

Agencies Jurisdiction	Permanent Impacts	Temporary Impacts
CDFW (creek bed and bank)	84.7 ft^2 (<0.01 acre)	0.21 acre (9,150 ft^2)
USACE and RWQCB (creek bed)	-12.6 ft^2 (<0.01 acre)/ 4 linear feet	0.13 acre/ 270 linear feet
NMFS (creek bed and bank because of critical habitat)	84.7 ft^2 (<0.01 acre)	0.21 acre (9,150 ft^2)

RIPARIAN WOODLAND

Survey Results

The BSA consists of an open canopy Riparian Woodland similar to California Bay (*Umbellularia Californica*) Forest Alliance (G4 S3) (Sawyer, J. O., T. Keeler-Wolf, and J. Evens. 2009) (Figure 3a). The G4 S3 ranking indicates that it is considered a community of special concern (sensitive) at the state, though not the global, level. However, California Bay Forest is prevalent in western California and the foothills. In the BSA, the sparse overstory consists of native tree species (such as California bay, oaks, and buck-eye). The term 'riparian' is used here as a descriptor to indicate the slightly more mesic conditions within the stream's general influence. It should be noted that the plant community would be considered a woodland rather than a traditional riparian zone because of the lack of typical riparian vegetation (such as dense willow thickets).

Project Impacts

The proposed Project would temporarily impact 0.07 acre of Riparian Woodland as a result of access routes, removal of existing retaining walls, excavations for footings and riprap, and contour grading on the creek banks. A total of 113 square feet of Riparian Woodland would be permanently impacted by the proposed Project through placement of new retaining walls and abutments.

Riparian Woodland Avoidance and Minimization Efforts

The following avoidance and minimization measures will be employed to avoid or minimize impacts to the Riparian Woodland to the greatest extent possible:

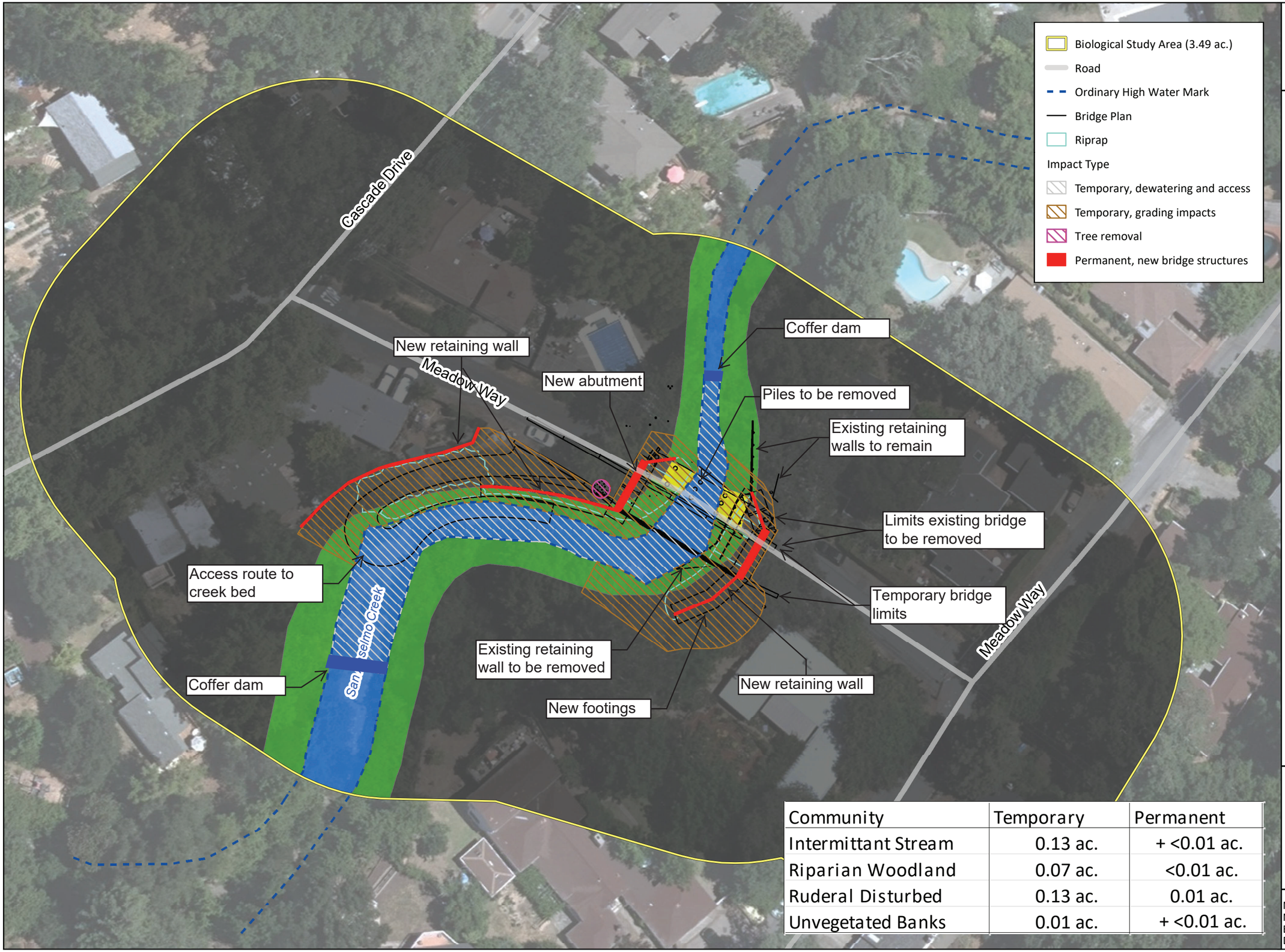
- The proposed Meadow Way Bridge work has been designed to avoid impacts to trees to the maximum extent feasible. The temporary access road will be placed in an area dominated by blackberry.
- Silt fencing or other approved sediment trapping BMPs will be installed down gradient of the work site to minimize off-site transport of sediments.
- Exclusion fencing will be installed along the limits of clearing and grubbing to prevent encroachment into undisturbed habitats.

Compensatory Mitigation

The proposed project avoids the Riparian Woodland community to the maximum extent feasible, and only one California bay tree cluster is to be removed. No compensatory mitigation is proposed.

Cumulative Impacts

No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. Therefore, cumulative effects are not anticipated for this proposed project.



Community	Temporary	Permanent
Intermittant Stream	0.13 ac.	+ <0.01 ac.
Riparian Woodland	0.07 ac.	<0.01 ac.
Ruderal Disturbed	0.13 ac.	0.01 ac.
Unvegetated Banks	0.01 ac.	+ <0.01 ac.

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Meadow Way Bridge
Bridge: No 27C-0008
Town of Fairfax
Marin County, California

Figure 3b.
Biological Communities Impacted within the Biological Study Area

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Feet

Map Prepared Date: 1/18/2019
Map Prepared By: njander
Base Source:
Data Source(s): WRA, Marin County

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Meadow Way\Impacts.mxd

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INTERMITTENT STREAM ("OTHER WATERS")

Survey Results

At this location, San Anselmo Creek is an intermittent creek with flows that vary with the rainfall patterns of a given season. Flows within the creek during a January 11, 2017 site visit extended to the edges of the creek bed. During a site visit at a similar time of year (February 1, 2018), flows were just above the low flow part of the channel. The watershed that supports creek flows is local, generally the western part of the Town of Fairfax and adjacent open space lands. The creek substrate is a mix of small gravel to larger cobble. The Ordinary High Water (OHW) mark indicators used for this study included slope change at the bed and bank junction and wrack observed at the edge of the creek bed. The channel width at the OHW mark was used to determine the intermittent stream ("other waters") boundary shown on Figure 3a. There are no wetlands in the BSA. There are wooden or cement retaining walls along the lower banks in some parts of the BSA. The rest of the banks are natural substrate. The creek is not included on the National System of Wild and Scenic Rivers published by the U.S. Department of the Interior.

Pursuant to the Clean Water Act Section 404 and 401 the creek below OHW would be within the USACE and RWCQB jurisdiction. It would also be protected by Porter Cologne (RWQCB). There are no areas in the BSA that would be considered only Waters of the State (not Waters of the US).

Project Impacts

As summarized in Table 2 above 0.13 acre temporary impacts and no permanent direct impacts to Intermittent Stream are anticipated as a result of proposed project construction. Removal of existing wooden piles from within the creek bed will result in a gain of 12.6 square feet (<0.01 acre) of Intermittent Stream habitat. Construction in the creek will be limited to areas that must be accessed for construction activities and creek bank excavations.

Avoidance and Minimization Efforts

The following measures are included to avoid and/or minimize and restore potential impacts to creek habitat resulting from the use of mechanical equipment in the creek bed.

- The primary construction in the creekbed will be completed between June 1 and October 15, and work within the creek bed and banks will occur when the work area is dry, or dewatered.
- Final grading in the creek bed will conform to the existing creek channel both downstream and upstream (except in the areas of permanent fill), and existing bed materials will be replaced with similar sized materials.
- Regulatory approval will be obtained for all work within potential jurisdictional areas, including the USACE, RWQCB, CDFW, and NMFS. All work within these areas will conform to any conditions imposed by the regulating agencies.
- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction will be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas and to prevent any equipment from unnecessarily extending the work area or entering the creekbed. In addition, silt fencing will be installed where appropriate to prevent debris from entering the creek. All fencing will be removed upon project completion.

- Prior to construction, the contractor will be required to prepare an Accidental Spill Prevention and Cleanup Plan.
- To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment spill control absorbent material will be in place underneath this equipment at all times to capture potential leaks. All refueling and maintenance of equipment, other than stationary equipment, will occur outside the creek's top-of-bank. Any hazardous chemical spills will be cleaned immediately.
- Stockpiling of construction materials and supplies will occur outside the creek channel.
- If there are drilling activities related to construction of the proposed project the contractor will be required to use a drilling mud and slurry seal that is nontoxic to aquatic life. All drilling muds and fluid will be contained on-site in tanks and disposed of in a permitted manner. Fluids from saw cutting and other activities will be collected and not allowed to flow into the creek.
- No equipment, including concrete trucks, will be washed within the channel of the creek, or where wash water could flow into the channel. Prior to proposed project construction, the contractor will establish a concrete washout area for concrete trucks in a location where wash water will not enter the creek or adjacent areas. The washout area will follow the practices outlined in the San Francisco Bay Regional Water Quality Control Board Erosion and Sediment Control Field Manual (page 107-108, July 1999) or more recent guidelines. Substitution of the designated concrete washout area or methods will require prior approval of the Town of Fairfax.
- All water that comes in contact with wet concrete will be pumped directly into tanks and disposed of at a permitted location.
- When working on the roadway and bridge approaches during the October 15 to June 1 period, all drainage inlets within the proposed project site will be protected from receiving polluted storm water through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs.
- Water encountered during construction of the bridge foundations will be managed in accordance with an approved dewatering plan.
- All workers will ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the BSA are deposited in covered or closed trash containers. The trash containers will not be left open and unattended overnight.
- At the end of construction, the Town of Fairfax will require that seed and certified weed-free straw will be placed on disturbed areas in the proposed project site (with the exception of the lower creek banks, creek bed, and areas below the OHW mark). A jute mesh type or equivalent matting will be placed over the straw, installed per the manufacturer's instructions. This matting will have no plastic incorporated into it. Substitution of materials or erosion control methods will require prior approval of the Town of Fairfax.
- After construction, the proposed project site will be inspected following the first heavy rain, during the middle of the rainy season and at the end of the rainy season. During each visit areas of significant erosion or erosion control device failure will be noted and appropriate remedial actions taken.

With the implementation of these measures, it is expected that the proposed project will not result in substantial adverse impacts to creek habitat.

Compensatory Mitigation

A total of 0.13 acre of temporary impacts to this natural community are anticipated from the proposed project. No permanent loss will occur but a gain of 12.6 square feet (<0.01 acre) of permanent direct impacts are proposed. The proposed project includes a fish habitat restoration plan to mitigate for the temporary loss of habitat, fish habitat restoration, using bio-engineering techniques, low earth berms and woody nooks, designed specifically for the site, will be implemented. No additional compensatory mitigation is proposed.

Cumulative Impacts

No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. Therefore, cumulative effects are not anticipated for this proposed project.

Special-Status Plant Species

Based upon a review of the resources and databases discussed in Section 2, 75 special-status plant species have been documented in the vicinity of the BSA. No critical habitat for special-status plants exists within the proposed project area. Table 1 discusses the potential for each of the special-status plant species to occur in the BSA. Suitable habitat is present in the BSA for four of the species. Here are key points regarding those species:

- Napa false indigo (*Amorpha californica* var. *napensis,* CNPS 1B.2). Woodland habitat within the BSA could support this species. However, this shrub species, which is easily identifiable, was not observed during the field surveys.
- Western leatherwood (*Dirca occidentalis,* CNPS 1B.2). Woodland habitat within the BSA could support this species. However, this woody perennial species, which is typically over 3 feet tall was not observed during the field surveys.
- Minute pocket moss (*Fissidens pauperculus,* USFSS, CNPS 1B.2). Mesic substrates within the BSA may have the potential to support this species. This species was not observed during the field surveys; though, a common member of the same genus was found (*Fissidens crispus*).
- Tamalpais oak (*Quercus parvula* var. *tamalpaisensis,* CNPS 1B.3). Though, the BSA provides potential habitat, this species is a woody shrub, which would have been identifiable during the site visits. No shrub oak species were observed during the field surveys.

The remaining special-status plant species documented in the vicinity are unlikely to occur in the BSA based on lack of suitable habitats (such as coastal dunes, coastal prairie, coastal salt marsh, or vernal pools) or specific substrates (i.e. serpentine rock outcrops). The BSA is in a residential area, with structures (houses, sheds, etc.), fenced backyards, and landscaped areas. Most of the creek bank (below the top of bank) is densely vegetated with blackberry and ivy. The creek bed is generally unvegetated.

No special-status plant species were observed in the BSA during floristic surveys completed during the appropriate flowering periods. No effects on special-status plant species are anticipated and no further discussion of special-status plant species is necessary.

Special-Status Wildlife Species

Ninety-one special-status wildlife species have been documented in the background literature as potentially occurring in the quadrangles or noted in a review of other resources as having

overlapping ranges and habitat requirements (Table 1). Eight of these special-status wildlife species have been documented in the CNDDB within 8 kilometers (5 miles), and six of those documented within 5 kilometers (3.1 miles) of the BSA; these species are shown in Figure 5 (CDFW 2018a).

The segment of San Anselmo Creek which runs through the BSA is designated critical habitat for both Coho salmon (64 FR 24049, 73 FR 7816) and CCC steelhead (70 FR 52488, 70 FR 52630), and EFH for Pacific Salmonids. Coho salmon is considered extirpated from San Francisco Bay and all of its tributaries; thus they will not be affected by the proposed project (NMFS 2012, Brown and Moyle 1991). However, CCC steelhead are presumed present in San Anselmo Creek (UC Davis 2018). Work will occur during the dry season, minimizing impacts to steelhead and its critical habitat, and if any water exists in the project area at the start of construction, a fish rescue will be performed. No loss of habitat function or value is anticipated from the proposed project. The proposed project is not anticipated to adversely affect EFH. Following implementation of avoidance and minimization measures outlined in the section below, the proposed project is anticipated to have no permanent adverse effect on steelhead, critical habitat, or EFH.

Coniferous forest adjacent to the BSA has documented occurrences of nesting NSO (CDFW 2018b). The BSA itself does not provide suitable nesting habitat for NSO. One bay tree is proposed to be removed as part of construction; however, the tree isn't of suitable size to contain nesting habitat, and following the implementation of avoidance and minimization measures outlined in the section below, the proposed project is anticipated to have no permanent adverse effect to NSO.

Of the 91 special-status wildlife species documented to occur in the vicinity, four species have potential to occur within the BSA. The remaining 87 species identified in Table 1 are unlikely to occur within the BSA because of existing conditions within and surrounding the BSA. Roadways, residential development, and various anthropogenic disturbances reduce the amount of available breeding, rearing, foraging, and refugia habitat for most special-status species. Several habitat types or habitat conditions which are required to support special-status wildlife species are also absent from the BSA, such as marsh, open grassland, dense riparian, and serpentine habitats.

Trees within the BSA are primarily small diameter California bay trees, which do not provide cavities or complex foliage required to support tree roosting bats. The underside of the existing bridge structure doesn't constitute suitable roosting habitat for bats. The interstitial spaces in the bridge are too large, allowing light and airflow into pockets. There were no roosting bats, or evidence of roosting bats observed during the site visit. The BSA also receives a high level of human disturbance from the residences and traffic in the vicinity, further reducing the potential for special-status bat species such as Townsend's big-eared bat (*Corynorhinus townsendii*) to occur within the BSA as this species is highly sensitive to disturbance at roost sites. The absence of hospitable roost sites and other habitat features within the BSA makes the presence of special-status bats or other bat species unlikely. Therefore, the project will have no effect on roosting bats.

Special-status amphibian and reptile species such as foothill yellow-legged frog (*Rana boylii*), California red-legged frog (*Rana draytonii*), California giant salamander (*Dicamptodon ensatus*), and western pond turtle (*Actinemys marmorata*) are also unlikely to occur. No occurrences of these species have been documented within the watershed, and California red-legged frog is not known within this portion of Marin County nor has it been documented within 5 miles of the BSA (CDFW 2018a). Nearby occurrences of foothill yellow-legged frog are located outside the watershed and are greater than 2 miles from the BSA (CDFW 2018a). Nearby occurrences of

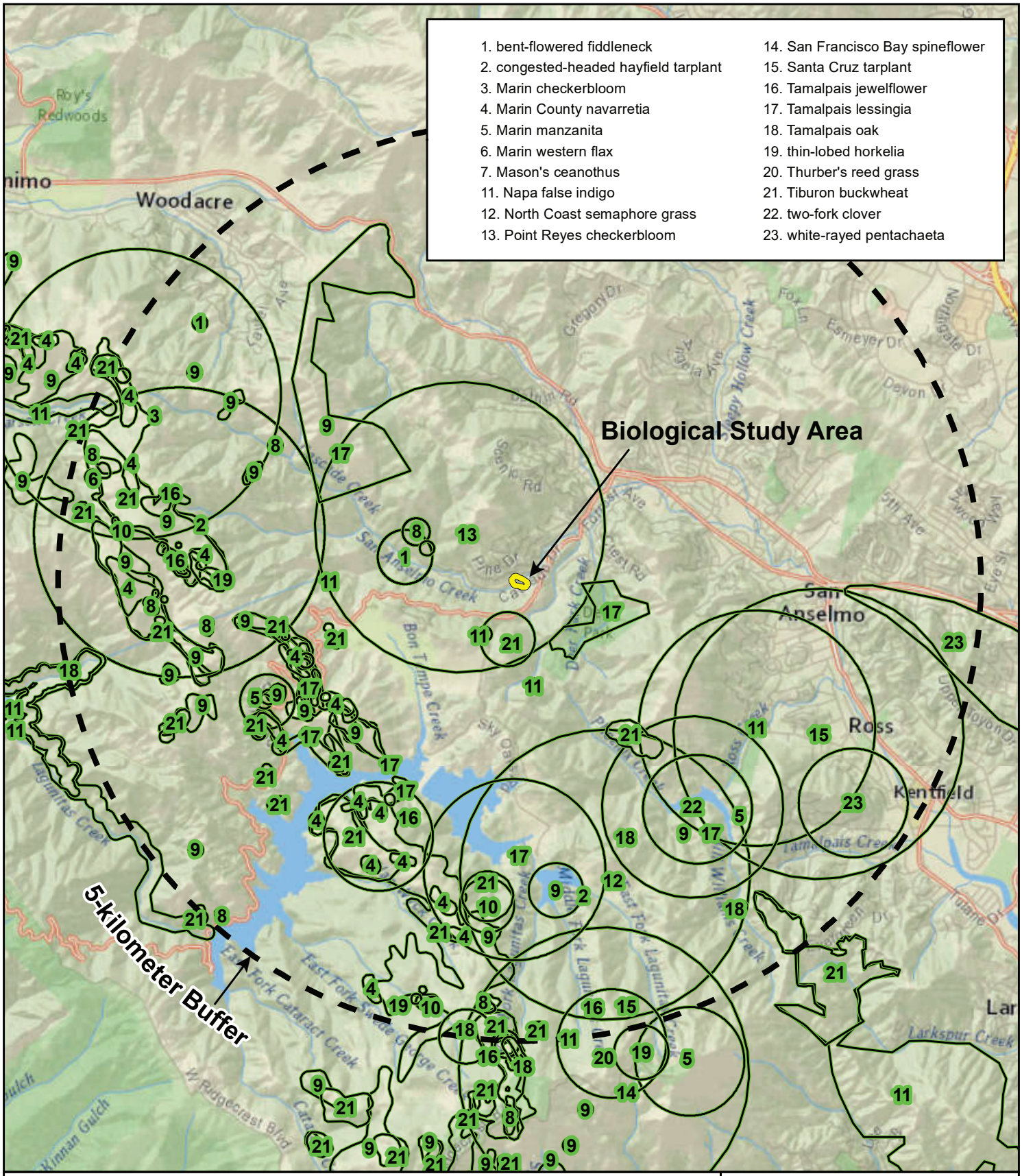

Figure 4. Special-status Plants Documented within 5 kilometers of the Biological Study Area

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Meadow Way Bridge
Bridge: No 27C-0008
Town of Fairfax, California

0 0.5 1 2
Miles

Map Prepared Date: 3/23/2018
Map Prepared By: smortensen
Base Source: National Geographic
Data Source(s): CNDDB March 2018

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Meadow Way\CNDDB Plants.mxd

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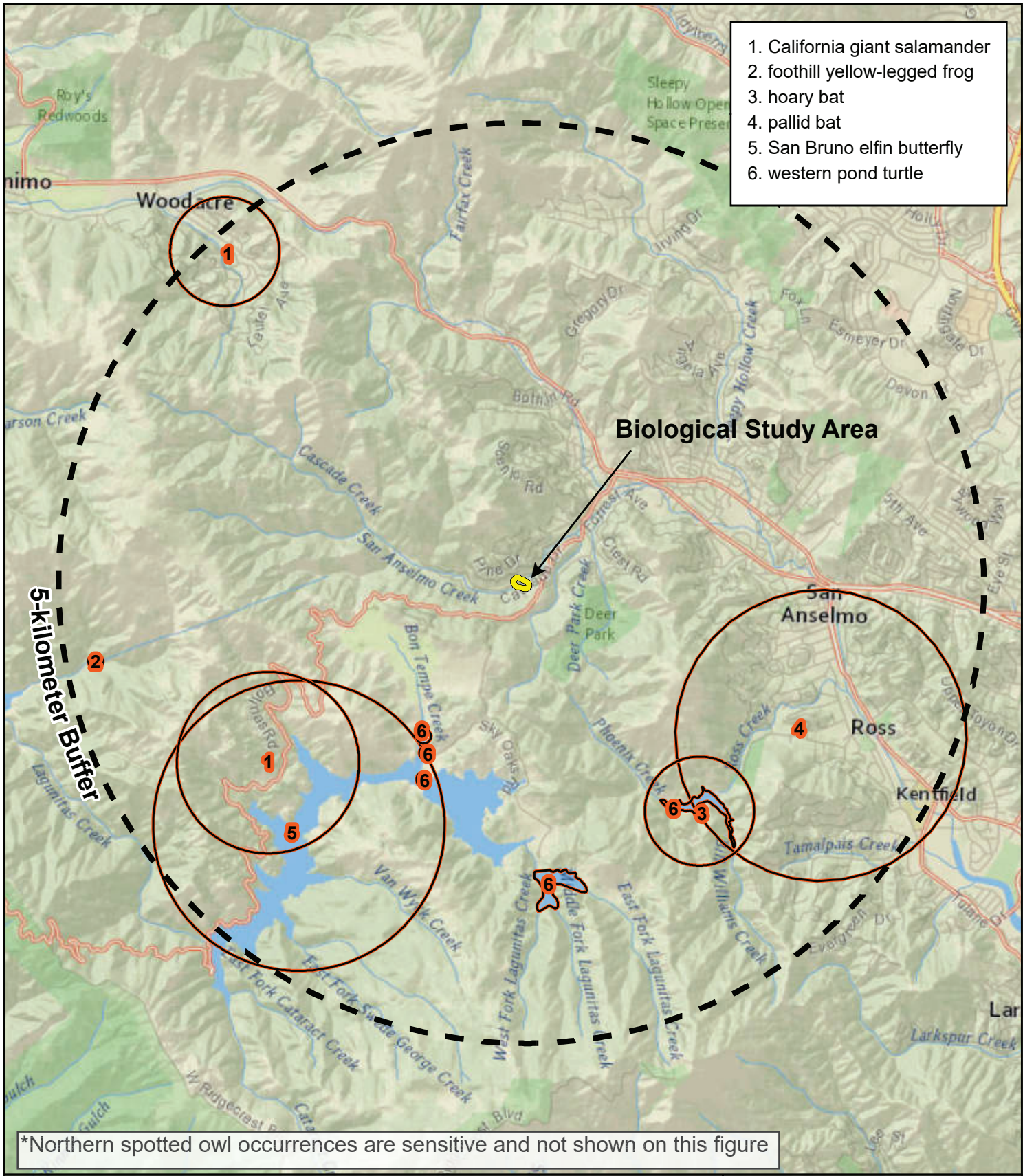

*Northern spotted owl occurrences are sensitive and not shown on this figure

Figure 5. Special-status Wildlife Species Documented within 5 kilometers of the Biological Study Area

Meadow Way Bridge
Bridge: No 27C-0008
Town of Fairfax, California

0 0.5 1 2
Miles

wra
ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 3/23/2018
Map Prepared By: smortensen
Base Source: National Geographic
Data Source(s): CNDDB March 2018

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Meadow Way\CNDDB Wildlife.mxd

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western pond turtle are located outside the watershed approximately 1.3 miles from the BSA (CDFW 2018a). In addition, San Anselmo Creek within the BSA is not perennial and lacks suitable pool habitat and sufficient water levels during the breeding season for foothill yellow-legged frog; therefore, it does not contain suitable breeding habitat for this species. The BSA also lacks an open canopy where significant sunlight can penetrate to the water as well as suitable basking and upland habitats for western pond turtle. California giant salamander, is not documented within San Anselmo Creek and the lack of perennial water and refugia in the BSA preclude presence of this species. The developed banks additionally lack underground refugia for adults of this species. The lack of nearby occurrences and suitable habitat within the BSA make it unlikely most special-status amphibian and reptile species will occur within the BSA; thus, the project will have no effect on foothill yellow-legged frog, California red-legged frog, California giant salamander, or western pond turtle.

Based on the habitat conditions present on the BSA and documented range and occurrence information for special-status wildlife species (CDFW 2018a and 2018b), it was determined that in addition to CCC steelhead and NSO, the BSA contains potential habitat for two other special-status or protected wildlife species including: Allen's hummingbird (*Selasphorus sasin*) and olive-sided flycatcher (*Contopus cooperi*). The BSA also has potential to support non-special-status nesting birds. These species and their potential for occurrence in the BSA are discussed in further detail below.

NORTHERN SPOTTED OWL

The NSO is a federally threatened and state threatened resident spotted owl subspecies found in cool temperate forests in the coastal portion of California, from Marin County northward. The natural history of this subspecies is summarized by the U.S. Fish and Wildlife Service (USFWS 2008) and Gutiérrez et al. (1995). Typical habitat consists of old-growth coniferous forests, or mixed stands of old-growth and mature trees; younger (second-growth) forests with patches of large trees are also occasionally used. High-quality year-round habitat features a tall, multi-tiered, multi-species canopy dominated by big trees, trees with cavities and/or broken tops, and woody debris and space under the canopy. NSO breeding pairs are usually monogamous and also demonstrate site fidelity, maintaining nesting territories and home ranges across years. The general breeding season is February through August, and nesting occurs on platform-like substrates in the forest canopy. Substrates used as nest sites include tree cavities, broken tree tops, epicormic branching (i.e., multiple branches forming from a single node), large horizontal branches, and old nests built by other birds or squirrels. While NSO nesting occurs predominantly in coniferous trees throughout its range, the population in Marin County is somewhat more generalist and has also been documented to use hardwoods for nesting (Chow 2001). Within Marin County, NSO young leave the nest (by gliding and climbing through the canopy) in late May through June, though they remain dependent on their parents for several weeks thereafter as they learn how to fly and forage independently. NSOs forage for nocturnal mammals; dusky-footed woodrats (*Neotoma fuscipes*) are the primary prey in northern California.

Survey Results

Within the BSA, the riparian woodland habitat consists primarily of California bay trees. This woodland is low density within and directly adjacent to the BSA because of the presence of creek channel and development in the immediate area. However, dense, undeveloped coniferous forest is located adjacent to the BSA to the south and upslope.

Per the CDFW Spotted Owl Viewer database (CDFW 2018b), there are no documented NSO nests within 0.25 miles of the Study Area. However, there are 51 documented NSO observations between the years 1998 and 2016 within 0.5 mile of the Study Area. All of these

observations are located within entirely forested areas over 1,300 feet south and west of the BSA. NSO have been documented to nest in several different trees in this area in 2000, 2001, 2003, 2005, 2006, 2009, 2011, and 2015.

No NSOs or indication of presence of this species (e.g., pellets or feces stains below potential nest or roost sites) were observed during the February 2018 site visit. Within the BSA, the canopy is more open and trees do not contain platform-like structures that are found in adjacent forest to the south west of the BSA. The trees within the BSA are therefore unlikely to support nesting NSO. Although NSOs in the area are unlikely to nest within the BSA, they may use the BSA as foraging habitat. The area of forest containing documented occurrences of NSO southwest of the BSA was not investigated during the site visit. However, available aerial imagery suggests that these areas feature contiguous stands of primarily older, larger conifers that provide more typical NSO habitat (Google Earth 2018). The nearest nesting habitat with potentially suitable nest tree structure is 1,000 feet southwest of the BSA.

The USFWS has published guidance on acoustic and visual disturbances for NSO (USFWS 2006). The term “disturbance-only” describes projects that will not impact NSO habitat directly, but will generate acoustic and/or visible disturbances potentially leading to nest abandonment. For such projects, potential NSO habitat areas within 0.25 mile (1,320 feet) of such disturbance point-sources are included in impact analyses (USFWS 2011). A single California bay tree is anticipated to be removed as part of the proposed Project, but isn’t of suitable size to contain NSO nesting habitat; therefore, there will be no impacts to NSO habitat in and around the BSA and the proposed Project is considered “disturbance only.”

Regarding visual disturbances, USFWS (2006) provides a general setback distance of 131 feet from active nests (i.e., those with eggs or young, or being attended by adults in preparation for nesting). The BSA is greater than 1,320 feet (0.25 mile) from the nearest documented nest tree, and is thus beyond the visual disturbance setback. Additionally, no trees within 1,000 feet of the BSA are likely to be used as nest trees due to a lack of platform-like tree structures and densely wooded vegetation characteristics. Thus, it is unlikely that NSO will nest within the 131-foot visual disturbance zone.

Ambient acoustic conditions during an assessment of a similar nearby site on Canyon Road averaged approximately 54 decibels, with a maximum reading of 79 decibels. Anthropogenic activities within the vicinity of the Canyon Road site included noise from residential properties and vehicle traffic over the Canyon Road Bridge, and is presumed to have similar levels of ambient disturbance as those in the Meadow Way BSA. A summary of potential project-generated disturbances that would likely provide the highest decibel levels and their “relative sound level” is provided in Table 4 below. Also included are ambient decibel levels that were observed at the Canyon Road site.

The USFWS (2006) provides an acoustic analysis matrix that compares ambient conditions to project conditions, and then derives an estimated linear distance from disturbance point-sources at which nesting NSOs have been documented (and/or should be expected) to be harassed/disturbed (Table 4). The harassment distance is the minimum buffer necessary to avoid acoustic impacts to an active NSO nest.

The potential acoustics of bridge maintenance have an average relative sound level of “High”, or, conservatively, could be at levels of “Very High.” In contrast, average ambient conditions in the immediate vicinity of the BSA appear to be “Very Low” to “Moderate.” Using a conservative approach in which ambient conditions are considered with an average level of 54 decibels, or “Very Low,” and proposed project conditions considered “Very High”, the estimated harassment distance is 825 feet. The nearest documented NSO nesting occurrence is located approximately 1,350 feet (over 0.25 mile) southwest of the BSA, and the nearest potential

nesting habitat is over 1,000 feet from the BSA. The BSA would be outside the area of potential acoustic impact if "Very Low" ambient sound levels are used as the basis for existing conditions even if a nest was present at the closest suitable habitat.

Table 4. Acoustic disturbance analysis for NSO as per USFWS (2006)

Disturbance regime	Disturbance	Decibel level ("standardized")	Relative sound level
Bridge maintenance	Yelling	70	Moderate
	Flatbed pickup truck	77	Moderate
	Generator (low end)	78	Moderate
	Backhoe (high end)	84	High
	Generator (high end)	84	High
	Concrete mixer (high end)	85	High
	Pumps, generators, compressors (high end)	87	High
	Jackhammer	89	High
	Medium construction (high end)	89	High
Ambient (existing conditions)	Power tool use from adjacent properties, light vehicle traffic, birds singing, wind.	45 - 79 (measured at Canyon Road Bridge over San Anselmo Creek on March 15, 2016)	Natural Ambient to Moderate

Table 5. Estimated harassment distance due to elevated action-generated sound levels for proposed actions affecting NSO, by sound level (USFWS 2006)

Existing (ambient) pre-project sound level (dB) [1,2]	Anticipated action-generated sound level (dB) [2,3]			
	Moderate (71-80)	High (81-90)	Very High (91-100)	Extreme (101-110)
"Natural Ambient"[4] (<=50)	165 feet	500 feet	1,320 feet	1,320 feet
Very Low (51-60)	0 feet	330 feet	825 feet	1,320 feet
Low (61-70)	0 feet	165 feet [5]	825 feet	1,320 feet
Moderate (71-80)	0 feet	165 feet	330 feet	1,320 feet
High (81-90)	0 feet	165 feet	165 feet	500 feet

[1] Existing (ambient) sound levels includes all natural and human-induced sounds occurring at the project site prior to the proposed action, and are not casually related to the proposed action.
[2] Sound levels provided in USFWS technical guidance document.
[3] Action-generated sound levels are given in decibels (dB) experienced by a receiver, when measured or estimated at 50 feet from the sound source.
[4] "Natural Ambient" refers to sound levels generally experienced in habitats not substantially influenced by human activities.
[5] Estimated dB level of proposed project activities, by estimated by dB level of natural ambient sound.

Project Impacts

A California bay tree would be removed by the proposed project and several others may need to be trimmed or removed. However, these trees do not contain suitable nesting habitat for NSO. The project construction would occur over two nesting seasons, and project construction may result in temporary acoustic impacts to nesting NSO in the vicinity; however, no permanent impacts are anticipated. The BSA is not visible from documented NSO nest locations in the vicinity and NSO is unlikely to nest within the 131-foot visual buffer zone of the BSA because of a lack of suitable nest trees. Thus, no visual disturbances to nesting NSO would occur from the proposed project. Although unlikely based upon habitat and previous nest locations, NSO may nest within auditory disturbance buffers between 0.20-0.25 miles (1,050-1,320 feet) of the BSA. Based on estimated project acoustic disturbance levels, the BSA is beyond the noise disturbance buffer (825 feet) from the nearest potential nest habitat (1,000 feet); thus, no acoustic disturbance to nesting NSO is anticipated in either season.

The proposed project would not result in loss of habitat for NSO, and implementation of avoidance and minimization measures would prevent acoustic impacts to NSO that may nest nearby. Therefore, the proposed project **may affect, not likely to adversely affect** NSO.

Avoidance and Minimization Efforts

The BSA does not contain habitat suitable for nesting NSO, and no potential NSO nesting habitat is within 0.20 mile (1,050 feet) of the BSA. However, dependent upon construction activities, NSO that nest in forest within 0.20-0.25 mile of the BSA may be affected by noise from proposed project activities during nesting. The following measures will be implemented to avoid and minimize potential project impacts to NSO:

- Final avoidance and minimization measures will be determined in consultation with the USFWS to ensure project design including avoidance and minimization measures do not result in adverse effects to NSO.
- If construction activities have the potential to exceed 101 dB (extreme levels), this work will be conducted to the extent feasible outside the nesting season (September 1 through January 31) to avoid disrupting nesting NSO adjacent to the BSA. Work generating extreme sound levels during the nesting season will require protocol-level surveys to determine nesting status and location and consultation with the USFWS and CDFW.
- If work within the BSA generating extreme sound levels must occur during the nesting season (February 1 through August 31), protocol-level surveys in accordance with the USFWS Protocol for Surveying Proposed Management Activities that may Impact Northern Spotted Owls (2012) will be conducted. For “disturbance only” projects (see Project Impacts section below), six surveys will be required during the nesting season of the BSA and the surrounding 0.25-mile area (survey area).
- If protocol-level surveys indicate that NSOs are nesting within the potential acoustic impact distance to be determined in consultation with the USFWS, project work may not commence until the end of the nesting season, i.e. September 1, or be limited to work within certain acoustic levels based upon distance from the nest and in consultation with the USFWS.
- If protocol-level surveys determine that NSO are not nesting or not nesting within the potential acoustic impact zone during the year of the surveys, project work may commence June 1. June 1 is the earliest date non-nesting status can be confirmed.
- If project work begins in the non-nesting season and is to continue into the nesting season, project work generating extreme levels of noise will cease January 31 and will

not recommence until protocol-level surveys as described above determine the nesting status of the survey area. Work generating noise levels below 100 dB (“Very High” or lower levels of disturbance) may continue into the nesting season.

Compensatory Mitigation

No NSO habitat is to be removed, and no compensatory mitigation is proposed.

Cumulative Impacts

No future public or private activities are known to be planned or reasonably foreseen for the BSA. The proposed project does not include any additional activities beyond those discussed in this document. Therefore, cumulative effects on NSO are not anticipated for the proposed project.

STEELHEAD, CRITICAL HABITAT, EFH, AND FISH PASSAGE

The CCC steelhead Distinct Population Segment (DPS) is federally threatened. This steelhead DPS includes all naturally spawned populations of steelhead and their progeny in California streams from the Russian River to Aptos Creek and the drainages of the San Francisco and San Pablo bays westward to and including the Napa River, excluding the Sacramento-San Joaquin River Basin.

Steelhead typically migrate to marine waters after spending 2 years (although up to 7) in freshwater. They then reside in marine waters for 2 to 3 years prior to returning to their natal stream to spawn as 4- or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females generally spawn two times before they die. Preferred spawning habitat for steelhead is composed of perennial streams with cool to cold water temperatures, high dissolved oxygen levels, and fast-flowing water. Abundant riffle areas with gravel or cobble substrate for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. The resident life form of steelhead is called rainbow trout, and are also protected in anadromous streams.

Survey Results

Within the BSA, San Anselmo Creek is intermittent and primarily contains riffle habitat with substrate composed of gravels and cobble, as well as a concrete wall leading up to the existing bridge. Portions of the bank have been stabilized with gabion baskets to prevent erosion, in addition to the concrete wingwalls and footing leading up to the bridge. During the February 1, 2018 site visit, there was minimal flow through the creek in the BSA, with the flowing portions of the creek approximately 10 feet wide. Slow riffle and glide flows are located upstream of the bridge for approximately 150 feet. There was some pooling directly below the bridge, and flows downstream from the bridge were primarily glide and slow riffle with some pool habitat.

Fish passage downstream of the BSA has been improved in recent years with the retrofit of the Center Boulevard box culvert in 2012 (CEMAR 2012). According to a 2006 fish passage assessment conducted by Taylor and Associates of Corte Madera Creek and its tributaries, four partial or complete barriers remain downstream of the BSA that reduce passage. There is a partial barrier at Fairfax-Bolinas Road where a box culvert reduces passage for adult salmonids and eliminates passage for immature fish. A concrete flood channel along Corte Madera Creek near McAllister Avenue impedes fish passage at low flows due to insufficient depths. The two remaining barriers consist of sub-standard Denil fish ladders. In 2006, Ross Taylor and Associates performed a functional analysis of the ladders at Saunders Avenue and Pastori

Avenue. The ladder at Saunders Avenue was classified as a total barrier, while Pastori was classified as a partial barrier. The ladder at Saunders Avenue does not meet required Denil fish ladder criteria and has a 42-foot-long concrete flume below the ladder which impedes the approach to the ladder (Taylor and Associates 2006). The ladder at Pastori was determined to have a flow capacity and ladder slope which make the ladder unusable by fish during many flow conditions (Taylor and Associates 2006). The combination of these barriers limits fish passage below the BSA. Assessments for the removal or modification of the Saunders and Pastori barriers have been completed and await funding and permitting through the group, Friends of Corte Madera Creek (FOCMCW 2017).

Despite potential barriers to fish passage below the BSA, San Anselmo Creek is still considered an anadromous stream because the barriers only prevent adult steelhead passage during portions of the year when flows are inappropriate for fish passage (Taylor and Associates 2006). Moreover, steelhead have been observed in San Anselmo Creek above the Saunders Avenue fish ladder, which is the most difficult of the four barriers for fish to overcome (CDFW 2018d, FOCMCW 2017). Thus, steelhead are considered present within San Anselmo Creek and may be present if suitable water depths and conditions are met. San Anselmo Creek within the BSA is intermittent and has potential to contain steelhead only when water is present.

Project Impacts

As summarized in Table 2 above, 0.21 acre (9,150 square feet) of temporary impacts to critical habitat and EFH would occur from the proposed project. Critical habitat and EFH are encompassed by the Intermittent Stream habitat within the BSA. Work in the creek bed would occur over two consecutive seasons, and would occur when water levels are low to non-existent. The contractor will work in isolation from water. If flowing water is present, a temporary water diversion will be installed. If any pools exist within the project area after the diversion is installed, a fish rescue will be performed to relocate any native species. If no water exists during construction in the creek bed, no fish would be present during work within the creekbed or banks and no direct impacts to steelhead would be anticipated. The current bridge has two bents with four 12-inch diameter wooden piles in the creek bed and two additional bents with five piles are located on the creek banks outside of the creek bed. The bridge is being replaced with a free span bridge, thus no permanent loss of Intermittent Stream habitat is anticipated from the proposed project. The removal of the wooden piles from the streambed, some of which have been preserved with creosote, may increase and improve the Intermittent Stream habitat for fish passage.

The bridge work would replace and add wingwalls and retaining walls; however, all wingwalls and retaining walls are outside of the creek bed, and the bridge work would not create a barrier across the channel, decrease flows, or change substrate size. An undercut bank will be restored to the existing bank edge to maintain bank stability. This will modify pool characteristics along this bank, but will not change channel width, create a barrier, or decrease flows. Temporary impacts to excavate the footings of the new walls would be necessary, but all new fill for stabilization of the walls are outside of the creekbed and will be placed below the surface and covered with previously excavated cobble and gravel.

Piles for support of the abutments will be drilled in the creek bank but above the Ordinary High Water Mark and all drilling would be done in isolation from water. Therefore, no hydroacoustic impacts to fish are anticipated. New fill would be placed below the surface of the creek banks and covered with previously excavated cobble and gravel. The only direct impacts to the creek bed beyond access routes and dewatering, would be removal of existing wooden piles. A total of four wooden piles will be removed from the creek bed totaling 12.6 square feet, and five piles will be removed from the unvegetated bank totaling 15.7 square feet. No new piles would be installed.

A program of fish habitat restoration will also be implemented as part of the proposed project. A layer of large logs will be laid in a grid at the bottom of the excavation and on the creek bed, to be incorporated in the log-root wad revetment structure. The base of the embankment will be planted with native plants and small trees to create near-shore overhanging vegetation. In conjunction with the revetment, the creek bed in front of the revetment structure will be re-contoured to create pools for fish and replace the pool previously provided by the undercut bank. The net effect will be restoring the site to a deep and wide soil "trough" traversing the bridge site for natural fish passage without any obstructions in the creek other than creek materials and native plants.

The stream channel will be restored to near pre-project conditions following the completion of bridge work, recreating the gradient which currently exists. The creek bed throughout the project site will be restored to a trough-like flow conveyance environment. Restoration will use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation including creek gradient. Removal of six piles that are currently in the creek bed will reduce potential stream damming from wrack buildup. As such, the proposed project may improve fish passage conditions.

The proposed project would not result in any changes to existing land use; and the BSA would be restored to conditions similar to those before the project. Therefore, no indirect impacts are expected.

The proposed project would not result in loss of habitat for steelhead or a reduction or detectable change (apart from removal of piles in the creek) in the physical and biological properties of critical habitat or EFH. No steelhead are anticipated to be present based upon the work windows; however, if sufficient water is in the BSA, fish may be present and would require relocation outside of the BSA during work in the creek bed. Therefore, the proposed project **may affect, may adversely affect** steelhead, and **may affect, not likely to adversely affect** critical habitat, and EFH.

Avoidance and Minimization Efforts

Habitat in the BSA is within critical habitat for both Coho salmon and steelhead, and is within EFH for Pacific salmonids. As mentioned above, Coho salmon are considered extirpated in the watershed, but CCC steelhead are assumed present. In addition to the measures identified for the Intermittent Stream Biological Community; the following measures will be implemented to avoid and minimize potential project impacts to steelhead, critical habitat for steelhead and Coho Salmon, and EFH.

- Consultation with NMFS will be conducted to ensure proposed project design will not result in permanent adverse effects to steelhead, critical habitat, or EFH.
- Construction within the bed and banks of the creek will be done within two dry seasons and work within the creek channel will be limited to the period between June 1 and October 15 (inclusive), and avoid the spawning and migration season. All coffer dams and construction materials will be removed from the creek bed at the end of each season of work. In-water work outside of this period (June 1-October 15) will require formal consultation with NMFS.
- Erosion control best management practices (BMPs) such as silt fencing, construction exclusion fencing, straw waddles and erosion control fabric installation will be implemented.
- Contaminants (including construction debris, materials, and PAHs) will be prevented from entering the stream.
- No equipment will be washed within the creek channel or where wash water could flow

into the creek channel.

- Prior to proposed project construction, the contractor will establish a concrete washout area for concrete trucks in a location where wash water will not enter the creek or adjacent areas.
- Spill containment and treatment materials will be contained on site.
- All refueling and maintenance of equipment, other than stationary equipment, will occur outside the creek's top-of-bank.
- Spill control absorbent material will be in place underneath stationary equipment at all times to capture potential leaks. Any hazardous chemical spills will be cleaned immediately.
- All stockpiling of construction materials, equipment, and supplies, including storage of chemicals, will occur outside the creek channel.
- All workers will ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash generated are deposited in covered or closed trash containers. Trash containers will not be left open and unattended overnight.
- All construction materials and waste will be completely removed and properly disposed.
- Work shall be conducted in isolation from flowing surface water. If surface water is present, prior to the start of in-water activities, the work area will be isolated using temporary cofferdams, and flowing water shall be temporarily diverted around the isolated area.
- A fish rescue will be completed if water remains in the BSA at the time of work in the creek bed. This includes if no surface flow is present, but pools containing water with potential to support fish are present within the BSA. A fish rescue and relocation plan shall be developed prior to the onset of any in-water work. The plan shall be implemented by a qualified biologist during dewatering activities in San Anselmo Creek. The fish rescue and relocation plan shall include an overview of the proposed methods for dewatering, expected location and duration of dewatering activities, and methods for conducting fish rescue and relocation during dewatering activities. The plan will be submitted to NMFS no less than 90 days prior to the initiation of construction.
- If de-watering is necessary, pump intakes will be screened with 2.38 mm woven wire, 2.38 mm perforated plate, or 1.75 mm profile wire. Pumps will be used to remove standing water from the work area within the coffer dams to a filtration basin to prevent direct discharge into the creek. If a filtration basin is not available, filter bags will be placed surrounding the hose-release and the hose-release end will be placed on a level area outside of the wetted creek channel to allow water to settle prior to returning to the creek. No pumped water will be directly discharged into the creek. Allowing the pumped water to settle in a filtration basin or release through filter bags will prevent increase in turbidity or sediment loads during the de-watering process.
- Where disturbed, the creek channel will be restored to the pre-project grade using native cobble, gravel, and soils in appropriate ratios to mimic pre-project conditions.
- Replace all native, riparian trees (4-inch DBH or larger) and shrubs (3 feet tall or larger) that were removed from the creekbed or banks at a ratio of 2:1. A site specific replanting and mitigation plan will be prepared prior to the initiation of construction and sent to NMFS and agencies as required by permit conditions for approval.

Compensatory Mitigation

The proposed project includes fish habitat restoration using bio-engineering techniques, low earth berms and woody nooks, designed specifically for the site. The net effect will be restoring the site to a deep and wide soil "trough" traversing the bridge site for natural fish passage without any obstructions in the creek other than creek materials and native plants. No additional compensatory mitigation is proposed.

Cumulative Impacts

No cumulative effects are anticipated from the proposed project. Downstream fish passage improvements have been recently made and the future improvements to the Saunders and Pastori Avenue crossings are planned (FOCMCW 2017). The improvement of these structures will remove and/or improve passage over the partial barriers which currently impede anadromy during certain flow conditions. The proposed project will restore the BSA to near pre-project conditions, and may improve fish passage within the BSA with the removal of three existing piles in the stream. Restoration to near pre-project conditions will ensure that no barriers are created to fish passage during proposed project activities, and any improvements to downstream fish passage will not be hindered by the proposed project.

SPECIAL-STATUS AND NON-SPECIAL-STATUS NESTING BIRDS

Two special-status species of birds, including Allen's hummingbird and olive-sided flycatcher, have potential to nest within or adjacent to the BSA in addition to NSO discussed above. A brief discussion on these species is provided below. In addition to the special-status bird species, non-special-status birds have the potential to nest within the BSA. Most native birds in the United States, including non-status species, are protected by the Federal Migratory Bird Treaty Act of 1918 and California Fish and Game Code. Under these regulations, destroying active nests, eggs, or young is illegal.

- **Allen's hummingbird (*Selasphorus sasin*, USFWS Bird of Conservation Concern).** Allen's hummingbird, common in many portions of its range, is a summer resident along the majority of California's coast and a year-round resident in portions of coastal southern California and the Channel Islands. Breeding occurs in association with the coastal fog belt, and typical habitats used include coastal scrub, riparian, woodland and forest edges, and eucalyptus and cypress groves (Mitchell 2000). It feeds on nectar, as well as insects and spiders.

- **Olive-sided flycatcher (*Contopus cooperi*, CDFW Species of Special Concern, USFWS Bird of Conservation Concern).** This species if found within the coniferous forest biome, most often associated with forest openings, forest edges near natural openings (e.g. meadows, canyons, or rivers) or human-made openings (e.g., harvest units), or open to semi-open forest stands (Altman, 2000).

Survey Results

Trees and vegetation within and surrounding the BSA may provide potential nest sites or foraging habitat for Allen's hummingbird, olive-sided flycatcher, and non-special-status bird species.

Project Impacts

The BSA contains potential nesting habitat for special-status and non-special-status nesting birds. One California bay tree is proposed to be removed and several others may need to be trimmed or removed. Construction activities, including vegetation trimming, could result in direct impacts to active nests, and construction noise could result in indirect impacts to active nests. The BSA will be restored to near pre-project conditions, and as such, no permanent direct impacts to nesting birds are expected.

The proposed project would not result in any changes to existing land use and the BSA would be restored to near pre-project conditions; therefore, no indirect effects are expected.

Avoidance and Minimization Efforts

Although potential nesting habitat for nesting birds would be only minimally impacted as a result of the proposed project by the removal of a single California bay tree, construction could disturb active nests. The following measures will be implemented to avoid and minimize potential impacts to special-status and non-special-status nesting birds:

- If proposed project activities begin between February 15 and August 31, pre-construction surveys will be conducted by a qualified biologist prior to ground disturbance or vegetation removal to determine whether active nests containing eggs, chicks, or young are present in the BSA. Pre-construction surveys for active nests will be conducted no more than 14 days prior to ground disturbing or vegetation removal activities.
- If active nests containing eggs, chicks, or young are not observed during pre-construction surveys, construction can proceed.
- If active nests containing eggs, chicks, or young are observed, ground-disturbing activities will be avoided within a 25- to 100-foot exclusion zone for passerine birds and a 200- to 500-foot exclusion zone for raptors and special-status species. Exclusion size will be dependent upon species and nest location. Appropriate exclusion distances will be determined by a qualified biologist based on the species present and location of the nest relative to construction activities (e.g., the nest is sufficiently shielded from construction to avoid disturbance). Construction within this buffer will be prohibited until the qualified biologist determines that the nest is no longer active. If an active nest is found after the completion of the pre-construction surveys or after construction begins, all construction activities will stop until a qualified biologist has evaluated the nest and determined an appropriate buffer to be placed around the nest. If avoidance of a buffer zone is not feasible, CDFW and/or the USFWS will be contacted to coordinate an appropriate course of action.
- No surveys will be required if project activities begin during the non-nesting season, between September 1 and February 14.

Compensatory Mitigation

No permanent nesting bird habitat is to be removed, and no compensatory mitigation is proposed.

Cumulative Impacts

No future public or private activities are known to be planned or reasonably foreseen for the BSA. The proposed project does not include any additional activities beyond those discussed in this document. Therefore, cumulative effects on special-status and non-special-status nesting birds are not anticipated for the proposed project.

Chapter 5 – Conclusions and Regulatory Determinations

Federal Endangered Species Act Consultation Summary

There has been no federal Endangered Species Act Section 7 consultation to date with the USFWS and/or NMFS. The proposed project **may affect, is not likely to adversely affect** NSO, a federally threatened species. Construction activities are anticipated to be at levels which will not disturb NSO based on the distance to suitable nesting habitat. Impacts to NSO may be avoided by restricting construction activities which may result in extreme sound levels to the non-nesting season, September 1 through January 31. However, if avoiding the nesting season for extreme sound-generating activities (greater than 100 dB) is not feasible, protocol-level surveys will be conducted in the year of proposed project activities to determine nesting status. Consultation with USFWS will be required to assess impacts of the proposed project and avoidance and minimization measures used to limit effects to NSO. A Biological Assessment and a request for concurrence will be submitted to USFWS as part of the consultation process.

The proposed project **may affect, may adversely affect** CCC steelhead, a federally threatened species, and **may affect, is not likely to adversely affect** designated critical habitat for CCC steelhead and Coho salmon. The project will be scheduled when San Anselmo Creek is mostly dry within the BSA. If flowing water is present, a temporary diversion will be installed, and a fish rescue will be performed to relocate native species. No work will occur when fish have potential to be present within the work area, and work will be conducted in isolation from flowing water. Consultation is required from NMFS to assess impacts of the project as well as avoidance and minimization measures used to reduce impacts on steelhead and designated critical habitat for steelhead and Coho salmon. This may include a review of the project design by NMFS for fish passage consideration, and compensatory mitigation. A Biological Assessment and a request for concurrence will be submitted to NMFS as part of the consultation process.

Coho salmon are considered extirpated from San Francisco Bay (NMFS 2012, Brown and Moyle 1991); therefore, the proposed project will have **no effect** on Coho salmon and consultation is not required.

Essential Fish Habitat Consultation Summary

As discussed in the previous section, the proposed project may affect designated critical habitat for steelhead and Coho salmon. Coho salmon are covered by Pacific Salmon EFH in California; however, this species is extirpated from the tributaries of San Francisco Bay and is therefore not present within San Anselmo Creek. Although no species covered under EFH are anticipated to occur, the BSA still contains habitat identified as Pacific Salmon EFH. Work will occur during the dry season, minimizing any significant impact on Pacific Salmon EFH, and if any water exists in the project area at the start of construction, a fish rescue will be performed. No loss of habitat function or value is anticipated from the proposed project. The proposed project **will not adversely affect** EFH.

California Endangered Species Act Consultation Summary

California state-listed species do not have potential to occur within the BSA. Northern spotted owl is listed as threatened under the California Endangered Species Act and may occur near the BSA, but is not anticipated to occur within the BSA. The proposed project will not take NSO under the definition of CESA, and no take of any other state-listed species is anticipated to occur during the proposed project; therefore, consultation in relation to CESA is not necessary for the proposed project. However, a Consistency Determination with USFWS is recommended to be requested from CDFW.

Wetlands and Other Waters Coordination Summary

As summarized in Table 2 above, 0.13 acre (approximately 270 linear feet) of temporary impacts and a gain of 18.8 square feet (<0.01 acre, approximately 6 linear feet) of permanent impacts to potentially jurisdictional “other waters” (creek bed) are proposed. A preliminary Jurisdictional Determination will be submitted to the USACE for verification. The permits that will be required include a Lake and Streambed Alteration Agreement (CDFW), CWA 401 certification (RWQCB), and CWA 404 Nationwide Permit 14 (Linear Transportation Projects) (USACE).

Invasive Species

With implementation of the avoidance and minimization efforts in Section 3, the proposed project would not result in severe infestations of invasive plant species or spread of the New Zealand mud snail.

Other

Migratory Bird Treaty Act and California Fish and Game Code. Although potential nesting habitat for nesting birds would not be lost as a result of the project, construction could result in temporary impacts if active nests are disturbed. Measures including preconstruction surveys and establishment of buffers if active nests are found will ensure that the project will not affect nesting birds.

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Appendix A – Plant and Wildlife Species Observed during the Site Visits

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Appendix A1: Plant Species Observed in the BSA During the Meadow Way Bridge Fieldwork on April 12 and June 23 2016, January 11 and May 2, 2017, and February 1, 2018

Family	*Scientific Name*	Common Name
Other		
Dennstaedtiaceae	*Pteridium aquilinum* var. *pubescens*	bracken fern
lichen	*Ramalina menziesii*	lace lichen
liverwort (Lunulariaceae)	*Lunularia* sp.	-
moss	*Dendroalsia abietina*	-
moss	*Fissidens crispus*	-
moss	*Pohlia* sp.	-
Magnoliids		
Aristolochiaceae	*Aristolochia californica*	Dutchman's pipe
Lauraceae	*Umbellularia californica*	California bay
Eudicots		
Adoxaceae	*Sambucus nigra* ssp. *caerulea*	blue elderberry
Anacardiaceae	*Toxicodendron diversilobum*	poison oak
Apiaceae	*Foeniculum vulgare*	fennel
Apiaceae	*Torilis arvensis* ssp. *purpurea*	hedge parsley
Apocynaceae	*Vinca major*	big leaf periwinkle
Araliaceae	*Hedera helix*	English ivy
Asteraceae	*Artemisia douglasiana*	mugwort
Asteraceae	*Baccharis pilularis*	coyote brush
Asteraceae	*Gamochaeta ustulata*	purple cudweed
Asteraceae	*Taraxacum officinale*	common dandelion
Boraginaceae	*Myosotis latifolia*	broadleaf forget me not
Brassicaceae	*Nasturtium officinale*	water-cress
Caprifoliaceae	*Lonicera japonica*	Japanese honeysuckle
Caprifoliaceae	*Symphoricarpos albus* var. *laevigatus*	snowberry
Caryophyllaceae	*Stellaria media*	common chickweed
Chenopodiaceae	*Chenopodium album*	lambs quarters
Cucurbitaceae	*Marah fabacea*	California man-root
Fabaceae	*Genista monspessulana*	French broom
Fabaceae	*Hoita macrostachya cf.*	leather root
Fabaceae	*Trifolium dubium*	little hop clover
Fabaceae	*Vicia americana* ssp. *americana*	American vetch
Fagaceae	*Quercus agrifolia var. agrifolia*	coast live oak
Fagaceae	*Quercus garryana*	garry oak
Fagaceae	*Quercus kelloggii*	black oak
Geraniaceae	*Erodium cicutarium*	storks bill

Family	*Scientific Name*	Common Name
Hypericacaeae	*Hypericum anagalloides*	Tinkers penny
Lamiaceae	*Mentha pulegium*	penny royal
Lamiaceae	*Stachys rigida* var. *querectorum*	hedge-nettle
Montiaceae	*Claytonia perfoliata*	miners lettuce
Plantaginaceae	*Plantago lanceolata*	English plantain
Polygonaceae	*Rumex (obtusifolius*?)	bitterdock
Polygonaceae	*Rumex acetosella*	sheep sorrel
Polygonaceae	*Rumex conglomeratus*	dock
Polygonaceae	*Rumex pulcher*	bitterdock
Rosaceae	*Prunus* sp.	prunus
Rosaceae	*Rubus armeniacus*	Himalayan blackberry
Rosaceae	*Rubus ursinus*	California blackberry
Rubiaceae	*Galium aparine*	goosegrass
Salicaceae	*Salix lasiandra* var. *lasiandra*	Pacific willow
Salicaceae	*Salix lasiolepis*	arroyo willow
Sapindaceae	*Acer macrophyllum*	big leaf maple
Sapindaceae	*Aesculus californica*	buckeye
Scrophulariaceae	*Scrophularia californica*	bee plant
Urticaceae	*Urtica dioica*	stinging nettle
Monocots		
Alliaceae	*Allium triquetrum*	Three-cornered leek
Cyperaceae	*Cyperus eragrostis*	tall flat nut-sedge
Juncaceae	*Juncus patens*	rush
Poaceae	*Avena barbata*	slender wild oat
Poaceae	*Bromus carinatus*	California brome
Poaceae	*Bromus diandrus*	ripgut brome
Poaceae	*Bromus* sp.	brome
Poaceae	*Bromus sterilis*	poverty brome
Poaceae	*Cynosurus echinatus*	hedgehog dogtail
Poaceae	*Ehrharta erecta*	panic veldtgrass
Poaceae	*Festuca myuros*	rattail grass
Poaceae	*Festuca perennis*	perennial ryegrass
Poaceae	*Hordeum murinum* sp. *murinum*	wall barley
Poaceae	*Poa annua*	annual bluegrass
Poaceae	*Polypogon monspeliensis*	rabbitfoot grass

Appendix A2: Wildlife Species Observed in the BSA During the Meadow Way Bridge site visit on February 1, 2018

Family	Scientific Name	Common Name
Wildlife		
Birds	*Passer domesticus*	house sparrow
Birds	*Sayornis nigricans*	black phoebe
Birds	*Aphelocoma californica*	California scrub jay
Birds	*Corvus brachyrhynchos*	American crow
Mammals	*Felis catus*	house cat

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Appendix B - USFWS Information for Planning and Conservation Resource List

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Consultation Code: 08ESMF00-2019-SLI-0801
Event Code: 08ESMF00-2019-E-06441
Project Name: Meadow Way Bridge Project

May 24, 2019

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-0801

Event Code: 08ESMF00-2019-E-06441

Project Name: Meadow Way Bridge Project

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Meadow Way Bridge is primarily wooden and has been determined to be structurally deficient and needs to be replaced. It serves as the only egress and ingress facility for nearly two dozen homes on Meadow Way. The bridge is supported at four locations within the creek banks, two of which are in the creekbed. The new bridge would be designed to clear the greater of the 50-year flows and two feet of freeboard, or the 100-year design flows, the former controlling in this case. It would be a 70 foot long single-span concrete arch bridge, supported on two new abutments, with no additional supports in the creek. The abutments would connect with wingwalls and retaining walls of varying lengths and heights at its four corners. The new bridge would be built on the south side of the existing bridge while the existing bridge remains in service, and relocated to its permanent location after the existing bridge is removed. Construction would take two seasons and work in the creek would be performed between June 1 and October 15 in order to avoid the spawning and migration season for protected California Central Coast steelhead.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.97603730364997N122.6003467512148W

Counties: Marin, CA

Endangered Species Act Species

There is a total of 18 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Short-tailed Albatross *Phoebastria (=Diomedea) albatrus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/433	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Mission Blue Butterfly *Icaricia icarioides missionensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6928	Endangered
Myrtle's Silverspot Butterfly *Speyeria zerene myrtleae* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6929	Endangered
San Bruno Elfin Butterfly *Callophrys mossii bayensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered

Flowering Plants

NAME	STATUS
Marin Dwarf-flax *Hesperolinon congestum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5363	Threatened
Santa Cruz Tarplant *Holocarpha macradenia* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6832	Threatened
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered
White-rayed Pentachaeta *Pentachaeta bellidiflora* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7782	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Intersection of USGS Topographic Quads with NOAA Fisheries ESA Listed Species, Critical Habitat, Essential Fish Habitat, and MMPA Species
Data NMFS Species List - November 2016 and last accessed January 2019

Quad Name	Bolinas	Novato	San Geronimo	San Rafael
Quad Number	37122-H6	38122-A5	38122-A6	37122-H5

X = Present on the Quadrangle

ESA ANADROMOUS FISH (E) = Endangered, (T) = Threatened											
COHO		CHINOOK			STEELHEAD					Eulachon (T)	Southern DPS Green Sturgeon (T)
SONCC (T)	CCC (E)	CC (T)	CVSR (T)	SRWR (E)	NC (T)	CCC (T)	SCCC (T)	SC (E)	CCV (T)		
	X					X					X
	X					X					X
	X					X					
	X		X	X		X			X		X

ESA ANADROMOUS FISH CRITICAL HABITAT											
COHO		CHINOOK			STEELHEAD					Eulachon	Southern DPS Green Sturgeon
SONCC	CCC	CC	CVSR	SRWR	NC	CCC	SCCC	SC	CCV		
	X					X					X
	X					X					X
	X					X					
	X			X		X					X

Intersection of USGS Topographic Quads with NOAA Fisheries ESA Listed Species, Critical Habitat, Essential Fish Habitat, and MMPA Species
Data NMFS Species List - November 2016 and last accessed January 2019

Quad Name	Bolinas	Novato	San Geroni	San Rafael
Quad Number	37122-H6	38122-A5	38122-A6	37122-H5

X = Present on the Quadrangle

ESA MARINE INVERTEBRATES		ESA MARINE INVERT. CRITICAL HABITAT	ESA SEA TURTLES				ESA WHALES	ESA PINNIPEDS	ESA PINNIPEDS CRITICAL HABITAT
Black Abalone (E)	White Abalone (E)	Black Abalone	East Pacific Green Sea Turtle (T)	Olive Ridley Sea Turtle (T/E)	Leatherback Sea Turtle (E)	North Pacific Loggerhead Sea Turtle (E)	Whales (see list below)	Guadalupe Fur Seal (T)	Steller Sea Lion
X		X	X	X	X		X	X	
X		X	X	X	X		X	X	

ESSENTIAL FISH HABITAT					MMPA SPECIES	
SALMON		Groundfish	Coastal Pelagic	Highly Migratory Species	MMPA Cetaceans (see "MMPA Species" tab for list)	MMPA Pinnipeds (see "MMPA Species" tab for list)
Coho	Chinook					
X	X	X	X		X	X
X	X	X	X			
X	X					
X	X	X	X		X	X

Appendix C – Preparers Qualifications

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Kelly Biological Consulting
5San Anselmo, CA 94960
(415) 482-9703

P.O. Box 1625
Truckee, CA 96160
(530) 582-9713

CAPABILITIES

Kelly Biological Consulting is a WBE certified, small business experienced in conducting wetland delineations and special status plant surveys, creating vegetation maps, preparing permits, mitigation plans, and the vegetation sections of CEQA and NEPA environmental documents. The firm's primary goals are responding to client needs and providing top quality work using the knowledge that comes from years of experience. Kelly Biological Consulting subcontracts wildlife and fisheries biologists to offer a full range of biological services.

PRINCIPAL

Micki Kelly, Principal, Plant Ecologist
Professional Wetland Scientist (Certification #001007)

- Experienced in conducting plant surveys and wetland delineations in a wide variety of habitats.
- Managed the wetland permitting tasks for construction of a gas transmission line that crossed over 200 wetlands and "other waters" in California, Oregon, and Nevada. Negotiated with 3 U.S. Army Corps of Engineers Districts, 5 Regional Water Quality Control Boards, and other agencies pursuant to the Clean Water Act Sections 401, 402, and 404, and the Porter Cologne Act.
- Taught plant identification and ecology for the U.S. Army Corps of Engineers wetland delineation 40-hour training program. Also taught a class in Sierra Nevada flora and special status plants.
- Designed and implemented a monitoring plan that provided accurate comprehensive data while controlling costs for the 230-mile Tuscarora Gas Transmission Line and the 164-mile Alturas Intertie Project.
- Developed and implemented two large-scale off-site wetland mitigation areas.
- Received written commendation from the U.S. Army Corps of Engineers and California Department of Fish and Wildlife on a wetland permit and mitigation plan for a project in the Sierra foothills involving a Section 7 consultation.

Ms. Kelly has 25 years of relevant experience, successfully managing multi-faceted projects with wetland and endangered species issues, supervising staff and subcontractors. She completes projects on time and within budget. She studied plant ecology, taxonomy, and statistics at the University of Michigan, San Francisco State University, and the University of California, Berkeley. She has taught plant identification and ecology for the U.S. Army Corps of Engineers wetland delineation 40-hour training program. Prior to establishing Kelly Biological Consulting in 1994, she worked as a plant ecologist for WRA, CH2MHill, and Harding Lawson Associates.

Ms. Kelly has conducted sensitive plant species surveys and written impact and mitigation texts for California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documents and as well as baseline information on restoration sites. She is experienced in designing sensitive plant surveys in accordance with the current California Native Plant Society and the California Department of Fish and Wildlife guidelines. She has conducted vegetation studies in habitats ranging from coastal salt marsh to foothill riparian and montane meadows in California and Nevada. She has extensive experience in designing suitable search patterns based on the desired level of intensity. Ms. Kelly has prepared biological assessments and developed special status plant mitigation and monitoring plans requiring substantial understanding of plant ecology.

Ms. Kelly has performed wetland assessments and delineations on numerous projects including complex filled and excavated problem wetlands, montane areas, farmed wetlands, two diked historic salt marshes that were over 1,000 acres, numerous small emergent wetlands, several 2,000+ acre sites in the Sierra Nevada, alkali playas, foothill riparian zones, and coastal salt marsh restoration sites. Ms. Kelly has expertise in Army Corps of Engineers approved sampling techniques and the data analysis that is used in performing routine and comprehensive delineation. She has developed and implemented wetland monitoring plans using the techniques currently known to be the most successful in wetland mitigation design and construction.

Ms. Kelly has extensive experience in the legal aspects of sensitive species and wetland protection. She has authored Army Corps of Engineers Permits involving Section 7 consultations, one of which received written commendation from the Army Corps of Engineers and Department of Fish and Game.

EDUCATION

BS Botany, University of Michigan
Graduate studies, University of California Berkeley and San Francisco State University

PROFESSIONAL SOCIETIES

Society of Wetland Scientists, Certified Professional Wetland Scientist
California Native Plant Society, Past Marin Chapter Board Member (8 years)
Society for Ecological Restoration
California Botanical Society
California Native Grass Association
California Invasive Plant Council (Cal-IPC)

REPRESENTATIVE PROJECTS

Project: Central Marin Police Station, Larkspur, CA
Client: Central Marin Police Authority

The Twin Cites Police Authority was planning to rebuild their police station when concerns about the existing storm drain outfalls and bank stability arose. Initial building construction was pending. Therefore, the first challenge was obtaining the federal and state permits quickly, even though sensitive brackish marsh habitat was adjacent to the site. Kelly Biological Consulting was able to conduct the wetland delineation and special status species surveys, and expedite the permits within the project deadlines. The second challenge was the site constraints (physical and biological). The site is on the outside bank of a ninety-degree bend in the creek, at the junction of freshwater and tidal flows. It is subject to large hydraulic forces in the winter and high salinity in the summer. In conjunction with the project geotechnical firm and the engineers, Ms. Kelly developed a restoration

design that successfully addressed the difficult site conditions. Ms. Kelly is currently conducting the wetland monitoring.

Project: Doherty Drive, Larkspur, CA
Client: Larkspur Department of Public Works (partially funded by Caltrans)

The Larkspur Department of Public Works rebuilt Doherty Drive and replaced storm drain outfall structures to address flood control and other road problems. In addition, they incorporated an NTTP bike path. One of the challenges of the project was dealing with construction within brackish marsh habitat where special status species are known to occur, while working within a tight schedule. Kelly Biological Consulting conducted a wetland delineation and botanical studies. The firm prepared the permit applications, and negotiated with the regulatory agencies with the goal of constructing the outfalls in a timely, cost effective manner. Construction was completed with positive reviews from the agencies.

Project: Alexander Avenue Bridge Retrofit/Rehabilitation, Larkspur, CA
Client: Larkspur Department of Public Works (partially funded by Caltrans)

The Larkspur Department of Public Works retrofitted and rehabilitated the Alexander Ave. Bridge. Kelly Biological Consulting provided pre-construction monitoring which was conducted by WRA as a subcontractor. Ms Kelly also negotiated with California Department of Fish and Wildlife regarding tree removal and planted acorns as mitigation for tree removal.

Project: Doherty Drive Bridge Replacement, Larkspur, CA
Client: Larkspur Department of Public Works (partially funded by Caltrans)

The Larkspur Department of Public Works replaced Doherty Drive Bridge. The project required construction within brackish marsh habitat and a creek where special status species are known to occur. Kelly Biological Consulting provided construction monitoring with WRA as a subcontractor. Due to schedule issues, the project required working within protected species work windows. Ms Kelly negotiated with the regulatory agencies with the goal of completing construction to avoid the additional impacts to the community that would have occurred had construction been halted until the following season.

Project: Highway Interchange, San Benito, CA
Client: Subcontractor to WRA

A proposed project required the evaluation of potential interchange alternatives. The site was near the Pajaro River. Kelly Biological Consulting conducted the special status plant surveys and contributed to preparation of the NES.

Project: Caltrans Marin Narrows Road Widening, Marin County, CA
Client: Subcontractor to WRA

Kelly Biological Consulting conducted a wetland delineation for the proposed Highway 101 widening in Marin as a subcontractor to WRA and CH2MHill. Work included field analysis, report and map preparation, and supervising WRA and CH2MHill staff. The most challenging element of the work was addressing SWANCC and Rapanos issues along a highway that had highly altered hydrology.

Project: U.S. Army Corps of Engineers Wetland Training Class, CA
Client: San Francisco State University

Ms. Kelly has taught the plant ecology portion of a wetland delineation class. The students learned the basic elements of plant identification, methods for determining wetland status, dominant species, and the wetland-upland boundary.

Information on additional projects available on request.

PATRICIA VALCARCEL, MS

Senior Wildlife Biologist

valcarcel@wra-ca.com

o: 415.524.7542

Years of Experience: 13

Education

MS, Wildlife Sciences, Oregon State University, 2011

BA, Environmental Sciences, Northwestern University, 2003

Professional Affiliations/ Certifications

USFWS Recovery Permit for giant gartersnake and San Francisco gartersnake (TE-64146A-1)

California Department of Fish and Wildlife Scientific Collecting Permit

The Wildlife Society

Specialized Training

- California Vernal Pool Crustacean Identification Class with Mary Belk, December 2015
- Biology and Management of the Alameda Striped Racer, Alameda County Conservation Partnership, May 2014
- San Joaquin Kit Fox Ecology, Conservation, and Survey Techniques, Central Coast Chapter of The Wildlife Society, Summer 2013
- Swainson's Hawks in California's Central Valley, Sacramento-Shasta Chapter of The Wildlife Society, Spring 2012
- Workshop on the Biology and Conservation of the California Tiger Salamander, Alameda County Conservation Partnership, June 2012

Patricia Valcarcel earned a MS in Wildlife Sciences while conducting research on the spatial ecology of the threatened giant gartersnake. She has worked on a variety of field research projects ranging from animal movements to behavior and reproduction. She has presented her work at conferences and published in peer-reviewed journals. She has also been trained on collection of samples for environmental DNA (eDNA) analysis and implemented this method for detection of giant gartersnake. The results are used in combination with other methods to help inform on presence of the cryptic species.

Patricia has extensive experience working with and permitting for special-status species in California. Her focus is reptiles and amphibian species, but has broad experience with wildlife species in California's Central Valley. Patricia has also led a large trapping and relocation effort for Pacific pond turtle, conducted protocol-level surveys for Swainson's hawk, burrowing owl, assists with sampling for California tiger salamander and vernal pool crustaceans, and performed assessments for San Joaquin kit fox and blunt-nosed leopard lizard.

Her primary responsibilities are to conduct surveys, habitat assessments, prepare associated technical reports, prepare permit applications, and consult with wildlife agencies on special-status wildlife species during the permitting process. She consults with both federal and state wildlife agencies and has prepared federal Section 7 Biological Assessments, federal Section 10 Habitat Conservation Plans, and California Incidental Take Permits. In addition, Patricia is involved in environmental permitting, permit compliance, and mitigation and monitoring efforts associated with these permits.

Representative Projects

Sherman Island Whale's Mouth Wetland Restoration Project, Sacramento County, California (2013 – 2015)

As part of continued collaboration with Ducks Unlimited, Inc. and the California Department of Water Resources (DWR), WRA assisted with the permitting process for a habitat restoration project on Sherman Island. Sherman Island is located in the extreme western Delta near the confluence of the Sacramento and San Joaquin Rivers. The project restored approximately 600 acres of palustrine wetlands on lands owned by DWR which are currently managed for flood-irrigated pasture lands. WRA performed rare plant surveys and consulted with USFWS for listed species including giant gartersnake and Delta smelt. Patricia conducted the habitat assessment for wildlife species; provided analyses and measures to avoid and minimize impacts for giant gartersnake, Delta smelt, and longfin smelt; and wrote technical documents used in the consultation process. She wrote and implemented the Pacific pond turtle Trapping and Relocation Plan and submitted the plan to California Department of Fish and Wildlife (CDFW) for approval. Patricia coordinated and led the pre-construction trapping and relocation and capture and salvage efforts during construction. A total of 222 individual turtles were successfully relocated during trapping and construction salvage efforts.

Flat-tailed Horned Lizard Habitat Modelling, Bureau of Land Management, Yuma, Arizona (2015 - 2017)
In partnership with San Diego Natural History Museum (SDNHM), WRA is creating a range-wide habitat model for the flat-tailed horned lizard (FTHL). The model was created by request from the Bureau of Land Management and other managing agencies to better assess potential for FTHL population locations and improve management on lands occupied by FTHL. WRA and the SDNHM have gathered all known locality datasets for FTHL and GIS information including geographic, topographic, and climate variables to create a predictive model that better assesses potential for FTHL in a given area. Patricia was involved at all stages from model software selection to review and analysis of data and methods. A presence-only habitat model was created using the MaxEnt software and available climate and habitat layers covering the entire range of the species. Presence data was taken from multiple sources including non-public data from researchers. Patricia also coordinated between organizations to ensure the habitat model completion timeline remained on schedule and presented to the FTHL Interagency Coordinating Committee on the draft and final model.

San Joaquin Council of Governments, Multi-Species Habitat Conservation and Open Space Plan On-Call, San Joaquin County, California (2012 – Present)
WRA is contracted for on-call services related to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). Patricia has performed pre-construction surveys and recommended avoidance and minimization measures to ensure participants are in compliance with the SJMSCP. Wildlife species and habitats Patricia has encountered as part of this work include burrowing owl, giant gartersnake, California tiger salamander, Swainson's hawk, and San Joaquin kit fox. She regularly conducts pre-construction surveys for Swainson's hawk, burrowing owl, and nesting birds in accordance with the SJMSCP for covered projects. In addition, Patricia has prepared and implemented several burrowing owl exclusion and monitoring plans in consultation with the California Department of Fish and Wildlife for various SJMSCP-covered projects. Implementation includes monitoring owls to ensure all young have fledged, installation of one-way doors for eviction, and monitoring of the site to ensure burrowing owl do not reestablish on-site during project activities.

Antonio Mountain Ranch Mitigation Bank, Placer County, California
The Antonio Mountain Ranch Mitigation Bank is a proposed approximately 800-acre wetland and protected species mitigation bank in Placer County. The bank serves as offsite mitigation for impacts to wetlands and non-wetland waters, including vernal pool and swale complexes, seasonal and perennial wetlands, and streams, and as a conservation bank, pursuant to federal and California Endangered Species Acts (for special-status vernal pool invertebrates in Placer County and surrounding counties). Swainson's hawk and tri-colored blackbird habitat credits are also provided for covered activities under the Placer County Conservation Plan. Patricia has assisted in special-status species surveys including sampling for vernal pool branchiopods and assessments for Swainson's hawk nesting and foraging use of the proposed Bank. She wrote the Section 7 Biological Assessment submitted to the Corps as part of the formal consultation process for effects to federal-listed vernal pool species during a proposed vernal pool and riparian restoration project in a previously farmed portion of the proposed Bank. She worked closely with the restoration design team to limit effects to existing vernal pool habitat while trying to restore functionality of the pool and swale system in the degraded area. She assisted with the formal consultation process and the project received the Biological Opinion in 2017. Restoration work is anticipated to begin in 2018.

Port of Oakland Maintenance Dredging, Oakland, California (2015 – 2018)
Maintenance dredging of the Port of Oakland Inner and Outer Harbor Channels is necessary to maintain passageways for the active port. The Pacific herring is a protected fishery, and dredging operations within the Pacific herring spawning season is unavoidable. Patricia is a California Department of Fish and Wildlife approved observer for the Project, and she manages a team of observers for the maintenance dredging Project. No spawn

events or Pacific herring activity were noted during dredge activities for 2015-2016 or 2016-2017 spawn seasons. All Project activities have been completed in compliance with the Project's Pacific Herring Work Window Waiver. The Project is on-going during the 2017-2018 herring spawn season.

Bruno's Island Bridge Repair Project, Southwestern Sacramento County, California (2014)
Bruno's Island is a small recreational boat harbor located off Andrus Island along the San Joaquin River in the western Delta. Bridge repair activities included sheathing piles within the channel and could potentially affect listed aquatic species. Patricia provided the hydroacoustic analysis and wrote the Section 7 Biological Assessment for Delta smelt, steelhead, and giant gartersnake. Through her work and advising on project design such as strike limits and use of bubble curtains outside of the work windows, a "Not Likely to Adversely Affect" was received from both NMFS and USFWS. This Project was completed in 2014.

Napa Valley Marina Permitting and Dredge Monitoring, Napa, California (2012 – 2017)
The Napa Valley Marina is an active recreational marina along the Napa River near Bull Island. Maintenance dredging of the Marina is necessary for boat access to and from the Napa River. Patricia was involved with a variety of environmental consulting services for the maintenance dredging including preparation of applications for the Dredged Materials Management Office (DMMO) and the California Department of Fish and Wildlife Streambed Alteration Agreement. Maintenance dredging permits included monitoring for special-status species and habitat conditions such as temperature and salinity monitoring for longfin smelt. Patricia oversees annual episode approval, reporting, monitoring, and compliance surveys for the multi-year maintenance dredging project.

Vulcan Materials Pilarcitos Quarry, San Mateo County, California (2012 – present)
The Pilarcitos Quarry is a 53-acre aggregate mining facility located on approximately 593 acres just east of the town of Half Moon Bay in rural San Mateo County. As part of the planned expansion and ongoing operations, and in compliance with the USFWS Biological Opinion (81420-2008-F-0294-1), a conservation easement was placed on 192.5 acres of the northern portion of the property, and two mitigation ponds were constructed to provide habitat for federally listed California red-legged frog (CRLF) and San Francisco garter snake (SFGS). Patricia was a USFWS-approved biological monitor and responsible for the compliance of the USFWS conservation measures and CDFW Streambed Alteration Agreement during the construction of the mitigation ponds during standard quarry maintenance activities and quarry expansion planning activities including exploratory drilling. Patricia is also involved in the permitting for a quarry expansion and continued operation through the lifetime of the quarry, approximately 100 years. She wrote the Section 7 Biological Assessment to be submitted to the Corps for effects to CRLF, SFGS, and marbled murrelet. The permitting process is ongoing.

White Rock Lake Maintenance Project, Monterey County, California (2014)
White Rock Lake is an artificially-dammed lake that has been maintained and used since 1925 for recreational swimming and fishing. The lake accumulated sediment and required maintenance-dredging to return the original water capacity of the lakebed. Additionally, voluntary wetland and riparian restoration along the fringe of the lake was planned to increase quality habitat for the resident California red-legged frog. Patricia drafted and finalized the biological assessment submitted to the Corps for informal consultation regarding effects to California red-legged frog known to occur at the lake. The Project received a "Not Likely to Adversely Affect" determination based upon the avoidance and minimization measures provided in the assessment.

Wavecrest Coastal Trail Northern and Southern Alignments, Half Moon Bay, San Mateo County, California (2014- present)
WRA was the biological consultant for the Wavecrest Northern and Southern Trail Alignments in Half Moon Bay, California. WRA completed a comprehensive biological constraints analysis of the properties, including a wetland delineation, rare plant surveys, and coastal zone environmentally sensitive habitat (ESHA) analysis to document the existing sensitive biological resources. These studies informed the trail design prepared by Placeworks to minimize impacts to sensitive biological resources to the maximum extent feasible. Construction of the Northern Alignment was conducted and completed in the Fall of 2014, and Patricia was the lead biologist coordinating biological monitoring and sensitivity trainings during construction activities. Species of concern included California red-legged frog, San Francisco garter snake, San Francisco dusky-footed woodrat, and Choris' popcorn flower. She provided advice on wildlife exclusion fence placement, conducted pre-construction surveys for wildlife species, and coordinated biological monitors in compliance with Corps, RWQCB, CDFW, and Coastal Development Permit conditions. Patricia is also involved in the Southern Alignment and has assisted in preparation of biological constraints analysis for wildlife and ESHAs. Placeworks is incorporating the results of the analysis into trail location and design planning to limit impacts to ESHAs and wildlife species. The design is currently in review.

Publications

Halstead, B.J., Valcarcel, P., Wylie, G.D., Coates, P.S., Casazza, M. L., and Rosenberg, D.K. 2016. Active Season Microhabitat and Vegetation Selection by Giant Gartersnakes Associated with a Restored Marsh in California. Journal of Fish and Wildlife Management 7(2): 397-407.

Halstead, B.J., Wylie, G.D., Coates, P.S., Valcarcel, P., and Casazza, M. L. 2012. Bayesian shared frailty models for regional inference about wildlife survival. Animal Conservation 15: 117–124.

Valcarcel, P. 2011. Giant gartersnake spatial ecology in agricultural and constructed wetlands. Corvallis, Oregon, Oregon State University. Master's thesis.

Nicholas Brinton, BS
Fisheries Biologist
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o: 415.524.7248
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Years of Experience: 7

Education
BS Wildlife, Fish and Conservation Biology, UC Davis, 2012

Technical Training:
Cal-Nevada AFS Fish Passage and Screening Criteria Workshop Sacramento, California, 2015.

BCM Bat Survey Techniques. Portal Arizona. 2016

Professional Affiliations/ Certifications

Member: American Fisheries Society
Member: Salmonid Restoration Federation

MSHA Certified

Nick holds a B.S. degree in Wildlife, Fish and Conservation Biology from the University of California, Davis. Prior to coming to work with WRA, Nick worked in both the Sierra Nevada Mountains and the Central Valley of California, gaining experience surveying for and handling a variety of special-status species.

With WRA, Nick performs a variety of specialized tasks for aquatic species including: fish passage assessments, fish rescue and relocation, habitat and water quality assessments, biological monitoring. In addition, he has written a variety of project specific reports for projects ranging from bridge repair to pile driving. He has specialized in fisheries related issues and leads fish salvages, and writes assessments for fisheries related projects throughout the state.

Representative Projects

Mare Island Ship Yard Dry Dock Fish Salvage, Vallejo, California.
Mothballed vessels from the National Defense Reserve Fleet in Suisun Bay and private ships needing repair are brought to the dry docks at the former Mare Island Naval Shipyard. In accordance with permit requirements of USFWS, National Marine Fisheries Service (NMFS), and CDFW, biologists are required to be present during final stages of dewatering to rescue stranded fish from the dry dock. Captured fish are placed in aerated holding coolers, identified to species, counted, and measured before being returned to the Mare Island Channel of the Napa River. Nick serves a lead fisheries biologist for this operation. His primary responsibility for this project is leading the fisheries crew for the salvage operations. He also coordinates with resource agency personnel ensuring permit compliance, and writes technical reports following each salvage event. He is authorized to handle and relocate longfin smelt, Delta smelt, steelhead, fall, late-fall, winter and spring-run Chinook salmon as well as green sturgeon at this site. To date he has performed more than 75 salvages at this site. This project is ongoing.

Novato Creek Maintenance and Sediment Removal, San Rafael, California.
The Marin County Flood Control District conducts regular maintenance within the lower portions of Novato Creek as well as within Warner and Arroyo Avichi Creeks. Before work can begin a fisheries biologist must clear each reach to assure that steelhead are not present. Nick lead a team of volunteers who systematically cleared and relocated any native or special-status fish encountered in the creeks. During the salvage work, multiple steelhead were encountered and successfully relocated without injury.

Lucas Valley Bridge Emergency Repair, San Rafael, California.
Following winter storms in November 2017, erosion at the Lucas Valley Road Bridge required emergency repairs in order to maintain functionality of the bridge. WRA was contracted to salvage and relocate steelhead from Miller Creek before emergency repair operations could begin. Nick led the team of fisheries biologists and county volunteers for this project, successfully relocating 47 steelhead. No mortality was documented among steelhead and the project was completed on time. Methodology used for this project relied primarily on electrofishing.

San Geronimo Creek Fish Passage and Habitat Improvement Project, San Rafael, California.
As part of a fisheries restoration grant, this project sought to eliminate a major fish passage barrier and enhance fish habitat by using large woody debris. As part of the restoration effort, a fish rescue and relocation was required in order to capture and relocate Coho salmon and steelhead within or immediately downstream of the work area. Under the supervision of a CDFW biologist, Nick assisted with the fish rescue effort which successfully relocated over 400 Coho salmon and steelhead. Methods for rescue and relocation primarily relied upon electroshocking.

US Forest Service, Tahoe National Forest.
The Tahoe National Forest covers over one million acres and is home to 23 species of fish. Nick worked as a fisheries technician performing more than 200 hours of electrofishing and seine surveys throughout the forest for both population trend analysis, and range expansion surveys. He has handled several thousand fish during this project including: Lahontan cutthroat trout, rainbow trout, and brown trout. As part of this project he performed surveys on two watersheds to using the US Forest Service Basinwide Survey protocol to map, classify and measure current habitat conditions. He also performed habitat assessment surveys in those same watersheds for Sierra mountain yellow-legged frog and successfully identified adults, sub-adults and larval forms of the species.

Slinkard Creek, Walker, California.
Slinkard Creek is a tributary of the West Walker River and is located within the state wildlife refuge of Slinkard Valley. It contains one of the few remaining populations of federally threatened Lahontan cutthroat trout (LCT) as well as a large population of non-native brook trout. In cooperation with CDFW, Nick was contracted by California Trout to facilitate the removal of brook trout from Slinkard Creek to enhance conditions for LCT. Nick designed a series of portable Alaskan weirs to divide Slinkard Creek into reaches which were then systematically cleared of all fish using a backpack electrofisher. LCT were retained in the creek, and allowed to repopulate reaches once all brook trout were removed. Nick logged approximately 80 hours of time using a backpack electrofisher on this project while electroshocking, and capturing over 300 LCT. Mortality among LCT was exceptionally low (<1 percent) and approximately 1 kilometer of creek was restored during the season which he worked on this project.

Healdsburg Veterans Memorial Dam Spillway Repair, Healdsburg, California.
The Healdsburg Veterans Memorial Dam is a flashboard dam located within the city of Healdsburg on the Russian River. The dam is installed seasonally to create a temporary recreational lake. For this project, Nick was approved as the lead fisheries biologist, and biological monitor. He conducted pre-construction surveys for breeding birds as well as Pacific pond turtle. Turtles were identified near to the project area daily. As the approved fisheries biologist he lead a team of biologists who performed multiple fish salvages within the project area following de-watering events. All steelhead encountered during the salvages were captured and successfully relocated without injury or mortality.

Lower Miller Creek Channel Maintenance, San Rafael , California.
The Las Gallinas Valley Sanitary district regularly removes accumulated sediments from the channel within Lower Miller Creek. As part of the project mitigation efforts, a fish salvage was required in order to salvage and relocate any native fish in the proposed work area which stretched approximately ½ mile in length. Nick was approved as the lead fisheries biologist for the project and organized all of the associated salvage work on Lower Miller Creek. All work was conducted in accordance with project permits and the creek was effectively cleared of native fish, prior to the start of dredging and in accordance with project permits.

Frenchman's Creek Water District, San Mateo County.
Frenchman's Creek Water District (FCWD) is a small water service provider located north of Half Moon Bay along coastal San Mateo County. A CDFW 1602 permit allows for the temporary installation of a flashboard dam and water withdrawal from the system for agricultural purposes. Nick serves as a fisheries biologist for this project,

which involves monitoring flow, water quality sampling, as well as habitat connectivity and condition for steelhead during the diversion period. This project is currently ongoing.

Napa Dry Bypass, Napa, California.
The Napa Dry Bypass is part of a series of flood control projects headed by the Army corps of Engineers designed to divert 100 year flows around the oxbow reach of the Napa River to avoid flooding the Soscol Gateway area in downtown Napa. Nick was approved as the lead fisheries biologist for this project, and conducted multiple fish salvage operations at the site. During the salvage operations all steelhead encountered were successfully relocated without mortality or injury. Nick assisted in otter trawl surveys and fish exclusion work which were required during pile driving operations.

UC Davis, Fangue Laboratory, Davis California.
Research in the Fangue lab focused on understanding the physiological adaptations that allow animals to survive in complex environments. As part of his work with the laboratory, Nick conducted experiments to assess the physiological responses to conditions such as critical thermal, stimuli aversion, and entrainment of native fishes. The fish used in these experiments were raised and cared for in a hatchery that he helped to maintain and construct. Species cared for at the laboratory included: northern DPS green sturgeon, fall-run Chinook salmon, hardhead and Sacramento splittail.

Red Rocks Warehouse Creosote Removal and Pacific Herring Habitat Restoration Project, Richmond, California
WRA helped to prepare plans for monitoring light availability and turbidity to protect local eelgrass beds during the removal of creosote pilings and other anthropomorphic materials from the dilapidated Red Rocks Warehouse facility. Nick assisted in conducting a light and turbidity monitoring studies following National Marine Fisheries Service (NMFS) protocols. The project used a WRA vessel to deploy light monitoring loggers and collect turbidity samples during work to assure that pile removal operations were not impacting nearby eelgrass beds. Nick was also and approved to monitor for Pacific herring, and performed surveys in compliance with construction permits.

Port of Oakland Maintenance Dredging, Oakland, California.
Maintenance dredging of the Port of Oakland Inner and Outer Harbor Channels was necessary to maintain passageways for the active port. Pacific herring is a protected commercial fishery, and dredging operations within the Pacific herring spawning season were unavoidable and required observers to assure operations did not occur during spawning events. Nick was a CDFW approved observer for the Project. No spawn events or Pacific herring activity was noted during dredge activities. All Project activities were completed in compliance with the Project's Pacific Herring Work Window Waiver.

Port of Richmond Inner Harbor Maintenance Dredging, Richmond, California.
Maintenance dredging for the Port of Richmond was conducted in the winter of 2014 to maintain passageways for heavy ships entering and exiting the port. Pacific herring is a protected fishery, and dredging operations within the harbor overlapped with the Pacific herring spawning season. Nick acted as an approved CDFW observer for the Project. During operations, two spawning events occurred within or adjacent to the Project Area. Nick observed the spawning events aided crews with required procedures to maintain compliance and avoid impacts to the spawn. All Project activities were completed in compliance with the Project's Pacific Herring Work Window Waiver.

STEWART DESMEULES

Fisheries Biologist

desmeules@wra-ca.com

o: 415.454.8868 x2040

c: 207.380.6138

Years of Experience: 6

Education

B.A. Biology, Wheaton College, 2010

Professional Affiliations/ Certifications

American Fisheries Society

Certified Commercial Fisheries Observer

Certified Marine Mammal Observer

Specialized Training

Industry Funded Scallop Dredge Observer Trained

Northeast Fisheries Observer Program Trained

Special Recognitions/ Publications

Poster Presentation: Fisheries Observer Retention Strategies presented at the International Fisheries Observing and Monitoring Conference 2016

Co-author: American Eel potting presentation: American Fisheries Society Conference 2014

Stewart DesMeules holds a B.A. in Biology from Wheaton College in Massachusetts. Prior to joining WRA, Stewart worked with the National Oceanic and Atmospheric Administration (NOAA) Fisheries Observer Program on the East Coast. He has conducted field work onboard commercial fishing vessels where he gained experience handling a number of special status species. Prior to working with the Fisheries Observer Program, Stewart worked with the Massachusetts Division of Marine Fisheries monitoring river herring, and conducted a mark recapture study on American eels.

With WRA, Stewart works as a fisheries and wildlife biologist and performs a variety of specialized tasks, including biological monitoring, fish relocation, habitat assessments, construction monitoring, redd and carcass spawner surveys, and authoring biological resource assessments and technical reports. He specializes in handling special status fish species, water quality monitoring, and habitat assessments. In addition, he has experience monitoring for Pacific herring spawning activity, marine mammal observing, and has extensive fish sampling experience.

Representative Projects

Redd and Carcass Spawning Survey Work, Pt. Reyes Station, California.

Stewart has worked with National Park Service (NPS) staff to complete redd and carcass spawning surveys for Coho salmon in Pt. Reyes National Seashore. Work involved traversing sections of creek monitoring for Coho salmon and other salmonids. Encountered reds were measured and marked with GPS after being evaluated for condition. Encountered Coho salmon carcasses were sampled for otoliths and DNA. Live fish had their locations marked with GPS and were visually measured. In addition, water quality measurements and depths were taken incrementally over the survey area. Survey work is ongoing.

Mare Island Ship Yard Dry Dock Fish Salvage, Vallejo, California.

Government, commercial, and private ships needing repair are brought to the dry docks at the former Mare Island Naval Shipyard. In accordance with permit requirements of USFWS, National Marine Fisheries Service (NMFS), and CDFW, biologists are required to be present during final stages of dewatering to rescue stranded fish from the dry dock. Captured fish are placed in aerated holding coolers, identified to species, counted, and measured before being returned to the Mare Island Channel of the Napa River. Stewart assists with this operation, compiles data from fish salvages and writes technical reports following each salvage event. He is authorized to handle and relocate longfin smelt, Delta smelt, steelhead, fall, late-fall, winter and spring-run Chinook salmon as well as green sturgeon at this site. This project is ongoing.

Ridge Top Ranch Wildlife Conservation Bank, Solano County, California
Stewart assisted WRA Biologist Brian Freiermuth, in counting Federal listed California red-legged frog egg masses that had produced from frogs raised from egg masses within newly established ponds. Site checks on mesh enclosures containing egg masses were performed, and over five adult California red-legged frogs were identified during the nighttime survey.

Marin County Flood Control and Water Conservation District, Lucas Valley Bridge Emergency Repair, San Rafael, California
Following winter storms in November 2017, erosion at the Lucas Valley Road Bridge required emergency repairs in order to maintain functionality of the bridge. WRA was contracted to capture and relocate steelhead from Miller Creek before emergency repair operations could begin. Stewart assisted the team of fisheries biologists and county volunteers for this project, successfully relocating 47 steelhead. No mortality was observed among steelhead and the project was completed on time. Methodology used for this project relied primarily on electrofishing.

Port of Oakland Maintenance Dredging, Oakland, California
Maintenance dredging of the Port of Oakland Inner and Outer Harbor Channels was necessary to maintain passageways for the active port. Pacific herring is a protected commercial fishery, and dredging operations within the Pacific herring spawning season were unavoidable and required observers to assure operations did not occur during spawning events. Stewart was a CDFW approved observer for the Project. This project is ongoing.

Niebaum-Coppola Estate Winery, L.P., Bear Canyon Creek Fish Passage Maintenance Project and Biological Construction Monitoring, Rutherford, California
WRA assisted the Napa Resource Conservation District with biological monitoring during sediment removal activities for a reservoir on Bear Creek, in Napa County. Work for this project was authorized through a California Department of Fish and Wildlife 1600 Stream Bed Alteration Agreement (SAA), and Stewart worked as a biological monitor and assisted with compliance of the SAA. Protected species known for the area included foothill yellow-legged frog, pallid bat, Pacific pond turtle, and steelhead. No protected species were encountered during the monitoring. Sediment control measures were monitored to minimize sediment flowing offsite.

Experience Prior to WRA

Massachusetts Division of Marine Fisheries, Lake Sabattia American Eel Mark Recapture Study, Taunton, Massachusetts
For the Massachusetts Division of Marine Fisheries, Stewart coordinated and conducted field work to assess American eel populations in water body prior to a downstream dam removal project. American eels were collected with modified gee traps using herring as bait. Trapping locations were chosen based on a previously completed habitat assessment. Traps were retrieved daily, using a 15 foot trailer launched boat. Water quality measurements were taken at each trapping locations. Once eels were caught, they were sedated, measured, injected with pit tags, and released.

Massachusetts Division of Marine Fisheries, Southeastern Massachusetts River Herring Count, Southeastern Massachusetts
For the Massachusetts Division of Marine Fisheries, Stewart conducted a river herring count during the spring runs, using primarily Smith Root electronic counters and video counters. He made bi-weekly visits to 8 counting stations to offload count data, take water quality measurements, and to maintain the fish counting platforms. Stewart conducted weekly sampling of individual river herring runs, taking 100 fish at a time for processing. Processing involved measuring, sexing, and extracting otoliths. Count data supplemented the Atlantic States Marine Fisheries Commission (ASMFC) river herring population assessment.

Massachusetts Division of Marine Fisheries, American Eel Monitoring, Southeastern Massachusetts
As part of the Massachusetts Division of Marine Fisheries young of year assessments for American eel, Stewart conducted standardized monitoring of glass eels under the coordination of ASMFC. The monitoring of the glass eels contributed to a coast-wide index of eel population relative abundance. Stewart installed eel ramps to aid in upstream migration, and monitored 9 sites, counting and taking length data on the American eels as they passed through. Over a half million eels have passed through the counting stations since they were installed in 2007.

City of New Bedford, Massachusetts, Marine Mammal Observing, New Bedford, Massachusetts
Underwater blasting occurred in New Bedford harbor before dredge work could be done to increase depth outside heavily trafficked fish processing plants. Fathom Resources LLC. was contracted to provide marine mammal observing services under the Marine Mammal Protection Act (MMPA). As a certified marine mammal observer, Stewart surveyed the area in and around the blasting site for any signs of marine mammals, and alerted the barge crew of their presence. Blasting schedules were delayed whenever a marine mammal was observed within the work area. No marine mammals were harmed during the blasting period.

Lloyd Davis Anadromous Fish Trust, Annual Medomak River Herring Count, Waldoboro, Maine
Stewart managed over 30 volunteers to conduct an annual count of river herring on the Medomak River. He trained volunteers in fish counting procedures, and coordinated their counting schedule. All fish swimming upstream were channeled through a 3 foot wide white ramp using a set of nets. Volunteers then counted fish as they passed from above. Stewart was the point person for the count, and maintained the nets as needed, clearing debris from them daily, and ensuring they were properly anchored to only allow fish to swim through the ramp. He took weekly samples of river herring to collect scale samples from to provide to state fisheries biologists. Upon conclusion of the count, he compiled the count data for submission to the state of Maine.

Presentations

Poster Presentation: Fisheries Observer Retention Strategies presented at the International Fisheries Observing and Monitoring Conference 2016

MEADOW WAY BRIDGE PROJECT **BA**

Biological Assessment

Meadow Way Bridge

Town of Fairfax, Marin County

Bridge Number: 27C-0008

Project Number: BRLO 5277 (025)

Locator: [District 4]-[MRN]-[0]-[FRFX]

March 2019

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Biological Assessment

Meadow Way Bridge

Town of Fairfax, Marin County

Bridge Number: 27C-0008

Project Number: BRLO 5277 (025)

Locator: [District 4]-[MRN]-[0]-[FRFX]

March 2019

Prepared By: _____ Date: 03/18/2019

Patricia Valcarcel, Senior Wildlife Biologist
415-524-7542
WRA, Inc., San Rafael, California
Authorized Local Agency Representative

Recommended for Approval By: _____ Date: _____

Keevan Harding, Environmental Planner – Natural Sciences
510-622-5912
Office of Local Assistance District 4
Caltrans, District 4
Oakland, California

Approved By: _____ Date: _____

Thomas Holstein, Environmental Branch Chief
510-286-6371
Office of Local Assistance
Caltrans, District 4
Oakland, California

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List of Abbreviated Terms

CA	Covered Activity
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
dbh	Diameter at breast height (~4 ft)
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
FHWA	Federal Highway Administration
FR	Federal Register
Ft	foot/feet
km	kilometer(s)
LWD	Large woody debris
m	meter(s)
mi	mile(s)
NES	Natural Environment Study
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Marine Fisheries Service
OHWM	Ordinary High Water Mark
PBO	Programmatic Biological Opinion
PM	post mile
RWQCB	Regional Water Quality Control Board
USACE	US Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USC	United States Code
USGS	United States Geological Service
WRA	WRA, Inc. Environmental Consultants

Glossary

ACTION: Any highway construction, reconstruction, rehabilitation, repair, or improvement undertaken with Federal-aid highway funds or FHWA approval.

ANADROMOUS: Refers to fish that typically inhabit seas or lakes but ascend streams to spawn; for example, salmon.

BEST MANAGEMENT PRACTICE (BMP): Any program, technology, process, operating method, measure, or device that controls, prevents, removes or reduces pollution.

COFFERDAM: Temporary watertight enclosure from which water is pumped-out to expose the bottom of a body of water and permit construction.

DIRECT EFFECTS: Effects that are caused by and action and occur at the same time and place as the action.

ENDANGERED: Plant or animal species that are in danger of extinction throughout all or a significant portion of its range.

FEDERAL HIGHWAY ADMINISTRATION (FHWA): The Federal agency within the U.S. Department of Transportation responsible for administering the Federal-aid Highway Program and the Motor Carrier Safety Program.

FEDERAL REGISTER (FR): The *Federal Register* is the official daily publication for agency rules, proposed rules, and notices of federal agencies and organizations, as well as for Executive Orders and other presidential documents.

INDIRECT EFFECTS: Effects that are caused by an action and occur later in time, or at another location, yet are reasonably foreseeable.

MIGRATION: Intentional, directional, and usually seasonal movement of animals between two regions or habitats; involves departure and return of the same individual.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA): Enacted in 1969, NEPA requires all federal agencies to consider environmental factors through a systematic interdisciplinary approach before committing to a course of action. The NEPA process is an overall framework for the environmental evaluation of federal actions.

PROJECT (FHWA): 23 Code of Federal Regulations §1.2 defines a project as an undertaking by a State highway department for highway construction, including preliminary engineering, acquisition of rights-of-way and actual construction, or for highway planning and research, or for any other work or activity to carry out the provisions of the Federal laws for the administration of Federal-aid for highways.

RIPARIAN: Along banks of rivers and streams; riverbank forests are often called gallery forests.

RUDERAL: Disturbed area with a prevalence of introduced weedy species. Ruderal habitats are associated with unpaved highway shoulders and weedy areas around and between dwellings and other structures.

THREATENED: A species that is likely to become endangered in the foreseeable future in the absence of special protection.

TURBIDITY: Cloudiness (or a measure of the cloudiness in water due to the presence of suspended particulates).

Biological Assessment Outline for Caltrans FESA Section 7 Consultations:

National Marine Fisheries Service and

U.S. Fish and Wildlife Service

Executive Summary

The purpose of this biological assessment is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project may affect threatened, endangered, or proposed species. The California Department of Transportation (Department), as assigned by the Federal Highway Administration (FHWA), has prepared this biological assessment under its assumption of responsibility at 23 United States Code (USC) 326 or 23 USC 327. The biological assessment is also prepared in accordance with 50 CFR 402, legal requirements found in Section 7 (a)(2) of the Endangered Species Act (16 U.S.C. 1536(c)) and with Federal Highway Administration and California Department of Transportation regulation, policy and guidance. The document presents technical information upon which later decisions regarding project effects are developed.

The proposed Action **may affect-likely to adversely affect** steelhead and **may affect-not likely to adversely affect** northern spotted owl or designated critical habitat for CCC steelhead and Coho salmon, and may have a **minor, temporary adverse effect** to Essential Fish Habitat. Informal consultation is required with the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS).

Chapter 1. Introduction

1.1. Purpose and Need of the Proposed Action

California Department of Transportation (Caltrans) has determined that Meadow Way Bridge over San Anselmo Creek (Caltrans Bridge Number 27C-0008), in the Town of Fairfax in Marin County, needs full replacement. The bridge is labeled as Structurally Deficient (SD) by Caltrans. The purpose of this project is to replace it with a similar one-lane single span bridge.

The purpose of this biological assessment is to provide technical information and to review the proposed Action in sufficient detail to determine to what extent the proposed project may affect threatened, endangered, or proposed species. The biological assessment is prepared in accordance with legal requirements found in Section 7 (a)(2) of the Endangered Species Act (16 U.S. C 1536(c)) and with Federal Highway Administration (FHWA) and Caltrans regulation, policy and guidance. The document presents technical information upon which later decisions regarding project impacts are developed.

1.2. Threatened, Endangered, Proposed Threatened or Proposed Endangered Species, Critical Habitat

An updated species list was provided by U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) for the Action Area of this project (see Appendix A). The following listed and proposed species and/or designated critical habitats were identified on the updated federal species list and were considered during this analysis, and a more detailed description of species potentials is provided in Appendix B:

- Coho salmon (*Oncorhynchus kisutch*) FE
- Central California Coast (CCC) steelhead (*Oncorhynchus mykiss*) FT
- Northern spotted owl (NSO; *Strix occidentalis caurina*) FT

TABLE 1 SPECIES CONSIDERED IN THIS ANALYSIS AND DETERMINATIONS

Common Name	Scientific Name	Status*	Determination
northern spotted owl	*Strix occidentalis caurina*	E	May affect, not likely to adversely affect
marbled murrelet	*Brachyramphus marmoratus*	T	No effect
short-tailed albatross	*Phoebastria albatrus*	E	No effect
California least tern	*Sternula antillarum browni*	E	No effect
western snowy plover	*Charadrius alexandrinus nivosus*	T	No effect
California Ridgway's rail	*Rallus obsoletus obsoletus*	E	No effect

salt-marsh harvest mouse	*Reithrodontomys raviventris*	E	No effect
southern sea otter	*Enhydra lutris nereis*	T	No effect
California red-legged frog	*Rana draytonii*	T	No effect
green sturgeon	*Acipenser medirostris*	T	No effect
tidewater goby	*Eucyclogobius newberryi*	E	No effect
delta smelt	*Hypomesus transpacificus*	T	No effect
Coho salmon - central California coast	*Oncorhynchus kisutch*	E	No effect
steelhead - central California coast DPS	*Oncorhynchus mykiss*	T	May affect, likely to adversely affect
chinook salmon - California coastal ESU	*Oncorhynchus tshawytscha*	T	No effect
longfin smelt	*Spirinchus thaleichthys*	C	No effect
eulachon	*Thaleichthys pacificus*	T	No effect
Bay checkerspot butterfly	*Euphydryas editha bayensis*	T	No effect
San Bruno elfin butterfly	*Callophrys mossii bayensis*	E	No effect
mission blue butterfly	*Icaricia icarioides missionensis*	E	No effect
Callippe silverspot butterfly	*Speyeria callippe*	E	No effect
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	E	No effect
California freshwater shrimp	*Syncaris pacifica*	E	No Effect
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*	E	No effect
Franciscan manzanita	*Arctostaphylos franciscana*	E	No effect
Presidio manzanita	*Arctostaphylos montana* ssp. *ravenii*	E	No effect
Marsh sandwort	*Arenaria paludicola*	E	No effect
Tiburon mariposa lily	*Calochortus tiburonensis*	T	No effect
Tiburon Indian paintbrush	*Castilleja affinis* ssp. *neglecta*	E	No effect

Sonoma spineflower	*Chorizanthe valida*	E	No effect
Presidio clarkia	*Clarkia franciscana*	E	No effect
Marin western flax	*Hesperolinon congestum*	T	No effect
Santa Cruz tarplant	*Holocarpha macradenia*	T	No effect
Contra costa goldfields	*Lasthenia conjugens*	E	No effect
Beach layia	*Layia carnosa*	E	No effect
San Francisco lessingia	*Lessingia germanorum*	E	No effect
White-rayed pentachaeta	*Pentachaeta bellidiflora*	E	No effect
Tiburon jewel-flower	*Streptanthus glandulosus* ssp. *niger (previously Streptanthus niger)*	E	No effect
Two fork clover	*Trifolium amoenum*	E	No effect

* Status definitions: E = Endangered, T = Threatened, C = Candidate

Candidate Species

No federal candidate species will be affected by the proposed Action.

Critical Habitat

The segment of San Anselmo Creek which runs through the Action Area is designated critical habitat for both Coho salmon (64 FR 24049, 73 FR 7816) and CCC steelhead (70 FR 52488, 70 FR 52630).

1.3. Consultation History

There has been no federal Endangered Species Act Section 7 consultation with the USFWS or NMFS for the proposed Action.

1.4. Description of Proposed Action

Meadow Way Bridge is primarily wooden, approximately 20 feet above the creek bed, 70 feet long, and 14 feet wide, with five spans and four bents. It has a narrow single travel lane and adjacent pedestrian path. The bridge runs in a northwest-southeast direction, while the creek flows towards the northeast under it. The site is in a residential area of the Town of Fairfax. It serves as the only egress and ingress facility for nearly two dozen homes on Meadow Way.

San Anselmo Creek runs through a relatively wide and deep section of the waterway and an S-bend at the bridge location. The bridge is labeled as Structurally Deficient (SD) by Caltrans and will be replaced with a similar, one-lane single span bridge. The site/bridge configuration has caused historic bank erosion and bridge foundation scour at the site, which would also be corrected by the

proposed project so that it would not affect the new bridge. The existing structure is not eligible for placement in the National Register of Historic Places (NRHP).

1.4.1. Project Summary

The existing Meadow Way Bridge is reported to have been constructed in the 1950s over San Anselmo Creek in the Town of Fairfax by the U.S. Army Corps of Engineers (Corps). The existing, primarily wood, bridge has five spans with four bents in the creek, is approximately 70 feet long and 14 feet wide, and supports a narrow single travel lane and a narrow adjacent pedestrian path approximately 20 feet above the creek bed. The bridge runs in a northwest-southeast direction while the creek flows towards the northeast under it. The bridge serves as the only egress and ingress facility for nearly two dozen homes on Meadow Way across the creek from Cascade Drive. The bridge is supported at four locations within the creek banks, two of which are in the creekbed, and at each location there are three 12-inch diameter wooden piles driven into the ground to an unknown depth. Some of the wooden bridge timbers have been preserved with creosote.

1.4.1.1. CONSTRUCTION SCHEDULE

Construction would take two seasons and work in the creek would be performed only after June 1 and must end prior to October 15 in order to avoid the spawning and migration season for the protected CCC steelhead (*Oncorhynchus mykiss*). Work near or above the top of bank and at the roadway level may occur outside this work window. Therefore, the bridge would be installed in its temporary location during one season, and the project would be completed within the following season. In compliance with the Town's Noise Ordinance, construction activities would be limited to the hours of 8:00 a.m. to 5:00 p.m. on weekdays, and 9:00 a.m. to 5:00 p.m. on Saturdays, with no noise-generating construction on Sundays or Holidays. Placement of the new bridge in its permanent location would be the one exception regarding construction hours. As traffic would need to be shut down in order to move the bridge to its permanent location, this would occur in one evening after 5:00 p.m. in order to provide the least disruption for local residences that depend on this bridge for access.

1.4.1.2. BRIDGE DESIGN

The new bridge would be designed to clear the greater of the 50-year flows and two feet of freeboard, or the 100-year design flows, the former controlling in this case. It would be a 70-foot long single-span concrete arch bridge supported on two new abutments and no additional supports in the creek. The abutments would connect with wingwalls and retaining walls of varying lengths and heights at its four corners. See Figure 1 (Site Plan) for the proposed bridge design. The existing bridge is only 14-feet wide and Caltrans has determined the bridge is currently too narrow for both automobiles and pedestrians to use the bridge safely. The replacement bridge would be 21.5-feet wide to allow safe passage for both automobiles and pedestrians. The proposed replacement bridge would also include raised reflective pavement markers at proper intervals to alert the drivers and pedestrians of the two separate travel zones. The new bridge would comply with federal and state design codes and weight limits and would do away with the deficiencies of the existing bridge.

1.4.1.3. CONSTRUCTION PHASING

Where the existing bridge sits tucked up against the northern boundary of the Town's right-of-way (ROW), the new bridge would be located in the middle of the ±40-foot-wide ROW. Despite this, the

footprints of the existing and new bridge would overlap. For this reason, the new bridge would be built on the south side of the existing bridge while the existing bridge remains in service, and moved sideways to its permanent location after the existing bridge is removed. Thus, the existing bridge would be replaced in stages, as follows:

Stage 1 Construction

The first season of construction would be spent on Stage 1 of the improvements. During this stage, traffic would continue using the existing bridge. The southern halves of each of the two new cast-in-place concrete abutments would be constructed approximately in line with the existing bridge abutments. These are only portions of the permanent abutments, and are designed to support the new bridge in its temporary location adjacent to and south of the existing bridge during Stage 1.

For Stage 1 construction, an access ramp to the creek would be necessary. This earthen ramp would be used to transport of materials and heavy equipment, such as pile drilling rigs, dump trucks cranes, loaders, excavators, large containers, etc., to the creek bed elevation and back. The ramp would be located on the southwest quadrant of the bridge behind a proposed retaining wall connecting with the bridge. This wall is needed to stop the historic erosion taking place here adjacent to the bridge abutment, threatening to undermine the abutment and private properties on both north and south sides of the bridge.

The access road would be an approximately ±230-foot-long ramp at 10% grade, half of which would be behind the above-referenced retaining wall, the rest winding around the wall's lower end and doubling back on the creek bed in front of the wall. For the second half of the ramp, temporary fill on the creek bed would be necessary. This ramp would facilitate the equipment for wall and abutment foundation excavations on both sides of the creek. To build the ramp, temporary earth retention, using soil nails next to private property and the inside edge of the ramp, would be necessary. Excavation spoils, required for backfilling later on, would be stored in containers placed on the creek bed temporarily due to lack of space above at the roadway level. The remainder of the spoils would be hauled away on a daily basis. Any creosote treated timber piles or surrounding contaminated soils will be disposed of at an appropriate facility permitted to handle hazardous waste.

Removal of a California bay tree (*Umbellularia Californica*) and invasive Himalayan blackberry (*Rubus armeniacus)* bushes on the southwest corner of the new bridge as well as pruning of other trees and removal of other vegetation in the construction zones would be necessary. According to the Town's Municipal Code Chapter 8.36 (Trees), a tree removal permit is required for the removal of any tree within the Town.

The creek bed in the Area of Potential Effect (APE) would be used by the construction operations. Very little to no creek flow is expected during the peak summer construction months. However, the contractor will be required to install a bypass pipe to convey certain minimum low-flow volumes through the construction site and release downstream of the bridge. This will be accomplished through installation of a low dam across the creek bed upstream of the bridge to collect the summer flows and guide it to the pipe. Turbidity and water quality tests will be performed regularly, as required by permits. Any water collected in excavation pits or pools on the creek bed will be run through sediment control tanks, such as a Baker Tank, before being released to the creek.

Figure 1A. Proposed Bridge General Plan

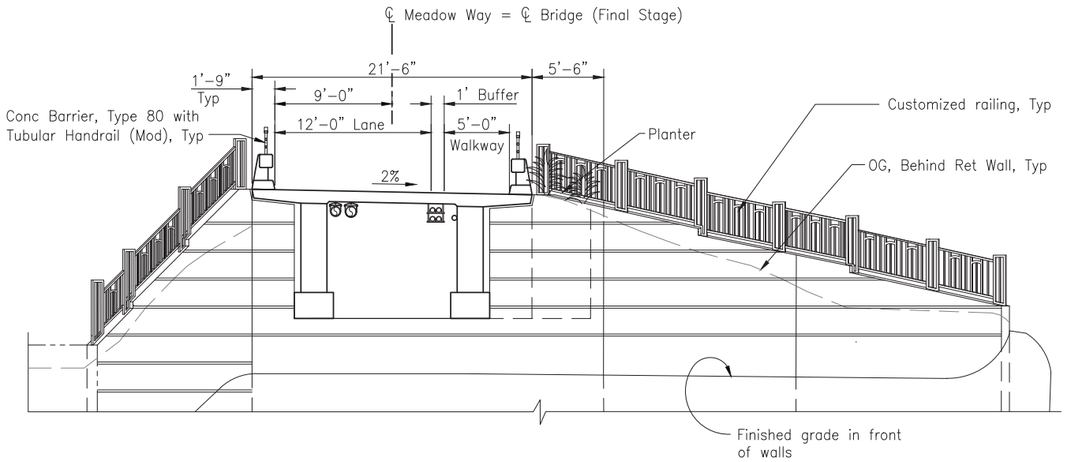
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Mrn				

REGISTERED CIVIL ENGINEER

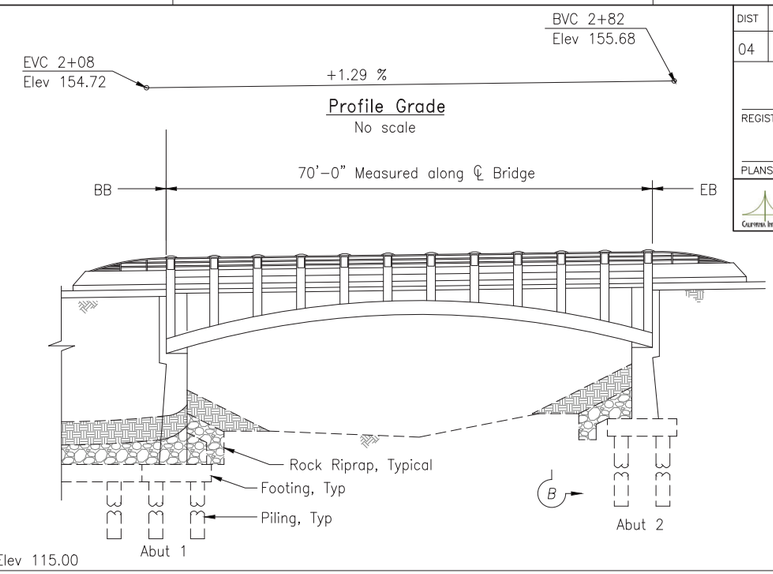
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — NADER TAMANNAIE — NO. 37289 — EXP. 6/30/16 — CIVIL — STATE OF CALIFORNIA

CALIFORNIA INFRASTRUCTURE CONSULTANCY
930 ALHAMBRA BLVD. SUITE 220
SACRAMENTO, CA 95816

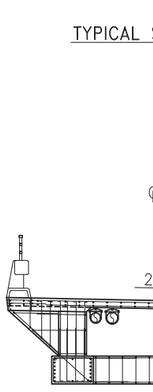


TYPICAL SECTION (@ ABUT 2)
1" = 5'

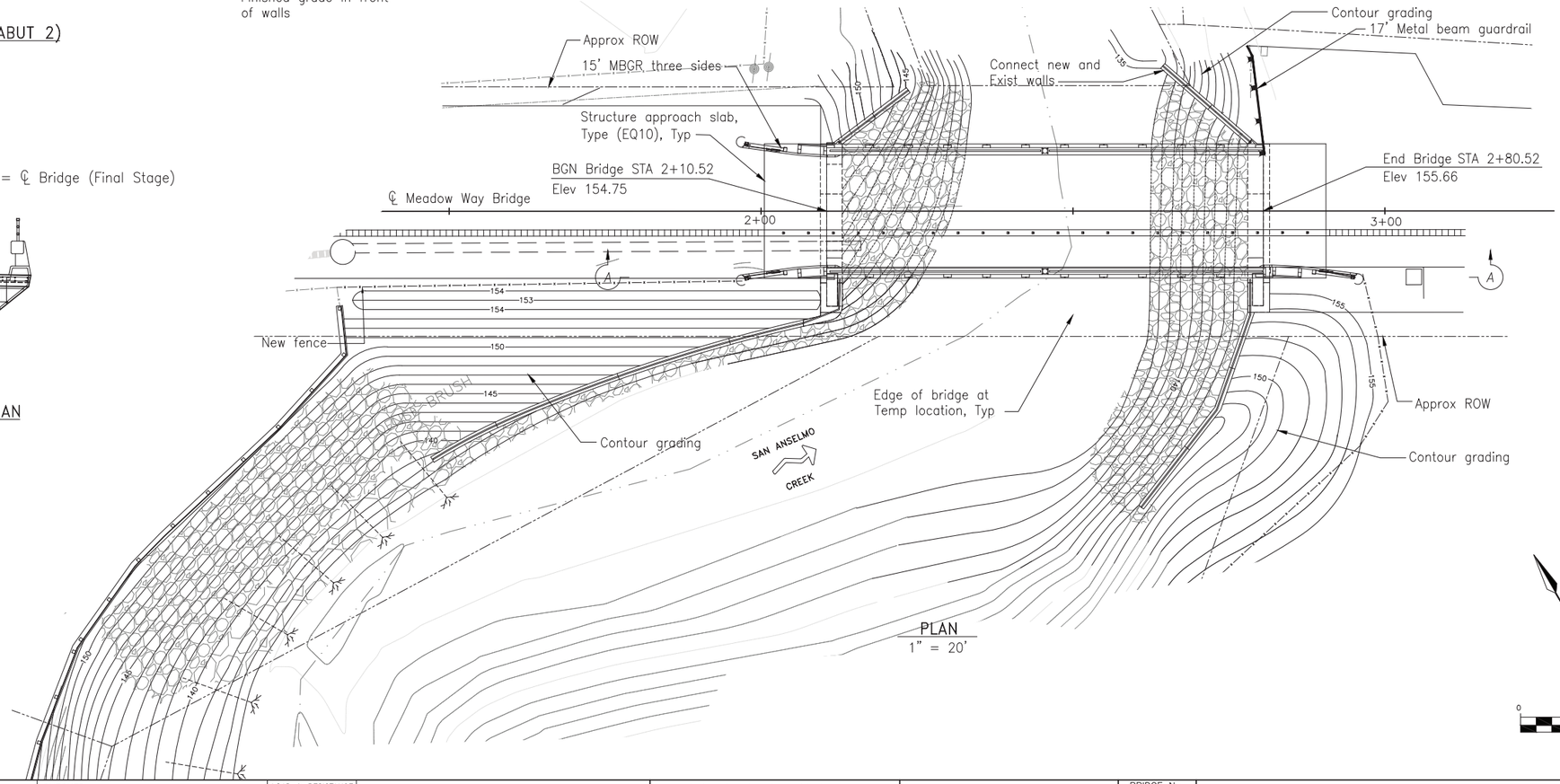


Profile Grade
No scale

ELEVATION A–A
1" = 10'



TYPICAL SECTION @ MIDSPAN
1" = 5'



PLAN
1" = 20'

DESIGN OVERSIGHT	DESIGN	BY D. Vang	CHECKED	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 AND PERMIT DESIGN VEHICLE		PREPARED FOR THE TOWN OF FAIRFAX DEPARTMENT OF PUBLIC WORKS
	DETAILS	BY J. Caravalho	CHECKED	LAYOUT	BY N. Tamannaie	CHECKED	
SIGNOFF DATE	QUANTITIES	BY	CHECKED	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED	

Nader Tamannaie, PE
PROJECT ENGINEER

BRIDGE No.	MEADOW WAY BRIDGE OVER SAN ANSELMO CREEK
27C–0008	GENERAL PLAN
POST MILE	
––	

DS OSD 2138 (CADD 4/89)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU
EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 1 OF

CONTRACT NO.

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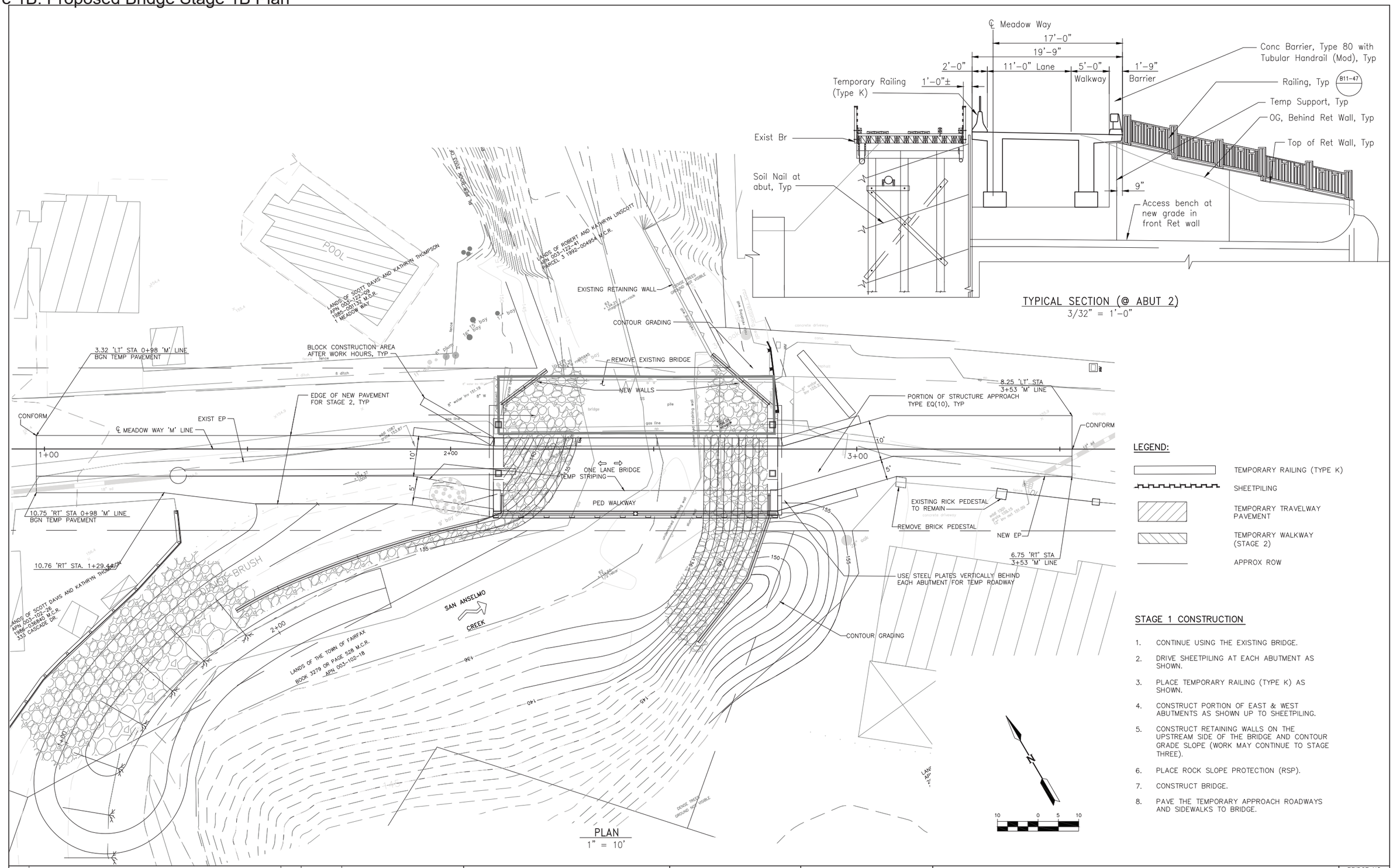
Figure 1B. Proposed Bridge Stage 1B Plan



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DRAWN BY :
CHECKED BY :
SCALE : AS NOTED
DATE :
BRIDGE NO. :
PROJ NO. :

California Infrastructure Consultancy
930 ALHAMBRA BLVD. SUITE 220
SACRAMENTO, CA 95816

TOWN OF FAIRFAX
142 BOLINAS ROAD.
FAIRFAX, CA 94930

MEADOW WAY BRIDGE

CONSTRUCTION DETAILS - STAGE 1B

BRIDGE NO
SHEET
OF

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To construct the initial halves of the new abutments, the approach embankments behind them and next to the current approach roads would also need to be excavated. In order to avoid undermining the approach roadways and abutments of the existing bridge while it is still in operation, the embankments behind and in front of the existing abutments will be retained temporarily with soil nails perpendicular to the roadway alignment. Traffic will be separated from the construction area with temporary concrete barrier railings (Type K) during this stage.

Since geotechnical borings and investigations have been conducted at the site, it is known that the bridge abutments and retaining walls attached to the abutments will need to be supported on piles. To minimize disturbance to the residents, 24-inch diameter cast-in-drilled-hole (CIDH) concrete piles, which are significantly quieter to install than driven piles, will be used to support the walls. For this, the creek bed would be excavated approximately eight feet deep to reach the approximate elevation of the concrete pile heads. After completing the excavations, drilling rigs would be called upon to drill the 24-inch-diameter CIDH piles supporting the future structural elements. The drilling auger would be mounted on a truck that can negotiate the access road and be capable of drilling deep holes with augers added on progressively. The drilling spoils would be spun loose from the auger, dumped in containers, and hauled away.

Due to the riverine environment of the operations, underground and surface water may seep into the drilled holes and excavations, potentially threatening their collapse and/or contamination of the concrete that would be poured later on. For this reason, the contractor would use various wet-drilling hole stabilization techniques, such as driving a steel pipe sleeve into the hole all the way to the bottom, simultaneous with drilling. In this case, the reinforcement cage is placed in the hole using a crane and the concrete is pumped from the bottom of the hole up using a tremie pipe. This way, any water in the hole is displaced to the top, and then vacuumed and collected in containers. At the same time of the concrete pour, the steel sleeve is extracted, leaving behind a deep hole filled with steel rebar and clean concrete. Another wet-drilling technique would be filling the hole with slurry, such as a drilling polymer, that displaces the water and provides hole wall stability through hydrostatic pressure before concrete is poured in. In the case of slurry displacement method, the steel cage is placed in the slurry, the heavier concrete is again pumped from the bottom up, pushing the lighter slurry up, which is then vacuumed into special tank trucks for disposal off-site. Again, as the clean concrete reaches the top and all of the slurry has been picked up, the result would be 24-inch diameter concrete piles. The piles are then ready to be capped with a concrete footing (or pile cap, as sometimes called).

Once the concrete pile caps are constructed, their top surface would be five to six feet below the creek bed. At this point, these foundations of the new walls and bridge abutments would be protected with filter fabric and a two- to two and a half--foot layer of rock riprap on top for scour control. Ultimately, the underground riprap would crawl up on the wall face to some height and be subsequently covered with three feet of creek bed materials, restoring the creek bed and embankment slopes to their original levels through the site. The net effect will be restoring the site to a deep and wide soil “trough” traversing through the bridge site for natural fish passage without any obstructions in the creekbed or anything other than creek materials and native plants.

Once the southern (upstream) halves of the abutments and the two upstream connecting retaining walls are constructed, the new concrete superstructure would be cast to span them immediately

adjacent to and south of the existing bridge. The bridge abutments would be cantilevered walls, providing seats for the ends of the new bridge superstructure. This location of the new bridge superstructure would be temporary. The design concept would utilize two concrete arch ribs spanning the abutments and supporting vertical spandrel columns which, in turn, would support a thin concrete deck slab and railings at the top. The bridge would be 21.5 feet wide from edge to edge and have a 12-foot lane, a one-foot buffer, a five-foot wide sidewalk, and barrier and hand railings on both edges of the deck. Due to space limitations, 1'-9" of the final deck width would be cast in Stage 2, described below. The arch ribs would be cast in place in wooden forms supported on a wooden or steel falsework system temporarily placed on the creek bed. The arch ribs would be connected to each other for stability with four transverse beams. Once the arch rib concrete has cured and gained sufficient strength, the falsework would be removed. The arch ribs and the transverse connecting beams would be timed to gain strength by the end of the first dry season so that they are self-supporting once the falsework is removed by October 15th. The remainder of formwork, if needed beyond the dry season, would be attached to the arch ribs themselves above the 100-year flows from that point forward.

At the conclusion of Stage 1, the southern halves of the abutment walls and the retaining walls connecting to them, as well as the new bridge superstructure, would be completed. Construction at the bridge deck level and the existing roadway may continue beyond October 15 if work remains to be done in order to complete Stage 1. The underground riprap fortifications in front of the completed abutments and walls would be in place, the access road into the creek terminated, and the creek bed in the area of the Stage 1 construction would be restored. The new bridge, in its temporary location, would be ready for service, and traffic would be conveyed away from the existing bridge to the new bridge. At the end of the season, the site would be cleaned up and debris removed, the equipment would be taken away, and the site winterized until the next season. No materials will remain in the creekbed after the first season of work, the surface of the creekbed will be returned to pre-project conditions prior to the start of the wet season. If the bridge is not ready for traffic, the existing bridge would remain in service during the following winter and early spring.

Stage 2 Construction

Stage 2 construction would take place during the second season of construction. By the end of the first season, the new bridge would be in its temporary location, the temporary approach roadways are constructed south of the existing bridge, and the vehicular and non-motorized traffic would be using the new bridge. Cars and pedestrians would be kept within the small detour area with temporary railing (Type K) and temporary fencing. Prior to the removal of the old bridge, the existing "wet" utility pipes (sewer, water and gas) would be placed on a shoofly north of the existing bridge and supported in place during construction. They would eventually be relocated and housed and hung under the existing bridge deck well above the 50- and 100-year flow elevations.

At this stage, the existing bridge would be removed piece by piece with a crane or two, starting with its superstructure members. To avoid dropping pieces of the bridge into the creek, special catchment containers and bridge removal methods would be specified. After the removal of the superstructure, the wooden pile extensions would be cut at least three feet below the creek bed elevations and the holes backfilled with existing creek materials. The creosote-laden wood timbers would be disposed by the contractor at an appropriate facility permitted to handle hazardous waste.

After the bridge removal, the northern halves of each of the two abutments and the two downstream wingwalls connecting with the abutment corners would be constructed. Excavations, CIDH pile and rock riprap installations, and backfilling over the riprap would be completed similar to Stage 1 construction, and the same access route will be reopened and used. The slopes above the retaining walls and wingwalls would be contour-graded. This aspect of the work can continue into the Final Stage, described below. During this stage, the excavations for the north abutments and wingwalls would continue to be protected from traffic with Temporary Railing Type K. The areas behind the walls would be backfilled and approach slabs and the approach roadways would be constructed in line with the alignment of the bridge in its final position, which would be approximately in the middle of Meadow Way's ROW.

Final Stage Construction

The new bridge would be closed for a few hours during a one night operation when little or no traffic is expected. The new bridge superstructure would be either pushed hydraulically sideways to the north or lifted with a crane on each side and placed back on the abutment seats at its final location near the middle of Meadow Way. The remaining 1'-9" wide strip of the deck width would be cast after this move. Since this is the only access to the homes on the other side of the creek, emergency fire and paramedic crews would be stationed on both sides of the bridge to provide emergency services to surrounding residences. After the relocation of the new bridge to its final position, the bridge would be reopened to traffic. Approach railings at all four bridge corners, landscaping and vegetation restoration with native plants (trees, bushes and other ground cover) on all affected slopes, fencing, and other surface improvements around the bridge would continue until project completion.

A program of fish habitat restoration, using bio-engineering techniques, low earth berms and woody nooks, designed specifically for the site, will be implemented. The current proposed location of the large wood is the bank along the access route, immediately upstream of the new retaining wall on the north side. A layer of large logs will be laid in a grid at the bottom of the excavation and on the creek bed, to be incorporated in the log-root wad revetment structure. The logs will be rot-resistant species, such as eucalyptus and redwood, typically obtained as re-purposed salvage from local urban tree removal companies. The structure will be designed so that the log grid is made integral with large rock rip-rap pieces placed within it and stacked under the new overtopping embankment slope. The ends of the logs perpendicular to the creek centerline will protrude out of the base of the embankment into the creek's edge flow, catching small woody drift. The base of the embankment will be planted with native plants and small trees to create near-shore overhanging vegetation. In conjunction with the revetment, the creek bed in front of the revetment structure will be re-contoured to create pools for fish. The net effect will be restoring the site to a deep and wide soil "trough" traversing the bridge site for natural fish passage without any obstructions in the creek other than creek materials and native plants.

The wet utilities would be rerouted under the new bridge and the smaller "dry" utilities may be placed inside the barrier railings, the deck, or the sidewalk. A Revegetation Plan for the site will be prepared. The Revegetation Plan will be implemented once all construction is complete. Planting below the top of the creek bank will be monitored annually for 5 years. The primary focus of the

monitoring will on lower part of the creek bank. Evidence of erosion, sedimentation, or other problems will be documented. Photos will be taken from fixed photo points.

1.4.2. Authorities and Discretion

The Action is proposed by the Town of Fairfax and Caltrans under the FHWA Local Assistance Program. Caltrans, as assigned by the FHWA, assumes all of the FHWA environmental responsibilities under National Environmental Policy Act (NEPA) and other environmental laws (NEPA Delegation). This delegation authority is limited to highway projects, including Local Assistance Federal Aid projects, and specific projects within the State or a programmatic delegation. Therefore, Caltrans must ensure joint projects with FHWA or projects funded with Federal Aid are in compliance with NEPA. The proposed Action is regulated by the Clean Water Act (CWA) Sections 404 and 401 and California Fish and Game Code Sections 1600-1616.

1.4.3. Project Location

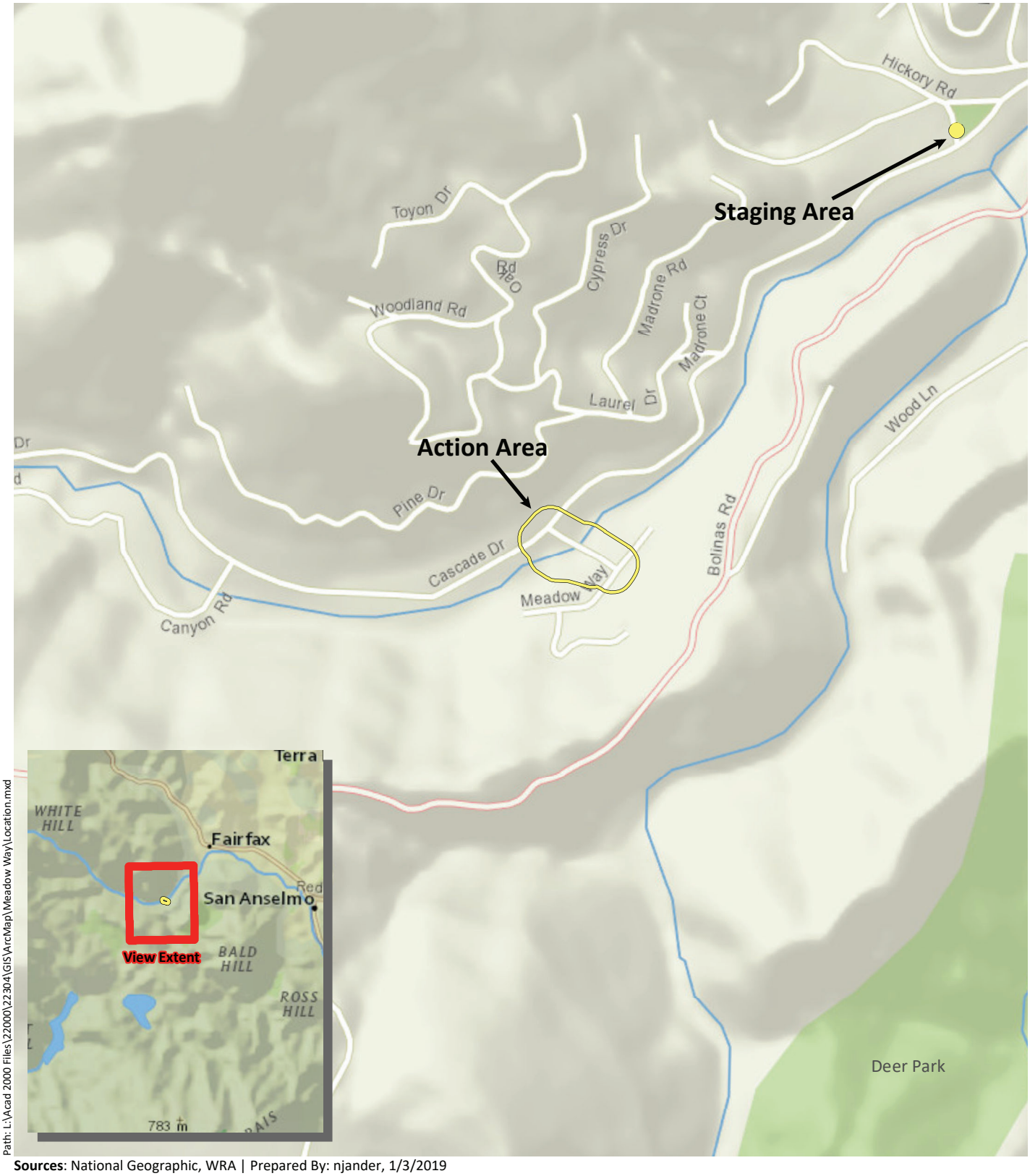
The project site is located in a developed area of the Town of Fairfax in Marin County (Figure 2). The project site consists of Meadow Way Bridge, Caltrans Bridge Number 27C-0008, which is located over San Anselmo Creek between Cascade Drive and Meadow Way within the western portion of the Town. The project site consists of Assessor's Parcel Numbers (APNs) 003-102-18 and 003-122-41. Site elevations range from approximately 100 to 200 feet NAVD88. Surrounding land use is residential. The bridge is located on the San Rafael USGS 7.5-minute quadrangle map at latitude W37.583366, longitude N122.36085.

1.4.4. Define Action Area

The Action Area includes all habitats directly and indirectly affected by the proposed Action. This includes all areas to be disturbed by the proposed Project, access roads, staging areas, and extends 100-200 feet beyond the proposed Project (Figure 3). No effects are anticipated beyond 100-200 feet based upon implementation of measures as described below and surrounding urban development. The Action Area extends upstream 200 feet and downstream 100 feet from the bridge along the stream corridor to account for temporary effects, such as turbidity, during the de-watering phase of work. A secondary staging area is located outside of the Action Area and is shown on Figure 2; however, this staging area is restricted to paved and developed habitat and no effects to listed species would occur. Therefore, this area is not included within the Action Area shown on Figure 3.

1.4.5. Conservation Measures

The proposed Action incorporates several measures to avoid or minimize effects to listed fish and their critical habitat and NSO. These measures are outlined in the subsequent sections.



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Sources: National Geographic, WRA | Prepared By: njander, 1/3/2019

Figure 2. Action Area Location

Meadow Way Bridge
Town of Fairfax, Marin County, California

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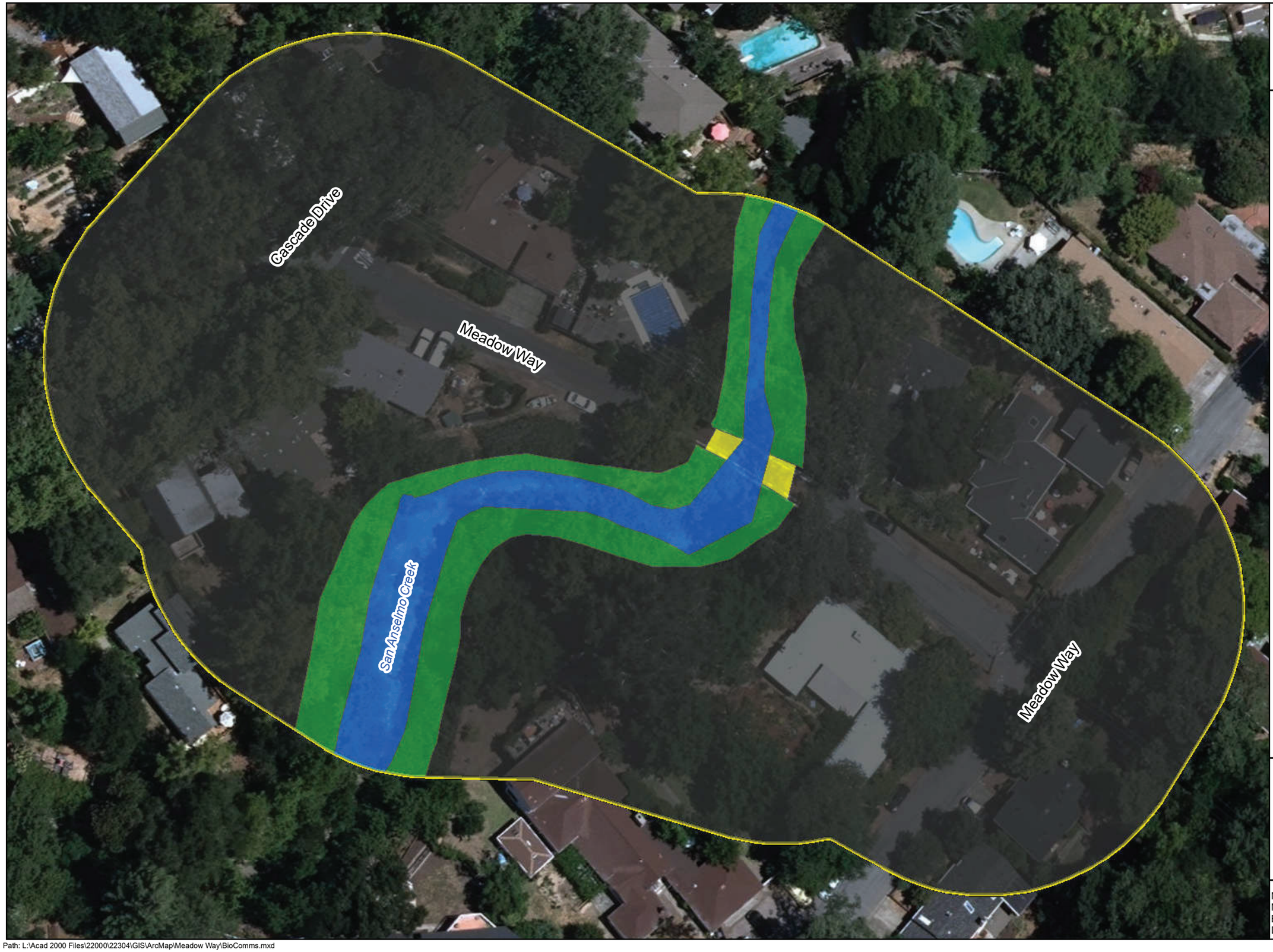

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ENVIRONMENTAL CONSULTANTS

Meadow Way Bridge
Bridge: No 27C-0008
Town of Fairfax
Marin County, California

Figure 3.
Biological Communities
within the Action Area

Action Area (3.49 ac.)

Biological Communities:

- Intermittent Stream (0.18 ac.)
- Riparian Woodland (0.26 ac.)
- Ruderal Disturbed (3.04 ac.)
- Unvegetated Banks (0.01 ac.)

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S

0 20 40 60
Feet

Map Prepared Date: 2/14/2018
Map Prepared By: smortensen
Base Source:
Data Source(s): WRA, Marin County

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Meadow Way\BioComms.mxd

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1.4.5.1. PROJECT DESIGN MODIFICATIONS FOR AVOIDANCE AND MINIMIZATION

The following measures are included to avoid and/or minimize potential impacts to sensitive habitats including the creek bed and banks at each location:

- The primary construction or access in the creekbed and banks will be completed between June 1 and October 15, and work within the creek bed and banks will occur when the work area is dry, or dewatered.
- Final grading in the creek bed will conform to the existing creek channel both downstream and upstream (except in the areas of permanent fill or fish habitat creation), and existing bed materials will be replaced with similar sized materials.
- Regulatory approval will be obtained for all work within potential jurisdictional areas, including the USACE, RWQCB, CDFW, and NMFS. All work within these areas will conform to any conditions imposed by the regulating agencies.
- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction will be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas and to prevent any equipment from unnecessarily extending the work area or entering the creekbed. In addition, silt fencing will be installed where appropriate to prevent debris from entering the creek. All fencing will be removed upon project completion.
- Prior to construction, the contractor will be required to prepare an Accidental Spill Prevention and Cleanup Plan.
- To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment spill control absorbent material will be in place underneath this equipment at all times to capture potential leaks. All refueling and maintenance of equipment, other than stationary equipment, will occur outside the creek's top-of-bank. Any hazardous chemical spills will be cleaned immediately.
- Stockpiling of construction materials and supplies will occur outside the creek channel.
- If there are drilling activities related to construction of the proposed project the contractor will be required to use a drilling mud and slurry seal that is nontoxic to aquatic life. All drilling muds and fluid will be contained on-site in tanks and disposed of in a permitted manner. Fluids from saw cutting and other activities will be collected and not allowed to flow into the creek.
- No equipment, including concrete trucks, will be washed within the channel of the creek, or where wash water could flow into the channel. Prior to proposed project construction, the contractor will establish a concrete washout area for concrete trucks in a location where wash water will not enter the creek or adjacent areas. The washout area will follow the practices outlined in the San Francisco Bay Regional Water Quality Control Board Erosion and Sediment Control Field Manual (page 107-108, July 1999) or more recent guidelines. Substitution of the designated concrete washout area or methods will require prior approval of the Town of Fairfax.
- All water that comes in contact with wet concrete will be pumped directly into tanks and disposed of at a permitted location.
- When working on the roadway and bridge approaches during the October 15 to June 1 period, all drainage inlets within the proposed project site will be protected from receiving polluted storm water through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs.
- Water encountered during construction of the bridge foundations will be managed in accordance with an approved dewatering plan.

- All workers will ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the Action Area are deposited in covered or closed trash containers. The trash containers will not be left open and unattended overnight.
- At the end of construction, the Town of Fairfax will require that seed and certified weed-free straw will be placed on disturbed areas in the proposed project site (with the exception of the lower creek banks, creek bed, and areas below the OHW mark). A jute mesh type or equivalent matting will be placed over the straw, installed per the manufacturer's instructions. This matting will have no plastic incorporated into it. Substitution of materials or erosion control methods will require prior approval of the Town of Fairfax.
- After construction, the proposed project site will be inspected following the first heavy rain, during the middle of the rainy season and at the end of the rainy season. During each visit areas of significant erosion or erosion control device failure will be noted and appropriate remedial actions taken.

1.4.5.2. SPECIES SPECIFIC AVOIDANCE/MINIMIZATION MEASURES OR BMPS FROM THE USFWS/NMFS BA CHECKLISTS

Habitat in the Action Area is within critical habitat for both Coho salmon and steelhead, and is within EFH for Pacific salmonids. As mentioned above, Coho salmon are considered extirpated in the watershed, but CCC steelhead are assumed present. In addition to the measures identified for the Intermittent Stream Biological Community; the following measures will be implemented to avoid and minimize potential project impacts to steelhead, critical habitat for steelhead and Coho Salmon, and EFH.

- Formal consultation with NMFS will be conducted to ensure proposed project design will not result in permanent adverse effects to steelhead, critical habitat, or EFH.
- Construction within the bed and banks of the creek will be done within two dry seasons and in-water work will be performed only on or after June 1 and must end on or prior to October 15 in each year, and avoid the spawning and migration season. All coffer dams and construction materials will be removed from the creek bed at the end of each season of work. In-water work outside of this period (June 1-October 15) will require further consultation with NMFS.
- Work shall be conducted in isolation from flowing surface water. If surface water is present, prior to the start of in-water activities, the work area will be isolated using temporary cofferdams, and flowing water shall be temporarily diverted around the isolated area.
- A fish rescue will be completed if water remains in the Action Area at the time of work in the creek bed. This includes if no surface flow is present, but pools containing water with potential to support fish are present within the Action Area. A fish rescue and relocation plan shall be developed prior to the onset of any in-water work. The plan shall be implemented by a qualified biologist during dewatering activities in San Anselmo Creek. The fish rescue and relocation plan shall include an overview of the proposed methods for dewatering, expected location and duration of dewatering activities, and methods for conducting fish rescue and relocation during dewatering activities.
- If de-watering is necessary, pumps with 0.1-inch mesh will be used to remove standing water from the work area within the coffer dams to a filtration basin to prevent direct discharge into the creek. If a filtration basin is not available, filter bags will be placed surrounding the hose-release and the hose-release end will be placed on a level area outside of the wetted creek channel to allow water to settle prior to returning to the creek. No pumped water will be directly discharged into the creek. Allowing the pumped water to settle in a filtration basin or release through filter bags will prevent increase in turbidity or sediment loads during the de-watering process.

- Concrete, dust, and other debris from concrete removal activities will be captured and removed from the work site so as not to enter the creek channel.
- Where disturbed, the creek channel will be restored to the pre-project grade using native cobble, gravel, and soils in appropriate ratios to mimic pre-project conditions.

The Meadow Way Action Area does not contain habitat suitable for nesting NSO, and no potential NSO nesting habitat is within 0.20 mile (1,050 feet) of the Action Area. However, dependent upon construction activities, NSO that nest in forest within 0.20-0.25 mile of the Action Area may be affected by noise from proposed project activities during nesting. The following measures will be implemented to avoid and minimize potential project impacts to NSO:

- Final avoidance and minimization measures will be determined in consultation with the USFWS to ensure project design including avoidance and minimization measures do not result in adverse effects to NSO.
- If construction activities have the potential to exceed 101 dB (extreme levels), this work will be conducted to the extent feasible outside the nesting season (September 1 through January 31) to avoid disrupting nesting NSO adjacent to the Action Area. Work generating extreme sound levels during the nesting season will require protocol-level surveys to determine nesting status and location and consultation with the USFWS and CDFW.
- If work within the Action Area generating extreme sound levels must occur during the nesting season (February 1 through August 31), protocol-level surveys in accordance with the USFWS Protocol for Surveying Proposed Management Activities that may Impact Northern Spotted Owls (2012) will be conducted. For “disturbance only” projects (see Project Impacts section below), six surveys will be required during the nesting season of the Action Area and the surrounding 0.25-mile area (survey area).
- If protocol-level surveys indicate that NSOs are nesting within the potential acoustic impact distance to be determined in consultation with the USFWS, project work may not commence until the end of the nesting season, i.e. September 1, or be limited to work within certain acoustic levels based upon distance from the nest and in consultation with the USFWS.
- If protocol-level surveys determine that NSO are not nesting or not nesting within the potential acoustic impact zone during the year of the surveys, project work may commence June 1. June 1 is the earliest date non-nesting status can be confirmed.
- If project work begins in the non-nesting season and is to continue into the nesting season, project work generating extreme levels of noise will cease January 31 and will not recommence until protocol-level surveys as described above determine the nesting status of the survey area. Work generating noise levels below 100 dB (“Very High” or lower levels of disturbance) may continue into the nesting season.

1.4.5.3. CONSERVATION MEASURES

Work within San Anselmo Creek is necessary to complete the proposed Action. San Anselmo Creek is designated critical habitat and steelhead may be present. In addition, both San Anselmo Creek is EFH. Implementation of the above described conservation measures will reduce potential effects to steelhead, critical habitat, and EFH.

All in-water work will be limited to the June 1 – October 15, the standard work window to avoid the adult steelhead migration season and when steelhead are least likely to be present within the Action Area. This window is also the period of lowest flow to limit temporary downstream effects during de-watering activities. Erosion control measures including de-watering the work area if water is present

during proposed project activities will reduce the potential for increased sediment loads downstream of the Action Area. BMPs during de-watering will ensure no temporary increase in turbidity or sediment loads will occur. A fish rescue and relocation will occur prior to de-watering the creek work area to ensure all fish species are relocated safely outside of the work area.

The bridge work will replace and add wingwalls and retaining walls; however, all wingwalls and retaining walls are outside of the creek bed, and the bridge work will not create a barrier across the channel, decrease flows, or change substrate size. Temporary impacts to excavate the footings of the new walls will be necessary, but all new fill for stabilization of the walls are outside of the creekbed and will be placed below the surface and covered with previously excavated cobble and gravel.

A program of fish habitat restoration will also be implemented as part of the Action. A layer of large logs will be laid in a grid at the bottom of the excavation and on the creek bed, to be incorporated in the log-root wad revetment structure. The base of the embankment will be planted with native plants and small trees to create near-shore overhanging vegetation. In conjunction with the revetment, the creek bed in front of the revetment structure will be re-contoured to create pools for fish. The net effect will be restoring the site to a deep and wide soil “trough” traversing the bridge site for natural fish passage without any obstructions in the creek other than creek materials and native plants.

The stream channel will be restored to near pre-project conditions following the completion of bridge work, recreating the gradient which currently exists. The creek bed throughout the project site will be restored to a trough-like flow conveyance environment. Restoration will use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation including creek gradient. Removal of six piles that are currently in the creek bed will reduce potential stream damming from wrack buildup. As such, the proposed project may improve fish passage conditions.

1.4.6. Interrelated and interdependent Actions

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

No interrelated or interdependent effects are expected as a result of the Action because all Action activities are considered under the primary Action described in this document.

Chapter 2. Study Methods

2.1. Summary

A Natural Environment Study (NES) was prepared for the proposed Action in 2019 by the Town's consultants, WRA, Inc. (WRA) and Kelly Biological Consulting (KBC) (KBC and WRA 2019). As part of that document, the CDFW's California Natural Diversity Database (CNDDB), USFWS and NMFS official species lists, and the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants were reviewed to determine which federally listed plant and wildlife species have been documented from within the vicinity of the Action Area. These database inquiries focused on the 7.5-minute U.S. Geological Survey quadrangles within five miles of the Action Area: Bolinas, Novato, Petaluma Point, Point Bonita, San Francisco North, San Geronimo, San Rafael, and San Quentin quadrangles. The USFWS and NMFS updated official species lists are provided as Appendix A. Documented occurrence information and habitat conditions observed at the Action Area (see Chapter 3) were used to evaluate the potential for federally listed species to occur within the Action Area based on the professional expertise and experience of the investigating biologists. A habitat assessment for fish and wildlife was conducted by WRA biologists; however, no formal surveys were performed. Assessment level surveys for wildlife species were deemed appropriate for this location based on the nature of the activity, small area of construction, and the general disturbed quality of habitat for federal listed species. Presence is assumed for steelhead based on the review of databases and local knowledge. Surveys for listed plants was conducted by KBC.

2.2. Personnel and Survey Dates

The Town's consultant, Micki Kelly, Certified Professional Wetland Scientist and plant ecologist with 25 years of experience, conducted the wetland delineation on June 23, 2016, and May 2, 2017 and sensitive plant surveys on April 12 and June 23, 2016, January 11 and May 2, 2017, and February 1, 2018. WRA biologist Nicholas Brinton conducted the biological resource site visit on February 1, 2018. Their qualifications are provided in Appendix C.

2.3. Resource Agency Coordination and Professional Contacts

No agency coordination has begun.

2.4. Limitations and Assumptions that may Influence Results

The site visits were conducted during daylight hours and consisted of an assessment of likely habitats for special-status plants and wildlife; they did not conform to specific USFWS or NMFS protocols for any species. No NSO surveys or detailed fish studies were completed to identify and enumerate fish species present. Due to variable water levels in the region, water levels at the time of the site visit don't necessarily represent those that will exist during construction. Data and documents from previous studies in the area were relied upon to evaluate species potential.

Chapter 3. Environmental Baseline

The Environmental Baseline describes the setting in which the project will occur and includes the effects from past and present Federal, State, private actions; proposed Federal projects with completed section 7 consultations; and contemporaneous State or private actions with consultation in progress. The environmental baseline also considers non-permitted actions (i.e., other nonfederal actions occurring within the Action Area).

3.1. Habitat Conditions in the Action Area

Topography

Within the Action Area, the creek flows to the northeast. The steep banks are approximately 20 vertical feet (top of bank to channel). Adjacent to the top of bank, lands are relatively flat. There is a hill to the northwest and a ridge to the south and east of the Action Area.

Hydrology

The principal natural hydrological sources for the Action Area are creek flow, direct precipitation, and surface run-off from adjacent lands. San Anselmo Creek begins in the hills west of the site. Downstream of Action Area, it flows to the northeast. In roughly 1 mile, it joins Fairfax Creek and turns east/southeast, eventually flowing into Corte Madera Creek, then San Francisco Bay, and the Pacific Ocean. At the Meadow Way Bridge the flow is intermittent, though some pools may persist well into the dry season. Flows vary substantially, depending on the season and the recent rainfall pattern.

Soils

The soils that occur in the Action Area are Tocaloma-McMullin-Urban land complex (30 to 50 percent slopes) (USDA NRCS 2018). The Tocaloma-McMullin-Urban land complex is a fine-loamy, mixed, mesic Typic Haploxeroll. Its drainage class is well drained.

3.2. Summary of Environmental Baseline

The Action Area is a low-density residential community set within a forested landscape. At this location, San Anselmo Creek is an intermittent creek with flows that vary with the rainfall patterns of a given season. The watershed that supports it is local, generally the western part of the Town of Fairfax and adjacent open space lands. The creek substrate is a mix of small gravel to larger cobbles. There are no wetlands in the Action Area. Within portions of the Action Area, there are wooden or cement retaining walls along the lower banks. The rest of the bank areas are natural substrate.

3.3. Describe the Action Area

The Meadow Way Bridge is over San Anselmo Creek in the Town of Fairfax, Marin County, California. Meadow Way is a local residential road. This Action Area covers the areas where the

proposed project-related direct or indirect actions such as ground-disturbing, construction, staging, or access activities would occur and goes beyond that to ensure that key biological issues are addressed. Meadow Way is a local road in a suburban developed area. The adjacent land use is residential (single family homes). This Action Area extends up and downstream from the bridge along the stream corridor covering the primary natural area.

3.3.1. Vegetation Communities within the Action Area

Three biological communities are present within this Action Area. Ruderal disturbed/ developed, riparian redwood forest, and intermittent stream (Figure 3). The intermittent stream is described in the environmental baseline above. The Ruderal Disturbed/Developed portion of the Action Area includes paved areas, structures, roadsides, landscaping, and gravel or bare dirt areas. Within the Action Area, this plant community is predominately landscaping cultivars and non-native herbaceous species commonly found in the region, such as American vetch (*Vicia americana*), various clovers (*Trifolium* spp.), oats (*Avena barbata*), bromes (*Bromus* spp.), and hedge-hog dogtail (*Cynosurus echinatus*). The dominant vegetation along the middle to upper part of the creek bank is Himalayan blackberry and English ivy.

Riparian redwood forest within this Action Area has overstory species including native tree species such as California bay, buckeye (*Aesculus californica)*, oaks (*Quercus kelloggii, Q, garryana*, and *Q. agrifolia var. agrifolia*), and a multi-stem arroyo willow (*Salix lasiolepis*). The understory is comprised mainly of California blackberry *(Rubus ursinus)*, Himalayan blackberry, English ivy (*Hedera helix*), and various grasses including panic veldtgrass (*Ehrharta erecta*).

Chapter 4. Federally-Listed/Proposed Species and Designated Critical Habitat within Action Area

4.1. Federally-Listed/Proposed Species

Of the species documented in the vicinity of the proposed Action (Table 1), only two federally listed species, NSO and CCC steelhead, may be affected by the proposed Action. The species reviewed and potential for presence are shown below in Appendix B. Coniferous forest adjacent to the Action Area has documented occurrences of nesting NSO (CDFW 2018b). For all other species, the Action Area is outside of the known or current range of the species, no suitable habitat is present, or there are barriers to dispersal. No marine, coastal, marsh, or serpentine habitats are present within the Action Area. Coho salmon are extinct from San Francisco Bay tributaries (NMFS 2012, Brown and Moyle 1991); thus, the proposed Action will have no effect on Coho salmon. The Action Area also contains critical habitat for steelhead and Coho salmon, and is EFH for Pacific Salmonids. Anadromous fish, their critical habitat, and EFH require consultation with NMFS. No species or critical habitat under the jurisdiction of the USFWS will be affected by the proposed Action. The remainder of this document focuses on NSO, steelhead, salmonid critical habitat, and EFH.

4.2. Discussion of Steelhead

The CCC steelhead Distinct Population Segment (DPS) is federally threatened. This steelhead DPS includes all naturally spawned populations of steelhead and their progeny in California streams from the Russian River to Aptos Creek and the drainages of the San Francisco and San Pablo bays westward to and including the Napa River, excluding the Sacramento-San Joaquin River Basin.

Steelhead typically migrate to marine waters after spending 2 years (although up to 7) in freshwater. They then reside in marine waters for 2 to 3 years prior to returning to their natal stream to spawn as 4- or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females generally spawn two times before they die. Preferred spawning habitat for steelhead is composed of perennial streams with cool to cold water temperatures, high dissolved oxygen levels, and fast-flowing water. Abundant riffle areas with gravel or cobble substrate for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. The resident life form of steelhead is called rainbow trout, and are also protected in anadromous streams. Steelhead adults typically return to their natal streams to spawn between December and June. Unlike other Pacific salmonids, steelhead are iteoparous, meaning adults do not always die after spawning (NMFS 2007). Spawning redds or nests generally occur in gravel substrate ranging from 0.5 to six inches and are dominated by two to three inch gravels (CDFG 1998). Juvenile steelhead prefer to rear in eddies and along velocity breaks where they can exert minimal energy holding in one position while being in close proximity to forage on terrestrial and aquatic invertebrates washed downstream. Instream cover such as large woody debris and undercut banks in deep pools, along with sufficient riparian cover are important components of rearing habitat

(USFWS 1986). Growth rate varies based on temperature, with optimal growth thought to occur between 15 and 19 degrees Celsius (Hayes et al 2008).

4.2.1. Survey Results

Within the Action Area, San Anselmo Creek is intermittent and primarily contains riffle habitat with substrate composed of gravels and cobble, as well as a concrete wall leading up to the existing bridge. Portions of the bank have been stabilized with gabion baskets to prevent erosion, in addition to the concrete wingwalls and footing leading up to the bridge. During the February 1, 2018 site visit, there was minimal flow through the creek in the Action Area, with the flowing portions of the creek approximately 10 feet wide. Slow riffle and glide flows are located upstream of the bridge for approximately 150 feet. There was some pooling directly below the bridge, and flows downstream from the bridge were primarily glide and slow riffle with some pool habitat.

Fish passage downstream of the Action Area has been improved in recent years with the retrofit of the Center Boulevard box culvert in 2012 (CEMAR 2012). According to a 2006 fish passage assessment conducted by Taylor and Associates of Corte Madera Creek and its tributaries, four partial or complete barriers remain downstream of the Action Area that reduce passage. There is a partial barrier at Fairfax-Bolinas Road where a box culvert reduces passage for adult salmonids and eliminates passage for immature fish. A concrete flood channel along Corte Madera Creek near McAllister Avenue impedes fish passage at low flows due to insufficient depths. The two remaining barriers consist of sub-standard Denil fish ladders. In 2006, Ross Taylor and Associates performed a functional analysis of the ladders at Saunders Avenue and Pastori Avenue. The ladder at Saunders Avenue was classified as a total barrier, while Pastori was classified as a partial barrier. The ladder at Saunders Avenue does not meet required Denil fish ladder criteria and has a 42-foot-long concrete flume below the ladder which impedes the approach to the ladder (Taylor and Associates 2006). The ladder at Pastori was determined to have a flow capacity and ladder slope which make the ladder unusable by fish during many flow conditions (Taylor and Associates 2006). The combination of these barriers limits fish passage below the Action Area. Assessments for the removal or modification of the Saunders and Pastori barriers have been completed and await funding and permitting through the group, Friends of Corte Madera Creek (FOCMCW 2017).

Despite potential barriers to fish passage below the Action Area, San Anselmo Creek is still considered an anadromous stream because the barriers only prevent adult steelhead passage during portions of the year when flows are inappropriate for fish passage (Taylor and Associates 2006). Moreover, steelhead have been observed in San Anselmo Creek above the Saunders Avenue fish ladder, which is the most difficult of the four barriers for fish to overcome (CDFW 2018d, FOCMCW 2017). Thus, steelhead are considered present within San Anselmo Creek and may be present if suitable water depths and conditions are met. San Anselmo Creek within the Action Area is intermittent and has potential to contain steelhead only when water is present.

4.3. Discussion of Northern Spotted Owl

The NSO is a federally threatened and state threatened resident spotted owl subspecies found in cool temperate forests in the coastal portion of California, from Marin County northward. The natural history of this subspecies is summarized by the U.S. Fish and Wildlife Service (USFWS 2008) and Gutiérrez et al. (1995). Typical habitat consists of old-growth coniferous forests, or mixed stands of old-growth and mature trees; younger (second-growth) forests with patches of large trees are also occasionally used. High-quality year-round habitat features a tall, multi-tiered, multi-species canopy dominated by big trees, trees with cavities and/or broken tops, and woody debris and space under the canopy. NSO breeding pairs are usually monogamous and also demonstrate site fidelity, maintaining nesting territories and home ranges across years. The general breeding season is February through August, and nesting occurs on platform-like substrates in the forest canopy. Substrates used as nest sites include tree cavities, broken tree tops, epicormic branching (i.e., multiple branches forming from a single node), large horizontal branches, and old nests built by other birds or squirrels. While NSO nesting occurs predominantly in coniferous trees throughout its range, the population in Marin County is somewhat more generalist and has also been documented to use hardwoods for nesting (Chow 2001). Within Marin County, NSO young leave the nest (by gliding and climbing through the canopy) in late May through June, though they remain dependent on their parents for several weeks thereafter as they learn how to fly and forage independently. NSOs forage for nocturnal mammals; dusky-footed woodrats (*Neotoma fuscipes*) are the primary prey in northern California.

4.3.1. Survey Results

Within the Action Area, the riparian woodland habitat consists primarily of California bay trees. This woodland is low density within and directly adjacent to the Action Area because of the presence of creek channel and development in the immediate area. However, dense, undeveloped coniferous forest is located adjacent to the Action Area to the south and upslope.

Per the CDFW Spotted Owl Viewer database (CDFW 2018b), there are no documented NSO nests within 0.25 miles of the Study Area. However, there are 51 documented NSO observations between the years 1998 and 2016 within 0.5 mile of the Study Area. All of these observations are located within entirely forested areas over 1,300 feet south and west of the Action Area. NSO have been documented to nest in several different trees in this area in 2000, 2001, 2003, 2005, 2006, 2009, 2011, and 2015.

No NSOs or indication of presence of this species (e.g., pellets or feces stains below potential nest or roost sites) were observed during the February 2018 site visit. Within the Action Area, the canopy is more open and trees do not contain platform-like structures that are found in adjacent forest to the south west of the Action Area. The trees within the Action Area are therefore unlikely to support nesting NSO. Although NSOs in the area are unlikely to nest within

the Action Area, they may use the Action Area as foraging habitat. The area of forest containing documented occurrences of NSO southwest of the Action Area was not investigated during the site visit. However, available aerial imagery suggests that these areas feature contiguous stands of primarily older, larger conifers that provide more typical NSO habitat (Google Earth 2018). The nearest nesting habitat and potentially suitable nest tree is 1,000 feet southwest of the Action Area.

4.4. Status of Designated Critical Habitat in the Action Area for Coho Salmon and CCC steelhead

The segment of San Anselmo Creek which runs through the Action Area is designated critical habitat for both Coho salmon (64 FR 24049, 73 FR 7816) and CCC steelhead (70 FR 52488, 70 FR 52630). The definition of critical habitat includes “space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing offspring; and, generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of this species.” For salmon and steelhead species, the physical and biological features which are essential to these functions and defined in the critical habitat designation include, but are not limited to, spawning sites, food resources, water quality and quantity, riparian vegetation, migration corridors, estuarine areas, nearshore marine areas, and offshore marine areas. Critical habitat within the Action Area totals 0.45 acre and includes riparian forest and intermittent stream habitats. These features within the Action Area act as a migration corridor for the species, contain riparian vegetation to improve water quality including temperature, and may provide feeding or rearing habitat in the pools at the upstream and downstream ends of the Action Area when fish and water are present. No spawning habitat is present.

Chapter 5. Effects of the Project on the Action Area

5.1 Deconstruct Action

The proposed Action at Meadow Way Bridge requires work in the vicinity of documented NSO nesting habitat. The project is at least 0.2 mile from potential nesting habitat and would schedule activities resulting in extreme noise levels (exceeding 101 dB) to occur outside of the nesting season for NSO, and if extreme noise in the nesting season cannot be avoided, protocol-level surveys will be conducted to determine the nearest nesting pair. Work will not occur during the nesting season if a pair is determined to be within distances described in the USFWS protocol for disturbance-related projects.

The proposed Action would require work within the creekbed at Meadow Way Bridge to remove existing support piles and retaining walls. The Action is designed to return the creekbed to near pre-project conditions (if not improving fish passage due to the removal of in-water piles), has minimized removal of vegetation to the maximum extent, and includes a fish habitat restoration plan through placement of root wads and pool creation. Work within the creekbed will occur within standard fish work windows (June 1 – October 15) and BMPs will be implemented to minimize effects. A fish rescue plan will be implemented to safely relocate fish species safely outside of the work area, and a de-watering plan will maintain a dry work area free of steelhead. The project design and implementation of BMPs will minimize potential temporary and permanent effects to steelhead and salmonid critical habitat.

5.1.1. Construction Scenario (summary)

All staging would be restricted to top of bank areas within developed and disturbed habitats. Construction would take two seasons and work within the creek bed and banks would be performed only after June 1 and must end on or prior to October 15 in order to avoid the spawning and migration season for the protected CCC steelhead. Therefore, the bridge would be installed in its temporary location during one season, and the project would be completed within the following season. San Anselmo Creek within the Action Area is anticipated to be dry during work within the creekbed and no de-watering is anticipated at this location. If water is present in pools, the work area will be de-watered and a fish rescue will be performed.

The first season of construction would be spent on Stage 1 of the improvements. During this stage, traffic would continue using the existing bridge. The southern halves of each of the two new cast-in-place concrete abutments would be constructed approximately in line with the existing bridge abutments. These are only portions of the permanent abutments, but are designed to support the new bridge in its temporary location adjacent to and south of the existing bridge during Stage 1. To construct the initial halves of the new abutments, the approach embankments behind them and next to the current approach roads would also need to be excavated. Stage 1 includes construction of an access ramp which would be used to transport materials and heavy equipment such as pile drilling rigs, dump trucks cranes, loaders, excavators, large containers, etc., to the creek bed elevation and

back. At the conclusion of Stage 1, the southern halves of the abutment walls and the retaining walls connecting to them, as well as the new bridge superstructure, would be completed. The underground riprap fortifications in front of the completed abutments and walls would be in place, the creek bed in the area of the Stage 1 construction would be restored, and the access road into the creek terminated for the season.

Surface work above the top of bank may continue following closure of the access road to the creek; however, work would not be conducted year-round and the site would be winterized at the completion of Stage 1. By the end of the first season (Stage 1), the new bridge would be in its temporary location, the temporary approach roadways are constructed south of the existing bridge, and the vehicular and non-motorized traffic would be using the new bridge.

At the start of the next season (Stage 2), the existing bridge would be removed piece by piece with a crane or two, starting with its superstructure members. To avoid dropping pieces of the bridge into the creek, special catchment containers and bridge removal methods would be specified. After the removal of the superstructure, access to the creek would be reopened and the wooden pile extensions would be cut at least three feet below the creek bed elevations and the holes backfilled with existing creek materials. Cars and pedestrians would be kept within the small detour area with Temporary Railing (Type K) and temporary fencing. Prior to the removal of the old bridge, the existing "wet" utility pipes (sewer, water and gas) would be placed on a shoofly north of the existing bridge and supported in place during construction. They would eventually be relocated and housed and hung under the existing bridge deck.

During the final stage of construction, the new bridge would be closed for a few hours during one night operation when little or no traffic is expected. The new bridge superstructure would be either pushed hydraulically sideways to the north or lifted with a crane on each side and placed back on the abutment seats at its final location near the middle of Meadow Way. Prior to restoring the creek bank, the fish habitat restoration including placement of root wads and pool creation will occur.

Table 2 and Figure 4 provide the total permanent and temporary effects to habitat.

TABLE 2. DIRECT EFFECTS OF THE PROPOSED ACTION ON SALMONID CRITICAL HABITAT AND EFH.

Vegetation Community	Permanent Effects[1]	Temporary Effects
Riparian Woodland	113.0 ft^2 (<0.01 acre)	0.07 acre
Unvegetated banks	-15.7 ft^2 (<0.01 acre)	362 ft^2 (0.01 acre)
Intermittent Stream "Other Waters"	-12.6 ft^2 (<0.01 acre)/ 4 linear feet	0.13 acre/ 270 linear feet
Total	84.7 ft^2 (<0.01 acre)	0.21 acre (9,150 ft^2)

[1] Positive numbers represent a loss of habitat and negative represent a gain of habitat.

5.1.2. Sequencing and Schedule

The proposed Action is anticipated to take two seasons. Work within the creek bed and banks will be necessary in both seasons and occur within the fish work window (June 1 – October 15). All work conducted outside of the fish work window would be restricted to the existing road surface in disturbed and developed habitats above top of bank. All BMPs will be in place prior to the start of ground disturbance. The bridge would be installed in its temporary location during the first season, and the project would be completed within the following season. Season 2 work would include removal of old bridge infrastructure, moving of the new bridge into its permanent location, and fish habitat restoration.

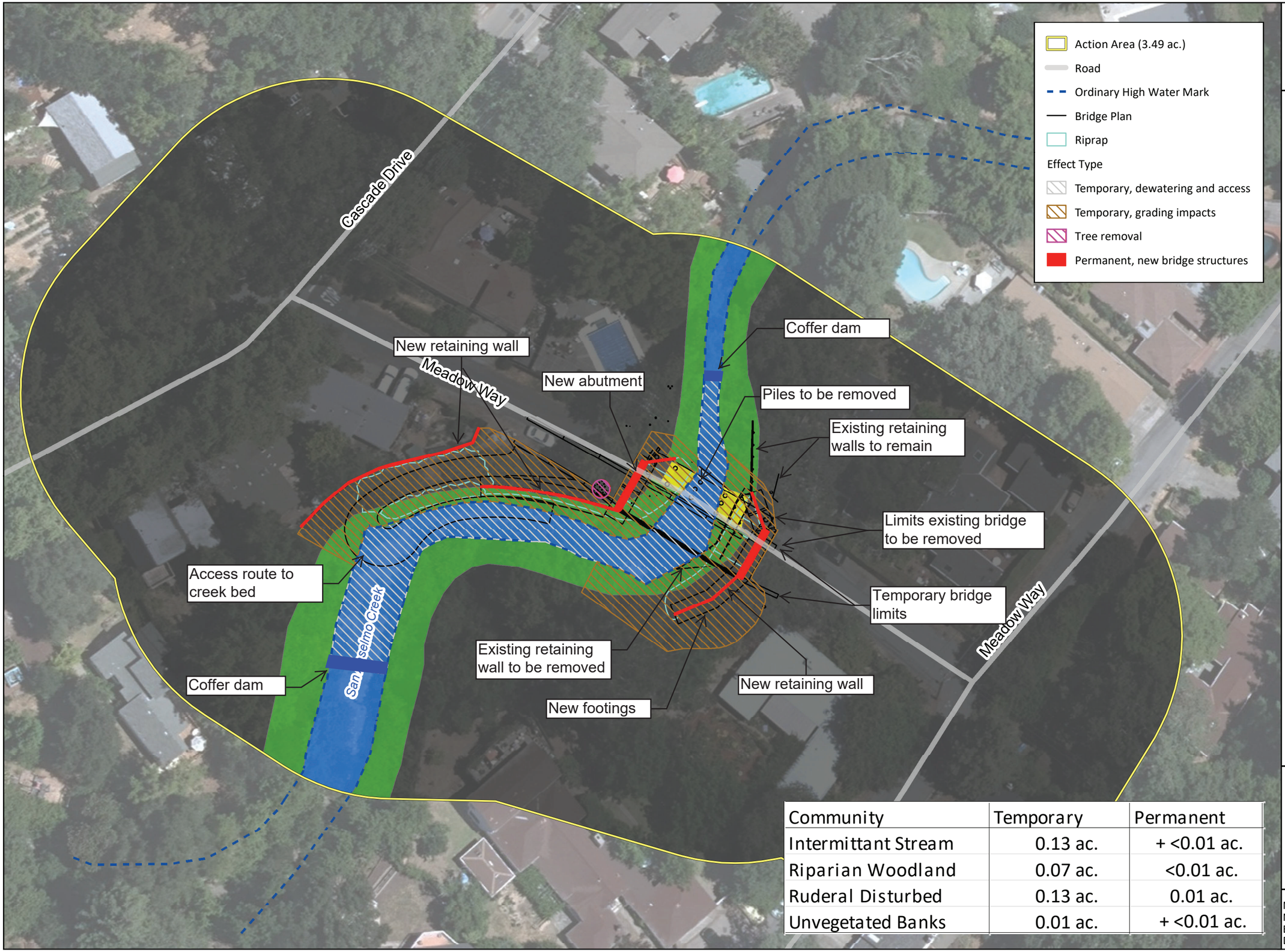
5.1.1. Stressors from Project Actions

Stressors induce an adverse response in an organism by any physical, chemical, or biological alteration of the environment (or resource) that can lead to a response from the individual. Stressors can act directly on an individual, or indirectly through effects to a resource.

The Action will occur in San Anselmo Creek (Meadow Way Bridge) when no flow is anticipated; however, pools may contain water and fish may be present in these pools. BMPs will be in place if de-watering of San Anselmo Creek is necessary to limit the increase in turbidity. This is a distinct and temporary indirect stressor to fish downstream of the work area; however, work is restricted to the time of low flow conditions and implementation of BMPs such as temporary water diversion, de-watering of the work area, and filtration during de-watering will reduce potential for a temporary increase in turbidity. With the implementation of BMPs as described above, no temporary increase in turbidity downstream is anticipated. Fish rescue and relocation as part of de-watering activities will result in a temporary direct stressor to captured fish from capture, handling, and potential environmental changes between capture site and relocation site. Implementation of a fish rescue and relocation plan with qualified biologists will reduce the exposure to stress as a result of fish relocation efforts.

No permanent stressors are anticipated to occur to steelhead or salmonid critical habitat as a result of the proposed Action. The Project design will not result in changes to riparian cover, creek temperature, or fish passage conditions and no such stressors are anticipated as a result of the proposed Action. The Project design also includes fish habitat restoration through installation of root wads and additional pools; this may result in improved fish rearing habitat within the Action Area. Minimal riparian vegetation is to be removed during work activities, only one bay tree cluster is to be removed and trimming of other trees for access; disturbed areas will be replanted following completion of the Action. No change in temperature or flow velocity is anticipated to occur based on revegetation of disturbed areas and returning the creekbed to pre-project grade.

Based on distance to suitable nest trees (0.2 mile), only construction activities producing extreme sound levels (greater than 101 dB) at Meadow Way Bridge may disturb nesting NSO if present within 0.25 mile of the work. Activities producing extreme sound levels will be scheduled outside of the NSO nesting season to avoid disturbance to breeding adults and chicks. The proposed Action will remove one California bay tree in the Action Area but the tree is not of sufficient size to be suitable for nesting by NSO. The proposed Action will not remove NSO habitat.



Community	Temporary	Permanent
Intermittant Stream	0.13 ac.	+ <0.01 ac.
Riparian Woodland	0.07 ac.	<0.01 ac.
Ruderal Disturbed	0.13 ac.	0.01 ac.
Unvegetated Banks	0.01 ac.	+ <0.01 ac.

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ENVIRONMENTAL CONSULTANTS

Meadow Way Bridge
Bridge: No 27C-0008
Town of Fairfax
Marin County, California

Figure 4.
Biological Communities Affected within the Action Area

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Feet

Map Prepared Date: 1/18/2019
Map Prepared By: njander
Base Source:
Data Source(s): WRA, Marin County

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Meadow Way\Impacts.mxd

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5.1.2. Project Operation and Maintenance

During all phases of work, BMPs including erosion control measures will be implemented. Access and staging would be restricted to top of bank areas, and work within the creek bed and banks would be limited to the minimum amount necessary to complete repairs.

Work within the San Anselmo creekbed will be restricted to the June 1 – October 15 work window and when the work area is dry. If the work area is not dry, work areas will be isolated from surface water through installation of temporary cofferdams and a temporary water diversion to bypass the work area. Isolation of the work area from water will reduce potential for increased turbidity downstream of the work area. Following installation of the cofferdams and temporary water diversion, the work area will be de-watered and a fish rescue and relocation will be conducted during de-watering activities.

The project site offers very limited storage and staging areas for the contractor. The publicly-owned block of Hickory Road at Cascade Drive, about ½-mile northeast of the project site, will be designated for the contractor's use for storing equipment and materials during construction (Figure 1). This area is completely developed and no direct or indirect effects to listed species will occur at this staging area or transit to and from the staging area. The contractor will use various pickups, dump trucks, cranes, drilling vehicles, water and other liquid-carrying trucks, loaders, tractor trailers, excavation machinery, generators and handheld equipment. The contractor's personnel will be able to access the creek areas on foot.

5.2. Exposure to Stressors from the Action

Exposures are defined as the interaction of the species, their resources, and the stressors that result from the project action. The proposed Action is anticipated to occur when San Anselmo Creek is not anticipated to have flow, but pools with potential to support fish may be present. The proposed Action will require de-watering of the work area in two seasons and any fish present will be relocated. Work within the creekbed in each season is scheduled outside of the adult steelhead migration period and at the period of lowest flow to reduce potential for fish to be present in the work area. Relocation will temporarily expose fish to capture, handling, and changes in temperature or stream conditions when released. A suitable relocation site will be chosen before the fish rescue and relocation occurs; however, relocation may increase potential for predation in the short-term. Temporary direct effects to steelhead are anticipated during project activities, if present, in the form of harassment or capture for relocation.

De-watering of the work area may temporarily increase turbidity and decrease water quality for fish downstream. De-watering is a distinct, short-term event and implementation of BMPs as described above will prevent an increase in turbidity downstream of the work area during de-watering.

Although the Action will result in a minor loss of habitat for this species, it is not anticipated to result in stressors or indirect adverse effects to steelhead or designated critical habitat because fish passage conditions will remain unchanged and the Action Area does not contain spawning habitat. The Action includes fish habitat restoration to improve fish rearing conditions within the Action Area.

The Action will not result in a change to fish passage, forage, cover, connectivity; no indirect adverse effects are anticipated to steelhead or salmonid critical habitat.

The proposed Action also requires work in the vicinity of NSO nesting habitat at Meadow Way Bridge. The Action will not directly affect nesting habitat, but increased noise levels may indirectly affect breeding behavior or foraging behavior. Temporary indirect effects to nesting NSO, if present, will be in the form of harassment. Distance from suitable nesting habitat and work windows for activities producing extreme sound levels will reduce potential for temporary indirect effects.

5.3. Response to the Exposure

The proposed Action will occur in a steelhead migratory corridor, but no spawning habitat is present. The proposed Action will occur when the Meadow Way Bridge Action Area is anticipated to have no flow, but pools containing water may be present. The proposed Action will conduct in-water work outside of the adult migration season; therefore, only juveniles may be present. Rearing habitat may be present in these pools, and habitat modification to the creek bed is limited to creation of additional pools and installation of root wads on the creek bank. Although a temporary passage barrier will be created by in-water work, this work will occur when no major fish movements within the watershed are anticipated. Temporary direct effects to steelhead are anticipated during project activities, if present, in the form of harassment or capture for relocation. Fish will be held in transfer containers for only a short amount of time and will be quickly relocated to a pre-determined location which provides suitable refuge and conditions for the individuals. Limiting time of the fish in transfer containers will reduce time and amount of stress hormones released in the water and potential for injury in containers. All direct effects will be temporary and short-lived during relocation activities. The temporary water diversion will reduce potential for changes in stream condition such as turbidity; however, turbidity may temporarily increase during de-watering of the work area. Implementation of BMPs as described above will prevent an increase in turbidity downstream of the work area during de-watering. Therefore, de-watering is not anticipated to result in a detectable adverse effect to fish downstream.

The Action will not result in a permanent loss of habitat for this species, and it is not anticipated to result in indirect adverse effects to steelhead or designated critical habitat because fish passage conditions will remain unchanged and the Action Area does not contain spawning habitat. Fish habitat restoration included in the Action may improve fish rearing conditions within the Action Area. The portion of San Anselmo Creek within the Action Area is located above two partial fish passage barriers at Saunders Avenue and a flood control channel where Corte Madera Creek feeds into a larger slough. Despite these barriers, San Anselmo Creek is considered anadromous because the barriers only deter passage during low flow portions of the year, which will include the period where work is occurring in the creek bed. The Action will not result in a change to fish passage, forage, cover, connectivity; no indirect adverse effects are anticipated to steelhead or salmonid critical habitat.

Nesting NSO may be present in the vicinity of Meadow Way Bridge, and if work occurs during the nesting season, NSO may be indirectly affected. No NSO habitat will be directly disturbed by the Action; however, increased noise levels from construction activities could disrupt nesting or foraging

behavior of breeding owls. This could reduce success of the breeding pair should feeding rates of chicks be reduced or disrupted as a result of the increased disturbance. All indirect effects are temporary, and the number of times noise levels are expected to reach levels that would disturb nesting NSO are extremely limited. Activities generating extreme sound levels will be limited to outside the NSO nesting season. The Action will not result in a change to NSO habitat.

5.4. Effects of the Action

Effect is a description of the manner in which the action may affect any listed species or critical habitat and an analysis of any cumulative effect (50 CFR 402.02). The effect of the action is the consequence (behavioral, physical, or physiological) of a response to a stressor.

5.4.1. Steelhead

Work within the San Anselmo creekbed will be restricted to the June 1 – October 15 work window and when the work area is dry. If the work area is not dry, work areas will be isolated from surface water through installation of temporary cofferdams and a temporary water diversion to bypass the work area. Though water is unlikely to be flowing in the creek bed during work periods, any pools will be de-watered and fish, including steelhead if present, will be relocated to suitable habitat. Therefore, some direct effects to steelhead may occur as a result of construction should relocations be necessary. The bridge work will add material to the existing structures but will not create a barrier across the channel, decrease flows, change substrate size, or channelize the stream. Further, removal of current wooden piles from the creek bed area will result in less obstruction to anadromous fish movement in San Anselmo Creek.

The Action will not result in a loss of habitat for this species, and is not anticipated to result in an indirect adverse effect to steelhead because fish passage conditions will remain unchanged and the Action Area does not contain spawning habitat. The Action includes fish habitat restoration which may improve fish rearing conditions. Therefore, no indirect adverse effects to reproduction, juvenile survival, or migrating adult steelhead are anticipated to occur following construction.

5.4.2. Salmonid Critical Habitat

Approximately 0.21 acre (9,148 sq. ft.) of temporary effects and a small permanent gain in critical habitat for steelhead and Coho salmon (resulting from the removal of piles) are expected to occur. Critical habitat in the Meadow Way Bridge Action Area includes San Anselmo Creek, unvegetated bank, and riparian habitat within the Action Area. Temporary direct effects to critical habitat will occur as a result of access along the creek bed for removal of existing wingwalls, installation of new abutments and retaining walls, and removal of existing piles. Riprap will be placed at the wingwall and retaining walls; however, the fill will be restricted to creek banks and below the surface and natural substrate will be placed above the fill. Excavations within the creek bed are limited to the creation of additional fish pools. In addition to fish pool creation, the Action will install root wads as part of the Action's fish habitat restoration plan. The work is scheduled to occur when the work area is dry, and no loss of habitat from the Action will occur. Removal of the existing wooden support piles may help improve fish passage by reducing potential stream damming from wrack buildup.

The proposed project will not result in any changes to existing land use; and the Action Area will be restored to conditions similar to those before the project except in areas designated for fish habitat restoration (installation of root wads and creation of fish pools). As such, the project will not change fish passage conditions. The Action Area does not contain spawning habitat, and no changes to pools or potential rearing habitat would occur. Therefore, no indirect effects are expected following completion of the Action.

5.4.3. Northern Spotted Owl

The USFWS has published guidance on acoustic and visual disturbances for NSO (USFWS 2006). The term "disturbance-only" describes projects that will not impact NSO habitat directly, but will generate acoustic and/or visible disturbances potentially leading to nest abandonment. For such projects, potential NSO habitat areas within 0.25 mile (1,320 feet) of such disturbance point-sources are included in impact analyses (USFWS 2011). Because no large trees are anticipated to be removed as part of the proposed Project, there will be no impacts to the amount of NSO habitat in and around this Action Area and the proposed Project is considered "disturbance only." The one small tree (California Bay) to be removed as part of the Meadow Way Bridge Action is not suitable for nesting and unlikely to be used as a foraging perch by NSO.

Regarding visual disturbances, USFWS (2006) provides a general setback distance of 131 feet from active nests (i.e., those with eggs or young, or being attended by adults in preparation for nesting). This Action Area is approximately 0.25 mile (1,320 feet) from the nearest documented nest tree, and is thus beyond the visual disturbance setback. Additionally, no trees within 1,000 feet of this Action Area are likely to be used as nest trees due to a lack of platform-like tree structures and densely wooded vegetation characteristics. Thus, it is unlikely that NSO will nest within the 131-foot visual disturbance zone.

Ambient acoustic conditions during an assessment of a similar nearby site on Canyon Road averaged approximately 54 decibels, with a maximum reading of 79 decibels. Anthropogenic activities within the vicinity of the Canyon Road site included noise from residential properties and vehicle traffic over the Canyon Road Bridge, and is presumed to have similar levels of ambient disturbance as those in the Meadow Way Action Area. A summary of potential project-generated disturbances that would likely provide the highest decibel levels and their "relative sound level" is provided in Table 3 below. Also included are ambient decibel levels that were observed at the Canyon Road site.

TABLE 3 ACOUSTIC DISTURBANCE ANALYSIS FOR NSO PER USFWS (2006)

Disturbance regime	Disturbance	Decibel level ("standardized")	Relative sound level
Bridge maintenance	Yelling	70	Moderate
	Flatbed pickup truck	77	Moderate
	Generator (low end)	78	Moderate
	Backhoe (high end)	84	High
	Generator (high end)	84	High
	Concrete mixer (high end)	85	High
	Pumps, generators, compressors (high end)	87	High
	Jackhammer	89	High
	Medium construction (high end)	89	High
Ambient (existing conditions)	Power tool use from adjacent properties, light vehicle traffic, birds singing, wind.	45 - 79 (measured at Canyon Road Bridge over San Anselmo Creek on March 15, 2016)	Natural Ambient to Moderate

The USFWS (2006) provides an acoustic analysis matrix that compares ambient conditions to project conditions, and then derives an estimated linear distance from disturbance point-sources at which nesting NSOs have been documented (and/or should be expected) to be harassed/disturbed (Table 4). The harassment distance is the minimum buffer necessary to avoid acoustic impacts to an active NSO nest.

TABLE 4 ESTIMATED HARASSMENT DISTANCE DUE TO ELEVATED ACTION-GENERATED SOUND LEVELS FOR PROPOSED ACTIONS AFFECTING NSO, BY SOUND LEVEL (USFWS 2006)

Existing (ambient) pre-project sound level (dB) [1,2]	Anticipated action-generated sound level (dB) [2,3]			
	Moderate (71-80)	High (81-90)	Very High (91-100)	Extreme (101-110)
"Natural Ambient"[4] (<=50)	165 feet	500 feet	1,320 feet	1,320 feet
Very Low (51-60)	0 feet	330 feet	825 feet	1,320 feet
Low (61-70)	0 feet	165 feet	825 feet	1,320 feet
Moderate (71-80)	0 feet	165 feet	330 feet	1,320 feet
High (81-90)	0 feet	165 feet	165 feet	500 feet

[1] Existing (ambient) sound levels includes all natural and human-induced sounds occurring at the project site prior to the proposed action, and are not casually related to the proposed action.

[2] Sound levels provided in USFWS technical guidance document.

[3] Action-generated sound levels are given in decibels (dB) experienced by a receiver, when measured or estimated at 50 feet from the sound source.

[4] "Natural Ambient" refers to sound levels generally experienced in habitats not substantially influenced by human activities.

The potential acoustics of project activities have an average relative sound level of “High” or, conservatively, could be at levels of “Very High”. In contrast, average ambient conditions in the immediate vicinity of this Action Area appear to be “Very Low” to “Moderate.” Using a conservative approach in which ambient conditions are considered with an average level of 54 decibels, or “Very Low,” and proposed project conditions considered “Very High”, the estimated harassment distance is 825 feet. The nearest documented NSO nesting occurrence is located over 1,300 feet southwest of this Action Area. The Action Area would be outside the area of potential acoustic impact if “Very Low” ambient sound levels are used as the basis for existing conditions even if a nest was present at the closest suitable habitat (1,000 feet). However, for extreme sound generating activities the disturbance buffer is 0.25 mile (1,320 feet), and although no documented nest site is within 1,320 feet, potential habitat is present within this distance. This Action Area may be within the area of potential acoustic impact if extreme sound levels are generated, but is dependent upon nest location in the year of construction.

The proposed Action at Meadow Way Bridge is anticipated to take two seasons to complete. The work generating extreme sound levels will be scheduled outside of the NSO nesting season to avoid disturbance to breeding NSO. However, if work generating extreme sound levels must be scheduled to begin prior to September 1, the earliest activities will begin is June 1. Protocol level surveys in accordance with USFWS guidance will begin in February of the year prior to initiation of work to determine if NSO are nesting in the vicinity of the Action Area. If surveys determine no nests are active within disturbance buffers determined in consultation with the USFWS, then work may begin after June 1. However, if an active NSO nest is determined within the disturbance buffer, work will not be initiated until September 1 to avoid disturbance to NSO breeding adults and chicks.

5.5. Conservation Measures and Compensation Proposal

5.5.1. Conservation Measures

The avoidance and minimization measures, project design, and species specific avoidance and minimization measures are described above in Section 1.4.5. These measures will be implemented and are summarized again in this section.

Work within San Anselmo Creek is necessary to complete the proposed Action. San Anselmo Creek is designated critical habitat, and steelhead may be present. Implementation of the above described conservation measures will reduce potential effects to steelhead and salmonid critical habitat. Work within San Anselmo Creek will occur when the creekbed is dry and no fish are present.

No excavations for retaining walls or abutments will occur within the creek bed, but six wooden piles will be removed and pools will be created for fish in the creek bed. The removal of the piles may be beneficial to fish passage conditions by reducing potential damming from wrack buildup. No negative permanent direct or indirect effects are anticipated to occur to designated critical habitat as a result of the proposed Action.

No loss or change in NSO habitat will occur as a result of the proposed Action and the Action is scheduled to occur outside of the breeding season to avoid affects to breeding NSO. Tree removal is limited to one small tree which is unlikely to be utilized by NSO.

5.5.2. Compensation

The Action includes fish habitat restoration such as earthen berms, woody nooks/root wads, and pools in the vicinity of the root wads. No additional compensatory mitigation is proposed for steelhead.

The Action will avoid the NSO nesting season and no adverse effects to NSO are anticipated. No compensatory mitigation is proposed for NSO.

5.6. Effects of Interrelated and Interdependent Actions/Conclusions and Determination

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

No interrelated or interdependent effects are expected as a result of the action because all action activities are considered under the primary action.

5.7. Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area described in this biological assessment. Future Federal actions that are unrelated to the proposed action are not considered in this this section because they require separate consultation pursuant to Section 7 of the Act.

No cumulative effects are anticipated from the proposed project. Downstream fish passage improvements have recently been made and the Lansdale crossing and future improvements to the Saunders and Pastori Avenue crossings are planned (FOCMCW 2015). The improvement of these structures will remove and/or improve passage over the partial barriers which currently impede anadromy during certain flow conditions. The proposed project will restore the Action Area to near pre-project conditions except in areas designated for fish habitat improvements, will allow continued fish passage, and may improve fish rearing habitat. Restoration to near pre-project conditions will ensure that no barriers are created to fish passage during project activities, and any improvements to downstream fish passage will not be hindered by the proposed project.

No changes to forested habitat or NSO habitat will occur as a result of the Action.

5.8. Determination

5.8.1. Species and critical habitat determination

1.) No Effect

A **no effect** determination was made for the following species. No consultation is required.

TABLE 5 SPECIES DETERMINED TO HAVE NO EFFECT FROM THE PROPOSED ACTION.

Common Name	Scientific Name	Status*
marbled murrelet	*Brachyramphus marmoratus*	T
short-tailed albatross	*Phoebastria albatrus*	E
California least tern	*Sternula antillarum browni*	E
western snowy plover	*Charadrius alexandrinus nivosus*	T
California Ridgway's rail	*Rallus obsoletus obsoletus*	E
salt-marsh harvest mouse	*Reithrodontomys raviventris*	E
southern sea otter	*Enhydra lutris nereis*	T
California red-legged frog	*Rana draytonii*	T
green sturgeon	*Acipenser medirostris*	T
tidewater goby	*Eucyclogobius newberryi*	E
delta smelt	*Hypomesus transpacificus*	T
Coho salmon - central California coast	*Oncorhynchus kisutch*	E
chinook salmon - California coastal ESU	*Oncorhynchus tshawytscha*	T
longfin smelt	*Spirinchus thaleichthys*	C
eulachon	*Thaleichthys pacificus*	T
Bay checkerspot butterfly	*Euphydryas editha bayensis*	T
San Bruno elfin butterfly	*Callophrys mossii bayensis*	E
mission blue butterfly	*Icaricia icarioides missionensis*	E
Callippe silverspot butterfly	*Speyeria callippe*	E

Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	E
California freshwater shrimp	*Syncaris pacifica*	E
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*	E
Franciscan manzanita	*Arctostaphylos franciscana*	E
Presidio manzanita	*Arctostaphylos montana* ssp. *ravenii*	E
Marsh sandwort	*Arenaria paludicola*	E
Tiburon mariposa lily	*Calochortus tiburonensis*	T
Tiburon Indian paintbrush	*Castilleja affinis* ssp. *neglecta*	E
Sonoma spineflower	*Chorizanthe valida*	E
Presidio clarkia	*Clarkia franciscana*	E
Marin western flax	*Hesperolinon congestum*	T
Santa Cruz tarplant	*Holocarpha macradenia*	T
Contra costa goldfields	*Lasthenia conjugens*	E
Beach layia	*Layia carnosa*	E
San Francisco lessingia	*Lessingia germanorum*	E
White-rayed pentachaeta	*Pentachaeta bellidiflora*	E
Tiburon jewel-flower	*Streptanthus glandulosus* ssp. *niger (previously Streptanthus niger)*	E
Two fork clover	*Trifolium amoenum*	E

* Status definitions: E = Endangered, T = Threatened, C = Candidate

2.) May Affect-Not Likely to Adversely Affect (NLAA)

A **may affect-not likely to adversely affect** determination was made for NSO and designated critical habitat for CCC steelhead and Coho salmon. Informal consultation is required.

3.) May Affect-Likely to Adversely Affect (LAA)

A **may affect-likely to adversely affect** determination was made for CCC steelhead. Formal consultation is required.

5.8.2. Discussion supporting determination

5.8.2.1. STEELHEAD

The proposed Action is anticipated to occur when San Anselmo Creek is not anticipated to have flow, but pools with potential to support fish may be present. The proposed Action will require de-watering of the work area in two seasons and any fish present will be relocated. Work within the creekbed in each season is scheduled outside of the adult steelhead migration period and at the period of lowest flow to reduce potential for fish to be present in the work area. Relocation will temporarily expose fish to capture, handling, and changes in temperature or stream conditions when released. A suitable relocation site will be chosen before the fish rescue and relocation occurs; however, relocation may increase potential for predation in the short-term. Temporary direct effects to steelhead are anticipated during project activities, if present, in the form of harassment or capture for relocation.

5.8.2.2. CRITICAL HABITAT

Critical habitat for CCC steelhead and Coho salmon is present within the Meadow Way Bridge Action Area. Implementation of BMPs, project design, and avoidance and minimization measures described in Section 1.4.5 will reduce potential for adverse modification of critical habitat. The Action will occur when San Anselmo Creek is not anticipated to have flowing water. The use of bio-engineering techniques to create low-earth berms and woody nooks will result in no change to subsurface creek habitat, and will not result in a change to the surface, substrate, grade, or flow conditions outside of the fish habitat restoration area. These berms and nooks may provide additional shelter for fish during passage through the Action Area. Restoration will use previously excavated substrate to mimic the channel conditions prior to excavation, including creek gradient, and will occur within the disturbance footprint of the Action. Removal of the existing wooden support piles will result in a minor gain in habitat, and may reduce potential stream damming from wrack buildup at the piles. As such, the project may improve fish passage conditions. No permanent adverse effects to physical and biological features necessary to support the salmonid life cycle including spawning, rearing, and migration habitats will occur as a result of the proposed Action. The proposed Action will not adversely affect or modify critical habitat.

5.8.2.3. NORTHERN SPOTTED OWL

Typical project activities would not result in visual or sound disturbance to nesting NSO located at least 0.20 mile from the proposed Project site. However, activities generating extreme sound levels will be scheduled to occur outside the nesting season at the Meadow Way Bridge Action Area. If work generating extreme sound levels must occur between June 1 – September 1, protocol-level surveys will be conducted to ensure no active nests are within disturbance distance of project activities. If an active nest is proximate to the Action Area and within a disturbance buffer confirmed by USFWS, no work generating extreme sound levels will begin until September 1, outside the nesting season. The one small understory tree planned for removal is not a potential nest tree and not likely to be used by NSO for foraging. The Action will not modify forested habitat and no changes will occur to NSO habitat as a result of the Action.

Chapter 6. Magnuson Stevens Fishery Conservation and Management Act of 1976 (as amended)

This act takes immediate action to conserve and manage fishery resources found off the coasts of the US, and the anadromous species and Continental Shelf fishery resources of the US, by exercising sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic anadromous species, Continental Shelf fishery resources and fishery resources in the special areas.

6.1. Essential Fish Habitat

6.1.1. Essential Fish Habitat Background

Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the MSFCMA to establish new requirements for EFH descriptions in federal fishery management plans. In addition the MSFCMA established procedures designed to identify, conserve, and enhance EFH for those species regulated under a federal fisheries management plan. Pursuant to the MSFCMA:

- Federal agencies must consult with National Marine Fisheries Service (NMFS or NOAA FISHERIES) on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NOAA FISHERIES must provide conservation recommendations for any federal or state action that would adversely affect EFH;
- Federal agencies must provide a detailed response in writing to the NOAA FISHERIES within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the effect of the activity on EFH. In the case of a response that is inconsistent with the NOAA FISHERIES' EFH conservation recommendations, the federal agency must explain its reasons for not following the recommendations.

EFH has been defined for the purposes of the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (NOAA FISHERIES 1999). NOAA FISHERIES has further added the following interpretations to clarify this definition:

- **"Waters"** include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate;
- **"Substrate"** includes sediment, hard bottom, structures underlying the waters, and associated biological communities;
- **"Necessary"** means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and

- **"Spawning, breeding, feeding, or growth to maturity"** covers the full life cycle of a species.

Adverse effect means any effect that reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), or site-specific or habitat-wide effects, including individual, cumulative, or synergistic consequences of actions.

EFH consultation with the NOAA FISHERIES is required regarding any federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the Proposed Action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH. The Magnuson-Stevens Act requires consultation for all federal agency actions that may adversely affect EFH. EFH consultation with NOAA FISHERIES is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location. Under Section 305(b)(4) of the MSFCMA, NOAA FISHERIES is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Wherever possible, NOAA FISHERIES utilizes existing interagency coordination processes to fulfill EFH consultations with federal agencies. For the proposed action, this goal is being met by incorporating EFH consultation into the ESA Section 7 consultation, as represented by this BA.

6.2. Managed Fisheries with Potential to Occur in the Action Area

The MSFCMA requires that EFH be identified for all federally managed species including all species managed by the Pacific Fisheries Management Council (PFMC). The PFMC is responsible for managing commercial fisheries resources along the coast of Washington, Oregon, and California. Managed species that have a potential to occur in the Action Area are covered under the Pacific Salmon Fishery Management Plan (FMP).

The Action Area falls within the Pacific Coast Salmon FMP. Chinook and Coho salmon are managed under this FMP; however, Coho salmon is extirpated from the tributaries of San Francisco Bay and are therefore not present within San Anselmo Creek. Chinook salmon, which do occur in San Francisco Bay, do not occur within the San Anselmo Creek watershed.

6.3. Potential Adverse Effects of Proposed Project on EFH

6.3.1 Adverse Effects on Essential Fish Habitat for Pacific Salmonids

Although no species covered under EFH are anticipated to occur, the Action Area still contains habitat identified as Pacific Coast Salmon EFH. No loss of habitat function or value is anticipated from the proposed project.

Approximately 0.21 acre (9,150 square feet) of temporary effects to EFH are expected to occur. Some beneficial permanent effects will occur within the EFH in the form of removal of the existing

wooden support piles and installation of roots wads; this may help improve fish passage by reducing potential stream damming from wrack buildup and fish rearing habitat. A total of four wooden piles will be removed from the creek bed totaling a gain of 12.6 square feet, and five piles will be removed from the unvegetated bank totaling 15.7 square feet. Temporary direct effects to EFH will occur should temporary de-watering be necessary and as a result of work in the creek bed. Temporary impacts may result from equipment access in the creek, but all excavations will occur on the creek banks, no excavations will occur within the creek bed except for fish habitat restoration to create pools where root wads will be installed. No change to the creek surface, substrate, or grade is anticipated to occur, and erosion control measures including de-watering the work area during proposed project activities will reduce the potential for increased sediment loads downstream of the Action Area. Implementation of BMPs during de-watering will prevent a temporary increase in turbidity downstream of the work area, and no adverse effects are anticipated. The Action at San Anselmo Creek is scheduled to occur when the creek is anticipated to have no flow, but pools containing water may be present and require de-watering. Therefore, no detectable temporary or permanent indirect adverse effects are anticipated to occur to EFH as a result of the proposed project.

A program of fish habitat restoration, using bio-engineering techniques, low earth berms and woody nooks, designed specifically for the site, will be implemented. The proposed berms and large wood would be installed during project construction and within the footprint of disturbance for the project. The current proposed location of the large wood is the bank along the access route, immediately upstream of the new retaining wall on the north side. No additional temporary impacts will result from the installation. The net effect will be restoring the site to a deep and wide soil “trough” traversing the bridge site for natural fish passage without any obstructions in the creek other than creek materials and native plants and may improve fish rearing habitat in the Action Area.

No loss of EFH will occur, and the Action is not anticipated to result in an indirect adverse effect to EFH because creek surface substrate and fish passage conditions will remain unchanged, and the Action Area does not contain habitat utilized by species managed by the Pacific Coast Salmon FMP.

6.4. Essential Fish Habitat Conservation Measures

6.4.1. Describe the conservation measures that have been incorporated into the project that will minimize the potential adverse effects to EFH.

The avoidance and minimization measures, project design, and species specific avoidance and minimization measures are described above in Section 1.4.5. These measures will be implemented and are summarized again in this section. Measures designed to avoid and minimize effects to critical habitat will be sufficient to avoid and minimize effects to EFH.

The Action at Meadow Way Bridge requires work within San Anselmo Creek in two seasons to complete the proposed Action and will be conducted when the creek during the low flow period, between June 1 – October 15 in both seasons. The stream channel will be restored to near pre-project conditions following the completion of bridge work, recreating the gradient which currently

exists. The creek bed throughout the project site will be restored to a trough-like flow conveyance environment. Restoration will use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation including creek gradient. Removal of six piles that are currently in the creek bed will reduce potential stream damming from wrack buildup. Fish habitat restoration including installation of earthen berms, root wads, and pools in the vicinity of the root wads is incorporated into the Action. Therefore, no permanent indirect effects are anticipated to occur to EFH or species managed by the Pacific Coast Salmon FMP as a result of the proposed Action. No changes to fish passage are anticipated.

6.5. Conclusions

Caltrans has determined that the proposed Action will not permanently adversely affect EFH for Pacific Salmonids although temporary impacts may occur. The Action is not anticipated to adversely affect EFH and permanent project impacts may be beneficial. The Action will not result in a loss of EFH. No changes in flow conditions are anticipated and fish passage conditions may be improved from the removal of the existing piles, and the Action Area and the greater San Anselmo Creek watershed does not contain habitat occupied or used by Chinook or Coho salmon species. Therefore, the proposed Action will have a minor, temporary adverse effect Pacific Salmonid EFH.

Chapter 7. Literature Cited

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Appendix A Official Species Lists

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: January 30, 2019
Consultation Code: 08ESMF00-2019-SLI-0801
Event Code: 08ESMF00-2019-E-02443
Project Name: Meadow Way Bridge Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-0801

Event Code: 08ESMF00-2019-E-02443

Project Name: Meadow Way Bridge Project

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Meadow Way Bridge is primarily wooden and has been determined to be structurally deficient and needs to be replaced. It serves as the only egress and ingress facility for nearly two dozen homes on Meadow Way. The bridge is supported at four locations within the creek banks, two of which are in the creekbed. The new bridge would be designed to clear the greater of the 50-year flows and two feet of freeboard, or the 100-year design flows, the former controlling in this case. It would be a 70 foot long single-span concrete arch bridge, supported on two new abutments, with no additional supports in the creek. The abutments would connect with wingwalls and retaining walls of varying lengths and heights at its four corners. The new bridge would be built on the south side of the existing bridge while the existing bridge remains in service, and relocated to its permanent location after the existing bridge is removed. Construction would take two seasons and work in the creek would be performed between June 1 and October 15 in order to avoid the spawning and migration season for protected California Central Coast steelhead.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.97603730364997N122.6003467512148W

Counties: Marin, CA

Endangered Species Act Species

There is a total of 18 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Short-tailed Albatross *Phoebastria (=Diomedea) albatrus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/433	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Mission Blue Butterfly *Icaricia icarioides missionensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6928	Endangered
Myrtle's Silverspot Butterfly *Speyeria zerene myrtleae* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6929	Endangered
San Bruno Elfin Butterfly *Callophrys mossii bayensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered

Flowering Plants

NAME	STATUS
Marin Dwarf-flax *Hesperolinon congestum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5363	Threatened
Santa Cruz Tarplant *Holocarpha macradenia* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6832	Threatened
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered
White-rayed Pentachaeta *Pentachaeta bellidiflora* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7782	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Intersection of USGS Topographic Quads with NOAA Fisheries ESA Listed Species, Critical Habitat, Essential Fish Habitat, and MMPA Species
Data NMFS Species List - November 2016 and last accessed January 2019

Quad Name	Bolinas	Novato	San Geronimo	San Rafael
Quad Number	37122-H6	38122-A5	38122-A6	37122-H5

X = Present on the Quadrangle

ESA ANADROMOUS FISH (E) = Endangered, (T) = Threatened											
COHO		CHINOOK			STEELHEAD					Eulachon (T)	Southern DPS Green Sturgeon (T)
SONCC (T)	CCC (E)	CC (T)	CVSR (T)	SRWR (E)	NC (T)	CCC (T)	SCCC (T)	SC (E)	CCV (T)		
	X					X					X
	X					X					X
	X					X					
	X		X	X		X			X		X

ESA ANADROMOUS FISH CRITICAL HABITAT											
COHO		CHINOOK			STEELHEAD					Eulachon	Southern DPS Green Sturgeon
SONCC	CCC	CC	CVSR	SRWR	NC	CCC	SCCC	SC	CCV		
	X					X					X
	X					X					X
	X					X					
	X			X		X					X

Intersection of USGS Topographic Quads with NOAA Fisheries ESA Listed Species, Critical Habitat, Essential Fish Habitat, and MMPA Species
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Quad Name	Bolinas	Novato	San Geroni	San Rafael
Quad Number	37122-H6	38122-A5	38122-A6	37122-H5

X = Present on the Quadrangle

ESA MARINE INVERTEBRATES		ESA MARINE INVERT. CRITICAL HABITAT	ESA SEA TURTLES				ESA WHALES	ESA PINNIPEDS	ESA PINNIPEDS CRITICAL HABITAT
Black Abalone (E)	White Abalone (E)	Black Abalone	East Pacific Green Sea Turtle (T)	Olive Ridley Sea Turtle (T/E)	Leatherback Sea Turtle (E)	North Pacific Loggerhead Sea Turtle (E)	Whales (see list below)	Guadalupe Fur Seal (T)	Steller Sea Lion
X		X	X	X	X		X	X	
X		X	X	X	X		X	X	

ESSENTIAL FISH HABITAT					MMPA SPECIES	
SALMON		Groundfish	Coastal Pelagic	Highly Migratory Species	MMPA Cetaceans (see "MMPA Species" tab for list)	MMPA Pinnipeds (see "MMPA Species" tab for list)
Coho	Chinook					
X	X	X	X		X	X
X	X	X	X			
X	X					
X	X	X	X		X	X

Appendix B Potential for Listed Species, Proposed Species, and Critical Habitat Documented in the Vicinity of the Action Area

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Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Birds					
northern spotted owl	*Strix occidentalis caurina*	FT	Old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees. Prefers high, multistory canopy dominated by big trees, trees with cavities or broken tops, woody debris and space under canopy.	HP	The BSA and immediately surrounding area are low-density residential developments and riparian woodland; however, riparian redwood forest community is in proximity to the BSA. This species has been documented to nest in dense forest approximately 0.28 miles southwest of the BSA (CDFW 2018b). No nesting habitat is present in the BSA.
American peregrine falcon	*Falco peregrinus anatum*	FD, BCC	Year-round resident and winter visitor in the region. Habitat variable, though usually associated with coasts, bays, marshes and other bodies of water. Nests on sheer, protected cliffs and also on manmade structures including buildings and bridges. Preys on birds, especially waterbirds. Forages widely.	A	High cliffs and tall buildings typically used for nesting by this species are absent from the BSA and immediate surrounding area. Large water-bodies which provide foraging habitat are absent from the BSA and vicinity.
California brown pelican	*Pelecanus occidentalis californicus*	FD	Colonial nester on coastal islands just outside the surf line. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators.	A	California brown pelican does not nest in Marin County (Shuford 1993). Additionally, suitable foraging habitat does not occur within 2 miles of the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
marbled murrelet	*Brachyramphus marmoratus*	FT	Feeds near shore; nests inland along the Pacific coast, from Eureka to Oregon border, and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland. Nests often built in Douglas-fir or redwood stands containing platform-like branches.	A	Despite the presence of riparian redwood forest in proximity to the BSA and the designated critical habitat 3.5 miles south of the BSA, marbled murrelet is not known to breed within Marin County (Shuford 1993, McShane et al. 2004, USFWS 2009).
short-tailed albatross	*Phoebastria albatrus*	FE	Highly pelagic; comes to land only when breeding. Nests on remote Pacific islands. A rare non-breeding visitor to the eastern Pacific.	A	Short-tailed albatross does not nest in Marin County. Additionally, suitable marine foraging habitat does not occur within 5 miles of the BSA.
California least tern	*Sternula antillarum browni*	FE	Colonial breeder on barren or sparsely vegetated, flat substrates near water. Breeding colonies in San Francisco Bay along estuarine shores and in abandoned salt ponds.	A	The BSA is not within the known breeding distribution of this species. Islands, shores, levees or salt ponds that support nesting by this species are absent. The BSA does not occur near marine environments to support foraging.
western snowy plover	*Charadrius alexandrinus nivosus*	FT, BCC	Federal listing applies only to the Pacific coastal population. Found on sandy beaches, salt pond levees and shores of large alkali lakes. Requires sandy, gravelly or friable soils for nesting.	A	The BSA and immediately surrounding area are low-density residential developments within a largely forested landscape. Sandy beaches, salt flats or alkali lake flats that this species inhabits are absent from the BSA and vicinity.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
California Ridgway's rail	*Rallus obsoletus obsoletus*	FE	Resident in tidal marshes of the San Francisco Bay Estuary. Requires tidal sloughs and mud flats for foraging, and dense vegetation for nesting. Associated with abundant growth of cordgrass and pickleweed. Largest populations in south San Francisco Bay.	A	The BSA is not within the known breeding distribution of this species. The BSA lacks any salt marsh habitat which this species requires for nesting and foraging.
Mammals					
salt-marsh harvest mouse	*Reithrodontomys raviventris*	FE	Found only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat. Do not burrow, build loosely organized nests. Require higher areas for flood escape.	A	The BSA and immediately surrounding area are low-density residential developments and riparian redwood forest. Marshes and tidal marine environments that are required to support this species do not occur within or near the BSA.
southern sea otter	*Enhydra lutris nereis*	FT	Nearshore marine environments from about Año Nuevo, San Mateo County to Point Sal, Santa Barbara County.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.
Amphibians and Reptiles					
California red-legged frog	*Rana draytonii*	FT	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of inundation for larval development. Must have access to estivation habitat.	A	No ponds or lakes exist nearby that could provide adequate still water habitat to support breeding by this species. Additionally, this species has not been documented in this portion of Marin County; the nearest documented occurrences are over 6 miles from the BSA (CDFW 2018a).

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Fishes					
green sturgeon	*Acipenser medirostris*	FT	Spawn in the Sacramento River and the Klamath River. Spawn at temperatures between 8-14 degrees C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	A	The BSA is not within the known distribution of this species (UC Davis 2018). Additionally, The BSA lacks any marine habitat which is required by this species for foraging.
tidewater goby	*Eucyclogobius newberryi*	FE	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in willow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	A	The BSA is not within the known distribution of this species (UC Davis 2018). Additionally, The BSA lacks any lagoon habitat which is required by this species.
delta smelt	*Hypomesus transpacificus*	FT	Lives in the Sacramento-San Joaquin estuary in areas where salt and freshwater systems meet. Occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay.	A	The BSA is not within the known distribution of this species (UC Davis 2018). Additionally, the BSA lacks any brackish water habitat which is required by this species.
Coho salmon - central California coast	*Oncorhynchus kisutch*	FE	State listing is limited to Coho south of San Francisco Bay. Federal listing is limited to naturally spawning populations in streams between Humboldt County and Santa Cruz County. Spawn in coastal streams 4-14C. Prefer beds of loose, silt-free, coarse gravel and cover nearby.	A, CH	San Anselmo Creek is designated as critical habitat for the species. However, the species is considered extirpated from the tributaries of San Francisco Bay (NMFS 2012, Brown and Moyle 1991).

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
steelhead - central California coast DPS	*Oncorhynchus mykiss*	FT	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	P, CH	San Anselmo Creek is designated as critical habitat for the central California coastal DPS of this species. Though two barriers to anadromy exist downstream of the BSA, the species is considered present within the creek.
chinook salmon - California coastal ESU	*Oncorhynchus tshawytscha*	FT	California Coastal Chinook Salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel.	A	The BSA is not within the known breeding distribution of this species (UC Davis 2018). This ESU is only known to spawn in tributaries along coastal California that lead directly to the ocean without going through San Francisco Bay. Additionally, the BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
longfin smelt	*Spirinchus thaleichthys*	FC	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	A	The BSA is not within the known distribution of this species. Additionally, the BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
eulachon	*Thaleichthys pacificus*	FT	Occur in nearshore ocean waters and to 1,000 feet (300 m) in depth, except for the brief spawning runs into their natal (birth) streams. Ranges from northern California to southwest Alaska and southeastern Bering Sea.	A	The BSA is not within the known distribution of this species. Additionally, the BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
Invertebrates					
Bay checkerspot butterfly	*Euphydryas editha bayensis*	FT	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. Plantago erecta is the primary host plant; Orthocarpus densiflorus and O. purpurscens are the secondary host plants.	A	The BSA is not within the known distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of coniferous forest. The BSA contains no serpentine soils that may support the host plants required by the species.
San Bruno elfin butterfly	*Callophrys mossii bayensis*	FE	Inhabits coastal mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium.*	A	The BSA is not within the known distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of coniferous forest. The BSA contains no grassland that may support the host plants required by the species.
mission blue butterfly	*Icaricia icarioides missionensis*	FE	Inhabits grasslands of the San Francisco peninsula. Three larval host plants: *Lupinus albifrons, L. variicolor*, and *L. formosus*, of which *L. albifrons* is favored.	A	The BSA is not within the known distribution of this species. The BSA does not contain grassland required to support the host plants of the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Callippe silverspot butterfly	*Speyeria callippe*	FE	Restricted to the northern coastal scrub of the San Francisco peninsula. Host plant is Viola pedunculata. Most adults found on east-facing slopes; males congregate on hilltops in search of females.	A	The BSA is not within the known distribution of this species. The BSA is in a low-density residential and forested habitat which does not contain scrub required to support the host plants of the species.
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	FE	Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County. Larval food plant thought to be Viola adunca.	A	The BSA is not within the known distribution of this species. The BSA is in a low-density residential and forested habitat. No dune or grassland habitat is present to support the host plants or foraging by the species.
California freshwater shrimp	*Syncaris pacifica*	FE	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy, willow pools away from main stream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	A	The BSA is not within the known distribution of this species. Suitable habitat for the species is primarily found within northern Marin County along the border with Sonoma County. This species has not been documented in San Anselmo Creek.
Plants					

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*	FE	Freshwater marsh and swamp, and riparian scrub. 5-360 m. Flowers May-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal freshwater marsh, swamp, or riparian scrub. The BSA lacks suitable habitat. No further actions are recommended for this species.
Franciscan manzanita	*Arctostaphylos franciscana*	FE	Serpentinite outcrops in chaparral. 60-300 m. Flowers January-April.	A	The BSA lacks suitable serpentine soils and chaparral habitat. No manzanitas (a woody perennial) were observed in the BSA. No further actions are recommended for this species.
Presidio manzanita	*Arctostaphylos montana* ssp. *ravenii*	FE	Serpentinite soil, chaparral, coastal prairie, coastal scrub. 20-215 m. Flowers February-April.	A	The BSA lacks suitable serpentine soils and chaparral habitat. No manzanitas (a woody perennial) were observed in the BSA. No further actions are recommended for this species.
Marsh sandwort	*Arenaria paludicola*	FE	Freshwater marsh. 10-170 m. Flowers May-August.	A	No suitable habitat. No further actions are recommended for this species.
Tiburon mariposa lily	*Calochortus tiburonensis*	FT	Serpentinite soil, valley and foothill grassland. Open rocky, serpentine. 50-150 m. Flowers March-June.	A	No suitable habitat. No further actions are recommended for this species.
Tiburon Indian paintbrush	*Castilleja affinis* ssp. *neglecta*	FE	Rocky serpentinite soil, valley and foothill grassland. 75-400 m. Flowers April-June.	A	No suitable habitat. No further actions are recommended for this species.
Sonoma spineflower	*Chorizanthe valida*	FE	Sandy coastal prairie. 10-305 m. Flowers June-August.	A	The BSA lacks suitable sandy coastal prairie habitat. No further actions are recommended for this species.
Presidio clarkia	*Clarkia franciscana*	FE	Serpentinite soil, valley and foothill grassland. 25-335 m. Flowers May-July.	A	No suitable serpentine habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Marin western flax	*Hesperolinon congestum*	FT	Serpentinite soil, chaparral, valley and foothill grassland. Known only from Marin, San Francisco, and San Mateo counties. In serpentine barrens and in serpentine grassland chaparral. 5-370 m. Flowers April-July.	A	No suitable habitat. No further actions are recommended for this species.
Santa Cruz tarplant	*Holocarpha macradenia*	FT	Coastal prairie, coastal scrub, Valley and foothill grassland, often clay. 10-20 m. Flowers June-October.	A	No suitable habitat. No further actions are recommended for this species.
Contra costa goldfields	*Lasthenia conjugens*	FE	Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools. 0-470 m. Flowers March-April.	A	The BSA does not provide suitable habitat. This species was not observed during the surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Beach layia	*Layia carnosa*	FE	Sandy soil, coastal dunes, coastal scrub. 0-60 m. Flowers March-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal scrub and dunes. The BSA lacks suitable habitat. No further actions are recommended for this species.
San Francisco lessingia	*Lessingia germanorum*	FE	Coastal scrub (remnant dunes) 25-110 m. Flowers June-November.	A	The BSA lacks suitable habitat. No further actions are recommended for this species.
White-rayed pentachaeta	*Pentachaeta bellidiflora*	FE	Valley and foothill grassland, coastal scrub, coastal prairie, open dry rocky areas, often serpentine. 35-620 m. Flowers March-May.	A	The BSA lacks suitable open dry rocky habit. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Tiburon jewel-flower	*Streptanthus glandulosus* ssp. *niger (previously Streptanthus niger)*	FE	Serpentinite soil, valley and foothill grassland. 30-150 m. Flowers May-June.	A	All known occurrences of this species in the vicinity of the BSA are associated with rocky serpentine soil. The BSA lacks suitable habitat. No further actions are recommended for this species.
Two fork clover	*Trifolium amoenum*	FE	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite), open sunny sites.5-415 m. Flowers April-June.	A	All known occurrences of this species in the vicinity of the BSA are found in open sunny sites in chaparral and grassland. The BSA does not have suitable habitat. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.

* Key to status codes:

FE	Federal Endangered
FT	Federal Threatened
FD	Federal Delisted
FC	Federal Candidate
BCC	USFWS Birds of Conservation Concern

*Presence:
Absent [A] - no habitat present and no further work needed.
Habitat Present [HP] -habitat is, or may be present. The species may be present.
Present [P] - the species is present.
Critical Habitat [CH] - proposed project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is *present.*

Appendix C Preparers Qualifications

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PATRICIA VALCARCEL, MS

Senior Wildlife Biologist

valcarcel@wra-ca.com

o: 415.524.7542

Years of Experience: 13

Education

MS, Wildlife Sciences, Oregon State University, 2011

BA, Environmental Sciences, Northwestern University, 2003

Professional Affiliations/ Certifications

USFWS Recovery Permit for giant gartersnake and San Francisco gartersnake (TE-64146A-1)

California Department of Fish and Wildlife Scientific Collecting Permit

The Wildlife Society

Specialized Training

- California Vernal Pool Crustacean Identification Class with Mary Belk, December 2015
- Biology and Management of the Alameda Striped Racer, Alameda County Conservation Partnership, May 2014
- San Joaquin Kit Fox Ecology, Conservation, and Survey Techniques, Central Coast Chapter of The Wildlife Society, Summer 2013
- Swainson's Hawks in California's Central Valley, Sacramento-Shasta Chapter of The Wildlife Society, Spring 2012
- Workshop on the Biology and Conservation of the California Tiger Salamander, Alameda County Conservation Partnership, June 2012

Patricia Valcarcel earned a MS in Wildlife Sciences while conducting research on the spatial ecology of the threatened giant gartersnake. She has worked on a variety of field research projects ranging from animal movements to behavior and reproduction. She has presented her work at conferences and published in peer-reviewed journals. She has also been trained on collection of samples for environmental DNA (eDNA) analysis and implemented this method for detection of giant gartersnake. The results are used in combination with other methods to help inform on presence of the cryptic species.

Patricia has extensive experience working with and permitting for special-status species in California. Her focus is reptiles and amphibian species, but has broad experience with wildlife species in California's Central Valley. Patricia has also led a large trapping and relocation effort for Pacific pond turtle, conducted protocol-level surveys for Swainson's hawk, burrowing owl, assists with sampling for California tiger salamander and vernal pool crustaceans, and performed assessments for San Joaquin kit fox and blunt-nosed leopard lizard.

Her primary responsibilities are to conduct surveys, habitat assessments, prepare associated technical reports, prepare permit applications, and consult with wildlife agencies on special-status wildlife species during the permitting process. She consults with both federal and state wildlife agencies and has prepared federal Section 7 Biological Assessments, federal Section 10 Habitat Conservation Plans, and California Incidental Take Permits. In addition, Patricia is involved in environmental permitting, permit compliance, and mitigation and monitoring efforts associated with these permits.

Representative Projects

Sherman Island Whale's Mouth Wetland Restoration Project, Sacramento County, California (2013 – 2015)

As part of continued collaboration with Ducks Unlimited, Inc. and the California Department of Water Resources (DWR), WRA assisted with the permitting process for a habitat restoration project on Sherman Island. Sherman Island is located in the extreme western Delta near the confluence of the Sacramento and San Joaquin Rivers. The project restored approximately 600 acres of palustrine wetlands on lands owned by DWR which are currently managed for flood-irrigated pasture lands. WRA performed rare plant surveys and consulted with USFWS for listed species including giant gartersnake and Delta smelt. Patricia conducted the habitat assessment for wildlife species; provided analyses and measures to avoid and minimize impacts for giant gartersnake, Delta smelt, and longfin smelt; and wrote technical documents used in the consultation process. She wrote and implemented the Pacific pond turtle Trapping and Relocation Plan and submitted the plan to California Department of Fish and Wildlife (CDFW) for approval. Patricia coordinated and led the pre-construction trapping and relocation and capture and salvage efforts during construction. A total of 222 individual turtles were successfully relocated during trapping and construction salvage efforts.

Flat-tailed Horned Lizard Habitat Modelling, Bureau of Land Management, Yuma, Arizona (2015 - 2017)
In partnership with San Diego Natural History Museum (SDNHM), WRA is creating a range-wide habitat model for the flat-tailed horned lizard (FTHL). The model was created by request from the Bureau of Land Management and other managing agencies to better assess potential for FTHL population locations and improve management on lands occupied by FTHL. WRA and the SDNHM have gathered all known locality datasets for FTHL and GIS information including geographic, topographic, and climate variables to create a predictive model that better assesses potential for FTHL in a given area. Patricia was involved at all stages from model software selection to review and analysis of data and methods. A presence-only habitat model was created using the MaxEnt software and available climate and habitat layers covering the entire range of the species. Presence data was taken from multiple sources including non-public data from researchers. Patricia also coordinated between organizations to ensure the habitat model completion timeline remained on schedule and presented to the FTHL Interagency Coordinating Committee on the draft and final model.

San Joaquin Council of Governments, Multi-Species Habitat Conservation and Open Space Plan On-Call, San Joaquin County, California (2012 – Present)
WRA is contracted for on-call services related to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). Patricia has performed pre-construction surveys and recommended avoidance and minimization measures to ensure participants are in compliance with the SJMSCP. Wildlife species and habitats Patricia has encountered as part of this work include burrowing owl, giant gartersnake, California tiger salamander, Swainson's hawk, and San Joaquin kit fox. She regularly conducts pre-construction surveys for Swainson's hawk, burrowing owl, and nesting birds in accordance with the SJMSCP for covered projects. In addition, Patricia has prepared and implemented several burrowing owl exclusion and monitoring plans in consultation with the California Department of Fish and Wildlife for various SJMSCP-covered projects. Implementation includes monitoring owls to ensure all young have fledged, installation of one-way doors for eviction, and monitoring of the site to ensure burrowing owl do not reestablish on-site during project activities.

Antonio Mountain Ranch Mitigation Bank, Placer County, California
The Antonio Mountain Ranch Mitigation Bank is a proposed approximately 800-acre wetland and protected species mitigation bank in Placer County. The bank serves as offsite mitigation for impacts to wetlands and non-wetland waters, including vernal pool and swale complexes, seasonal and perennial wetlands, and streams, and as a conservation bank, pursuant to federal and California Endangered Species Acts (for special-status vernal pool invertebrates in Placer County and surrounding counties). Swainson's hawk and tri-colored blackbird habitat credits are also provided for covered activities under the Placer County Conservation Plan. Patricia has assisted in special-status species surveys including sampling for vernal pool branchiopods and assessments for Swainson's hawk nesting and foraging use of the proposed Bank. She wrote the Section 7 Biological Assessment submitted to the Corps as part of the formal consultation process for effects to federal-listed vernal pool species during a proposed vernal pool and riparian restoration project in a previously farmed portion of the proposed Bank. She worked closely with the restoration design team to limit effects to existing vernal pool habitat while trying to restore functionality of the pool and swale system in the degraded area. She assisted with the formal consultation process and the project received the Biological Opinion in 2017. Restoration work is anticipated to begin in 2018.

Port of Oakland Maintenance Dredging, Oakland, California (2015 – 2018)
Maintenance dredging of the Port of Oakland Inner and Outer Harbor Channels is necessary to maintain passageways for the active port. The Pacific herring is a protected fishery, and dredging operations within the Pacific herring spawning season is unavoidable. Patricia is a California Department of Fish and Wildlife approved observer for the Project, and she manages a team of observers for the maintenance dredging Project. No spawn

events or Pacific herring activity were noted during dredge activities for 2015-2016 or 2016-2017 spawn seasons. All Project activities have been completed in compliance with the Project's Pacific Herring Work Window Waiver. The Project is on-going during the 2017-2018 herring spawn season.

Bruno's Island Bridge Repair Project, Southwestern Sacramento County, California (2014)
Bruno's Island is a small recreational boat harbor located off Andrus Island along the San Joaquin River in the western Delta. Bridge repair activities included sheathing piles within the channel and could potentially affect listed aquatic species. Patricia provided the hydroacoustic analysis and wrote the Section 7 Biological Assessment for Delta smelt, steelhead, and giant gartersnake. Through her work and advising on project design such as strike limits and use of bubble curtains outside of the work windows, a "Not Likely to Adversely Affect" was received from both NMFS and USFWS. This Project was completed in 2014.

Napa Valley Marina Permitting and Dredge Monitoring, Napa, California (2012 – 2017)
The Napa Valley Marina is an active recreational marina along the Napa River near Bull Island. Maintenance dredging of the Marina is necessary for boat access to and from the Napa River. Patricia was involved with a variety of environmental consulting services for the maintenance dredging including preparation of applications for the Dredged Materials Management Office (DMMO) and the California Department of Fish and Wildlife Streambed Alteration Agreement. Maintenance dredging permits included monitoring for special-status species and habitat conditions such as temperature and salinity monitoring for longfin smelt. Patricia oversees annual episode approval, reporting, monitoring, and compliance surveys for the multi-year maintenance dredging project.

Burrowing Owl Surveys and Passive Exclusion, Antioch, California (2013 – 2014)
The Walmart Store 2697 Expansion Project aims to develop and incorporate a 3.7 acre parcel adjacent to the existing store. Patricia conducted surveys and documented burrowing owls during the non-nesting and nesting seasons. She wrote the burrowing owl exclusion and monitoring plan approved by CDFW, and monitored the nest through the nesting season. Once all young were determined to have fledged and concurrence by CDFW, Patricia passively excluded the owls with one-way doors. She conducted weekly monitoring until all major ground disturbance had been completed and provided environmental sensitivity training to the construction crew.

Vulcan Materials Pilarcitos Quarry, San Mateo County, California (2012 – present)
The Pilarcitos Quarry is a 53-acre aggregate mining facility located on approximately 593 acres just east of the town of Half Moon Bay in rural San Mateo County. As part of the planned expansion and ongoing operations, and in compliance with the USFWS Biological Opinion (81420-2008-F-0294-1), a conservation easement was placed on 192.5 acres of the northern portion of the property, and two mitigation ponds were constructed to provide habitat for federally listed California red-legged frog (CRLF) and San Francisco garter snake (SFGS). Patricia was a USFWS-approved biological monitor and responsible for the compliance of the USFWS conservation measures and CDFW Streambed Alteration Agreement during the construction of the mitigation ponds during standard quarry maintenance activities and quarry expansion planning activities including exploratory drilling. Patricia is also involved in the permitting for a quarry expansion and continued operation through the lifetime of the quarry, approximately 100 years. She wrote the Section 7 Biological Assessment to be submitted to the Corps for effects to CRLF, SFGS, and marbled murrelet. The permitting process is ongoing.

White Rock Lake Maintenance Project, Monterey County, California (2014)
White Rock Lake is an artificially-dammed lake that has been maintained and used since 1925 for recreational swimming and fishing. The lake accumulated sediment and required maintenance-dredging to return the original

water capacity of the lakebed. Additionally, voluntary wetland and riparian restoration along the fringe of the lake was planned to increase quality habitat for the resident California red-legged frog. Patricia drafted and finalized the biological assessment submitted to the Corps for informal consultation regarding effects to California red-legged frog known to occur at the lake. The Project received a "Not Likely to Adversely Affect" determination based upon the avoidance and minimization measures provided in the assessment.

Wavecrest Coastal Trail Northern and Southern Alignments, Half Moon Bay, San Mateo County, California (2014- present)
WRA was the biological consultant for the Wavecrest Northern and Southern Trail Alignments in Half Moon Bay, California. WRA completed a comprehensive biological constraints analysis of the properties, including a wetland delineation, rare plant surveys, and coastal zone environmentally sensitive habitat (ESHA) analysis to document the existing sensitive biological resources. These studies informed the trail design prepared by Placeworks to minimize impacts to sensitive biological resources to the maximum extent feasible. Construction of the Northern Alignment was conducted and completed in the Fall of 2014, and Patricia was the lead biologist coordinating biological monitoring and sensitivity trainings during construction activities. Species of concern included California red-legged frog, San Francisco garter snake, San Francisco dusky-footed woodrat, and Choris' popcorn flower. She provided advice on wildlife exclusion fence placement, conducted pre-construction surveys for wildlife species, and coordinated biological monitors in compliance with Corps, RWQCB, CDFW, and Coastal Development Permit conditions. Patricia is also involved in the Southern Alignment and has assisted in preparation of biological constraints analysis for wildlife and ESHAs. Placeworks is incorporating the results of the analysis into trail location and design planning to limit impacts to ESHAs and wildlife species. The design is currently in review.

Publications

Halstead, B.J., Valcarcel, P., Wylie, G.D., Coates, P.S., Casazza, M. L., and Rosenberg, D.K. 2016. Active Season Microhabitat and Vegetation Selection by Giant Gartersnakes Associated with a Restored Marsh in California. Journal of Fish and Wildlife Management 7(2): 397-407.

Halstead, B.J., Wylie, G.D., Coates, P.S., Valcarcel, P., and Casazza, M. L. 2012. Bayesian shared frailty models for regional inference about wildlife survival. Animal Conservation 15: 117–124.

Valcarcel, P. 2011. Giant gartersnake spatial ecology in agricultural and constructed wetlands. Corvallis, Oregon, Oregon State University. Master's thesis.

Presentations

Giant Gartersnake Symposium, Elk Grove, California 2016
Patricia was author and presenter of the oral presentation entitled "Space Use by Giant Gartersnake in Structurally Different Wetland Habitats." The presentation focused on results of movements and space use sharing of adult female giant gartersnakes conducted as part of her graduate research. The symposium focused on sharing the latest scientific information on the biology, conservation, and management of the species to agency and private professionals, conservation managers, and students.

The Wildlife Society- Western Section Annual Conference, Pomona, California 2016
Patricia was author and presenter of the preliminary data obtained during a large scale trapping and relocation effort for Pacific (western) pond turtle. The talk was entitled "Population structure of western (Pacific) pond turtle

(*Actinemys marmorata*) at a pond in the California Delta: Results from a complete trapping and relocation effort." The project occurred as part of a Department of Water Resources wetland restoration project at Sherman Island in Sacramento County with assistance by Ducks Unlimited in wetland design and project coordination. Patricia authored and implemented the trapping and relocation plan with approval by California Department of Fish and Wildlife.

The Wildlife Society Annual Conference, Waikoloa, Hawaii 2011
Patricia co-authored an oral presentation based upon a portion of her graduate research. The talk, entitled "Microhabitat selection of the giant gartersnake," was presented by the first author and showed microhabitat and vegetation usage from two years of data. The data presented was incorporated into further research, and Patricia is second author of the final published article entitled "Active Season Microhabitat and Vegetation Selection by Giant Gartersnakes Associated with a Restored Marsh in California" (Halstead et al 2016).

Society for Northwestern Vertebrate Biology Annual Conference, Gig Harbor, Washington 2011
Patricia was first author and conference speaker presenting the results of her research conducted at Oregon State University in cooperation with the U.S. Geological Survey. The title of her presentation was "Wetland restoration, fragmentation, and conservation of the giant gartersnake," in which she explained how the results of an investigation into giant gartersnake space use have implications for wetland design and restoration which incorporate reptilian species.

The Wildlife Society- Western Section Annual Conference, Riverside, California 2011
Patricia was first author and presenter of the results of her research conducted at Oregon State University and in cooperation with the U.S. Geological Survey. She won second place for Best Speaker for her talk entitled "Space use of threatened giant gartersnakes in agricultural and constructed wetlands." This talk is currently in review for publication.

Pacific Northwest Climate Science Conference, Portland, Oregon 2010
A symposium poster entitled "Invasive species and changing climate conditions: How bullfrogs (*Rana catesbeiana*) will respond to shifting environments in the Pacific Northwest." Co-authored by Patricia and presented by lead author.

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Fisheries Biologist
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Years of Experience: 7

Education
BS Wildlife, Fish and Conservation Biology, UC Davis, 2012

Technical Training:
Cal-Nevada AFS Fish Passage and Screening Criteria Workshop Sacramento, California, 2015.

BCM Bat Survey Techniques. Portal Arizona. 2016

Professional Affiliations/ Certifications

Member: American Fisheries Society
Member: Salmonid Restoration Federation

MSHA Certified

Nick holds a B.S. degree in Wildlife, Fish and Conservation Biology from the University of California, Davis. Prior to coming to work with WRA, Nick worked in both the Sierra Nevada Mountains and the Central Valley of California, gaining experience surveying for and handling a variety of special-status species.

With WRA, Nick performs a variety of specialized tasks for aquatic species including: fish passage assessments, fish rescue and relocation, habitat and water quality assessments, biological monitoring. In addition, he has written a variety of project specific reports for projects ranging from bridge repair to pile driving. He has specialized in fisheries related issues and leads fish salvages, and writes assessments for fisheries related projects throughout the state.

Representative Projects

Mare Island Ship Yard Dry Dock Fish Salvage, Vallejo, California.
Mothballed vessels from the National Defense Reserve Fleet in Suisun Bay and private ships needing repair are brought to the dry docks at the former Mare Island Naval Shipyard. In accordance with permit requirements of USFWS, National Marine Fisheries Service (NMFS), and CDFW, biologists are required to be present during final stages of dewatering to rescue stranded fish from the dry dock. Captured fish are placed in aerated holding coolers, identified to species, counted, and measured before being returned to the Mare Island Channel of the Napa River. Nick serves a lead fisheries biologist for this operation. His primary responsibility for this project is leading the fisheries crew for the salvage operations. He also coordinates with resource agency personnel ensuring permit compliance, and writes technical reports following each salvage event. He is authorized to handle and relocate longfin smelt, Delta smelt, steelhead, fall, late-fall, winter and spring-run Chinook salmon as well as green sturgeon at this site. To date he has performed more than 75 salvages at this site. This project is ongoing.

Novato Creek Maintenance and Sediment Removal, San Rafael, California.
The Marin County Flood Control District conducts regular maintenance within the lower portions of Novato Creek as well as within Warner and Arroyo Avichi Creeks. Before work can begin a fisheries biologist must clear each reach to assure that steelhead are not present. Nick lead a team of volunteers who systematically cleared and relocated any native or special-status fish encountered in the creeks. During the salvage work, multiple steelhead were encountered and successfully relocated without injury.

Lucas Valley Bridge Emergency Repair, San Rafael, California.
Following winter storms in November 2017, erosion at the Lucas Valley Road Bridge required emergency repairs in order to maintain functionality of the bridge. WRA was contracted to salvage and relocate steelhead from Miller Creek before emergency repair operations could begin. Nick led the team of fisheries biologists and county volunteers for this project, successfully relocating 47 steelhead. No mortality was documented among steelhead and the project was completed on time. Methodology used for this project relied primarily on electrofishing.

San Geronimo Creek Fish Passage and Habitat Improvement Project, San Rafael, California.
As part of a fisheries restoration grant, this project sought to eliminate a major fish passage barrier and enhance fish habitat by using large woody debris. As part of the restoration effort, a fish rescue and relocation was required in order to capture and relocate Coho salmon and steelhead within or immediately downstream of the work area. Under the supervision of a CDFW biologist, Nick assisted with the fish rescue effort which successfully relocated over 400 Coho salmon and steelhead. Methods for rescue and relocation primarily relied upon electroshocking.

US Forest Service, Tahoe National Forest.
The Tahoe National Forest covers over one million acres and is home to 23 species of fish. Nick worked as a fisheries technician performing more than 200 hours of electrofishing and seine surveys throughout the forest for both population trend analysis, and range expansion surveys. He has handled several thousand fish during this project including: Lahontan cutthroat trout, rainbow trout, and brown trout. As part of this project he performed surveys on two watersheds to using the US Forest Service Basinwide Survey protocol to map, classify and measure current habitat conditions. He also performed habitat assessment surveys in those same watersheds for Sierra mountain yellow-legged frog and successfully identified adults, sub-adults and larval forms of the species.

Slinkard Creek, Walker, California.
Slinkard Creek is a tributary of the West Walker River and is located within the state wildlife refuge of Slinkard Valley. It contains one of the few remaining populations of federally threatened Lahontan cutthroat trout (LCT) as well as a large population of non-native brook trout. In cooperation with CDFW, Nick was contracted by California Trout to facilitate the removal of brook trout from Slinkard Creek to enhance conditions for LCT. Nick designed a series of portable Alaskan weirs to divide Slinkard Creek into reaches which were then systematically cleared of all fish using a backpack electrofisher. LCT were retained in the creek, and allowed to repopulate reaches once all brook trout were removed. Nick logged approximately 80 hours of time using a backpack electrofisher on this project while electroshocking, and capturing over 300 LCT. Mortality among LCT was exceptionally low (<1 percent) and approximately 1 kilometer of creek was restored during the season which he worked on this project.

Healdsburg Veterans Memorial Dam Spillway Repair, Healdsburg, California.
The Healdsburg Veterans Memorial Dam is a flashboard dam located within the city of Healdsburg on the Russian River. The dam is installed seasonally to create a temporary recreational lake. For this project, Nick was approved as the lead fisheries biologist, and biological monitor. He conducted pre-construction surveys for breeding birds as well as Pacific pond turtle. Turtles were identified near to the project area daily. As the approved fisheries biologist he lead a team of biologists who performed multiple fish salvages within the project area following de-watering events. All steelhead encountered during the salvages were captured and successfully relocated without injury or mortality.

Lower Miller Creek Channel Maintenance, San Rafael , California.
The Las Gallinas Valley Sanitary district regularly removes accumulated sediments from the channel within Lower Miller Creek. As part of the project mitigation efforts, a fish salvage was required in order to salvage and relocate any native fish in the proposed work area which stretched approximately ½ mile in length. Nick was approved as the lead fisheries biologist for the project and organized all of the associated salvage work on Lower Miller Creek.

All work was conducted in accordance with project permits and the creek was effectively cleared of native fish, prior to the start of dredging and in accordance with project permits.

Frenchman's Creek Water District, San Mateo County.
Frenchman's Creek Water District (FCWD) is a small water service provider located north of Half Moon Bay along coastal San Mateo County. A CDFW 1602 permit allows for the temporary installation of a flashboard dam and water withdrawal from the system for agricultural purposes. Nick serves as a fisheries biologist for this project, which involves monitoring flow, water quality sampling, as well as habitat connectivity and condition for steelhead during the diversion period. This project is currently ongoing.

Napa Dry Bypass, Napa, California.
The Napa Dry Bypass is part of a series of flood control projects headed by the Army corps of Engineers designed to divert 100 year flows around the oxbow reach of the Napa River to avoid flooding the Soscol Gateway area in downtown Napa. Nick was approved as the lead fisheries biologist for this project, and conducted multiple fish salvage operations at the site. During the salvage operations all steelhead encountered were successfully relocated without mortality or injury. Nick assisted in otter trawl surveys and fish exclusion work which were required during pile driving operations.

UC Davis, Fangue Laboratory, Davis California.
Research in the Fangue lab focused on understanding the physiological adaptations that allow animals to survive in complex environments. As part of his work with the laboratory, Nick conducted experiments to assess the physiological responses to conditions such as critical thermal, stimuli aversion, and entrainment of native fishes. The fish used in these experiments were raised and cared for in a hatchery that he helped to maintain and construct. Species cared for at the laboratory included: northern DPS green sturgeon, fall-run Chinook salmon, hardhead and Sacramento splittail.

Red Rocks Warehouse Creosote Removal and Pacific Herring Habitat Restoration Project, Richmond, California
WRA helped to prepare plans for monitoring light availability and turbidity to protect local eelgrass beds during the removal of creosote pilings and other anthropomorphic materials from the dilapidated Red Rocks Warehouse facility. Nick assisted in conducting a light and turbidity monitoring studies following National Marine Fisheries Service (NMFS) protocols. The project used a WRA vessel to deploy light monitoring loggers and collect turbidity samples during work to assure that pile removal operations were not impacting nearby eelgrass beds. Nick was also and approved to monitor for Pacific herring, and performed surveys in compliance with construction permits.

Port of Oakland Maintenance Dredging, Oakland, California.
Maintenance dredging of the Port of Oakland Inner and Outer Harbor Channels was necessary to maintain passageways for the active port. Pacific herring is a protected commercial fishery, and dredging operations within the Pacific herring spawning season were unavoidable and required observers to assure operations did not occur during spawning events. Nick was a CDFW approved observer for the Project. No spawn events or Pacific herring activity was noted during dredge activities. All Project activities were completed in compliance with the Project's Pacific Herring Work Window Waiver.

Port of Richmond Inner Harbor Maintenance Dredging, Richmond, California.
Maintenance dredging for the Port of Richmond was conducted in the winter of 2014 to maintain passageways for heavy ships entering and exiting the port. Pacific herring is a protected fishery, and dredging operations within the harbor overlapped with the Pacific herring spawning season. Nick acted as an approved CDFW observer for the Project. During operations, two spawning events occurred within or adjacent to the Project Area. Nick observed

the spawning events aided crews with required procedures to maintain compliance and avoid impacts to the spawn. All Project activities were completed in compliance with the Project's Pacific Herring Work Window Waiver.

APPENDIX B

Cultural Reports
(Archaolgeical Report confidental prepared under separate cover)

HISTORICAL RESOURCES EVALUATION REPORT

Meadow Way Bridge (Bridge 27C0008) Replacement Project

Fairfax, California

Federal Aid Project No. BRLO-5277 (025)

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 U.S.C. 327 and the Memorandum of Understanding dated December 23, 2016, and executed by FHWA and Caltrans.

Reviewed By:

Helen Blackmore, PQS, Principal Architectural Historian
California Department of Transportation, District 4

Approved By:

Helen Blackmore, Branch Chief,
Built Resources / Architectural History
Office of Cultural Resources Studies
California Department of Transportation, District 4

Prepared by:

Christopher McMorris, Partner / Architectural Historian
Heather Miller, Historian; Cheryl Brookshear, Historian
JRP Historical Consulting, LLC
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July 2019

SUMMARY OF FINDINGS

The Town of Fairfax, in coordination with the California Department of Transportation (Caltrans), is proposing to replace the Meadow Way Bridge over San Anselmo Creek (Bridge No. 27C0008). The proposed project involves temporary closure of the crossing, retrofit of the existing bridge support bents, and tying the bridge super and sub structure together. The project vicinity and location are illustrated in **Figures 1** and **2** in **Appendix A**. The Area of Potential Effect (APE) for this project is **Figure 3** in **Appendix A**.

The studies for this undertaking were carried out in a manner consistent with Caltrans' regulatory responsibilities under Section 106 of the National Historic Preservation Act (36 CFR Part 800) and pursuant to the January 2014 *First Amended Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section I 06 of the National Historic Preservation Act* (Section 106 PA). The Town of Fairfax is the lead California Environmental Quality Act (CEQA) and sponsoring agency of this undertaking.

JRP Historical Consulting, LLC (JRP) prepared this Historical Resources Evaluation Report (HRER) and identified four historic-period properties in the project APE that require formal evaluation (see table below). These properties are shown on the APE with Map Reference (MR) numbers. None of these properties meet the criteria for listing in the National Register of Historic Places (NRHP). This conclusion is pursuant with Stipulation VIII.C.2 of the Section 106 PA. The Meadow Way Bridge over Anselmo Creek, built in 1950, was previously evaluated as part of the Caltrans Historic Bridge Inventory and found not eligible for the NRHP. Additionally, pursuant to Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using criteria outlined in Section 5024.1 of the California Public Resources Code, the four resources are not historical resources for the purposes of CEQA. No state-owned properties are located in the APE. The Department of Parks and Recreation (DPR) 523 forms for the four evaluated properties are in **Appendix B**

Historic-Period Properties Evaluated in this HRER

Map Reference	Address / Assessor Parcel Number	Year Built
1	1 Meadow Way / 003-122-09	1947
2	333 Cascade Drive / 003-102-26	1959
3	6 Meadow Way / 003-102-19	1955
4	7 Meadow Way / 003-122-22	1948

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ATTACHMENTS

1 PROJECT DESCRIPTION[1]

The project site is located in a developed area of the Town of Fairfax in Marin County (Figure 1 and Figure 2). The project site consists of Meadow Way Bridge, California Department of Transportation (Caltrans) Bridge Number 27C-0008, which is located over San Anselmo Creek between Cascade Drive and Meadow Way within the western portion of the Town. The project site consists of Assessor's Parcel Numbers (APNs) 003-102-18 and 003-122-41.

The project site is located within a residential neighborhood zoned for single-family residential land use. San Anselmo Creek bisects the project site. Views of the project site and surrounding land uses are provided in Figures 3 and 4, below.

The existing Meadow Way Bridge is reported to have been constructed in the 1950s over San Anselmo Creek in the Town of Fairfax by the U.S. Army Corps of Engineers (Corps). The existing, primarily wood bridge has five spans with four bents in the creek, is approximately 70 feet long and 14 feet wide, and supports a narrow single travel lane and a narrow adjacent pedestrian path approximately 20 feet above the creek bed. The bridge runs in a northwest-southeast direction while the creek flows towards the northeast under it. The bridge serves as the only egress and ingress facility for nearly two dozen homes on Meadow Way across the creek from Cascade Drive. The bridge is supported at four locations within the creek, each location consisting of three 12-inch diameter wooden piles driven into the ground to an unknown depth. Some of the wooden bridge timbers have been preserved with creosote.

San Anselmo Creek runs through a relatively wide and deep section of the waterway and an S-bend at the bridge location. The bridge is labeled as Structurally Deficient (SD) by Caltrans and will be replaced with a one-lane single span bridge. The site/bridge configuration has caused historic bank erosion and bridge foundation scour at the site, which will also be corrected by the proposed project so that it will not affect the new bridge. The existing structure is not eligible for placement in the National Register of Historic Places (NRHP).

Construction Schedule

Construction will take two seasons and work in the creek will be performed only after June 1 and must end prior to October 15 in order to avoid the spawning and migration season for the protected California Central Cost Steelhead. Therefore, the bridge will be installed in its temporary location during one season, and the project will be completed within the following season. In compliance with the Town's Noise Ordinance, construction activities will be limited to the hours of 8:00 a.m. to 5:00 p.m. on weekdays, and 9:00 a.m. to 5:00 p.m. on Saturdays, with no noise-generating construction on Sundays or Holidays. Placement of the new bridge in

[1] WRA provided this project description in January 2019.

its permanent location –may be the one exception regarding construction hours. As traffic will need to be shut down in order to move the bridge to its permanent location, this may occur in one evening after 5:00 p.m. in order to provide the least disruption for local residences that depend on this bridge for access.

Bridge Design

The new bridge will be designed to clear the greater of the 50-year flows and two feet of freeboard, or the 100-year design flows, the former controlling in this case. It will be a 70-foot long single-span concrete arch bridge supported on two new abutments and no additional supports in the creek. The abutments will connect with wingwalls and retaining walls of varying lengths and heights at its four corners. See Figure 5 (Site Plan) for the proposed bridge design. The existing bridge is only 14-feet wide and Caltrans has determined the bridge is currently too narrow for both automobiles and pedestrians to use the bridge safely. The replacement bridge will include a 21.5-foot-wide deck to allow safe passage for both automobiles and pedestrians. The proposed replacement bridge will also include raised reflective pavement markers at proper intervals to alert the drivers and pedestrians of the two separate travel zones. The new bridge will comply with federal and state design codes and weight limits and will do away with the deficiencies of the existing bridge.

Construction Phasing

Where the existing bridge sits tucked up against the northern boundary of the Town's right-of-way (ROW), the new bridge will be located in the middle of the ±40-foot-wide ROW. Even as such, the footprints of the existing and new bridge will overlap. For this reason, the new bridge will be built on the south side of the existing bridge while the existing bridge remains in service, and relocated to its permanent location after the existing bridge is removed. Thus, the existing bridge will be replaced in stages, as follows:

<u>Stage 1 Construction</u>

The first season of construction will be spent on Stage 1 of the improvements. During this stage, traffic will continue using the existing bridge. The southern halves of each of the two new cast-in-place concrete abutments will be constructed approximately in line with locations of the existing bridge abutments. These are only portions of the permanent abutments, and are designed to support the new bridge in its temporary location adjacent to and south of the existing bridge during Stage 1.

For Stage 1 construction, an access ramp to the creek will be necessary. This earthen ramp will be used to transport of materials and heavy equipment, such as pile drilling rigs, dump trucks cranes, loaders, excavators, large containers, etc., to the creek bed elevation. The ramp will be located on the southwest quadrant of the bridge behind a proposed retaining wall connecting with

the bridge. This wall is needed to stop the historic erosion from taking place adjacent to the bridge abutment, threatening to undermine the abutment and private properties on both north and south sides of the bridge.

The access road will be an approximately ±230-foot-long ramp at 10% grade, half of which will be behind the above-referenced retaining wall, the rest winding around the wall's lower end and doubling back on the creek bed in front of the wall. For the second half of the ramp temporary fill on the creek bed will be necessary. This ramp will facilitate the equipment for wall and abutment foundation excavations on both sides of the creek. To build the ramp, temporary earth retention, using soil nails next to private property and the opposite edge of the ramp, will be necessary. Excavation spoils, required for backfilling later on will be stored in containers placed on the creek bed temporarily due to lack of space above at the roadway level. The remainder of the spoils will be hauled away on a daily basis. Any creosote treated timber piles or surrounding contaminated soils will be disposed of at an appropriate facility permitted to handle hazardous waste.

Removal of a bay tree and invasive blackberry bushes on the southwest corner of the new bridge, and pruning and removal of other vegetation in the construction zones will be necessary. According to the Town's Municipal Code Chapter 8.36 (Trees), a tree removal permit is required for the removal of any tree within the Town. The creek bed in the Area of Potential Effect (APE) will be used by the construction operations. Very little to no creek flow is expected during the peak summer construction months. However, the contractor will be required to install a bypass pipe to convey certain minimum low-flow volumes through the construction site and released downstream of the bridge. This will be accomplished through installation of a low dam across the creek bed upstream of the bridge to collect the summer flows and guide it to the pipe. Turbidity and water quality tests will be performed regularly, as required. Any water collected in excavation pits or pools on the creek bed will be run through sediment control tanks, such as a Baker Tank, before being released to the creek.

To construct the initial halves of the new abutments, the approach embankments behind them and next to the current approach roads will also need to be excavated. In order to avoid undermining the approach roadways and abutments of the existing bridge while it is still in operation, the embankments behind and in front of the existing abutments will be retained temporarily with soil nails perpendicular to the roadway alignment. Traffic will be separated from the construction area with temporary concrete barrier railings (Type K) during this stage.

Since geotechnical borings and investigations have been conducted at the site, it is known that the bridge abutments and retaining walls attached to the abutments will need to be supported on piles. To minimize disturbance to the residents, 24-inch diameter cast-in-drilled-hole (CIDH) concrete piles, which are significantly quieter to install than driven piles, will be used to support the walls. For this, the creek bed will be excavated approximately eight feet deep to reach the

approximate elevation of the concrete piles heads. After completing the excavations, drilling rigs will be called upon to drill the 24-inch-diameter CIDH piles supporting the future structural elements. The drilling auger will be mounted on a truck that can negotiate the access road and be capable of drilling deep holes with augers added on progressively. The drilling spoils will be spun loose from the auger, dumped in containers and hauled away.

Due to the riverine environment of the operations, underground and surface water may seep into the drilled holes and excavations, potentially threatening their collapse and/or contamination of the concrete that will be poured later on. For this reason, the contractor will use various wet-drilling hole stabilization techniques, such as driving a steel pipe sleeve into the hole all the way to the bottom, simultaneous with drilling. In this case, the reinforcement cage is placed in the hole using a crane and the concrete is pumped from the bottom of the hole up using a tremie pipe. This way, any water in the hole is displaced to the top, vacuumed and collected in containers. At the same time of the concrete pour, the steel sleeve is extracted, leaving behind a deep hole filled with steel rebar and clean concrete. Another wet-drilling technique will be filling the hole with slurry, such as a drilling polymer, that displaces the water and provides hole wall stability through hydrostatic pressure before concrete is poured in. In the case of slurry displacement method, the steel cage is placed in the slurry, the heavier concrete is again pumped from the bottom up, pushing the lighter slurry up, which is then vacuumed into special tank trucks for disposal off-site. Again, as the clean concrete reaches the top and all of the slurry has been picked up, the result will be 24-inch diameter concrete piles. The piles are then ready to be capped with a concrete footing (or pile cap, as sometimes called).

Once the concrete pile caps are constructed, their top surface will be five to six feet below the creek bed. At this point, these foundations of the new walls and bridge abutments will be protected with filter fabric and a two- to two and a half--foot layer of rock riprap on top for scour control. Ultimately, the riprap will crawl up on the wall face to some height and be subsequently covered with three feet of creek bed materials, restoring the creek bed and embankment slopes to their original levels through the site. The net effect will be restoring the site to a deep and wide soil “trough” that traverses through the bridge site, providing natural fish passage without any obstructions in the creek, or anything other than creek materials and native plants.

Once the southern (upstream) halves of the abutments and the two upstream, connecting retaining walls are constructed, the new concrete superstructure will be cast to span them immediately adjacent to and south of the existing bridge. The bridge abutments will be cantilevered walls, providing seats for the ends of the new bridge superstructure. This location of the new bridge superstructure will be temporary. The design concept will utilize two concrete arch ribs spanning the abutments and supporting vertical spandrel columns, which, in turn, will support a thin concrete deck slab and railings at the top. The bridge will be 21.5 feet wide from edge to edge and have a 12-foot-wide lane, a one-foot-wide buffer, and a five-foot-wide sidewalk

with a barrier and hand railings on both edges of the deck. Due to space limitations, 1 foot and 9 inches of the final deck width will be cast in Stage 2, described below. The arch ribs may be cast in place in wooden forms supported on a wooden or steel falsework system temporarily placed on the creek bed. Alternatively, the arch elements may be precast, transported to the site and erected without falsework on the creek bed. The arch ribs will be connected to each other for stability with four transverse beams. Once the arch rib concrete has cured, for the cast-in-place option, and gained sufficient strength, the falsework will be removed. The arch ribs and the transverse connecting beams will be timed to gain strength by the end of the first dry season so that they are self-supporting once the falsework is removed by October 15. The remainder of formwork, if needed beyond the dry season, will be hung from the arch ribs themselves above the 100-year flows from that point forward.

At the conclusion of Stage 1, the southern halves of the abutment walls and the retaining walls connecting to them, as well as the new bridge superstructure, will be completed. The underground riprap fortifications in front of the completed abutments and walls will be in place, the access road into the creek terminated, and the creek bed in the area of the Stage 1 construction will be restored. The new bridge, in its temporary location, will be ready for service, and traffic will be conveyed away from the existing bridge to the new bridge. At the end of the season, the site will be cleaned up and debris removed, the equipment will be taken away, and the site winterized until the next season. If the bridge is not ready for traffic at the end of Season 1, the existing bridge will remain in service during the following winter and early spring.

Stage 2 Construction

Stage 2 construction, if not started near the end of Season 1, will take place during the second season of construction. By the end of the first season, the new bridge will be in its temporary location, the temporary approach roadways are constructed south of the existing bridge, and the vehicular and non-motorized traffic will be using the new bridge. Cars and pedestrians will be kept within the small detour area with Temporary Railing (Type K) and temporary fencing. Prior to the removal of the old bridge, the existing “wet” utility pipes (sewer, water and gas) will likely be placed on a shoofly north of the existing bridge and supported in place during construction. They will eventually be relocated, housed, and hung under the existing bridge deck.

At this stage, the existing bridge will be removed piece by piece with a crane or two, starting with its superstructure members. To avoid dropping pieces of the bridge into the creek, special catchment containers and bridge removal methods will be specified. After the removal of the superstructure, the wooden pile extensions will be cut at least three feet below the creek bed elevations and the holes backfilled with existing creek materials. The creosote-laden wood timbers will be disposed of by the contractor at an appropriate facility permitted to handle hazardous waste.

After the bridge removal, the northern halves of each of the two abutments and the two downstream wingwalls connecting with the abutment corners will be constructed. Excavations, CIDH pile and rock riprap installations, and backfilling over the riprap will be completed similar to Stage 1 construction. The slopes above the retaining walls and wingwalls will be contour-graded. This aspect of the work can continue into the Final Stage, described below. During this stage, the excavations for the north abutments and wingwalls will continue to be protected from traffic with Temporary Railing Type K. The areas behind the walls will be backfilled and approach slabs and the approach roadways will be constructed in line with the alignment of the bridge in its final position, which will be approximately in the middle of Meadow Way's ROW.

Final Stage Construction

The new bridge will be closed for a few hours during one night or mid-day operation when little or no traffic is expected. The new bridge superstructure will be either pushed hydraulically sideways to the north or lifted with a crane on each side and placed back on the abutment seats at its final location near the middle of Meadow Way. The remaining 1'-9" wide strip of the deck width will be cast after this move. Since this is the only access to the homes on the other side of the creek, emergency fire and paramedic crews will be stationed on both sides of the bridge to provide emergency services to surrounding residences. After the relocation of the new bridge to its final position, the bridge will be reopened to traffic. Approach railings at all four bridge corners, landscaping and vegetation restoration with native plants (trees, bushes and other ground cover) on all affected slopes, fencing, and other surface improvements around the bridge will continue until project completion. See Figure 6 (Planting Plan) for the proposed vegetation of the site. The creek bed throughout the project site and will be restored to a trough-like flow conveyance environment. In addition, a log-rootwad revetment and a program of fish habitat restoration, using bioengineering techniques, low earth berms and woody nooks, designed specifically for the site, will be implemented. The wet utilities will be rerouted under the new bridge and the smaller "dry" utilities may be placed inside the barrier railings, the deck or the sidewalk.

1.1 Area of Potential Effects

In accordance with Section 106 PA Stipulation VIII.A, the Area of Potential Effects (APE) for the project was established in consultation with Helen Blackmore, PQS – Principal Architectural Historian and Jae-Myung Lee Local Assistance Engineer, and Garrett Toy, Town of Fairfax in July 2019. The APE map is in Appendix A, Figure 3.

The Architectural APE was developed by the Town of Fairfax and WRA Environmental Consultants with input from JRP. The APE encompasses areas that may be directly and indirectly affected by the project. The APE is a polygon that includes Meadow Way between the eastern side of Cascade Drive to the north east to the norther side of Meadow Way to the

southeast. The APE includes one parcel deep on either side of Meadow Way encompassing five residential parcels and the adjoining streambed. The APE also includes a staging area located within the street right of way of Hickory Road between Cascade Drive and Cypress Drive, approximately 0.6 miles northeast of the project area on Meadow Way.

2 RESEARCH AND FIELD METHODS

Survey and evaluation for the Meadow Way Bridge replacement project included research for developing a general historic context relative to Marin County, Fairfax, and The Cascades subdivision in which some of the properties in the APE are located, well as resource-specific research to confirm dates of construction, establish the evaluated the properties' physical histories, and to place the properties into their appropriate historic context. JRP conducted research at the California State Library, Shields Library at University of California Davis, Anne T. Kent California Room Marin County Free Library, Marin County Recorder's Office, Town of Fairfax records, JRP's in-house library, and online sources.

In addition, JRP examined standard sources of information that identify known and potential historic resources to determine whether any buildings, structures, objects, districts, or sites had been previously recorded or evaluated in or near the APE. This included review of the California Historical Resources database (includes State Landmarks, California Register of Historical Resources [CRHR], and Points of Interest), NRHP database, as well as the results of a California Historical Resources Information System records search (Northwest Information Center File No. 17-0529, September 15, 2017) performed by Adrian Whitaker of Far Western Anthropological Research Group, Inc. (Far Western). JRP also reviewed the Caltrans Historic Bridge Inventory (see **Appendix C** for the Caltrans Historic Highway Bridge Inventory Sheet for Bridge 27C0008, which was built in 1950). The records center search identified no previously identified resources near or in the APE.[2]

JRP staff conducted a field survey of the APE on September 20, 2017 and recorded the four historic-period properties in the project APE that require formal evaluation. JRP staff did not identify any other buildings, structures, or objects in the APE that required recordation.

JRP identified potential local interested parties for this project and sent notification letters on December 11, 2018. Recipients of the letter were the Fairfax Historical Society and the Marin History Museum. The Fairfax Historical Society responded that the early bridges over San Anselmo Creek are significant to Fairfax, and that the replacement of the existing bridge will change the character of the road from rural to urban. They also expressed concern that the project's expense is excessive. The Marin History Museum did not have any comments and invited researchers to visit the museum. A communications log and a copy of the correspondence are in **Appendix D**.

[2] National Park Service, National Register Spreadsheet, downloaded from, www.nps.gov/nr/research/index.htm (accessed December 2018); Office of Historic Preservation, *California Historical Resources,* Available at http://ohp.parks.ca.gov/ListedResources/?view=county&criteria=17, Accessed December 2018; Northwest Information Center, Sonoma State University to Adrian Whitaker of Far Western Anthropological Research Group, Information Center Response File No. 17-0529, September 15, 2017; Caltrans Historic Bridge Inventory is online at: http://www.dot.ca.gov/hq/structur/strmaint/historic.htm, Accessed December 2018.

3 HISTORICAL OVERVIEW

Fairfax sits at the top of Ross Valley in Marin County west of San Rafael where Fairfax Creek and San Anselmo Creek join and flow into Corte Madera Creek and out to San Francisco Bay. It is the most inland of the Ross Valley towns, sitting along the only east west route through Marin County, Sir Francis Drake Boulevard. Originally Fairfax was an agricultural area, but improved transportation from San Francisco – first from ferries, then railroads, and finally auto traffic over the Golden Gate Bridge – transformed it into a summer retreat and recreation area and finally a bedroom commuter community. In the early twentieth century, the town included a mix of summer commuters from San Francisco and recent Italian immigrants working on the Marin Municipal Water District's Alpine Dam in central Marin County. The steep terrain and surrounding wildlife areas prevented Fairfax from sprawling during the post-World War II building boom and it remains a deliberately small town in the wooded hills of Marin County.

3.1 Early Settlement

European explorers reached the Marin coast in 1579, but settlement awaited Spanish expansion northwards along the coast from the Golden Gate. Spanish missionaries established Mission San Francisco Delores on the southern side of the Golden Gate in 1776 staking claim to the area. Russian establishment of Fort Ross as a supply point in 1812 encouraged the Spanish to establish Mission San Rafael Archangel north of the Golden Gate along the protected San Francisco Bay in 1817. Establishment of Mission San Rafael was to prevent further Russian settlement in the area and to expand Spain's holdings. Mission San Rafael was the last mission established in California under Spanish control. Mexico overthrew their colonial ties to Spain and established itself as an independent country in 1821. With the secularization of missions in 1834 the area that was to become Marin County was divided into land grants.[3]

Among the 21 ranchos that make up Marin County is *Canada de Herrera*. The rancho covers the area at the head of Ross Valley now occupied by Fairfax and San Anselmo. Acting governor Manuel Jimeno granted the rancho to Domingo Sais in 1839. Following transition to American rule with statehood in 1850, Sais was the first area rancho holder to prove his claim. He died shortly after proving his claim, and the rancho was divided among heirs and portions sold to repay debts.[4]

[3] William Sagar and Brian Sagar, *Images of America Fairfax* (Charleston, SC: Arcadia Publishing, 2005), 7; Jack Mason and Helen Van Cleave Park, *Early Marin* (Petaluma, CA: House of Printing, 1971), 3-4, 9; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area and Point Reyes National Seashore California, Volume 1* (Denver, Colorado: National Park Services, 1980), 1, 20, 29, 31; R. Naylor Rogers, *Marin County California* (Sausalito, California: Sausalito News, 1907), n.p.

[4] Jack Mason and Helen Van Cleave Park, *Early Marin,* 73-74, 76; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 1,* 33; Warren A. Beck and Ynez D. Haase, *Historical Atlas of California* (Norman, Oklahoma: University of Oklahoma Press, 1974) 29; J.P. Munro-Fraser, *History of Marin County, California* (San Francisco: Alley, Bowen & Co, 1880), 192.

Domingo Sais gifted a portion of the land that was to become Fairfax to Dr. Alfred W. Taliaferro, the first doctor in the area and a hunting friend. Taliaferro in turn gave the land to his friend Charles Fairfax. Fairfax, a British lord before immigrating to California, was involved in California politics serving in county and state roles until his death in 1869 while attending the National Democratic Convention. Fairfax's home, Bird's Nest Glen, was situated on the gifted land in *Canada de Herrara*, and Charles and his wife Ada, along with subsequent owners, were noted for their hospitality at the property through the end of the nineteenth century and early twentieth century amid the surrounding ranches and farms.[5]

3.2 Arrival of the Railroad and Establishing a Community

Following California statehood San Rafael became the county seat for Marin County. The next largest town was on the Pacific Coast at Tomales. The coast range made inland travel difficult, but communities formed at Novato and Nicasio, north of where Fairfax was to form. In the early years, Marin County provided timber, dairy, poultry, and some crops for consumption in San Francisco. Easy water transport to San Francisco and its rapidly expanding markets was the key to growth for early Marin County towns. Regular ferry service between San Rafael and San Francisco was inaugurated in 1855. In 1868 enterprising developers established the Sausalito Land and Ferry Company providing service between San Francisco and the southern end of Marin County. Schooners also regularly plied the Pacific Coast.[6]

Inland development in the Ross Valley, however, awaited the development of larger transportation networks. Investors with tracts of redwoods along the Russian River formed the North Pacific Coast Railroad in 1871 to build a railroad across Main County connecting their stands of redwoods with San Francisco Bay markets via the Marin ferries. Their initial promise was to connect the two largest towns in Marin County, Tomales on the Pacific Coast and San Rafael on the bay. The more ambitious plan was to construct a railroad from Sausalito at the southern point of the county all the way to Gualala River on the north coast of Sonoma County. The initial plan gained county support in 1872, but the realities of the terrain resulted in the elimination of San Rafael from the main route leading to legal proceedings through 1875. Despite the legal problems the company began construction from Sausalito to Tomales in 1873. Railroad promoters extolled the benefits the railroad would provide to landholders along the route, and many responded with various permissions to cross their land. Manuella Sais, widow of Domingo Sais, leased 1,600 acres to the North Pacific Coast Railroad allowing it to cross *Canada de Herrera*. In return, the railroad established a stop near both the Sais ranch and the

[5] Jack Mason and Helen Van Cleave Park, *Early Marin,* 81-85; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961, H-16.
[6] A. Bray Dickinson, *Narrow Gauge to the Redwoods* (Los Angeles: Trans-Anglo Books, 1967), 12; Jack Mason and Helen Van Cleave Park, *The Making of Marin (1850-1975)* (Inverness, California: North Shore Books, 1975), 5-6, 29-30; R. Naylor Rogers, *Marin County California,* n.p; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 1,* 86-97.

Fairfax estate that became known as Fairfax. The first run from Sausalito to Tomales was in January 1875.[7]

During the late nineteenth century, Marin's untrammeled wilderness in comparison to the more urban life of San Francisco was a recreational draw. Major stockholders in the railroad had visions of shipping freight from the hinterlands to profitable markets, however, they were also aware of potential for tourist travel. North Pacific Coast Railroad established picnic grounds at the Fairfax station by April 1875, at first leasing it from Manuella Sais and then purchasing it. The creek-side location, now the city park, with wooded slopes was spectacularly successful, at least from the railroad's point of view. The first picnic drew 3,000 San Franciscans. Reportedly, the unfettered surroundings led to unfettered behavior displeasing local observers. Despite early wild behavior, Fairfax became a popular picnic excursion with the railroad scheduling special trains to the park. Even after the railroad turned over ownership and operation of the picnic grounds to local operators, Fairfax remained a preferred picnic place for San Francisco visitors.[8]

In addition to the common picnic grounds, Bird's Nest Glen, Fairfax's estate, soon began entertaining visitors. After Ada Fairfax left the area following her husband's death, Bird's Nest Glen was leased to Charles Pastori and his wife, Adele. Mrs. Pastori had been an opera singer and her husband constructed sets. At Bird's Nest Glen, they established a popular Italian restaurant named for them. Pastori's attracted visitors from across the country; drawn from their large network of stage friends. A fire in 1911 destroyed the original Bird's Nest Glen, but allowed Adele, now widowed, to expand offerings at Pastori's even further. The couple had already built overnight accommodations for visitors, now swimming and other outdoor pursuits were added to the amenities. Pastori's remained in operation until 1925 when prohibition limited the hospitality industry.[9]

The popularity of Fairfax for recreation soon brought permanent development near the station. First was Fairfax House, a saloon, just south of the station (**Plate 1**). It was joined by the Fairfax Park Annex by 1900. Slowly a cluster of commercial buildings developed near the station where Bolinas Road met the railroad.[10]

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[7] Dickinson, *Narrow Gauge to the Redwoods,* 20-21, 25, 31; Sagar, *Images of America Fairfax,* 21; Jack Mason and Helen Van Cleave Park, *Early Marin,* 79; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2* (Denver, Colorado: National Park Services, 1980), 2.

[8] Sagar, *Images of America Fairfax,* 21; Jack Mason and Helen Van Cleave Park, *Early Marin,* 79; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 125-126; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 2-3; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961.

[9] Sagar, *Images of America Fairfax,* 29; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 126-127; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City."

[10] Sagar, *Images of America Fairfax,* 43; Sanborn Fire Insurance Company, *Fairfax, California* (New York: Sanborn Fire Insurance Company, 1919), Sheet 2; Florence G. Donnelly, *Early Days in Marin: A Picture Review* (San Rafael, California: Marin County Savings and Loan Association, 1963), 40-41.

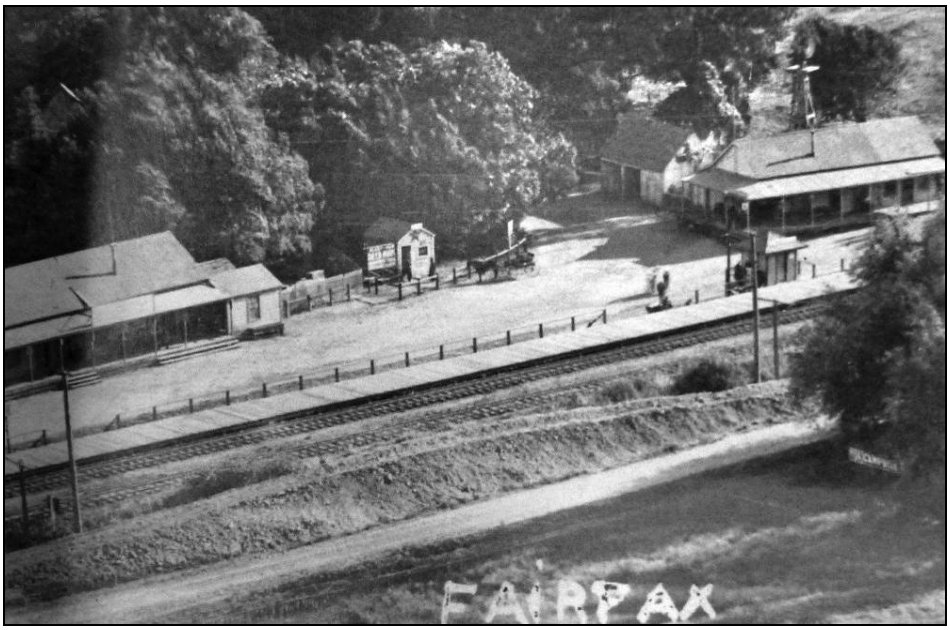

Plate 1. Restaurant and saloon serving visitors to the picnic ground. Bolinas Road is the intersecting road.[11]

In 1902 the North Pacific Coast Railroad was sold to the North Shore Railroad, which improved the line with a new tunnel, Bothin Tunnel, northwest of Fairfax, and electrified the line between Sausalito and Fairfax. Electrical operations decreased the travel time and increased the number of runs. This benefited picnickers and residents as high school students from the Fairfax area could now attend the school in Mill Valley. It also opened the possibility for more permanent settlement and long-term residents.[12]

Access provided by new transportation options alone did not result in residential growth in the Ross Valley. San Anselmo to the southeast had been subdivided in the 1880s, but remained agricultural despite the assistance of the railroad in marketing the site. However, following the earthquake of 1906 San Francisco residents, shaken by the quake and ensuing fire, looked further afield for new homes and San Anselmo finally began to grow.[13]

The growth of San Anselmo encouraged real estate developers to view the well-known picnic stop at Fairfax as the next opportunity. In 1907 land around the Fairfax stop was divided into three subdivisions, Fairfax Tract, Ridgeway, and Deer Park. Fairfax Tract and Ridgeway held close to the station, while Deer Park spread west of the Pastori's recreation grounds. Additional subdivisions followed: Pacheco Tract in 1910, Fairfax Manor Tract 1911, Fairfax Park 1911, Fairfax Heights 1912, Bush Annex 1913, Bothin Park 1913, Manor Tract 1914, and the Cascades (including a portion of the APE) in 1914. Active marketing promoted the area as a commuter

[11] Sagar, *Images of America Fairfax,* 45.
[12] Sagar, *Images of America Fairfax,* 21; Dickinson, *Narrow Gauge to the Redwoods,* 99, 101,119.
[13] Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 115-117, 120; *San Rafael Independent Journal*, "San Anselmo Started at Junction," H-14.

town, but it remained viewed largely as a recreational area, an idea furthered in part by the addition of an incline railroad on a nearby hill. The incline railroad was built as part of the Fairfax Manor subdivision to facilitate commuter access between the station and lots on the hillside to the northwest (**Plate 2**).

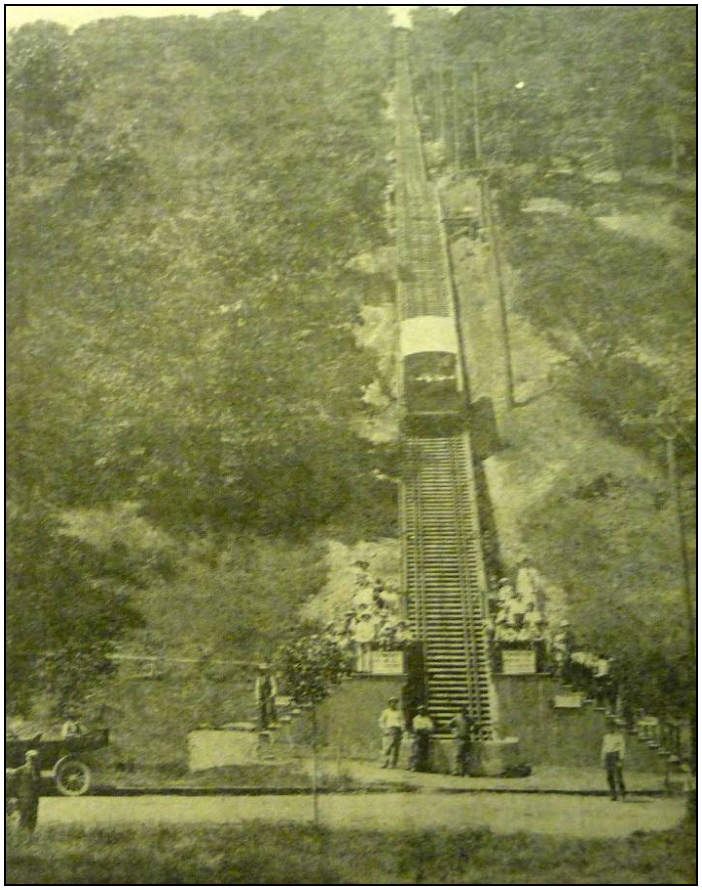

Plate 2. The incline railroad constructed as part of the Fairfax Manor subdivision became another recreational draw for Fairfax.[14]

The incline railroad became a popular tourist attraction between 1913 and 1928, providing panoramic views of the San Francisco Bay. Throughout Fairfax, purchased lots became residences, camping grounds, and summer homes. Nearby Mount Tamalpais attracted many nature seekers from San Francisco, who formed nature and hiking clubs. A chance to reside at least part of the year near hiking grounds remained a draw. Unsold lots provided backdrops for early movies filmed in the area between 1910 and 1923. Houses scattered throughout the subdivisions remained divided between commuters and summer residents.[15]

[14] *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City."
[15] Fairfax Historical Society, "A Brief History of Fairfax," *Fair Facts,* Bulletin 1, October 1988, 4; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 127; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 24.

3.3 Growth of Fairfax

The railroad and subdivision of land into residential lots initiated the development of Fairfax, but it still remained a largely recreational area. More permanent residents were the result of the construction of Alpine Dam, a part of the Marin Municipal Water District. The water district formed in 1912 to centralize and replace the numerous small water districts through the county. These earlier districts, often owned by developers, lacked capital and often provided poor service. Marin Municipal Water District completed the dam, located in central Marin southwest of Fairfax, in 1918. During construction, the World War I draft of soldiers limited available labor. The solution to the water district's problem was to hire recent Italian immigrants, who were not yet citizens. Since they were unnaturalized, they were excluded from the draft, so skilled immigrants were hired to construct Alpine Dam. Fairfax was conveniently located in relation to the dam and many Italian families moved to the area. Construction of the dam aided growth in the early twentieth century, but the large protected watershed would prevent the town growing to the west after World War II.[16]

Between the 1910s and early 1940s the community grew steadily. By 1920 the population included approximately 500 permanent residents and a total of 5,000 during the summer. During the 1910s, Fairfax's population was sufficient for establishment of a Volunteer Fire Department and a park. The park became the community center with a pavilion for events and meetings, and an athletic track. The school district, which covered the entire *Canada de Herrera*, constructed Central School adjacent to the park in 1921.[17] While Pastori's closed in 1925, recreation still remained an important part of Fairfax's identity. The Emporium, a large San Francisco department store purchased Pastori's and continued offering recreational opportunities to visitors.[18]

Transportation remained a challenge in the rugged terrain of Marin County. Increasingly motorists were interested in driving themselves across the county without using the railroad. Ferries first carried automobiles across the bay in 1902, and auto tours of Marin's natural areas became popular in the early decades of the twentieth century. The county requested aid from the United States Bureau of Public Roads in the development of a suitable road system in 1919. The existing system of roads was deemed in relatively good condition and suggestion made of new roads serving the northwest portion of the county. Under the plan, Sir Francis Drake Boulevard,

[16] Jean Secchintano, *The Golden Days of Fairfax 1831-1931* (Fairfax, CA: Fairfax PTA, 196?) 34; Robert W. Lethbridge, *The Old Company*, Marin Municipal Water District, 1985, www.marinwater.org/DocumentCenter/Home/View/ 930 (accessed April 23, 2015).

[17] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," *Marin county Historical Society Bulletin,* September 1992 18, 20, 23; Fairfax Historical Society, "A Brief History of Fairfax," 4; Randall Garrison, "Fairfax," *Marin County Almanac/ Bicentennial,* 1976, Fairfax, Pamphlet File, Anne Kent California Room, Marin County Library, San Rafael; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 129.

[18] Sagar, *Images of America Fairfax,* 29; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City.".

then known as the San Rafael – Olema Road, was to become a first-class road and the main east west artery for the county. As a result, the road which largely followed the railroad, was graded and paved. A grand opening was held in 1929. The era also saw a great improvement to the bridges and culverts across the county. Fairfax's location near the junction of local creeks resulted in multiple bridges being constructed in the town during this period. In 1924 these were narrow wooden structures at Senic Road, Azalea Avenue, and Merwin Avenue in the Manor Subdivision and at Bolinas Road on the western end of Deer Park. These improvements were just ahead of the completion of the Golden Gate Bridge in 1937, which led to the ability for individuals to reach Fairfax easily from San Francisco without using the railroad.[19]

Under agitation from the Deer Park Improvement Association, the community of Fairfax incorporated in 1931. Some sources point to the proliferation of illicit liquor service during the prohibition as a factor in incorporation. However, increasing population and desire for public services is more likely.[20]

3.4 The Cascades

The residences at 1 Meadow Way (MR 1) and 333 Cascade Drive (MR 2) are located in The Cascades subdivision. The properties at 6 Meadow Way (MR 3) and 7 Meadow Way (MR 4) are directly adjacent to the subdivision. The Cascades tract was located on the 800-acre Cascade Ranch that was owned for almost three decades by the Fairfax Villa Company. In 1914, the newly formed Cascade Land Company, comprised of San Francisco realtors and investors, purchased the ranch for approximately $150,000. Starting at the eastern periphery of the large property, closest to Fairfax, surveyors soon plotted narrow lots, generally 50-feet wide with variations in size and shape in response to the rolling hillsides. Nearly $100,000 was spent on grading the winding streets, pouring concrete curbs, an installing brick posts at the entrance. The Cascade Land Company filed *Map No. 1 of The Cascades* in 1914, followed by an expansion of the tract, to the west and north, the next year with *Map No. 2 of The Cascades*, and a third, and final, extension was added to the far west in 1926 with filing of *Map No. 1 of The Cascade Estates* in 1926 (**Plate 3**).[21]

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[19] Ben Blow, *California Highways* (San Francisco: H.S. Crocker Co, Inc., 1920), 77, 168-169; "Bridge at Point Reyes Completed Dedication Ceremonies Planned for Washington's Birthday" February 6, 1930, Roads, Clipping File, Anne Kent California Room, Marin County Library, San Rafael; "Sir Francis Drake Highway Follows Rout of 'Pack Trail' Says Old Pioneer, reprint from *San Rafael Independent,* November 23, 1929, *Marin County Historical Society Bulletin,* December 1993, 19-25; Sanborn Map Company, *Fairfax* (New York: Sanborn Map Company, 1924) 4-6; Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," *Fair Facts,* Fairfax Historical Society Bulletin 9, May 1991, 3; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 33-35, 39.

[20] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," 21; Jack Mason and Helen Van Cleave Park, *The Making of Marin*, 128.

[21] *Marin Journal,* "Realty Men Buy Cascade Ranch," July 16, 1914: 8; *San Francisco Chronicle,* "Operators Acquire Ranch at Fairfax," July 18, 1914: 8; Marin County Recorder, "Map No. 1 of The Cascades," August 4, 1914, Recorded in Book 4 of Recorded Maps: 88; Marin County Recorder, "Map No. 2 of The Cascades," July 7,

Sales of the lots were managed under the Ferguson-Bruener Company out of San Francisco who published a sales brochure extolling the rustic and isolated nature of the tract, electric train connection to San Francisco, and its proximity to the ferry at Sausalito (**Plate 4**). By late summer of 1915, a reported 70 lots were sold and a small advertising campaign for the tract took place in the spring and summer of 1916. An article in the *San Francisco Chronicle* lauded the tract as "one of the most picturesque suburban home parks in Marin county," and a few small advertisements for the tract were run in the *San Francisco Chronicle* and the *Oakland Tribune* throughout 1916. Unlike earlier tracts, The Cascades was promoted as a suburban year-round residential oasis rather than a summertime recreational retreat. Sales in the tract were sluggish and even after the roadways were paved in the early 1930s to bolster sales, the developers were forced to sell lots at auction for a fraction of the listed prices. Mapping of the area at the end of the decade shows just how little of the large subdivision was developed by the beginning of World War II 25 years later (**Plate 5**). [22]

1915, Recorded in Book 5 of Recorded Maps: 14; Marin County Recorder, "Map No. 1 of The Cascades Estates," May 22, 1926, Recorded in Book 5 of Recorded Maps: 42.

[22] Ferguson-Breuner Co. "The Cascades," Fairfax Pamphlets 1, Fairfax: Pamphlets, Arequipa, Clippings 1940-1989, Anne T. Kent California Room at the Marin County Library, San Rafael, California; *San Francisco Chronicle,* "Picturesque Tract Opened to Marin," May 13, 1916: 9; *San Francisco Chronicle,* advertisement, May 20, 1916: 9; *Oakland Tribune,* advertisement, July 22, 1916: 11; Bill Allen, "The Cascade Ranch," *Fair Facts*, Fairfax Historical Society Bulletin No. 19 (May 1994): 6, 12-13.

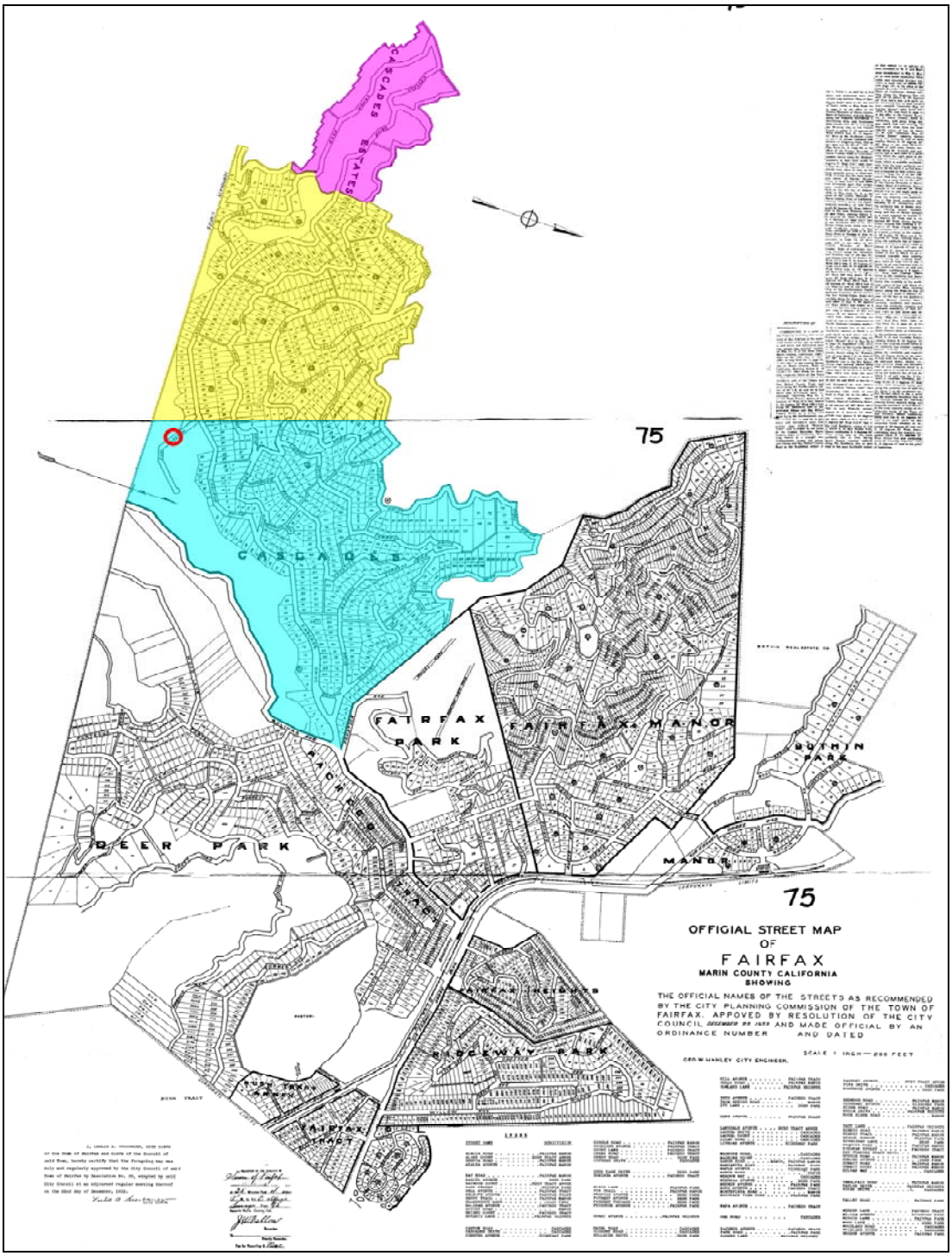

Plate 3. 1932 map of Fairfax showing subdivisions. The three Cascades subdivisions are colored. Location of Meadow Way Bridge marked with red circle.[23]

[23] George W. Manley, *Official Street Map of Fairfax, Marin County,"* Approved September 22, 1932, Record of Survey Map Book 2: 75.

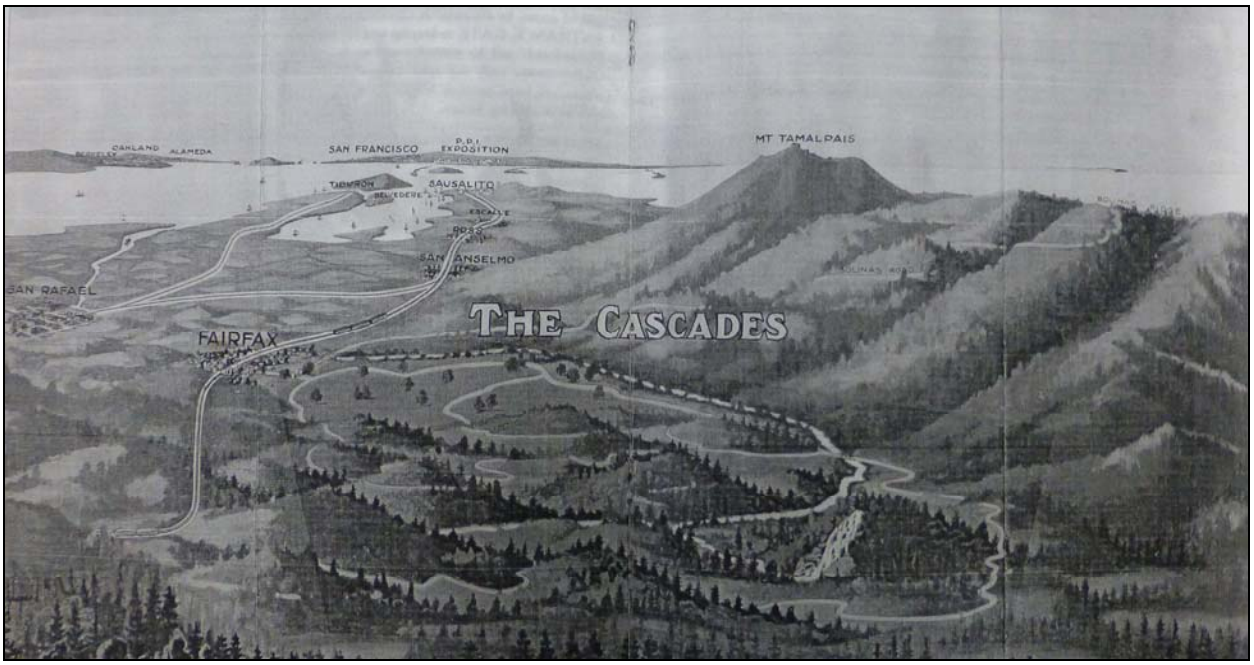

Plate 4. Illustration of the location of The Cascades and the surrounding environs, published in the 1914 sales brochure, facing south.[24]

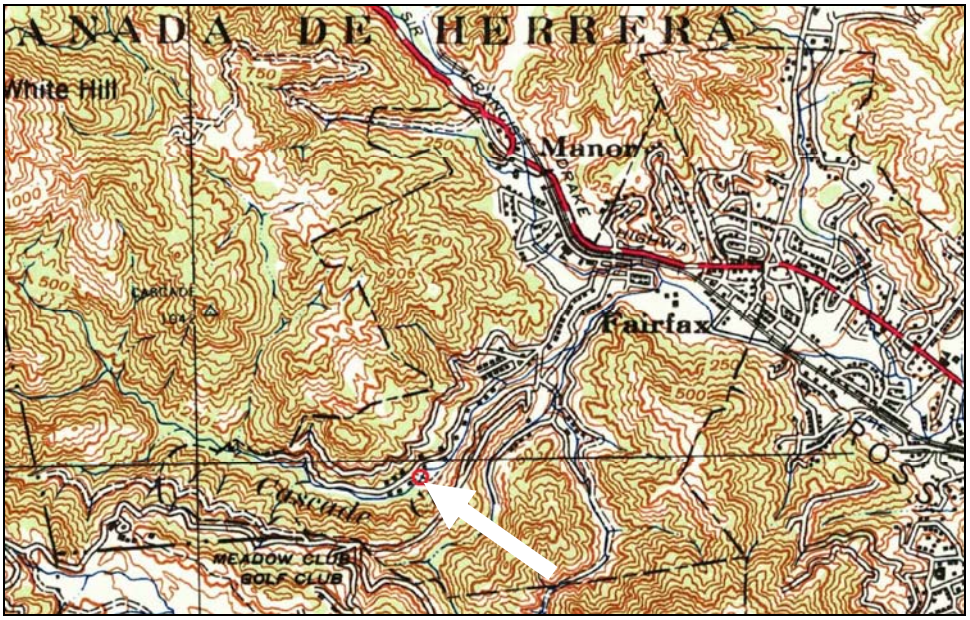

Plate 5. 1939 map showing development of the town of Fairfax and the underdevelopment of The Cascades. Meadow Way Bridge marked with red circle.[25]

[24] Ferguson-Breuner Co. "The Cascades.".
[25] Chief of Engineers, U.S. Army, *Tamalpais, Calif. Quadrangle* (Washington, D.C.: Chief of Engineers), 1939.

3.5 Post World War II Development

During World War II the introduction of Marinship and Hamilton Air Force Base on the eastern side of Marin resulted in an increasing permanent population in the county. Following the war, California experienced a general population increase which continued the increase in permanent residents in Fairfax. The town's terrain, however, limited its growth with much of the land to the west under conservation as part of the watershed for the Marin Municipal Water District. The advent of the automobile made the area more accessible, but at the same time Northwestern Pacific Railroad, the descendant of the North Shore Rail made its last Fairfax run in 1941. Empty lots were filled with apartment complexes, summer residences became year-round dwellings, and new residences were constructed in undeveloped lots in early twentieth century tracts in response to the housing shortage following World War II. These factors allowed Fairfax to avoid unwanted development while overall population increased. The Cascades filled in following World War II. Southeast of San Anselmo Creek some parcels had been sold off in larger lots. The Marin Title Guaranty Company subdivided land south of San Anselmo Creek from the earlier Cascades subdivision in 1948. Other larger land holders such as the Dershaimers also subdivided their land. Construction of the Meadow Way Bridge (Bridge No. 27C008) in 1950 replaced an earlier private bridge to the area expediting development on the new subdivided lots. The residences at 6 and 7 Meadow Way (MR 3 and 4) are a part of this later development.[26]

In town there were some general improvements for recreation during the mid-twentieth century. In particular, the Emporium greatly improved the former Pastori's grounds with numerous swimming pools, playing fields, and dance halls. Max Friedman purchased the property in 1940 and operated it as the Marin Town and Country Club through 1972. The property was placed up for sale in 1971, but the city declined to purchase it and open it to the public.[27]

The community's desire to remain small was reflected in the governance of the town. When the community developed its master plan in 1968, the town intended to limited population growth to 15,000 by 2020. In 2010, the population was only 7,441. Further reflecting the community's desire to remain small, the community decided to use "town" as their designation beginning in 1972. As a result of the limited land for additional development, new construction has frequently replaced earlier buildings as shown by **Plates 6 & 7**, rather than the community expanding outward from its original core. The *Town of Fairfax's 2015-2023 Housing Element Update* reported that 90 percent of the residential units in the town were constructed before 1979, with

[26] Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," 3; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," H-16; *San Rafael Independent Journal* "Circulation of I-J Grew with County," *A Century of Service 1861-1961* (special section), April 1, 1961, H17; Jean Secchintano, *The Golden Days of Fairfax 1831-1931,* 33; Marin County Recorder, Map of Meadow Way Tract, July 1948, Recorded in Book 6 of Recorded Maps: 65.

[27] Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 127; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City."

the largest percentage being built before 1939 (27%). The second largest building boom took place between 1960 and 1969 with construction of 20% of the current residential units, and the third boom was the preceding decade with 19%, built between 1950 and 1959. Since 1979, only 337 residential units have been constructed, comprising only 9% of the total housing stock. Although this slow building trend was the desire of the town to remain small, the surround steep hillsides have discouraged, and often prevented, residential construction. Additionally, the 504-acre Cascade Canyon Open Space Preserve is located along the northern boundary of The Cascades tract which has halted any development in this region since the first parcels were purchased in the early 1970s, with the last purchase made in the mid-1990s.[28]

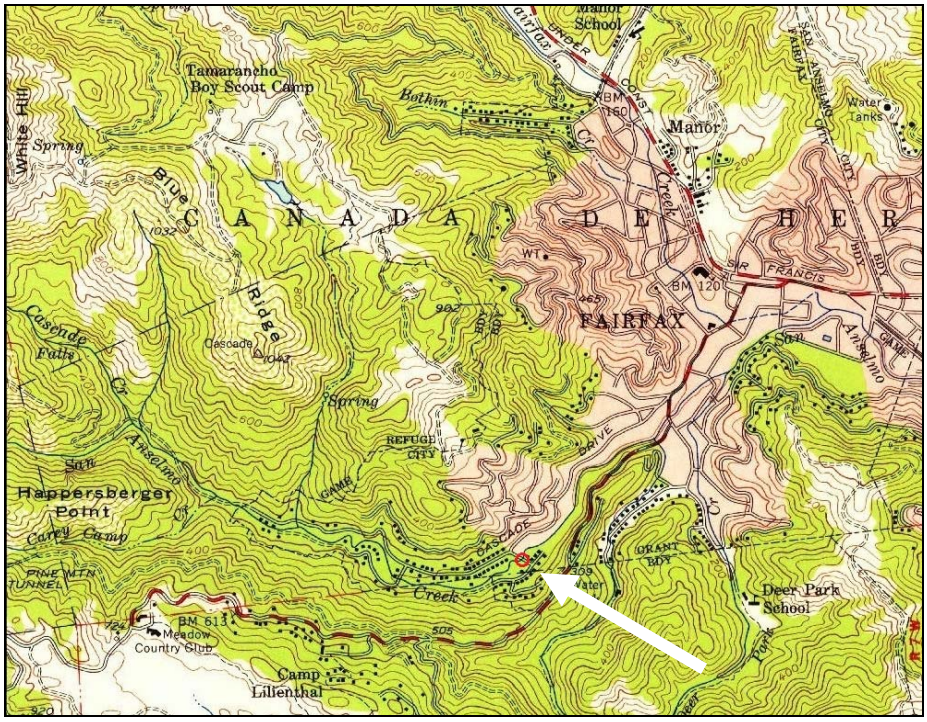

Plate 6. 1954 map showing development of Fairfax.
Meadow Way Bridge marked with red circle.[29]

[28] Jack Mason and Helen Van Cleave Park, *The Making of Marin*, 129; "2010 Census Interactive Population Search, CA – Fairfax town," United States Census 2010 website, http://www.census.gov/2010census/popmap/ipmtext.php?fl=06:0623168 (accessed August 2015); U.S. Geological Survey, *San Rafael Quadrangle* (Washington, D.C.: Geological Survey), 1954; U.S. Geological Survey, *San Rafael Quadrangle* (Washington, D.C.: Geological Survey), 1954 (Photorevised 1980); PMC, *Town of Fairfax's 2015-2023 Housing Element Update*, (May 2015), H-13 to H-14, HB-24; Marin County, Environmental Planning Partners Inc., et al., *Final Road and Trail Management Plan* (San Rafael, CA: County of Marin, Department of Parks and Open Space, 2014), 2-7; Marin County Parks, "Open Space: Cascade Canyon," https://www.marincountyparks.org/depts/pk/divisions/open-space/cascade-canyon (accessed September 2017).

[29] U.S. Geological Survey, *San Rafael Quadrangle*, 1954.

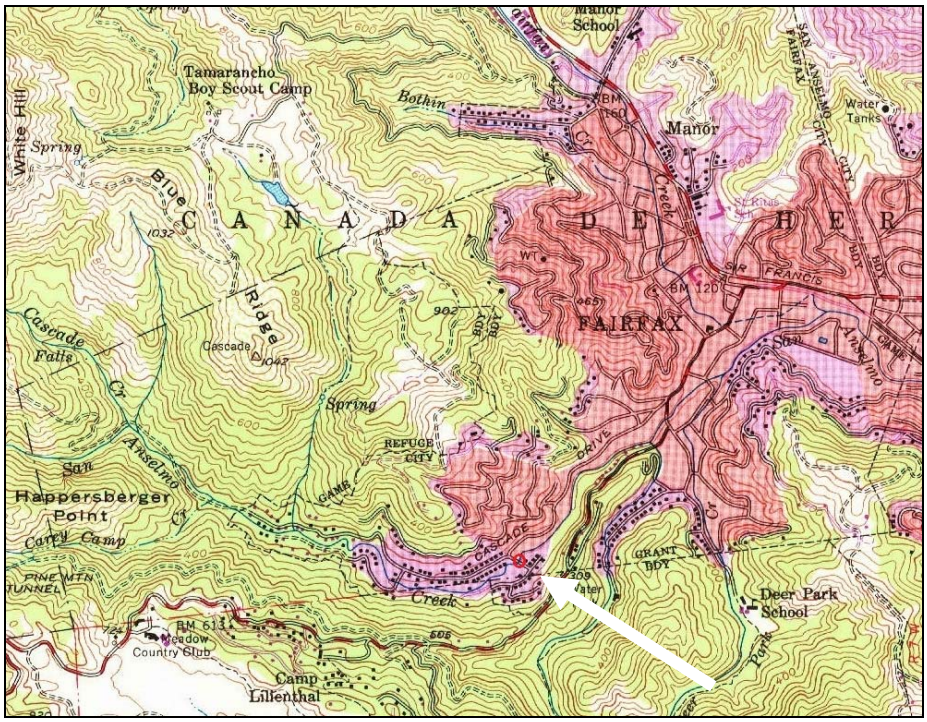

Plate 7. 1980 map showing development of Fairfax since 1954, in purple. Meadow Way Bridge marked with red circle.[30]

[30] U.S. Geological Survey, *San Rafael Quadrangle*, 1954 (Photorevised 1980).

4 FINDINGS AND CONCLUSIONS

The four historic properties within the APE evaluated in this HRER do not meet the criteria for listing in the NRHP or CRHR because they do not have historical significance. These resources have been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlines in Section 5024.1 of the California Public Resources Code, and are not historical resources for the purposes of CEQA. Evaluations for these properties are provided on the DPR 523 forms in **Appendix B**. The Meadow Way Bridge over San Anselmo Creek was previously evaluated as part of the Caltrans Historic Bridge Inventory and found not eligible for the NRHP. There are no state-owned historical resources in the APE.

The bullet points and tables below summarize the results of this report for the historic resources within the project area.

- Historic properties listed in the NRHP: **None**
- Historic properties previously determined eligible for the NRHP: **None**
- Resources previously determined ineligible for the NRHP: **None**
- Historic properties determined eligible for the NRHP as a result of current study: **None**
- Resources determined *not* eligible for the NRHP as a result of current study: **Four**

Map Reference	Address / Assessor Parcel Number	Year Built	City / County	OHP Status Code
1	1 Meadow Way / 003-122-09	1947	Fairfax / Marin	6Z
2	333 Cascade Drive / 003-102-26	1959	Fairfax / Marin	6Z
3	6 Meadow Way / 003-102-19	1955	Fairfax / Marin	6Z
4	7 Meadow Way / 003-122-22	1948	Fairfax / Marin	6Z

- Historical resources for the purposes of CEQA: **None**

- Resources that are *not* historical resources under CEQA, per CEQA guidelines §15064.5, because they do not meet the CRHR criteria outlined in PRC §5024.1:

Map Reference	Address / Assessor Parcel Number	Year Built	City / County	OHP Status Code
1	1 Meadow Way / 003-122-09	1947	Fairfax / Marin	6Z
2	333 Cascade Drive / 003-102-26	1959	Fairfax / Marin	6Z
3	6 Meadow Way / 003-102-19	1955	Fairfax / Marin	6Z
4	7 Meadow Way / 003-122-22	1948	Fairfax / Marin	6Z

Heather Miller, who meets the Professionally Qualified Staff Standards in Section 106 PA Attachment 1 as an Historian, determined that all other properties present within the APE, including state-owned resources, meet the criteria for Section 106 PA Attachment 4 (Properties Exempt from Evaluation) as Property Type 3. This is for the residence at 13 Meadow Way, which has been altered with additions and changes to materials. Pursuant to PRC 5024 Memorandum of Understanding Stipulation VIII.C.1 and Attachment 4, Ms. Miller has determined that there are no state-owned built environment cultural resources with the APE.

5 PREPARERS' QUALIFICATIONS

This HRER was conducted under the general direction of Christopher D. McMorris (M.S., Historic Preservation, Columbia University, New York), a partner of JRP with 21 years of experience conducting these types of studies. Mr. McMorris provided overall project direction and guidance, and reviewed and edited this report. Based on his level of experience and education, Mr. McMorris meets and exceeds the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61) under History and Architectural History. He also meets the standards for the Caltrans Professional Qualified Staff standards in the Section 106 PA Attachment 1 as a Principal Architectural Historian.

JRP Staff Historian Heather Miller (M.A., Public History, California State University, Sacramento) conducted fieldwork and research, and prepared this report and DPR 523 forms. Historian Cheryl Brookshear (M.S. Historic Preservation, University of Pennsylvania) prepared portions of the context and final edits for the report. Ms. Miller and Ms. Brookshear both meet and exceed the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61) under History and Architectural History. They also meet the Caltrans Professionally Qualified Staff Standards in Section 106 PA Attachment 1 as an Architectural Historian.

JRP Research Assistant Shelby Kendrick (M.A., Public History, California State University, Sacramento) conducted fieldwork and research.

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APPENDIX A

Figures

Figure 1. Location Map

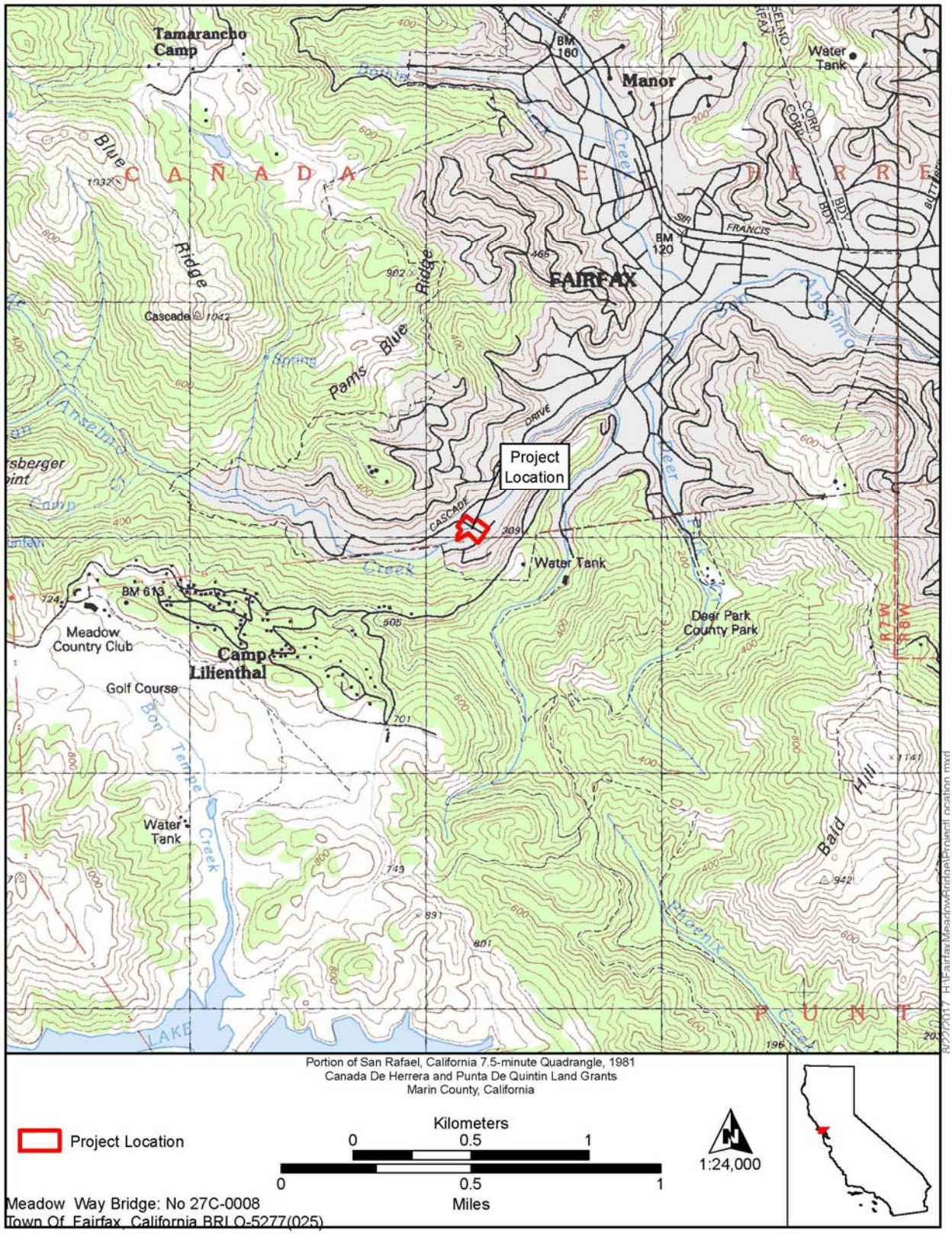


Figure 2. Vicinity Map

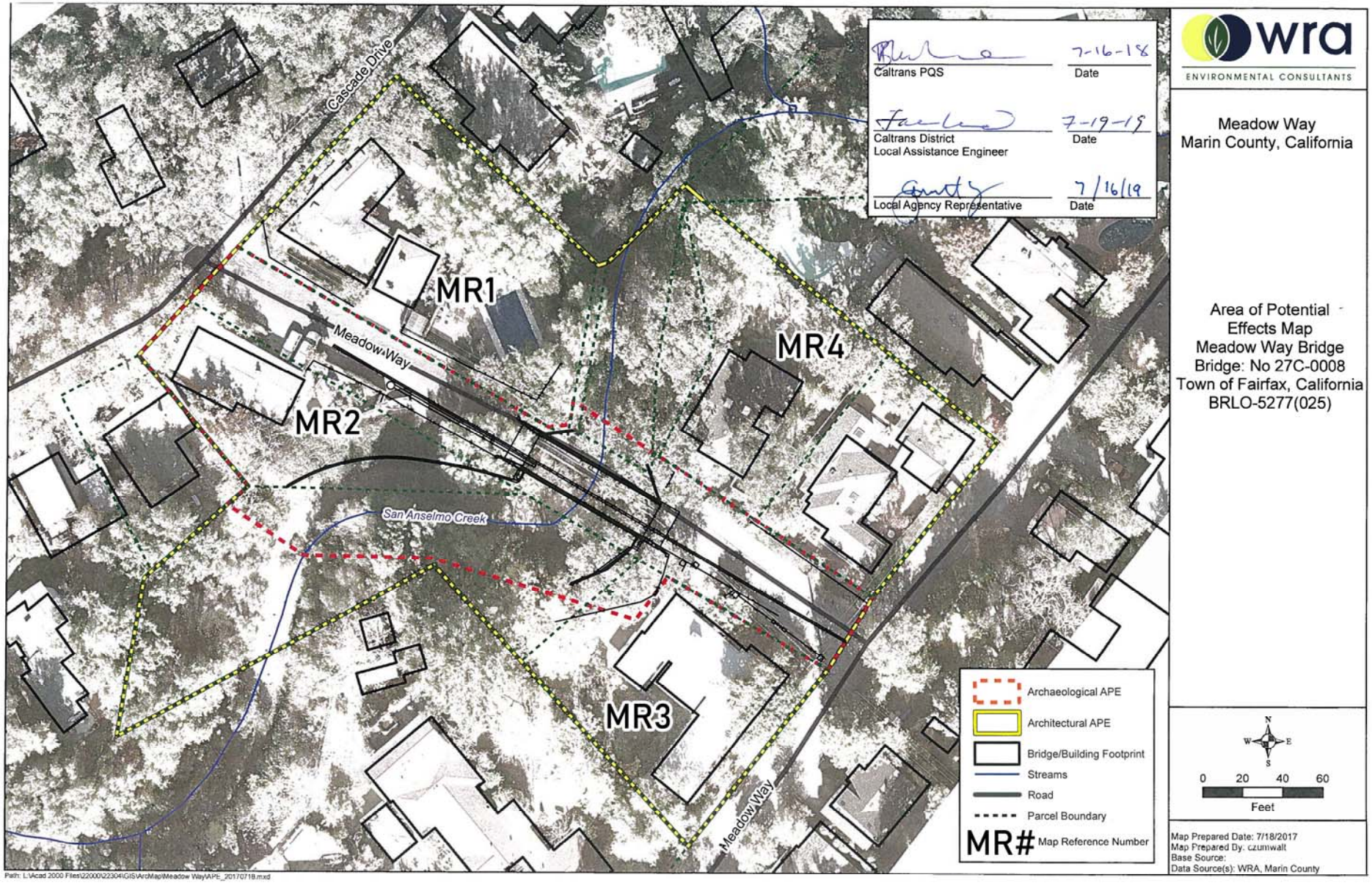


Figure 3a. Area of Potential Effects (APE)Fig

Figure 3b. Area of Potential Effects (APE)

APPENDIX B

California Department of Parks and Recreation (DPR) 523 Forms

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

***Resource Name or #** (Assigned by recorder) Map Reference #1

P1. Other Identifier: 1 Meadow Way

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** San Rafael, Calif **Date** 1954 (Photorevised 1968) **T** 2N; **R** 7W; __ ¼ **of Sec** ____; _____ **B.M.**

c. Address 1 Meadow Way City Fairfax Zip 94930

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Assessor Parcel Number: 003-122-09

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This 0.34-acre parcel in the Town of Fairfax contains a 1,781-square foot Ranch style residence with detached garage (**Photograph 1**). The parcel has fences along much of the perimeter and mature. The residence has a U-shaped footprint and is topped with a primary cross-hipped roof with a gable roof extension on the north side. Open eaves reveal exposed, plain rafter tails and the roof system is covered with composition shingles. The exterior is sheathed in a combination of board-and-batten siding around the northwest corner and wide, horizontal wood boards across the side and rear elevations. The detached garage is sited to the southwest of residence and is topped with a hipped roof and has the same building materials and finishes as the residence. The garage has a replacement overhead door is located on the south side and a multi-light, wood frame window is located on the east side. Both the residence and the garage have south facing solar panels affixed to the roofs (see Continuation Sheet).

***P3b. Resource Attributes:** (List attributes and codes) HP02 – Single family property

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) **Photograph 1:** East side of residence and south side of garage, facing north September 20, 2017

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1947, Marin County Assessor

***P7. Owner and Address:**
Steven J. & Nancy S. Wasserman
1 Meadow Way
Fairfax, CA 94930

***P8. Recorded by:** (Name, affiliation, address)
Heather Miller & Shelby Kendrick
JRP Historical Consulting, LLC
2850 Spafford Street
Davis, CA 95618

***P9. Date Recorded:** September 20, 2017

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, LLC, *Historical Resources Evaluation Report Meadow Way Bridge (Bridge 27C0008) Seismic Retrofit Project, Fairfax California* (BRLO-5277 (025), 2019.

***Attachments:** NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list) _____

B1. Historic Name: _____
B2. Common Name: _____
B3. Original Use: Residence B4. Present Use: Residence
***B5. Architectural Style:** Ranch
***B6. Construction History:** (Construction date, alteration, and date of alterations) Construction of original, southern section completed in 1947; Detached garage added 1952-1957; Addition to residence to its current U-shaped footprint 1957-1965; Solar panels installed in 2015.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown Date:** _____ **Original Location:** _____
***B8. Related Features:** none

B9. Architect: Unknown b. Builder: Harold G. Skaggs (inferred)
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** residence **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

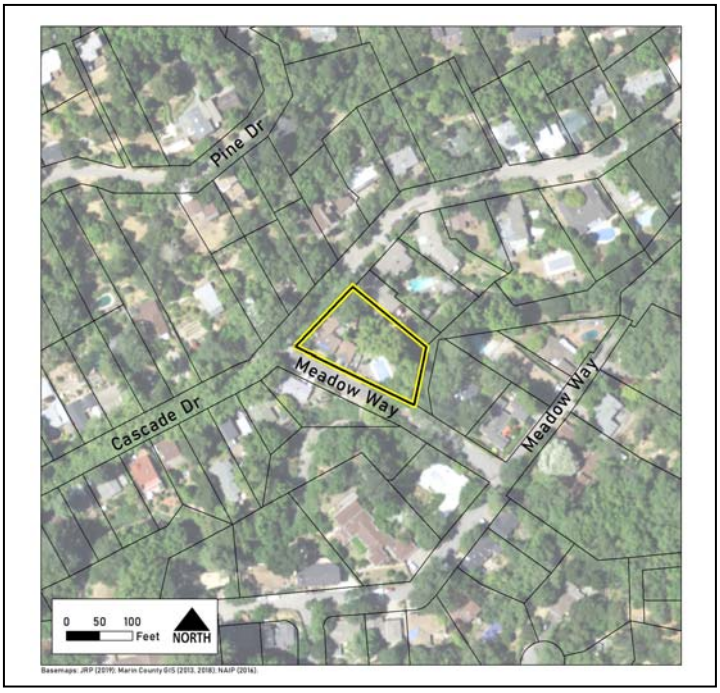
The residence at 1 Meadow Way does not meet the criteria for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR) or contribute to any potential larger historic property or historic district because it does not have historical significance. This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and is not a historical resource for the purposes of CEQA.

Historic Context

The residence at 1 Meadow Way was constructed in 1947 in The Cascades No. 2 Subdivision, which had been created in the early twentieth century. Fairfax originated as a railroad stop on the North Pacific Coast Railroad in the former Mexican-era *Canada de Herrara* rancho. During its early period, Marin County provided timber, dairy, poultry, and some crops for consumption in San Francisco. Easy water transport to San Francisco and its rapidly expanding markets was the key to growth for early Marin County towns (see Continuation Sheet).

B11. Additional Resource Attributes: (List attributes and codes) _____

***B12. References:** Allen, Bill. "Fairfax During the War Years." *Fair Facts.* Fairfax Historical Society Bulletin 9, May 1991; Dickinson, A. Bray. *Narrow Gauge to the Redwoods.* Los Angeles: Trans-Anglo Books, 1967; Fairfax Historical Society. "A Brief History of Fairfax." *Fair Facts,* Bulletin 1, October 1988, 4; Mason, Jack and Helen Van Cleave Park. *Early Marin.* Petaluma, CA: House of Printing, 1971; Mason, Jack and Helen Van Cleave Park. *The Making of Marin (1850-1975).* Inverness, California: North Shore Books, 1975; Sagar, William and Brian Sagar. *Images of America Fairfax.* Charleston, SC: Arcadia Publishing, 2005; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961 (also see footnotes.)



B13. Remarks:

***B14. Evaluator:** Heather Miller

***Date of Evaluation:** September 2017

(This space reserved for official comments.)

P3a. Description (continued):

The west side of the residence has two external brick chimneys and skylights (**Photograph 2**). Primary entry into the residence is located on the west side through a wood gate in the fence line (**Photograph 3**). The recessed, wood panel door has a fanlight and a sidelight to the north. A wood frame, four-light sliding window is located south of the door. Additional windows are modern replacement sliding units with false lights.

A gambrel roof, prefabricated shed is sited south of the garage and aerial photography reveals that a pool is located east of the garage.

B10. Significance (continued):

Railroad construction began with investors owning tracts of redwoods along the Russian River forming the North Pacific Coast Railroad in 1871 to build a railroad across Main County connecting their stands of redwoods with San Francisco Bay markets via the Marin ferries. The company began construction from Sausalito to Tomales in 1873. Railroad promoters extolled the benefits the railroad would provide to landholders along the route, and many responded with various permissions to cross their land. Manuella Sais leased 1,600 acres to the North Pacific Coast Railroad allowing it to cross *Canada de Herrera*. In return, the railroad established a stop near both the Sais ranch and the estate of Charles Fairfax that became known as Fairfax. The first run from Sausalito to Tomales was on January 7, 1875.[1]

Major stockholders in the railroad had visions of shipping freight from the hinterlands to profitable markets, however, they were also aware of potential for tourist travel. North Pacific Coast Railroad (later the North Shore Railroad) established a picnic grounds at the Fairfax station by April 1875. The stop became a popular picnic excursion with the railroad scheduling special trains to the park. Even after the railroad turned over ownership and operation of the picnic grounds to local operators, Fairfax remained a preferred picnic place for San Francisco visitors.[2] In addition to the common picnic grounds, Bird's Nest Glen was leased to Charles Pastori and his wife, Adele (a former opera singer), and they established a popular Italian restaurant named for them. Pastori's attracted visitors from across the country; drawn from their large network of stage friends. Pastori's remained in operation until 1925 when prohibition limited the hospitality industry.[3]

The popularity of Fairfax for recreation soon brought permanent development near the station. Slowly a cluster of commercial buildings developed near the station where Bolinas Road met the railroad.[4] In 1902 the railroad line was electrified between Sausalito and Fairfax. Electrical operations decreased the travel time and increased the number of runs. It also opened the possibility for more permanent settlement and long-term residents.[5]

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[1] A. Bray Dickinson, *Narrow Gauge to the Redwoods* (Los Angeles: Trans-Anglo Books, 1967) 12, 20-21, 25, 31; Jack Mason and Helen Van Cleave Park, *The Making of Marin (1850-1975)* (Inverness, California: North Shore Books, 1975) 5-6, 29-30; R. Naylor Rogers, *Marin County California* (Sausalito, California: Sausalito News), n.p; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area and Point Reyes National Seashore California, Volume 1* (Denver, Colorado: National Park Services, 1980), 86-97; William Sagar and Brian Sagar, *Images of America Fairfax* (Charleston, SC: Arcadia Publishing, 2005), 21; Jack Mason and Helen Van Cleave Park, *Early Marin* (Petaluma, California: North Shore Books, 1975), 79; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area and Point Reyes National Seashore California, Volume 2* (Denver, Colorado: National Park Services, 1980), 2.

[2] Sagar, *Images of America Fairfax,* 21; Jack Mason and Helen Van Cleave Park, *Early Marin,* 79; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 125-126; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 2-3; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961.

[3] Sagar, *Images of America Fairfax,* 29; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 126-127; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City."

[4] Sagar, *Images of America Fairfax,* 43; Sanborn Fire Insurance Company, *Fairfax, California* (New York: Sanborn Fire Insurance Company, 1919) Sheet 2; Florence G. Donnelly, *Early Days in Marin: A Picture Review* (San Rafael, California: Marin County Savings and Loan Association, 1963) 40-41.

[5] Sagar, *Images of America Fairfax,* 21; Dickinson, *Narrow Gauge to the Redwoods,* 99, 101,119.

Following the earthquake of 1906 San Francisco residents, shaken by the quake and ensuing fire, looked further afield for new homes and communities in the Ross Valley finally began to grow.[6] In 1907 land around the Fairfax stop was divided into three subdivisions, Fairfax Tract, Ridgeway, and Deer Park. Additional subdivisions followed: Pacheco Tract in 1910, Fairfax Manor Tract 1911, Fairfax Park 1911, Fairfax Heights 1912, Bush Annex 1913, Bothin Park 1913, Manor Tract 1914, and the Cascades, where 1 Meadow Way is located, in 1914. Active marketing promoted the area as a commuter town, but it remained viewed largely as a recreational area. Throughout Fairfax, purchased lots became residences, camping grounds, and summer homes. Houses scattered throughout the subdivisions remained divided between commuters and summer residents.[7]

Between the 1910s and early 1940s the community grew steadily. By 1920 the population included approximately 500 permanent residents and a total of 5,000 during the summer.[8] While Pastori's closed in 1925, recreation still remained an important part of Fairfax's identity. The Emporium, a large San Francisco department store purchased Pastori's and continued offering recreational opportunities to visitors.[9]

Transportation remained a challenge in the rugged terrain of Marin County. Increasingly motorists were interested in driving themselves across the county without using the railroad. Ferries first carried automobiles across the bay in 1902. The county requested aid from the United States Bureau of Public Roads in the development of a suitable road system in 1919. The existing system of roads was deemed in relatively good condition and suggestion made of new roads serving the northwest portion of the county. Under the plan, Sir Francis Drake Boulevard, then known as the San Rafael – Olema Road, was to become a first-class road and the main east west artery for the county. As a result, the road which largely followed the railroad, was graded and paved. These improvements were just in time for the completion of the Golden Gate Bridge in 1937. By this time individuals could finally reach Fairfax easily from San Francisco without using the railroad. [10]

Under agitation from the Deer Park Improvement Association the community of Fairfax incorporated in 1931.[11]

Property History

The residence at 1 Meadow Way is located on lot 43 of Block 5 of the Map No. 2 of The Cascades which was filed in 1915. The Cascades tract was located on the 800-acre Cascade Ranch that was owned for almost three decades by the Fairfax Villa Company. In 1914, the newly formed Cascade Land Company, comprised of San Francisco realtors and investors, purchased the ranch for approximately $150,000. Starting at the eastern periphery of the large property, closest to Fairfax, surveyors soon plotted narrow lots, generally 50-feet wide with variations in size and shape in response to the rolling hillsides. Nearly $100,000 was spent on grading the winding streets, pouring concrete curbs, an installing brick posts at the entrance. The Cascade Land Company filed *Map No. 1 of The Cascades* in 1914, followed by an expansion of the tract, to the west and

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[6] Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 115-117, 120; *San Rafael Independent Journal*, "San Anselmo Started at Junction," *A Century of Service 1861-1961* (special section), March 25, 1961, H-14.

[7] Fairfax Historical Society, "A Brief History of Fairfax," *Fair Facts,* Bulletin 1, October 1988, 4; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 127; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 24.

[8] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," *Marin county Historical Society Bulletin,* September 1992 18, 20, 23; Fairfax Historical Society, "A Brief History of Fairfax," 4; Randall Garrison, "Fairfax," *Marin County Almanac/ Bicentennial,* 1976, Fairfax, Pamphlet File, Anne Kent California Room, Marin County Library, San Rafael; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 129.

[9] Sagar, *Images of America Fairfax,* 29; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," H-16.

[10] Ben Blow, *California Highways* (San Francisco: H.S. Crocker Co, Inc., 1920) 77, 168-169; "Bridge at Point Reyes Completed Dedication Ceremonies Planned for Washington's Birthday" February 6, 1930, Roads, Clipping File, Anne Kent California Room, Marin County Library, San Rafael; "Sir Francis Drake Highway Follows Rout of 'Pack Trail' Says Old Pioneer, reprint from *San Rafael Independent,* November 23, 1929, *Marin County Historical Society Bulletin,* December 1993, 19-25; Sanborn Map Company, *Fairfax* (New York: Sanborn Map Company, 1924) 4-6; Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," *Fair Facts,* Fairfax Historical Society Bulletin 9, May 1991, 3; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 33-35, 39.

[11] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," 21; Jack Mason and Helen Van Cleave Park, *The Making of Marin*, 128.

north, the next year with *Map No. 2 of The Cascades*, and a third, and final, extension was added to the far west in 1926 with filing of *Map No. 1 of The Cascade Estates* in 1926.[12]

Sales of the lots were managed under the Ferguson-Bruener Company out of San Francisco who published a sales brochure extolling the rustic and isolated nature of the tract, electric train connection to San Francisco, and its proximity to the ferry at Sausalito. By late summer of 1915, a reported 70 lots were sold and a small advertising campaign for the tract took place in the spring and summer of 1916. An article in the *San Francisco Chronicle* lauded the tract as "one of the most picturesque suburban home parks in Marin county," and a few small advertisements for the tract were run in the *San Francisco Chronicle* and the *Oakland Tribune* throughout 1916. Unlike earlier tracts, The Cascades was promoted as a suburban year-round residential oasis rather than a summertime recreational retreat. Sales in the tract were sluggish and even after the roadways were paved in the early 1930s to bolster sales, the developers were forced to sell lots at auction for a fraction of the listed prices. Mapping of the area at the end of the decade shows just how little the large subdivision was developed by the beginning of World War II 25 years later. [13]

During World War II the introduction of Marinship and Hamilton Air Force Base on the eastern side of Marin resulted in an increasing permanent population. Following the war California experienced a general population increase which continued the increase in permanent residents in Fairfax. The town's terrain, however, limited explosive growth with much of the land to the west under conservation plans as part of the watershed for the Marin Municipal Water District. Empty lots did fill with apartment complexes, Broadway Boulevard facing the former railroad filled in, and summer residences became year-round dwellings in response to the housing shortage following World War II.[14]

The parcel on which 1 Meadow Way was built sat undeveloped until Harold Skaggs and his wife Denise purchased this parcel from Isaac Berkman in June 1946. Although there are no original building permits on file, it appears that Skaggs built the residence himself because he made his living as a carpenter and general contractor of residences. The couple met during World War II in England and were married in Denise's hometown of Ostend, Belgium in the fall of 1945. Harold was discharged from the Army in January 1946 and Denise arrived in America that April. Harold was pressed to finish construction before the arrival of their first child, Denise, who was born in March 1947. The couple lived together at the property until January 1985 when they sold to the current owners and retired to Bodega Bay.[15]

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[12] *Marin Journal,* "Realty Men Buy Cascade Ranch," July 16, 1914: 8; *San Francisco Chronicle,* "Operators Acquire Ranch at Fairfax," July 18, 1914: 8; Marin County Recorder, "Map No. 1 of The Cascades," August 4, 1914, Recorded in Book 4 of Recorded Maps: 88; Marin County Recorder, "Map No. 2 of The Cascades," July 7, 1915, Recorded in Book 5 of Recorded Maps: 14; Marin County Recorder, "Map No. 1 of The Cascades Estates," May 22, 1926, Recorded in Book 5 of Recorded Maps: 42.

[13] Ferguson-Breuner Co. "The Cascades," Fairfax Pamphlets 1, Fairfax: Pamphlets, Arequipa, Clippings 1940-1989, Anne T. Kent California Room, Marin County Library, San Rafael, California; *San Francisco Chronicle,* "Picturesque Tract Opened to Marin," May 13, 1916: 9; *San Francisco Chronicle,* advertisement, May 20, 1916: 9; *Oakland Tribune,* advertisement, July 22, 1916: 11; Bill Allen, "The Cascade Ranch," *Fair Facts*, Fairfax Historical Society Bulletin No. 19 (May 1994): 6, 12-13.

[14] Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," 3; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," H-16; *San Rafael Independent Journal* "Circulation of I-J Grew with County," *A Century of Service 1861-1961* (special section), April 1, 1961, H17; Jean Secchintano, *The Golden Days of Fairfax 1831-1931* (Fairfax, California: Fairfax PTA, 196?), , 33.

[15] Marin County Recorder, "Record of Survey: Land of Wasserman," September 2002, Recorded in Book 2003: 279; Marin County Recorder, "Map No. 1 of The Cascades,"; Marin County Recorder, "Map No. 2 of The Cascades,"; Marin County Recorder, Isaac Berkman to Denise M. and Herold G. Skaggs, Joint Tenancy Deed, Official Records Vol. 523, page 84, filed June 13, 1946; Jack Ammann Photogrammetric Engineers, Flight GS-CP, Frame 4-96, July 7, 1946; *Daily Independent Journal,* classified advertisement, January 20, 1953: 12; *Marin Independent,* "Harold Gordon Skaggs," February 6, 2009, available at http://www.legacy.com/obituaries/marinij/obituary.aspx?n=harold-gordon-skaggs&pid=123775440 (accessed September 2017); California, Federal Naturalization Records, 1843-1999 for Denise Marie Baroen Skaggs, available at Ancestry.com (accessed September 2017); U.S., Department of Veteran Affairs BIRLS Death Filed, 1850-2010 for Harold Skaggs, available at Ancestry.com; A to Z Directory Publishers, *Marin County Directory* (San Anselmo, CA: A to Z Directory Publishers, 1952); Recorder's Official Records Detail, Harold G. & Denise M. Skaggs to Steven J. & Nancy S. Wasserman, Deed, January 11, 1985, Document No. 1985-0001132 available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017).

The residence was originally constructed as a rectangular, hipped roof house without a garage, which is currently the southern section (**Plate 1**). It appears that the primary entry was centrally located on the south side and was accessed by concrete walkway. Between 1952 and 1957, Skaggs built the detached garage (**Plate 2**) and between 1957 and 1965 the residence was added onto to create its current U-shaped footprint (**Plate 3**). It was during this addition that the primary entry was moved from the south side to its current location on the west side. [16]

Ranch Architecture

The residence at 1 Meadow Way is constructed in the Ranch style, which began to emerge as a residential style in California in the late 1920s and early 1930s. The style reached peak popularity in first two decades after World War II, surpassing that of Minimal Traditional homes by the early 1950s. Four subtypes of the Ranch-style have been identified which are Hipped-Roof, Cross-Hipped Roof, Side-Gabled Roof, and Cross-Gabled Roof. This residence was originally constructed as a small, Hipped-Roof subtype, but through additions, has become a Cross-Hipped Roof subtype. The Ranch style also incorporated a variety of historic quasi-colonial/early-American period precedents, including the nineteenth century California adobe house and the nineteenth century California single-wall, board-and-batten rural buildings, like that found on 1 Meadow Way. As the style gained popularity, builders of middle- and upper-income homes across the country copied the designs of early custom homes of California. A typical Ranch style suburban house features include elongated, asymmetrical one-story plans with low pitched hip, cross gable, or side gable forms. Eaves are usually wide and create an overhanging shelter for a walkway along the sides of the house. A recessed entry is also common, as are large picture windows on the main facade. Early examples may feature metal casement windows, but sliding metal frame windows are the most common. Siding can be wood, brick, stucco, or a combination. Houses are typically composed of wings in a U- or L- shape that create for semi-enclosed outdoor living areas at the rear, often accessible from much of the house. Garages are usually attached. While sprawling, high-style custom Ranch houses were popular during the 1950s and 1960s, most Ranch houses were mass produced in post-war housing tracts and were unassuming in both size and design.[17]

[16] Pacific Air Industries, Flight ID DRH-1952-1K, Frame 116, August 16, 1952; Cartwright Aerial Surveys, Flight ID CAS_1957, Frame Fairfax, June 18, 1957; Cartwright Aerial Surveys, Flight ID CAS-65-130, Frame 40-102, June 12, 1965.

[17] David Gebhard, Eric Sandweiss, and Robert Winter, *Architecture in San Francisco and Northern California* (Salt Lake City, UT: Gibbs Smith Publisher, 1985), 579; Virginia Savage McAlester, *A Field Guide to American Houses: The Definitive Guide to Identifying and Understanding America's Domestic Architecture* (New York: Alfred A. Knopf, 2015), 596-611; Kenneth Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press: 1985: 540); Cliff May, *Western Ranch Houses, 1958* (Santa Monica, CA: Hennessey and Ingalls 1997), 13-24; California Department of Transportation (Caltrans), *Tract Housing in California, 1945-1973: A Context for National Register Evaluation* (Sacramento, CA: Caltrans, 2011), 70-78, available at http://www.dot.ca.gov/ser/downloads/cultural/tract_housing_in_ca_1945-1973.pdf.

Plate 1: 1952 aerial showing original configuration of the residence.[18]

Plate 2: 1957 aerial showing construction of garage.[19]

[18] Pacific Air Industries, Flight ID DRH-1952-1K, Frame 116, August 16, 1952.
[19] Cartwright Aerial Surveys, Flight ID CAS_1957, Frame Fairfax, June 18, 1957.

Plate 3: 1965 aerial showing additions to residence to present configuration.[20]

Evaluation

Under NRHP Criterion A/CRHR Criterion 1, the residence at 1 Meadow Way does not have significant associations with the residential development of Fairfax. The property is part of the post-war infill that took place inside the early twentieth century housing tracts that were never fully realized as conceived. This post-war trend also replaced the seasonal vacation homes, with permanent year-round residency and there is no evidence that it was significant within this context. The property at 1 Meadow Way has not fomented growth or stands as an important example. Research revealed no important association between this property, nor The Cascades subdivision within which it is situated, and the context of residential development on a local, state, or national level.

This property does not share significant associations with persons who made important contributions to history, and is therefore not eligible under NRHP Criterion B or CRHR Criterion 2. Research did not reveal that Harold or Denise Skaggs, made demonstrably important contributions to history at the local, state, or national level during their period of association with the property.

The property embodies come of the basic characteristics the Ranch style, period or method of construction (NRHP Criterion C/ CRHR Criterion 3) as it has a low long form without outdoor living area, and multiple types of rustic siding. The residence is not the work of a master, nor possesses high artistic values. The residence is not significant under these criteria because it is a modest example of a common architectural style.

Furthermore, the residence and its associated garage have not and are not likely to yield important information that furthers our knowledge of prehistory or history of the community, state, or nation. The construction methods for this type of construction are well documented elsewhere (NRHP Criterion D/CRHR Criterion 4). This evaluation does not include any potential historical archaeological deposits that may be related to the property.

While the integrity of location, setting, workmanship, feeling, and association remains intact, the property's historic integrity of design has been diminished through the construction of the detached garage and the large addition to the residence. However, regardless of integrity, the property lacks historical and architectural significance and does not meet the criteria for listing in the NRHP or CRHR.

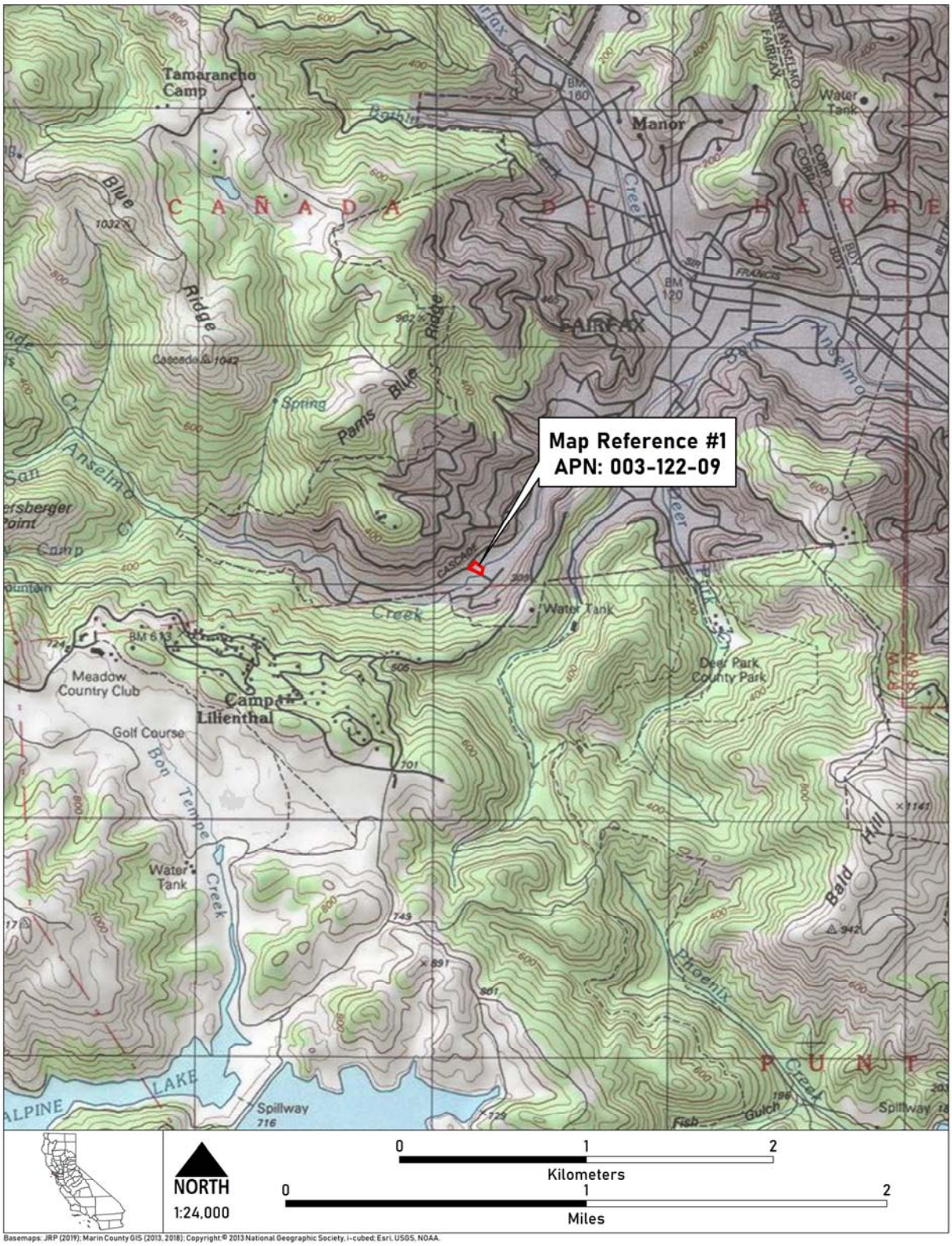
Photographs (continued):

Photograph 2: West side of residence, showing two external chimneys and skylights, facing northeast, September 20, 2017.

Photograph 3: Detail of entry on west side of residence, facing east, September 20, 2017.

[20] Cartwright Aerial Surveys, Flight ID CAS-65-130, Frame 40-102, June 12, 1965.

Location Map:



Basemaps: JRP (2019); Marin County GIS (2013, 2018); Copyright © 2013 National Geographic Society, i-cubed; Esri, USGS, NOAA.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

 ***Resource Name or #** (Assigned by recorder) Map Reference #2

P1. Other Identifier: 333 Cascade Drive

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5′ Quad** San Rafael, Calif **Date** 1954 (Photorevised 1968) **T** 2N; **R** 7W; __ ¼ **of Sec** ____; _____ **B.M.**

c. Address 333 Cascade Drive City Fairfax Zip 94930

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Assessor Parcel Number: 003-122-09

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This 0.18-acre parcel in the Town of Fairfax contains a modest 1,051-square foot linear Ranch style residence (**Photograph 1**). The residence is rectangular in plan and is topped with a side-gable roof with moderate, closed eaves that is covered with composition shingles. A three-quarter width shed roof extension is located on the south side that appears to serve as a patio cover. The exterior is sheathed in a combination of replacement vertical grooved plywood on the northern facing façade, and smooth stucco on the east and west sides. Entry into the residence is through a recessed, glazed vinyl panel door on the northern façade. A three-part replacement, vinyl casement window, and two, two-part replacement, vinyl sliding windows are located west of the entry and replacement overhead garage door for the integrated garage is located east of the entry. No wall openings in the west side and a single, square fixed window is located on the east side. An internal chimney projects near the center of the roofline.

***P3b. Resource Attributes:** (List attributes and codes) HP02 – Single family property

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) **Photograph 1:** North and east sides of residence, facing southwest, September 20, 2017

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1959, Marin County Assessor

***P7. Owner and Address:**
Scott Davis & M. Kathryn Thompson
333 Cascade Drive
Fairfax, CA 94930

***P8. Recorded by:** (Name, affiliation, address)
Heather Miller & Shelby Kendrick
JRP Historical Consulting, LLC
2850 Spafford Street
Davis, CA 95618

***P9. Date Recorded:** September 20, 2017

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, LLC, *Historical Resources Evaluation Report Meadow Way Bridge (Bridge 27C0008) Seismic Retrofit Project, Fairfax California* (BRLO-5277 (025), 2019.

***Attachments:** NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list) _____

B1. Historic Name: _____
B2. Common Name: _____
B3. Original Use: Residence B4. Present Use: Residence
***B5. Architectural Style:** Ranch
***B6. Construction History:** (Construction date, alteration, and date of alterations) Constructed in 1959; Replacement windows and siding installed before 2007.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown Date:** _____ **Original Location:** _____
***B8. Related Features:**

B9. Architect: Unknown b. Builder: Unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** residence **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The residence at 333 Cascade Drive does not meet the criteria for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR) or contribute to any potential larger historic property or historic district because it does not have historical significance. This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and is not a historical resource for the purposes of CEQA.

Historic Context

The residence at 333 Cascade Dr was constructed in 1959 in The Cascades No. 2 Subdivision, which had been created in the early twentieth century. Fairfax originated as a railroad stop on the North Pacific Coast Railroad in the former Mexican era *Canada de Herrara* rancho. During its early period, Marin County provided timber, dairy, poultry, and some crops for consumption in San Francisco. Easy water transport to San Francisco and its rapidly expanding markets was the key to growth for early Marin County towns. Regular ferry service between San Rafael and San Francisco was inaugurated in 1855 (see Continuation Sheet).

B11. Additional Resource Attributes: (List attributes and codes) _____

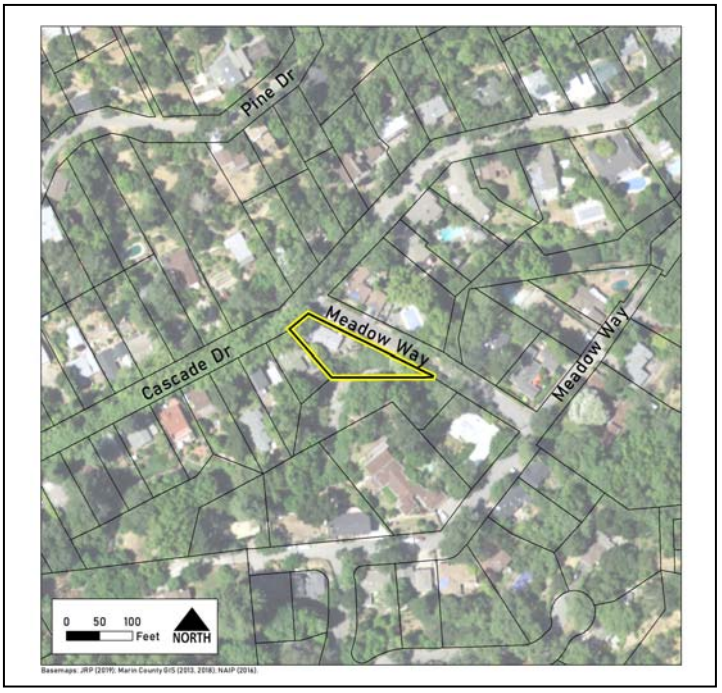
***B12. References:** Allen, Bill. "Fairfax During the War Years." *Fair Facts.* Fairfax Historical Society Bulletin 9, May 1991; Dickinson, A. Bray. *Narrow Gauge to the Redwoods.* Los Angeles: Trans-Anglo Books, 1967; Fairfax Historical Society. "A Brief History of Fairfax." *Fair Facts,* Bulletin 1, October 1988, 4; Mason, Jack and Helen Van Cleave Park. *Early Marin.* Petaluma, CA: House of Printing, 1971; Mason, Jack and Helen Van Cleave Park. *The Making of Marin (1850-1975).* Inverness, California: North Shore Books, 1975; Sagar, William and Brian Sagar. *Images of America Fairfax.* Charleston, SC: Arcadia Publishing, 2005; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961 (also see footnotes).

B13. Remarks:

***B14. Evaluator:** Heather Miller

***Date of Evaluation:** September 2017

(This space reserved for official comments.)



B10. Significance (continued):

Railroad construction began with investors owning tracts of redwoods along the Russian River forming the North Pacific Coast Railroad in 1871 to build a railroad across Main County connecting their stands of redwoods with San Francisco Bay markets via the Marin ferries. The company began construction from Sausalito to Tomales in 1873. Railroad promoters extolled the benefits the railroad would provide to landholders along the route, and many responded with various permissions to cross their land. Manuella Sais leased 1,600 acres to the North Pacific Coast Railroad allowing it to cross *Canada de Herrera*. In return, the railroad established a stop near both the Sais ranch and the estate of Charles Fairfax that became known as Fairfax. The first run from Sausalito to Tomales was on January 7, 1875.[1]

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[1] A. Bray Dickinson, *Narrow Gauge to the Redwoods* (Los Angeles: Trans-Anglo Books, 1967) 12, 20-21, 25, 31; Jack Mason and Helen Van Cleave Park, *The Making of Marin (1850-1975)* (Inverness, California: North Shore Books, 1975) 5-6, 29-30; R. Naylor Rogers, *Marin County California* (Sausalito, California: Sausalito News), n.p; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area and Point Reyes National Seashore California, Volume 1* (Denver, Colorado: National Park Services, 1980), 86-97; William Sagar and Brian Sagar, *Images of America Fairfax* (Charleston, SC: Arcadia Publishing, 2005), 21; Jack Mason and Helen Van Cleave Park, *Early Marin* (Petaluma, California: North Shore Books, 1975), 79; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area and Point Reyes National Seashore California, Volume 2* (Denver, Colorado: National Park Services, 1980), 2.

[2] Sagar, *Images of America Fairfax,* 21; Jack Mason and Helen Van Cleave Park, *Early Marin,* 79; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 125-126; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 2-3; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961.

[3] Sagar, *Images of America Fairfax,* 29; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 126-127; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City."

[4] Sagar, *Images of America Fairfax,* 43; Sanborn Fire Insurance Company, *Fairfax, California* (New York: Sanborn Fire Insurance Company, 1919) Sheet 2; Florence G. Donnelly, *Early Days in Marin: A Picture Review* (San Rafael, California: Marin County Savings and Loan Association, 1963) 40-41.

[5] Sagar, *Images of America Fairfax,* 21; Dickinson, *Narrow Gauge to the Redwoods,* 99, 101,119.

[6] Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 115-117, 120; *San Rafael Independent Journal*, "San Anselmo Started at Junction," *A Century of Service 1861-1961* (special section), March 25, 1961, H-14.

[7] Fairfax Historical Society, "A Brief History of Fairfax," *Fair Facts,* Bulletin 1, October 1988, 4; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 127; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 24.

Between the 1910s and early 1940s the community grew steadily. By 1920 the population included approximately 500 permanent residents and a total of 5,000 during the summer.[8] While Pastori's closed in 1925, recreation still remained an important part of Fairfax's identity. The Emporium, a large San Francisco department store purchased Pastori's and continued offering recreational opportunities to visitors.[9]

Transportation remained a challenge in the rugged terrain of Marin County. Increasingly motorists were interested in driving themselves across the county without using the railroad. Ferries first carried automobiles across the bay in 1902. The county requested aid from the United States Bureau of Public Roads in the development of a suitable road system in 1919. The existing system of roads was deemed in relatively good condition and suggestion made of new roads serving the northwest portion of the county. Under the plan, Sir Francis Drake Boulevard, then known as the San Rafael – Olema Road, was to become a first-class road and the main east west artery for the county. As a result, the road which largely followed the railroad, was graded and paved. These improvements were just in time for the completion of the Golden Gate Bridge in 1937. By this time individuals could finally reach Fairfax easily from San Francisco without using the railroad. [10]

Under agitation from the Deer Park Improvement Association the community of Fairfax incorporated in 1931.[11]

Property History

The house at 333 Cascade Drive is located on lot 1 of Block 7 of the *Map No. 2 of The Cascades,* which was filed in 1915. The Cascades tract was located on the 800-acre Cascade Ranch that was owned for almost three decades by the Fairfax Villa Company. In 1914, the newly formed Cascade Land Company, comprised of San Francisco realtors and investors, purchased the ranch for approximately $150,000. Starting at the eastern periphery of the large property, closest to Fairfax, surveyors soon plotted narrow lots, generally 50-feet wide with variations in size and shape in response to the rolling hillsides. Nearly $100,000 was spent on grading the winding streets, pouring concrete curbs, an installing brick posts at the entrance. The Cascade Land Company filed *Map No. 1 of The Cascades* in 1914, followed by an expansion of the tract, to the west and north, the next year with *Map No. 2 of The Cascades*, and a third, and final, extension was added to the far west in 1926 with filing of *Map No. 1 of The Cascade Estates* in 1926.[12]

Sales of the lots were managed under the Ferguson-Bruener Company out of San Francisco who published a sales brochure extolling the rustic and isolated nature of the tract, electric train connection to San Francisco, and its proximity to the ferry at Sausalito. By late summer of 1915, a reported 70 lots were sold and a small advertising campaign for the tract took place in the spring and summer of 1916. An article in the *San Francisco Chronicle* lauded the tract as "one of the most picturesque suburban home parks in Marin county," and a few small advertisements for the tract were run in the *San Francisco Chronicle* and the *Oakland Tribune* throughout 1916. Unlike earlier tracts, The Cascades was promoted as a suburban year-round residential oasis rather than a summertime recreational retreat. Sales in the tract were sluggish and even after the roadways were paved in the early 1930s to bolster sales, the developers were forced to sell lots at auction for a fraction of

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[8] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," *Marin county Historical Society Bulletin,* September 1992 18, 20, 23; Fairfax Historical Society, "A Brief History of Fairfax," 4; Randall Garrison, "Fairfax," *Marin County Almanac/ Bicentennial,* 1976, Fairfax, Pamphlet File, Anne Kent California Room, Marin County Library, San Rafael; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 129.

[9] Sagar, *Images of America Fairfax,* 29; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," H-16.

[10] Ben Blow, *California Highways* (San Francisco: H.S. Crocker Co, Inc., 1920) 77, 168-169; "Bridge at Point Reyes Completed Dedication Ceremonies Planned for Washington's Birthday" February 6, 1930, Roads, Clipping File, Anne Kent California Room, Marin County Library, San Rafael; "Sir Francis Drake Highway Follows Rout of 'Pack Trail' Says Old Pioneer, reprint from *San Rafael Independent,* November 23, 1929, *Marin County Historical Society Bulletin,* December 1993, 19-25; Sanborn Map Company, *Fairfax* (New York: Sanborn Map Company, 1924) 4-6; Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," *Fair Facts,* Fairfax Historical Society Bulletin 9, May 1991, 3; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 33-35, 39.

[11] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," 21; Jack Mason and Helen Van Cleave Park, *The Making of Marin*, 128.

[12] *Marin Journal,* "Realty Men Buy Cascade Ranch," July 16, 1914: 8; *San Francisco Chronicle,* "Operators Acquire Ranch at Fairfax," July 18, 1914: 8; Marin County Recorder, "Map No. 1 of The Cascades," August 4, 1914, Recorded in Book 4 of Recorded Maps: 88; Marin County Recorder, "Map No. 2 of The Cascades," July 7, 1915, Recorded in Book 5 of Recorded Maps: 14; Marin County Recorder, "Map No. 1 of The Cascades Estates," May 22, 1926, Recorded in Book 5 of Recorded Maps: 42.

the listed prices. Mapping of the area at the end of the decade shows just how little the large subdivision was developed by the beginning of World War II 25 years later. [13]

During World War II the introduction of Marinship and Hamilton Air Force Base on the eastern side of Marin resulted in an increasing permanent population. Following the war California experienced a general population increase which continued the increase in permanent residents in Fairfax. The town's terrain, however, limited explosive growth with much of the land to the west under conservation plans as part of the watershed for the Marin Municipal Water District. Empty lots did fill with apartment complexes, Broadway Boulevard facing the former railroad filled in, and summer residences became year-round dwellings in response to the housing shortage following World War II.[14]

This residence at 333 Cascade Drive was completed in 1959, but sat empty until 1961 when George Tong Jr. and his wife Jan Yuet purchased the property from H. Sloan. According to Tong in a 1978 interview, this residence and two other nearby residences in The Cascades were constructed around the same time and sold at a loss by the builders. George Tong Jr. was born in 1930 in San Rafael where his parents owned and operated Panama Grocery in San Anselmo. George's father died when he was four months old and his mother sold the business to brothers Ton, Harry, and Bing Fong, and took her children to China. George lived in China until he was nine years old when he was sent back to America to live with a series of relatives. In 1948, George returned to China under false pretenses when his mother insisted that he get married at 18-years old to a Chinese bride. Eventually, he married Jan Yuet of his own choosing and lived with her for six months at his mother's house. George wanted to return to Fairfax, but his mother protested that if the newlyweds moved, he would never return to China. Because he was also not financially ready to support a two-person household, he returned to Fairfax alone and began working for the Fong brothers who purchased his father's store. Ten years after their wedding, George finally felt financially stable enough to send for Jan Yuet and their nine-year old daughter Susan who both arrived in the United States in January 1959. The reunited family lived together in another part of Fairfax until the birth of their son Robert in 1960, followed by the purchase of this residence in 1961. The Tong's grew their family with the addition of two more children, Cindy and Richard, and Jan Yuet became a naturalized citizen in 1970. After 20 years at the residence, the Tong's sold the property to Wayne L. & Lorraine M. Lesser in 1981 who sold it two years later to George A. & Ann T. Gregory. The current owner, Scott Davis, originally purchased the property in 1986 from the Gregorys with Cathy T. Daly, but currently owns the property with M. Katherine Thompson.[15]

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[13] Ferguson-Breuner Co. "The Cascades," Fairfax Pamphlets 1, Fairfax: Pamphlets, Arequipa, Clippings 1940-1989, Anne T. Kent California Room, Marin County Library, San Rafael, California; *San Francisco Chronicle,* "Picturesque Tract Opened to Marin," May 13, 1916: 9; *San Francisco Chronicle,* advertisement, May 20, 1916: 9; *Oakland Tribune,* advertisement, July 22, 1916: 11; Bill Allen, "The Cascade Ranch," *Fair Facts*, Fairfax Historical Society Bulletin No. 19 (May 1994): 6, 12-13.

[14] Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," 3; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961, H-16; *San Rafael Independent Journal* "Circulation of I-J Grew with County," *A Century of Service 1861-1961* (special section), April 1, 1961, H17; Jean Secchintano, *The Golden Days of Fairfax 1831-1931* (Fairfax, California: Fairfax PTA, 196?), 33.

[15] Marin County Recorder, "Map No. 1 of The Cascades,"; Marin County Recorder, "Map No. 2 of The Cascades,"; Marin County Recorder, H. Sloan to George & Jan Y. Tong, Deed, Official Records Vol. 1455, Page 20, filed April 21, 1961; George Tong, Jr., interview by Carla Ehat and Anne T. Kent, May 2, 1978, Oral History Project of the Marin County Free Library, Anne T. Kent California Room, Marin County Free Library, San Rafael, California; California, Federal Naturalization Records, 1843-1999 for George Tong, available at Ancestry.com (accessed September 2017); California, Federal Naturalization Records, 1843-1999 for Jan Yuet Tong, available at Ancestry.com (accessed September 2017); R.L. Polk, *R.L. Polk's San Rafael City Directory* (Los Angeles, CA: R.L. Polk & Co. Publishers, 1960); *Independent-Journal,* "Dad Follows Daughter As U.S. Citizen," March 10, 1970: 17; Recorder's Official Records Detail, George & Jan Y. Tong to Lorraine M. & Wayne Lesser, Deed, March 3, 1981, Document No. 1981-0009135, available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017); Recorder's Official Records Detail, Lorraine M. & Wayne Lesser to George A. & Ann T. Gregory, Deed, September 13, 1983, Document No. 1983-0045677, available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017); Recorder's Official Records Detail, George A. & Ann T. Gregory to Scott A. Davis & Cathy T. Daly, Deed, July 16, 1986, Document No. 1983-1986-0036840, available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017); Recorder's Official Records Detail, Scott A. Davis to Scott A. Davis & M. Kathrine Thompson , Deed, January 27, 1997, Document No. 1997-0003939, available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017).

Ranch Architecture

The residence at 333 Cascade Drive is constructed in the Ranch style, which began to emerge as a residential style in California in the late 1920s and early 1930s. The style reached peak popularity in first two decades after World War II, surpassing that of Minimal Traditional homes by the early 1950s. The Ranch style also incorporated a variety of historic quasi-colonial/early-American period precedents, including the nineteenth century California adobe house and the nineteenth century California single-wall, board-and-batten rural buildings. As the style gained popularity, builders of middle- and upper-income homes across the country copied the designs of early custom homes of California. A typical Ranch style suburban house features include elongated, asymmetrical one-story plans with low pitched hip, cross gable, or side gable forms. Eaves are usually wide and create an overhanging shelter for a walkway along the sides of the house. A recessed entry is also common, as are large picture windows on the main facade. Early examples may feature metal casement windows, but sliding metal frame windows are the most common. Siding can be wood, brick, stucco, or a combination. Houses are typically composed of wings in a U- or L-shape that create for semi-enclosed outdoor living areas at the rear, often accessible from much of the house. Garages are usually attached. While sprawling, high-style custom Ranch houses were popular during the 1950s and 1960s, most Ranch houses were mass produced in post-war housing tracts and were unassuming in both size and design.[16]

Evaluation

Under NRHP Criterion A/CRHR Criterion 1, the residence at 333 Cascade Drive does not have significant associations with the residential development of Fairfax. The property is part of the post-war infill that took place inside the early twentieth century housing tracts that were never fully realized as conceived. This post-war trend also replaced the seasonal vacation homes, with permanent year-round residency and there is no evidence that it was significant within this context. The property at 333 Cascade Drive has not fomented growth or stands as an important example. Research revealed no important association between this property, nor The Cascades subdivision within which it is situated, and the context of residential development on a local, state, or national level.

This property does not share significant associations with persons who made important contributions to history, and is therefore not eligible under NRHP Criterion B or CRHR Criterion 2. Research did not reveal that any member of the Tong family, or any other individuals, made demonstrably important contributions to history at the local, state, or national level during their period of association with the property.

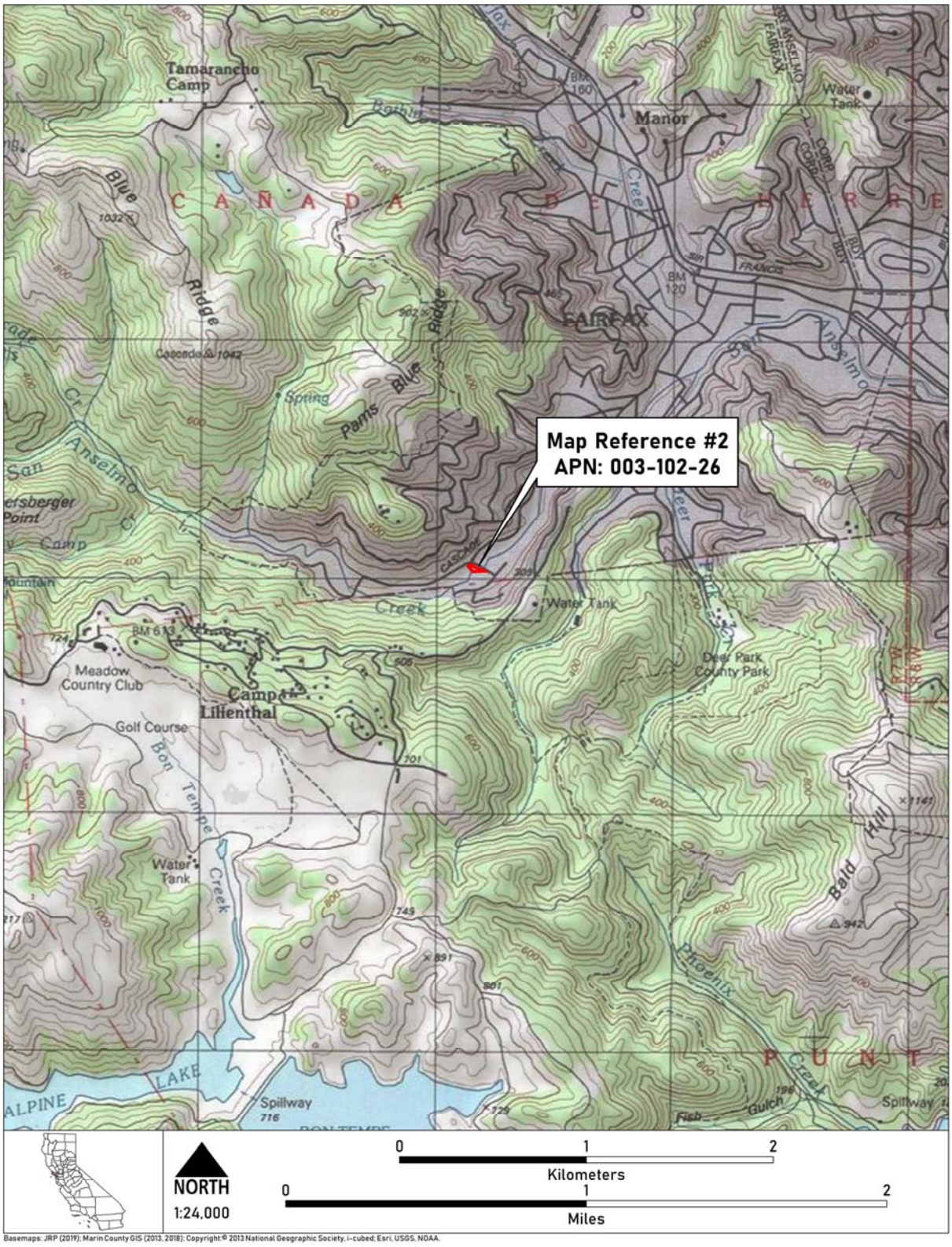
The property embodies some characteristics features of the Ranch style, period and method of construction (NRHP Criterion C/ CRHR Criterion 3) such as the compact form, an integrated garage, and a recessed door. The residence is, however, a prosaic example of the style and is not eligible for the NRHP or CRHR under these criteria. The residence is not the work of a master, nor possesses high artistic values.

Furthermore, the residence has not and is not likely to yield important information that furthers our knowledge of prehistory or history of the community, state, or nation and as such is not significant under NRHP Criterion D/CRHR Criterion 4. Construction methods for this type of construction are well documented elsewhere. This evaluation does not include any potential historical archaeological deposits that may be related to the property.

While the integrity of location, setting, design, feeling, and association remains intact, the property's historic integrity of the materials and workmanship has been diminished through the replacement siding and windows on the façade. However, regardless of integrity, the property lacks historical and architectural significance and does not meet the criteria for listing in the NRHP or CRHR.

[16] David Gebhard, Eric Sandweiss, and Robert Winter, *Architecture in San Francisco and Northern California* (Salt Lake City, UT: Gibbs Smith Publisher, 1985), 579; Virginia Savage McAlester, *A Field Guide to American Houses: The Definitive Guide to Identifying and Understanding America's Domestic Architecture* (New York: Alfred A. Knopf, 2015), 596-611; Kenneth Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press: 1985: 540); Cliff May, *Western Ranch Houses, 1958* (Santa Monica, CA: Hennessey and Ingalls 1997), 13-24; California Department of Transportation (Caltrans), *Tract Housing in California, 1945-1973: A Context for National Register Evaluation* (Sacramento, CA: Caltrans, 2011), 70-78, available at http://www.dot.ca.gov/ser/downloads/cultural/tract _housing_in_ca_1945-1973.pdf.

Location Map:



State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

***Resource Name or #** (Assigned by recorder) Map Reference #3

P1. Other Identifier: 6 & 6A Meadow Way

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** San Rafael, Calif **Date** 1954 (Photorevised 1968) **T** 2N; **R** 7W; __ ¼ **of Sec** ___; _____ **B.M.**

c. Address 6 & 6A Meadow Way City Fairfax Zip 94930

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Assessor Parcel Number: 003-102-19

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This 0.23-acre parcel in the Town of Fairfax contains a 2,306-square foot Ranch style residence with an attached apartment and a detached, modern shed (**Photograph 1**). The parcel has fences along much of the perimeter and mature landscaping. The residence has an irregular footprint and is topped with a low-pitched, cross-gable roof with moderate overhang, closed eaves, wide fascia board, and is covered with a tar & gravel roof. The exterior is sheathed with flush, wide wood boards. Entry into the primary residence is centrally located on the northern-facing façade and consists of a wood panel door that is accessed by low, wide concrete steps. The door is flanked by three-part, vinyl replacement casement windows with decorative Z-brace wood shutters (**Photographs 1 & 2**) (see Continuation Sheet).

***P3b. Resource Attributes:** (List attributes and codes) HP03 – Multiple family property

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) **Photograph 1:** North and west sides of residence at left, and shed at far right, and bridge approach in foreground, facing south, September 20, 2017

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1955, Marin County Assessor

***P7. Owner and Address:**
Russell Horton & Kristin Anderson
9430 La Jolla Shores Drive
La Jolla, CA 92037

***P8. Recorded by:** (Name, affiliation, address)
Heather Miller & Shelby Kendrick
JRP Historical Consulting, LLC
2850 Spafford Street
Davis, CA 95618

***P9. Date Recorded:** September 20, 2017

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, LLC, *Historical Resources Evaluation Report Meadow Way Bridge (Bridge 27C0008) Seismic Retrofit Project, Fairfax California* (BRLO-5277 (025), 2019.

***Attachments:** NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list) _____

B1. Historic Name: _____
B2. Common Name: _____
B3. Original Use: Residence B4. Present Use: Residence
***B5. Architectural Style:** Ranch
***B6. Construction History:** (Construction date, alteration, and date of alterations) Constructed in 1955; Partial replacement windows installed before 2007; Detached shed erected at unknown date.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown Date:** _____ **Original Location:** _____
***B8. Related Features:**

B9. Architect: Unknown b. Builder: Unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** residence **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The residence at 6 & 6A Meadow Way does not meet the criteria for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR) or contribute to any potential larger historic property or historic district because it does not have historical significance. This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and is not a historical resource for the purposes of CEQA.

Historic Context

This residence is located on the southeastern side of San Anselmo Creek opposite The Cascades subdivision created in 1914. Fairfax originated as a railroad stop on the North Pacific Coast Railroad in the former Mexican-era *Canada de Herrara* rancho. During its early period, Marin County provided timber, dairy, poultry, and some crops for consumption in San Francisco. Easy water transport to San Francisco and its rapidly expanding markets was the key to growth for early Marin County towns. Regular ferry service between San Rafael and San Francisco was inaugurated in 1855 (see Continuation Sheet).

B11. Additional Resource Attributes: (List attributes and codes) _____

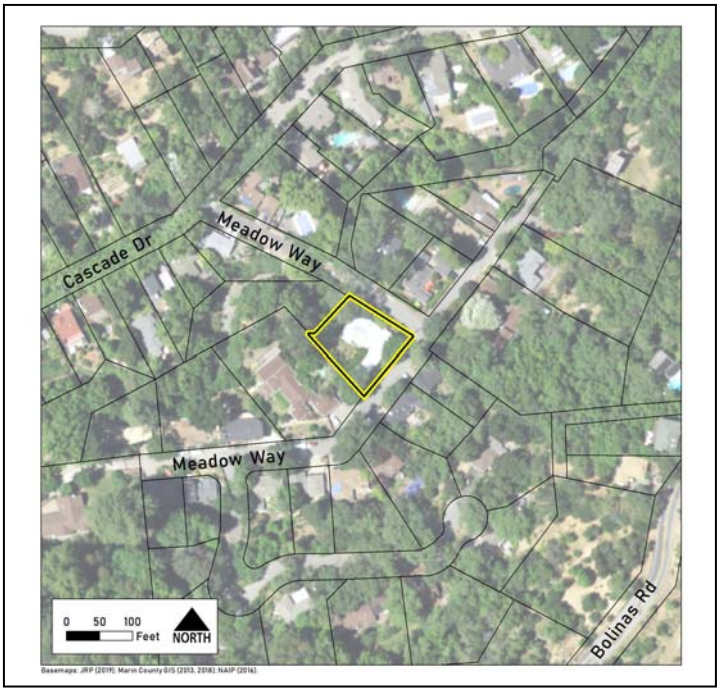
***B12. References:** Allen, Bill. "Fairfax During the War Years." *Fair Facts.* Fairfax Historical Society Bulletin 9, May 1991; Dickinson, A. Bray. *Narrow Gauge to the Redwoods.* Los Angeles: Trans-Anglo Books, 1967; Fairfax Historical Society. "A Brief History of Fairfax." *Fair Facts,* Bulletin 1, October 1988, 4; Mason, Jack and Helen Van Cleave Park. *Early Marin.* Petaluma, CA: House of Printing, 1971; Mason, Jack and Helen Van Cleave Park. *The Making of Marin (1850-1975).* Inverness, California: North Shore Books, 1975; Sagar, William and Brian Sagar. *Images of America Fairfax.* Charleston, SC: Arcadia Publishing, 2005; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961 (also see footnotes).

B13. Remarks:

***B14. Evaluator:** Heather Miller

***Date of Evaluation:** September 2017

(This space reserved for official comments.)



P3a. Description (continued):

An integrated two-car garage with a replacement overhead door is located on the west end of the façade and a metal frame, two-part sliding window is located on the west side of the garage. An internal chimney projects through the roofline and is sheathed with horizontal wood boards.

One-, two-, and three-part vinyl replacement windows are located along the north end of the east side. The integrated apartment is located in the south end of the east side of the residence and is accessed by a glazed wood door and a decorative wood screen door (**Photographs 3**). The windows in the apartment unit are original, three-part metal frame casement.

There is an enclosed, shed roof porch extension, as well as a shed roof patio cover extension, on the south side of the residence.

A wood-frame, detached shed is sited southwest from the west side of the residence. The shed is topped with a composition shingle covered gable roof that is supported along the north side with wood poles as part of a full-width porch. Two glazed doors are located on the northern-facing façade and the exterior is sheathed with narrow clapboard siding.

B10. Significance (continued):

Railroad construction began with investors owning tracts of redwoods along the Russian River forming the North Pacific Coast Railroad in 1871 to build a railroad across Main County connecting their stands of redwoods with San Francisco Bay markets via the Marin ferries. The company began construction from Sausalito to Tomales in 1873The railroad established a stop near both the Sais ranch and the estate of Charles Fairfax that became known as Fairfax. The first run from Sausalito to Tomales was on January 7, 1875.[1]

Major stockholders in the railroad had visions of shipping freight from the hinterlands to profitable markets, however, they were also aware of potential for tourist travel. North Pacific Coast Railroad (later the North Shore Railroad) established a picnic grounds at the Fairfax station by April 1875. The stop became a popular picnic excursion with the railroad scheduling special trains to the park. Even after the railroad turned over ownership and operation of the picnic grounds to local operators, Fairfax remained a preferred picnic place for San Francisco visitors.[2] In addition to the common picnic grounds, Bird's Nest Glen was leased to Charles Pastori and his wife, Adele (a former opera singer), and they established a popular Italian restaurant named for them. Pastori's attracted visitors from across the country; drawn from their large network of stage friends. Pastori's remained in operation until 1925 when prohibition limited the hospitality industry.[3]

The popularity of Fairfax for recreation soon brought permanent development near the station. Slowly a cluster of commercial buildings developed near the station where Bolinas Road met the railroad.[4] In 1902 the railroad line was electrified between Sausalito and Fairfax. Electrical operations decreased the travel time and increased the number of runs. It also opened the possibility for more permanent settlement and long-term residents[5]

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[1] A. Bray Dickinson, *Narrow Gauge to the Redwoods* (Los Angeles: Trans-Anglo Books, 1967) 12, 20-21, 25, 31; Jack Mason and Helen Van Cleave Park, *The Making of Marin (1850-1975)* (Inverness, California: North Shore Books, 1975) 5-6, 29-30; R. Naylor Rogers, *Marin County California* (Sausalito, California: Sausalito News), n.p; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area and Point Reyes National Seashore California, Volume 1* (Denver, Colorado: National Park Services, 1980), 86-97; William Sagar and Brian Sagar, *Images of America Fairfax* (Charleston, SC: Arcadia Publishing, 2005), 21; Jack Mason and Helen Van Cleave Park, *Early Marin* (Petaluma, California: North Shore Books, 1975), 79; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area and Point Reyes National Seashore California, Volume 2* (Denver, Colorado: National Park Services, 1980), 2.

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[5] Sagar, *Images of America Fairfax,* 21; Dickinson, *Narrow Gauge to the Redwoods,* 99, 101,119.

Following the earthquake of 1906 San Francisco residents, shaken by the quake and ensuing fire, looked further afield for new homes and communities in the Ross Valley finally began to grow.[6] In 1907 land around the Fairfax stop was divided into three subdivisions, Fairfax Tract, Ridgeway, and Deer Park. Additional subdivisions followed: Pacheco Tract in 1910, Fairfax Manor Tract 1911, Fairfax Park 1911, Fairfax Heights 1912, Bush Annex 1913, Bothin Park 1913, Manor Tract 1914, and the Cascades in 1914. Active marketing promoted the area as a commuter town, but it remained viewed largely as a recreational area. Throughout Fairfax, purchased lots became residences, camping grounds, and summer homes. Houses scattered throughout the subdivisions remained divided between commuters and summer residents.[7]

Between the 1910s and early 1940s the community grew steadily. By 1920 the population included approximately 500 permanent residents and a total of 5,000 during the summer.[8] While Pastori's closed in 1925, recreation still remained an important part of Fairfax's identity. The Emporium, a large San Francisco department store purchased Pastori's and continued offering recreational opportunities to visitors.[9]

Transportation remained a challenge in the rugged terrain of Marin County. Increasingly motorists were interested in driving themselves across the county without using the railroad. Ferries first carried automobiles across the bay in 1902. The county requested aid from the United States Bureau of Public Roads in the development of a suitable road system in 1919. The existing system of roads was deemed in relatively good condition and suggestion made of new roads serving the northwest portion of the county. Under the plan, Sir Francis Drake Boulevard, then known as the San Rafael – Olema Road, was to become a first-class road and the main east west artery for the county. As a result, the road which largely followed the railroad, was graded and paved. These improvements were just in time for the completion of the Golden Gate Bridge in 1937. By this time individuals could finally reach Fairfax easily from San Francisco without using the railroad. [10]

Under agitation from the Deer Park Improvement Association the community of Fairfax incorporated in 1931.[11]

During World War II the introduction of Marinship and Hamilton Air Force Base on the eastern side of Marin resulted in an increasing permanent population. Following the war California experienced a general population increase which continued the increase in permanent residents in Fairfax. The town's terrain, however, limited explosive growth, with much of the land to the west under conservation plans as part of the watershed for the Marin Municipal Water District. Empty lots did fill with apartment complexes, Broadway Boulevard facing the former railroad filled in, and summer residences became year-round dwellings in response to the housing shortage following World War II.[12]

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[6] Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 115-117, 120; *San Rafael Independent Journal*, "San Anselmo Started at Junction," *A Century of Service 1861-1961* (special section), March 25, 1961, H-14.

[7] Fairfax Historical Society, "A Brief History of Fairfax," *Fair Facts,* Bulletin 1, October 1988, 4; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 127; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 24.

[8] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," *Marin county Historical Society Bulletin,* September 1992 18, 20, 23; Fairfax Historical Society, "A Brief History of Fairfax," 4; Randall Garrison, "Fairfax," *Marin County Almanac/ Bicentennial,* 1976, Fairfax, Pamphlet File, Anne Kent California Room, Marin County Library, San Rafael; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 129.

[9] Sagar, *Images of America Fairfax,* 29; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," H-16.

[10] Ben Blow, *California Highways* (San Francisco: H.S. Crocker Co, Inc., 1920) 77, 168-169; "Bridge at Point Reyes Completed Dedication Ceremonies Planned for Washington's Birthday" February 6, 1930, Roads, Clipping File, Anne Kent California Room, Marin County Library, San Rafael; "Sir Francis Drake Highway Follows Rout of 'Pack Trail' Says Old Pioneer, reprint from *San Rafael Independent,* November 23, 1929, *Marin County Historical Society Bulletin,* December 1993, 19-25; Sanborn Map Company, *Fairfax* (New York: Sanborn Map Company, 1924) 4-6; Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," *Fair Facts,* Fairfax Historical Society Bulletin 9, May 1991, 3; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 33-35, 39.

[11] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," 21; Jack Mason and Helen Van Cleave Park, *The Making of Marin*, 128.

[12] Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," *Fair Facts,* 3; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961, H-16; *San Rafael Independent Journal* "Circulation of I-J Grew with County," *A Century of Service 1861-1961* (special section), April 1, 1961, H17; Jean Secchintano, *The Golden Days of Fairfax 1831-1931* (Fairfax, California: Fairfax PTS, 196?), 33.

Property History

This residence is located just outside *The Cascades* subdivision, which was filed in 1914 and expanded in 1915 by the Cascade Land Company. Although the parcel falls just outside the boundary of the subdivision, the property was sold by the Cascade Land Company in 1925 to a private owner as part of a larger land transaction. In 1941, Oscar H. Dersheimer and his wife Marydee purchased said parcel and constructed a residence at 27 Meadow Way in the early 1940s, located just west of the where 6 & 6A Meadow Way now stands. Dersheimer was employed as the general manager of the Pam Panga Sugar Mills in the Philippines and was often away from home. The couple commissioned the construction of the residence a 6 & 6A Meadow Way the same year that Oscar died while on a work trip. After his death, Marydee appears to have consolidated and sold most of the excess land they purchased in 1941, the house at 27 Meadow Way, and moved into the residence at 6 Meadow Way with her daughter, and her mother moved into the apartment unit.[13] Marydee sold the residence to retiree Frank Montera who lived at the residence with his new wife Katherine Henry Mickelson Etienne, and her daughter Karen K. Mickelson. The couple divorced in 1966, but continued to live at the residence when it appears that Katherine purchased, or was deeded the property from Frank around 1968. At some point in the 1990s, Katherine's brother, Howard E. Henry, purchased the property, but Katherine, who worked as a real estate agent, continued to live at the residence until her death in 1999. The year following her mother's death, Katherine's daughter, Karen K. Mickelson, bought the property from her uncle and moved back into the residence where she spent her teenage years. Karen sold the property the the current owners in 2015 who appear to use it as an income producing property.[14]

Ranch Architecture

The residence at 6 & 6A Meadow Way is constructed in the Ranch style, which began to emerge as a residential style in California in the late 1920s and early 1930s. The style reached peak popularity in first two decades after World War II, surpassing that of Minimal Traditional homes by the early 1950s. The Ranch style also incorporated a variety of historic

[13] Marin County Recorder, "Map No. 1 of The Cascades," August 4, 1914, Recorded in Book 4 of Recorded Maps: 88; Marin County Recorder, "Map No. 2 of The Cascades," July 7, 1915, Recorded in Book 5 of Recorded Maps: 14; *Marin County Directory 1954-1955* (San Anselmo, California: A to Z Directory Publishers, 1953; Marin County Recorder, Cascade Land Co. to George W. Hollister, Deed, OR Vol. 39, Page 128, filed October 5, 1925; Marin County Recorder, George W. Hollister & Maud Hollister to William Kent Estate Co., Deed, OR Vol. 411, Page 842, filed May 7, 1941; Marin County Recorder, O.H. Dersheimer and Marydee Dersheimer, Deed of Trust, OR Vol. 421, Page 254, filed October 27, 1941; Jack Ammann Photogrammetric Engineers, Flight GS-CP, Frame 4-96, July 7, 1946; Pennsylvania, Death Certificates, 1906-1964 for Oscar Harding Dersheimer, available at Ancestry.com (accessed September 2017); Marin County Recorder, "Map of Subdivision , Meadow Way Tract," July 13, 1948, Recorded in Book 65 of Recorded Maps: 157; R.L. Polk, *R.L. Polk's San Rafael City Directory* (Monterey Park, CA: R.L. Polk & Co. Publishers, 1960, 1962, 1963); *Independent-Journal,* "Handicapped Essay Wins Vets' Prize," March 8, 1963, 11; *Independent-Journal,* "Metta Clayton," September 19, 1967, 4.

[14] Pacific Telephone & Telegraph Co., *Pacific Telephone Yellow Pages, Marin County April 1964* (n.p.: 1964); *Independent-Journal,* "Theft Suspect Just Misses Facing Gun," February 9, 1965, 3; California, Divorce Index, 1966-1984, available at Ancestry.com (accessed September 2017); R.L. Polk, *R.L. Polk's San Rafael City Directory* (Monterey Park, CA: R.L. Polk & Co. Publishers, 1966, 1968); *Independent-Journal,* "Pair Will receive Diplomas on June 7," May 25, 1967, 16; Pacific Telephone & Telegraph Co., *Pacific Telephone Yellow Pages, Marin County April 1969* (n.p.: 1969); *Independent-Journal,* "20 Are Given Sentences for Driving While Drunk," September 26, 1973, 6; *U.S. Phone and Address Directories, 1993-2002*, available at Ancestry.com (accessed September 2017); *U.S., Social Security Death Index, 1935-2014*, available at Ancestry.com (accessed September 2017); *Independent-Journal,* "Katherine Etienne," February 12, 1999, available at http://boards.rootsweb.com/localities.northam.usa.states.california.counties.marin/1621/mb.ashx (accessed September 2017); Recorder's Official Records Detail, Howard E. Henry & Doris L. Henry to Howard E. Henry Trust & Doris L. Henry Trust, Deed, February 22, 1993, Document No. 1993-0015880, available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017); Recorder's Official Records Detail, Howard E. Henry Trust to Karen Mickelson, Deed, March 13, 2000, Document No. 2000-0012770, available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017); Recorder's Official Records Detail, Karen Mickleson to Karen Mickleson Trust, Deed, May 30, 2000, Document No. 2000-0027893 available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017); Recorder's Official Records Detail, Karen Mickelson Revocable Living Trust to Russell S. Horton & Kristen N. Anderson, Deed, June 15, 2015, Document No. 2015-0028862, available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017).

quasi-colonial/early-American period precedents, including the nineteenth century California adobe house and the nineteenth century California single-wall, board-and-batten rural buildings. As the style gained popularity, builders of middle- and upper-income homes across the country copied the designs of early custom homes of California. A typical Ranch style suburban house features include elongated, asymmetrical one-story plans with low pitched hip, cross gable, or side gable forms. Eaves are usually wide and create an overhanging shelter for a walkway along the sides of the house. A recessed entry is also common, as are large picture windows on the main facade. Early examples may feature metal casement windows, but sliding metal frame windows are the most common. Siding can be wood, brick, stucco, or a combination. Houses are typically composed of wings in a U- or L-shape that create for semi-enclosed outdoor living areas at the rear, often accessible from much of the house. Garages are usually attached. While sprawling, high-style custom Ranch houses were popular during the 1950s and 1960s, most Ranch houses were mass produced in post-war housing tracts and were unassuming in both size and design.[15]

Evaluation

Under NRHP Criterion A/CRHR Criterion 1, the property at 6 & 6A Meadow Way does not have significant associations with the residential development of Fairfax. The property is part of the post-war infill that took place inside the early twentieth century housing tracts that were never fully realized as conceived. This post-war trend also replaced the seasonal vacation homes, with permanent year-round residency and there is no evidence that it was significant within this context. The property at 6 & 6A Meadow Way has not fomented growth or stands as an important example. Research revealed no important association between this property, nor The Cascades subdivision within which it is situated, and the context of residential development on a local, state, or national level.

This property does not share significant associations with persons who made important contributions to history, and is therefore not eligible under NRHP Criterion B or CRHR Criterion 2. Research did not reveal that Oscar H. or Marydee Dersheimer, Frank Montero, Katherine Henry Mickelson Etienne, or any other individuals, made demonstrably important contributions to history at the local, state, or national level during their period of association with the property.

The property embodies some distinctive characteristics of Ranch style architecture, period and method of construction (NRHP Criterion C/ CRHR Criterion 3) as it has a long low profile, with an integrated garage, and wide eaves. The residence is not the work of a master, nor possesses high artistic values. The property is not significant under these criteria because it is not an important example of this common architectural style.

Furthermore, the residence and its associated buildings have not and are not likely to yield important information that furthers our knowledge of prehistory of the history of the community, state, or nation and is not significant under NRHP Criterion D/CRHR Criterion 4. Construction methods for this type of construction are well documented elsewhere. This evaluation does not include any potential historical archaeological deposits that may be related to the property.

While the integrity of location, setting, design, feeling, and association remains intact, the property's historic integrity of the materials and workmanship has been diminished through the installation of some replacement windows. However, regardless of integrity, the property lacks historical and architectural significance and does not meet the criteria for listing in the NRHP or CRHR.

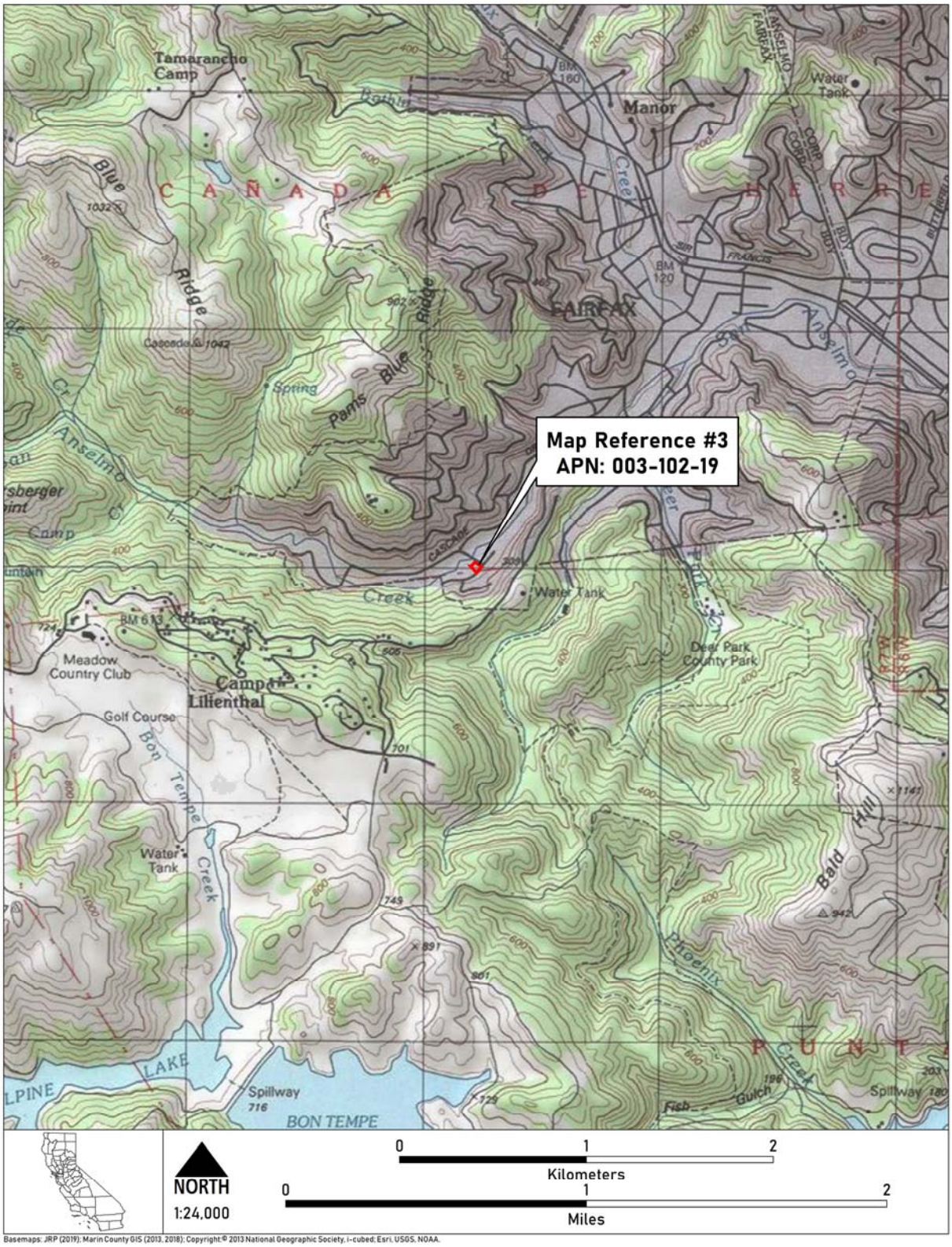
[15] David Gebhard, Eric Sandweiss, and Robert Winter, *Architecture in San Francisco and Northern California* (Salt Lake City, UT: Gibbs Smith Publisher, 1985), 579; Virginia Savage McAlester, *A Field Guide to American Houses: The Definitive Guide to Identifying and Understanding America's Domestic Architecture* (New York: Alfred A. Knopf, 2015), 596-611; Kenneth Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press: 1985: 540); Cliff May, *Western Ranch Houses, 1958* (Santa Monica, CA: Hennessey and Ingalls 1997), 13-24; California Department of Transportation (Caltrans), *Tract Housing in California, 1945-1973: A Context for National Register Evaluation* (Sacramento, CA: Caltrans, 2011), 70-78, available at http://www.dot.ca.gov/ser/downloads/cultural/tract_housing_in_ca_1945-1973.pdf.

Photographs (continued):

Photograph 2: Eastern corner of residence, facing southwest, September 20, 2017.

Photograph 3: Detail of apartment, facing north, September 20, 2017.

Location Map:



State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

***Resource Name or #** (Assigned by recorder) Map reference #4

P1. Other Identifier: 7 Meadow Way

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** San Rafael, Calif **Date** 1954 (Photorevised 1968) **T** 2N; **R** 7W; __ ¼ **of Sec** ____; _____ **B.M.**

c. Address 7 Meadow Way City Fairfax Zip 94930

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Assessor Parcel Number: 003-122-55

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This 0.23-acre parcel in the Town of Fairfax contains a modest 1,813-square foot Minimal Traditional style residence (**Photograph 1**). Mature landscaping and a tall fence on the east side of the parcel obscures much of the east side of the residence. The residence is roughly rectangular in plan and is topped with a primary cross-hipped roof with moderate, closed eaves, and is covered with composition shingles. The exterior is sheathed in replacement vertical grooved plywood siding. Primary entry into the residence is most likely located on the east side. An external, stucco clad chimney is located on the east side of the the northern cross-gable roof section. An eight-light, wood frame picture window, with two upper light casements is located on the southern facing façade with four similar lights that wrap around to the east side (see Continuation Sheet).

***P3b. Resource Attributes:** (List attributes and codes) HP02 – Single family property

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) **Photograph 1:** South and east sides residence, facing north, September 20, 2017

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1948, Marin County Assessor

***P7. Owner and Address:**
Alexander Binik Trust & Marilyn Gaynes Trust
7 Meadow Way
Fairfax, CA 94930

***P8. Recorded by:** (Name, affiliation, address)
Heather Miller & Shelby Kendrick
JRP Historical Consulting, LLC
2850 Spafford Street
Davis, CA 95618

***P9. Date Recorded:** September 20, 2017

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, LLC, *Historical Resources Evaluation Report Meadow Way Bridge (Bridge 27C0008) Seismic Retrofit Project, Fairfax California* (BRLO-5277 (025), 2019.

***Attachments:** NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list) _____

B1. Historic Name: _____
B2. Common Name: _____
B3. Original Use: Residence B4. Present Use: Residence
***B5. Architectural Style:** Minimal Traditional
***B6. Construction History:** (Construction date, alteration, and date of alterations) Constructed in 1948; shed rood addition on west side constructed 1948-1952; shed rood addition on west side extended to the entire length of the residence 1952-1957.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown Date:** _____ **Original Location:** _____
***B8. Related Features:**

B9. Architect: Unknown b. Builder: Unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** residence **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The residence at 7 Meadow Way does meet the criteria for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR) or contribute to any potential larger historic property or historic district because it does not have historical significance. This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and is not a historical resource for the purposes of CEQA.

Historic Context

This residence is located on the southeastern side of San Anselmo Creek opposite The Cascades subdivision, this area was not developed until after World War II. Fairfax originated as a railroad stop on the North Pacific Coast Railroad in the former Mexican-era *Canada de Herrara* rancho. During its early period, Marin County provided timber, dairy, poultry, and some crops for consumption in San Francisco. Easy water transport to San Francisco and its rapidly expanding markets was the key to growth for early Marin County towns. Regular ferry service between San Rafael and San Francisco was inaugurated in 1855 (see Continuation Sheet).

B11. Additional Resource Attributes: (List attributes and codes) _____

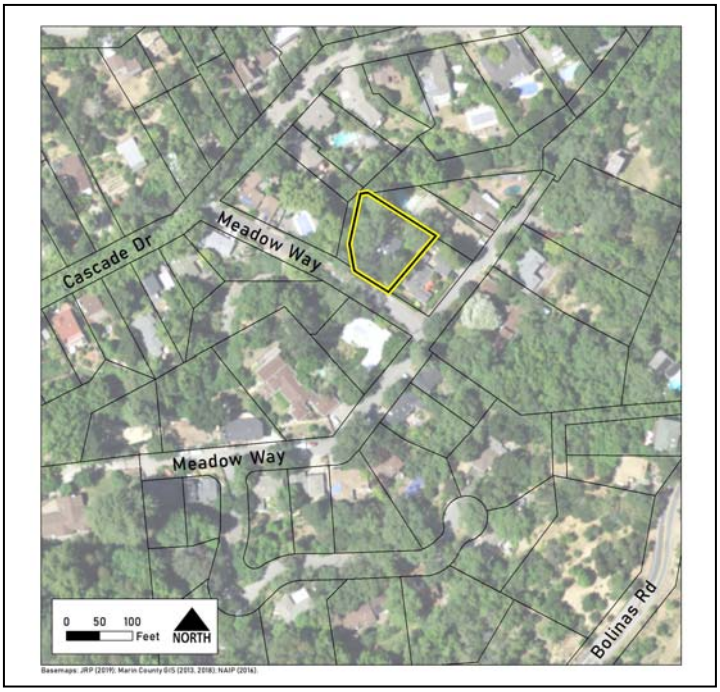
***B12. References:** Allen, Bill. "Fairfax During the War Years." *Fair Facts.* Fairfax Historical Society Bulletin 9, May 1991; Dickinson, A. Bray. *Narrow Gauge to the Redwoods.* Los Angeles: Trans-Anglo Books, 1967; Fairfax Historical Society. "A Brief History of Fairfax." *Fair Facts,* Bulletin 1, October 1988, 4; Mason, Jack and Helen Van Cleave Park. *Early Marin.* Petaluma, CA: House of Printing, 1971; Mason, Jack and Helen Van Cleave Park. *The Making of Marin (1850-1975).* Inverness, California: North Shore Books, 1975; Sagar, William and Brian Sagar. *Images of America Fairfax.* Charleston, SC: Arcadia Publishing, 2005; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961 (also see footnotes).

B13. Remarks:

***B14. Evaluator:** Heather Miller

***Date of Evaluation:** September 2017

(This space reserved for official comments.)



P3a. Description (continued):

An integrated, single car, wood garage door is located on the façade and a shorter, shed roof addition is located on the west side (**Photograph 2**). The addition extends along the length of the west side of the residence and has moderate overhang with a wide fascia board. The west side has two vinyl windows and a wood panel door, and a pair of one-over-one vinyl windows are located on the façade.

B10. Significance (continued):

Railroad construction began with investors owning tracts of redwoods along the Russian River forming the North Pacific Coast Railroad in 1871 to build a railroad across Main County connecting their stands of redwoods with San Francisco Bay markets via the Marin ferries. The company began construction from Sausalito to Tomales in 1873The railroad established a stop near both the Sais ranch and the estate of Charles Fairfax that became known as Fairfax. The first run from Sausalito to Tomales was on January 7, 1875.[1]

Major stockholders in the railroad had visions of shipping freight from the hinterlands to profitable markets, however, they were also aware of potential for tourist travel. North Pacific Coast Railroad (later the North Shore Railroad) established a picnic grounds at the Fairfax station by April 1875. The stop became a popular picnic excursion with the railroad scheduling special trains to the park. Even after the railroad turned over ownership and operation of the picnic grounds to local operators, Fairfax remained a preferred picnic place for San Francisco visitors.[2] In addition to the common picnic grounds, Bird's Nest Glen was leased to Charles Pastori and his wife, Adele (a former opera singer), and they established a popular Italian restaurant named for them. Pastori's attracted visitors from across the country; drawn from their large network of stage friends. Pastori's remained in operation until 1925 when prohibition limited the hospitality industry.[3]

The popularity of Fairfax for recreation soon brought permanent development near the station. Slowly a cluster of commercial buildings developed near the station where Bolinas Road met the railroad.[4] In 1902 the railroad line was electrified between Sausalito and Fairfax. Electrical operations decreased the travel time and increased the number of runs. It also opened the possibility for more permanent settlement and long-term residents[5]

Following the earthquake of 1906 San Francisco residents, shaken by the quake and ensuing fire, looked further afield for new homes and communities in the Ross Valley finally began to grow.[6] In 1907 land around the Fairfax stop was divided into three subdivisions, Fairfax Tract, Ridgeway, and Deer Park. Additional subdivisions followed: Pacheco Tract in 1910, Fairfax Manor Tract 1911, Fairfax Park 1911, Fairfax Heights 1912, Bush Annex 1913, Bothin Park 1913, Manor Tract

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[1] A. Bray Dickinson, *Narrow Gauge to the Redwoods* (Los Angeles: Trans-Anglo Books, 1967) 12, 20-21, 25, 31; Jack Mason and Helen Van Cleave Park, *The Making of Marin (1850-1975)* (Inverness, California: North Shore Books, 1975) 5-6, 29-30; R. Naylor Rogers, *Marin County California* (Sausalito, California: Sausalito News), n.p; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area and Point Reyes National Seashore California, Volume 1* (Denver, Colorado: National Park Services, 1980), 86-97; William Sagar and Brian Sagar, *Images of America Fairfax* (Charleston, SC: Arcadia Publishing, 2005), 21; Jack Mason and Helen Van Cleave Park, *Early Marin* (Petaluma, California: North Shore Books, 1975), 79; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area and Point Reyes National Seashore California, Volume 2* (Denver, Colorado: National Park Services, 1980), 2.

[2] Sagar, *Images of America Fairfax,* 21; Jack Mason and Helen Van Cleave Park, *Early Marin,* 79; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 125-126; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 2-3; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961.

[3] Sagar, *Images of America Fairfax,* 29; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 126-127; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City."

[4] Sagar, *Images of America Fairfax,* 43; Sanborn Fire Insurance Company, *Fairfax, California* (New York: Sanborn Fire Insurance Company, 1919) Sheet 2; Florence G. Donnelly, *Early Days in Marin: A Picture Review* (San Rafael, California: Marin County Savings and Loan Association, 1963) 40-41.

[5] Sagar, *Images of America Fairfax,* 21; Dickinson, *Narrow Gauge to the Redwoods,* 99, 101,119.

[6] Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 115-117, 120; *San Rafael Independent Journal*, "San Anselmo Started at Junction," *A Century of Service 1861-1961* (special section), March 25, 1961, H-14.

1914, and the Cascades in 1914. Active marketing promoted the area as a commuter town, but it remained viewed largely as a recreational area. Throughout Fairfax, purchased lots became residences, camping grounds, and summer homes. Houses scattered throughout the subdivisions remained divided between commuters and summer residents.[7]

Between the 1910s and early 1940s the community grew steadily. By 1920 the population included approximately 500 permanent residents and a total of 5,000 during the summer.[8] While Pastori's closed in 1925, recreation still remained an important part of Fairfax's identity. The Emporium, a large San Francisco department store purchased Pastori's and continued offering recreational opportunities to visitors.[9]

Transportation remained a challenge in the rugged terrain of Marin County. Increasingly motorists were interested in driving themselves across the county without using the railroad. Ferries first carried automobiles across the bay in 1902. The county requested aid from the United States Bureau of Public Roads in the development of a suitable road system in 1919. The existing system of roads was deemed in relatively good condition and suggestion made of new roads serving the northwest portion of the county. Under the plan, Sir Francis Drake Boulevard, then known as the San Rafael – Olema Road, was to become a first-class road and the main east west artery for the county. As a result, the road which largely followed the railroad, was graded and paved. These improvements were just in time for the completion of the Golden Gate Bridge in 1937. By this time individuals could finally reach Fairfax easily from San Francisco without using the railroad. [10]

Under agitation from the Deer Park Improvement Association the community of Fairfax incorporated in 1931.[11]

During World War II the introduction of Marinship and Hamilton Air Force Base on the eastern side of Marin resulted in an increasing permanent population. Following the war California experienced a general population increase which continued the increase in permanent residents in Fairfax. The town's terrain, however, limited explosive growth, with much of the land to the west under conservation plans as part of the watershed for the Marin Municipal Water District. Empty lots did fill with apartment complexes, Broadway Boulevard facing the former railroad filled in, and summer residences became year-round dwellings in response to the housing shortage following World War II.[12]

Property History

This residence is located just outside *The Cascades* subdivision, which was filed in 1914 and expanded in 1915 by the Cascade Land Company. Although the residence was completed in 1948, it was not purchased until 1950 when Burris Lumber Company salesman Bonnie Magruder and his wife Mildred acquired the property from prolific real estate developer Columbus L. Pierce. The Magruders lived at the property for approximately four years until they sold the property to San

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[7] Fairfax Historical Society, "A Brief History of Fairfax," *Fair Facts,* Bulletin 1, October 1988, 4; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 127; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 24.

[8] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," *Marin county Historical Society Bulletin,* September 1992 18, 20, 23; Fairfax Historical Society, "A Brief History of Fairfax," 4; Randall Garrison, "Fairfax," *Marin County Almanac/ Bicentennial,* 1976, Fairfax, Pamphlet File, Anne Kent California Room, Marin County Library, San Rafael; Jack Mason and Helen Van Cleave Park, *The Making of Marin,* 129.

[9] Sagar, *Images of America Fairfax,* 29; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," H-16.

[10] Ben Blow, *California Highways* (San Francisco: H.S. Crocker Co, Inc., 1920) 77, 168-169; "Bridge at Point Reyes Completed Dedication Ceremonies Planned for Washington's Birthday" February 6, 1930, Roads, Clipping File, Anne Kent California Room, Marin County Library, San Rafael; "Sir Francis Drake Highway Follows Rout of 'Pack Trail' Says Old Pioneer, reprint from *San Rafael Independent,* November 23, 1929, *Marin County Historical Society Bulletin,* December 1993, 19-25; Sanborn Map Company, *Fairfax* (New York: Sanborn Map Company, 1924) 4-6; Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," *Fair Facts,* Fairfax Historical Society Bulletin 9, May 1991, 3; Anna Coxe Toogood, *A Civil History of Golden Gate National Recreation Area Volume 2,* 33-35, 39.

[11] Thomas Sneed, "A Personal History – Growing up in Fairfax During the Prohibition Era," 21; Jack Mason and Helen Van Cleave Park, *The Making of Marin*, 128.

[12] Sagar, *Images of America Fairfax,* 21; Bill Allen, "Fairfax During the War Years," 3; *San Rafael Independent Journal*, "Recreation Area at First, Fairfax Became a City," *A Century of Service 1861-1961* (special section), April 1, 1961, H-16; *San Rafael Independent Journal* "Circulation of I-J Grew with County," *A Century of Service 1861-1961* (special section), April 1, 1961, H17; Jean Secchintano, *The Golden Days of Fairfax 1831-1931* (Fairfax, California: Fairfax PTS, 196?), 33.

Quentin prison captain Louis W. Thompson and his wife Marie in 1954. The Thompsons stayed at the residence for a decade before selling to mechanic Kenneth Evans and his wife Agnes and members of the Evans family lived at the residence until 1972. At some point between 1972 and 1986, Jim R. Jones purchased the property, but appears never to have lived in the residence. Jones sold the property to La Verne Pease in 1986 who then sold the property six years later to the current owners, Alexander Binik and Marilyn N. Gaynes.[13]

Minimal Traditional Style Architecture

The residential style now commonly referred to as "Minimal Traditional" developed in the 1930s following the decline in popularity of Bungalows, and as a continuation of the small house design tradition that dates to the nineteenth century. In the 1930s, the popular period revival dwellings, which tended to emulate Colonial (Spanish and East Coast) houses, picturesque medieval (so called "Tudor") houses, or rural European cottages, began to give way to simpler styles. Highly ornamented houses were economically infeasible for typical homebuyers during the Depression, and the emphasis of simplicity and unadorned surfaces of the Modern architectural movement began to influence domestic architecture. Considered a "compromise style," the Minimal Traditional house reflected the form and shape of earlier housing styles, but without the decorative detailing. Generally, these residences were built with low to medium roof pitches with close or no overhanging eaves. They were modestly sized, of wood frame construction, and were built with exterior walls clad in wood, stucco, brick, or stone siding, or a mixture of materials. Some were given large chimneys and detached garages were often sited adjacent to or to the rear of the residence. Aided by the establishment of the Federal Housing Administrations (FHA) and its small house program in the mid-1930s that established standards for the design and development of small, easily constructed and affordable houses funded by FHA-backed mortgages, Minimal Traditional style homes were built in great numbers in California, especially during and immediately after World War II to satisfy the substantial housing demands for wartime workers and returning service members.[14]

Evaluation

Under NRHP Criterion A/CRHR Criterion 1, the property at 7 Meadow Way does not have significant associations with the residential development of Fairfax. The property is part of the post-war infill that took place inside the early twentieth century housing tracts that were never fully realized as conceived. This post-war trend also replaced the seasonal vacation homes, with permanent year-round residency and there is no evidence that it was significant within this context. The property at 7 Meadow Way has not fomented growth or stands as an important example. Research revealed no important association between this property, nor The Cascades subdivision within which it is situated, and the context of residential development on a local, state, or national level.

This property does not share significant associations with persons who made important contributions to history, and is therefore not eligible under NRHP Criterion B or CRHR Criterion 2. Research did not reveal that any member of the

[13] Marin County Recorder, "Map No. 1 of The Cascades," August 4, 1914, Recorded in Book 4 of Recorded Maps: 88; Marin County Recorder, "Map No. 2 of The Cascades," July 7, 1915, Recorded in Book 5 of Recorded Maps: 14; Marin County Recorder, C.L. Pierce et al to Bonnie W. & Mildred A. Magruder, Deed, Official Records Vol. 660, Page 499, filed November 9, 1950; *Daily Independent Journal,* "C.L. Pierce, Marin Realty Broker, Dies," July 31, 1959: 5; *Independent-Journal,* "D.A. Sees 2nd Embezzlement Charge Filed," July 14, 1951: 1; *Marin County Directory 1952-1953* (San Anselmo, California: A to Z Directory Publishers, 1952); *Marin County Directory 1954-1955* (San Anselmo, California: A to Z Directory Publishers, 1954); R.L. Polk, *R.L. Polk's San Rafael City Directory* (Monterey Park, CA: R.L. Polk & Co. Publishers, 1960, 1963, 1966, 1968); *Independent-Journal,* "Sailors Train," July 14, 1964: 3; *Independent-Journal,* "Two-Auto Crackup Injures Fairfax Girl," June 15, 1970: 11; *Independent-Journal,* "Sentences Meted Out for 23 Drunk Drivers," May 24, 1972: 11; Recorder's Official Records Detail, Jim R. Jones to La Verne Pease, Deed, July 16, 1986, Document No. 1986-0036946, available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017); Recorder's Official Records Detail, La Verne Pease to Alexander Binik & Marilyn N. Gaynes, Deed, May 1, 1992, Document No. 1992-0032085, available at https://www.marincounty.org/depts/ar/divisions/recorder/official-records-search (accessed September 2017); Marin County Assessor n.d. Current property data. Via CoreLogic ParcelQuest. Accessed September 2017.

[14] Virginia Savage McAlester, *A Field Guide to American Houses: The Definitive Guide to Identifying and Understanding America's Domestic Architecture* (New York: Alfred A. Knopf, 2015), 586-595.

Magruder family, the Evans family, or any other individuals, made demonstrably important contributions to history at the local, state, or national level during their period of association with the property.

This property embodies some of the basic characteristic features of Minimal Traditional and Ranch style, the period, and method of construction, as it has a compact and economical plan, and an integrated garage. These two features are associated with the Minimal Traditional and Ranch style respectively. The residence is an expression of the transition between the two styles, and as such is not an important example of either style (NRHP Criterion C/ CRHR Criterion 3). The residence is not an important work of a master designer, nor does it embody the high artistic value that would merit listing in a national or state register under these criteria.

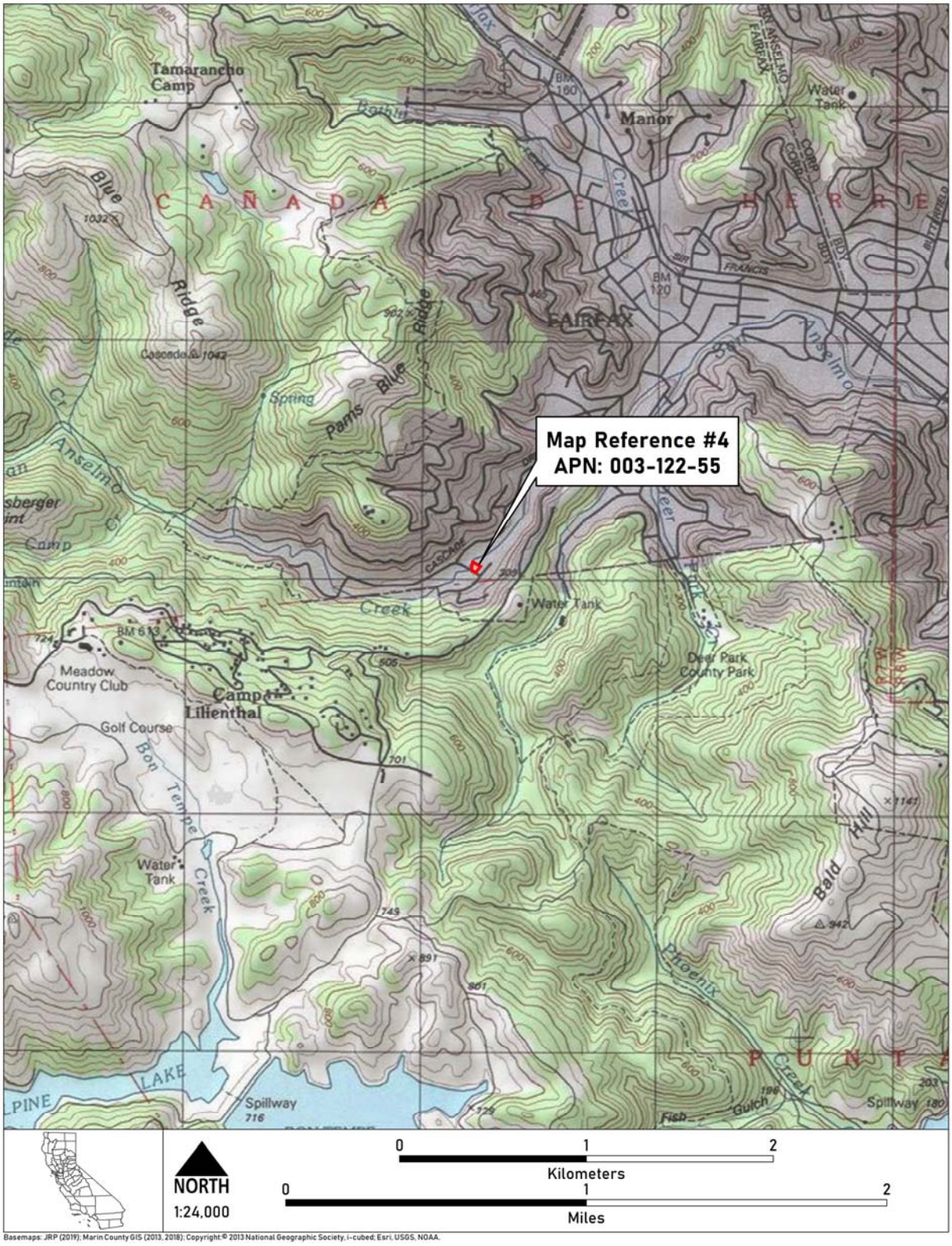
Furthermore, the residence has not and is not likely to yield important information that furthers our knowledge of prehistory or the history of the community, state, or nation, and as a result is not significant under NRHP Criterion D/CRHR Criterion 4. Construction methods for this type of construction are well documented elsewhere. This evaluation does not include any potential historical archaeological deposits that may be related to the property.

This residence has been altered with the construction of the shed roof addition along the west side, as well as replacement siding. These changes have diminished the property's historic integrity of design, workmanship, and materials. While the residence's integrity of location, setting, feeling, and association remains intact, however, it lacks historical and architectural significance and does not meet the criteria for listing in the NRHP or CRHR.

Photographs (continued):

Photograph 2: North and west sides of residence, with addition on far left, bridge rails in foreground, facing northeast, September 20, 2017.

Location Map:



Basemaps: JRP (2019); Marin County GIS (2013, 2018); Copyright © 2013 National Geographic Society, i-cubed; Esri, USGS, NOAA.

APPENDIX C

Caltrans Historic Bridge Inventory Sheet

Structure Maintenance & Investigations

Historical Significance - Local Agency Bridges

District 04

Marin County

Bridge Number	Bridge Name	Location	Historical Significance	Year Built	Year Wid/Ext
27C0008	SAN ANSELMO CREEK	0.1 MI SE OF CASCADE DR	5. Bridge not eligible for NRHP	1950	
27C0013	MILLER CREEK	0.87 MI N OF SR 101	5. Bridge not eligible for NRHP	1959	
27C0016	MILLER CREEK	1.7 MI W OF SR 101	5. Bridge not eligible for NRHP	1961	
27C0017	NICASIO CREEK	3.47 MI E STATE HWY 1	5. Bridge not eligible for NRHP	1960	
27C0018	LAGUNITAS CREEK	1.9 MI E SR 1 AT OLEMA	5. Bridge not eligible for NRHP	1964	
27C0019	SAN RAFAEL CREEK	500 FT E OF US HWY 101	5. Bridge not eligible for NRHP	1965	
27C0021	NOVATO CREEK	IN NOVATO	5. Bridge not eligible for NRHP	1936	
27C0022	IRWIN CREEK	WEST SIDE RTE 101	5. Bridge not eligible for NRHP	1965	
27C0023	ESTERO DE SAN ANTONIO	0.2 MI S WHITAKER BLUF RD	5. Bridge not eligible for NRHP	1964	
27C0024	NOVATO CREEK	0.5 MILE S OF SUTRO AVE.	5. Bridge not eligible for NRHP	1969	
27C0028	CORTE MADERA CREEK	.5 MI SW SR FRANCIS DRK B	5. Bridge not eligible for NRHP	1958	1994
27C0030	ARROYO CORTE MADERA DEL PRESIDIO	0.15 MI N MILLER AVE	5. Bridge not eligible for NRHP	1970	
27C0031	HALLECK CREEK	1 MI N LUCAS VLY RD	5. Bridge not eligible for NRHP	1931	1982
27C0032	NICASIO DRAIN #1	12.4 MI N OF SR 101	5. Bridge not eligible for NRHP	1968	
27C0033	NICASIO DRAIN NO 2	S PT. REYES - PETALM	5. Bridge not eligible for NRHP	1968	
27C0035	NICASIO CREEK	3.2 MI E OF SR 1	5. Bridge not eligible for NRHP	1937	
27C0036	ARROYO SAUSAL (CHEESE FACTORY)	0.5 MI S INTX NWTO BL	5. Bridge not eligible for NRHP	1933	1990
27C0037	BOWMAN CANYON	1 MILE N INTXN SUTRO AVE.	5. Bridge not eligible for NRHP	1948	
27C0038	NOVATO CREEK	N INTX NOVATO BLVD	5. Bridge not eligible for NRHP	1966	
27C0039	LAGUNITAS CREEK	SHAFTER BRIDGE	5. Bridge not eligible for NRHP	1982	
27C0040	CORTE MADERA CREEK (DRAKE)	3.5 MI W SR 101 SN ANSLM	5. Bridge not eligible for NRHP	1929	2011
27C0041	DEVILS GULCH	4.4 MI E OF SR 1	5. Bridge not eligible for NRHP	1920	1954
27C0042	LAGUNITAS CREEK	5.9 MI E OF SH 1	5. Bridge not eligible for NRHP	1929	
27C0043	SAN GERONIMO CREEK	7.6 MI E OF SR 1	5. Bridge not eligible for NRHP	1929	1993
27C0045	WOLFE GRADE POC	1.4 MI W OF SR 101	5. Bridge not eligible for NRHP	1968	
27C0046	ARROYO CORTE MADERA DEL PRESIDIO	2.0 MI N/O SR 1	5. Bridge not eligible for NRHP	1929	
27C0048	KEYES CREEK	0.1 MI EAST OF SR 1	5. Bridge not eligible for NRHP	1977	
27C0050	CORTE MADERA CREEK (DRAKE)	3.0 MI E OF US HWY 101	2. Bridge is eligible for NRHP	1926	
27C0051	SOUTH SAN ANTONIO CREEK	0.6 MI N OF S.H. 101	2. Bridge is eligible for NRHP	1917	
27C0052	SUMMIT AVENUE SIDEHILL VIADUCT	1.4 MI INTRX LOVELL AVE	5. Bridge not eligible for NRHP	1980	
27C0053	BUNKER ROAD TUNNEL	0.3 KM EAST OF RTE 101	3. Bridge is possibly eligible for NRHP	1938	
27C0054	EAST GATE ROAD UC	1.3 KM EAST OF SR 101	3. Bridge is possibly eligible for NRHP	1938	
27C0055	IGNACIO BLVD OH	EAST OF US HWY 101	5. Bridge not eligible for NRHP	1984	
27C0065	ARROYO CORTE MADERA DEL PRESIDIO	250 FT N OF MILLER AVE	5. Bridge not eligible for NRHP	1934	
27C0066	MARIN COUNTRY DAY SCHOOL POC	INTX UPLAND CIRCLE INTRX	5. Bridge not eligible for NRHP	1970	
27C0068	BRANCH CORTE MADERA CREEK	IN LARKSPUR	5. Bridge not eligible for NRHP	1974	
27C0069	BRANCH CORTE MADERA CREEK	IN CORTE MADERA	5. Bridge not eligible for NRHP	1970	
27C0070	CORTE MADERA CREEK	IN COUNTY OF MARIN	5. Bridge not eligible for NRHP	1970	
27C0072	ROSS CREEK	JUST N/O LAGUNITAS RD	2. Bridge is eligible for NRHP	1930	
27C0073	CORTE MADERA CREEK	E LEMOORE	5. Bridge not eligible for NRHP	1930	
27C0074	CORTE MADERA CREEK	0.03 MI E/O SIR FRAN DRK	5. Bridge not eligible for NRHP	1925	
27C0075	BELLAM BLVD UP	UNDER U.S. HIGHWAY 101	4. Historical Significance not determined	1930	
27C0076	MAHON CREEK	SOUTH OF ANDERSEN DR	5. Bridge not eligible for NRHP	1962	

APPENDIX D

Correspondence

Communication Log

Communication Log

JRP HISTORICAL CONSULTING, LLC
2850 Spafford Street, Davis, CA 95618
Phone (530) 757-2521 / Fax (530) 757-2566

Project	Meadow Way Bridge Replacement Project
Project No.	BRLO-05277 (025)
Subject	Contacting interested parties re: historic resources
Client	Town of Fairfax
Notes Prepared By	Cheryl Brookshear, Staff Historian, JRP Historical Consulting, LLC

Participants	Notes
Fairfax Historical Society P.O. Box 622 Fairfax, CA 94978-062	Letter sent via standard US Postal Service on December 11, 2018. Return e-mail received January 8, 2019. The historical society considers the early bridges over San Anselmo Creek significant to Fairfax. The historical society feels the removal and replacement of the existing bridge will change the character of the road from rural to urban and feels the expense is excessive.
Marin History Museum 1125 B Street San Rafael, CA 94901	Letter sent via standard US Postal Service on December 11, 2018. Return e-mail received December 27, 2018. The history museum did not have an address for the site and invited JRP to conduct research in their materials.

JRP HISTORICAL CONSULTING, LLC

2850 Spafford Street • Davis, CA 95618 • (530) 757-2521 • (530) 757-2566 Fax • www.jrphistorical.com

Stephen R. Wee, Principal / President
R. Meta Bunse, Principal / Vice President
Christopher D. McMorris, Partner
Bryan T. Larson, Partner
Scott A. Miltenberger, Partner

December 11, 2018

Fairfax Historical Society
P.O. Box 622
Fairfax, CA 94978-062

Marin History Museum
1125 B Street
San Rafael, CA 94901

To Whom It May Concern:

The Town of Fairfax is planning to replace the Meadow Way Bridge over San Anselmo Creek (Bridge No. 27C0008). The enclosed map illustrates the project location.

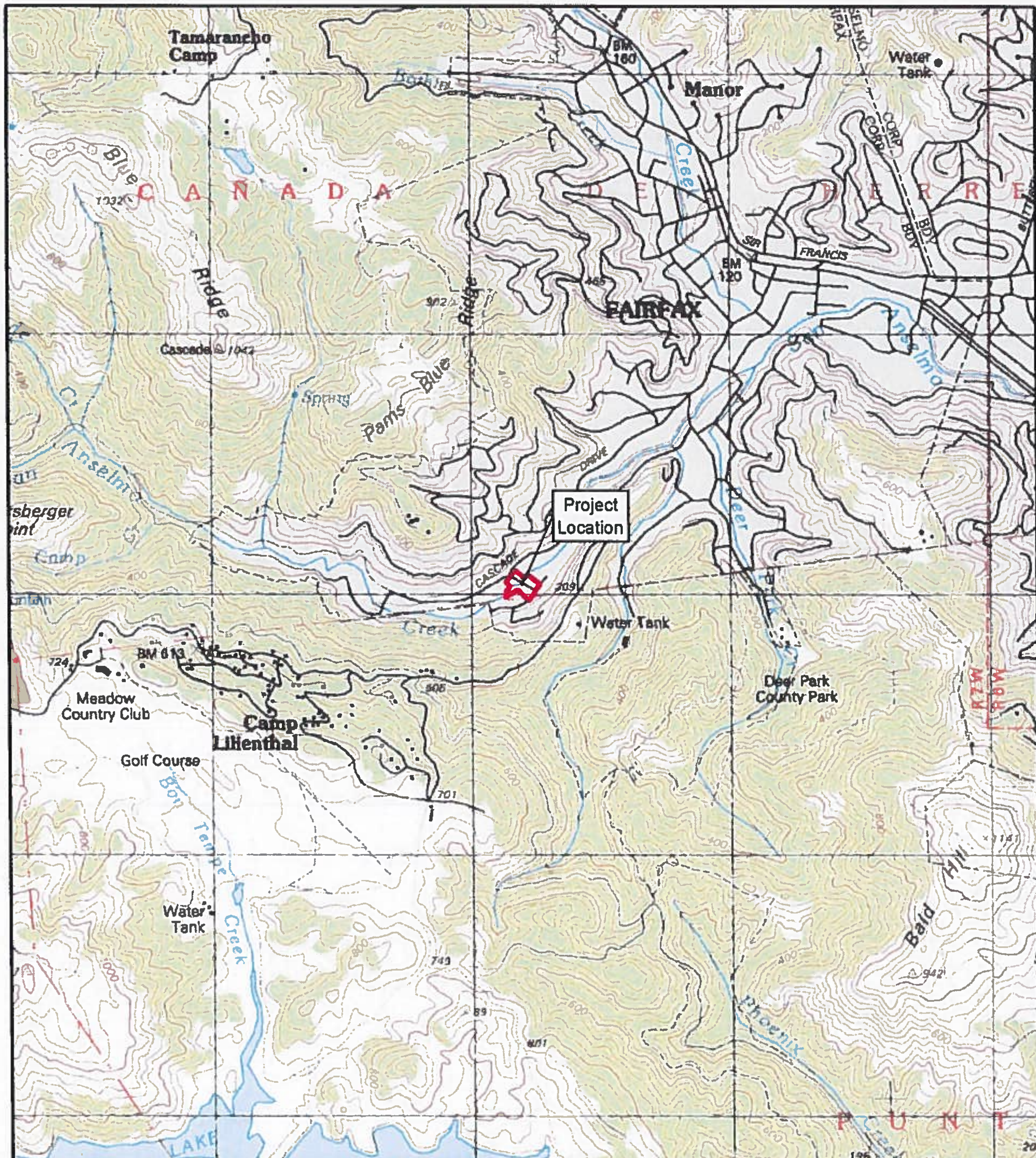
JRP Historical Consulting, LLC has been retained to conduct a study to survey and evaluate buildings and structures that may be affected by the project for their eligibility to be listed in the National Register of Historic (NRHP) and/or the California Register of Historical Resources (CRHR). This study is part of the environmental studies for the proposed project and is being conducted for project compliance with the National Historic Preservation Act and the California Environmental Quality Act. Meadow Way Bridge was constructed in 1950 and was previously evaluated as part of the Caltrans Historic Bridge Inventory and determined not eligible for either the NRHP or CRHR.

Your knowledge of local history is important to us. If you or your organization has any information or concerns regarding historic resources that could be affected by this project, please respond in writing to the address above, or via email at cbrookshear@jrphistorical.com, within the next 30 days. Please note this is not a request for research, just for information. Thank you for any assistance you can provide.

Regards,

Cheryl Brookshear

Cheryl Brookshear
Staff Historian



Portion of San Rafael, California 7.5-minute Quadrangle, 1981
Canada De Herrera and Punta De Quintin Land Grants
Marin County, California

Project Location

Kilometers
0 0.5 1

0 0.5 1
Miles

1:24,000

Meadow Way Bridge: No 27C-0008
Town Of Fairfax, California BRLO-5277(025)

Cheryl Brookshear

From: Brian Sagar <fairfaxca@gmail.com>
Sent: Tuesday, January 8, 2019 12:58 PM
To: Cheryl Brookshear
Subject: Meadow Way Bridge/possible comments

JRP Historical Consulting
2850 Spatford Street
Davis, CA, 95618

Ms Cheryl Brookshear, (cbrookshear@jrphistorical.com)

Thank you for alerting the Fairfax Historical Society RE: the replacement of the Meadow Way Bridge over San Anselmo Creek in the Fairfax Cascades.

The existing wooden bridge over San Anselmo Creek is the last of the old public wooden vehicle bridges in Fairfax. While ?Fairfax is an old Town dating back to 1856, it was not incorporated until 1931. To this day, 88 years after incorporation, Fairfax does not have a historical preservation ordinance to protect and preserve it many older wooden structures. While not as historical as the old covered wooden bridge destroyed in the Camp Fire in Paradise in 2018, it nevertheless has historical significance in Fairfax. The original wooden Meadow Way Bridge was built around 1924 and the current wooden bridge was built by the Corps of Engineers in 1956. It is a remnant of the Corps' trestle bridges with short steel girders.

It only serves 29 homes as Meadow Way is built out. The proposed construction of a concrete bridge with its 23 foot width and the removal of much of the mature tree cover, will change the character of the tiny road from a rural to urban environment. The existing wooden bridge could have a new deck and railings installed for somewhere in the $150,000 range and the proposed concrete structure will run from 2&1/2 to 3 million dollars with engineering and concrete retaining structures.

The question is "should CalTrans be preserving/restoring older North Coast California bridges"?

I believe we had this same request about a year ago...

FYI
I believe you sent your letter to the Marin Historical Society at the old San Rafael address and May longer be valid.

Marin History Museum, archives
45 Leveroni Ct.
Novato, CA 94949

Marin History Museum
P. O. Box 150727, San Rafael, CA 94915

Marin Kent room
http://www.marinlibrary.org/californiaroom/

Frank Egger/
Brian Sagar
Fairfax Historical Society.

Sent from my iPhone

Cheryl Brookshear

From: research@marinhistory.org
Sent: Thursday, December 27, 2018 2:10 PM
To: Cheryl Brookshear
Subject: Meadow Way Bridge

Hello Ms. Brookshear,

Per your request for info on bridging this creek. I am not able to determine an address for the location in question. The marking on your map labeled location does not tell me. Feel free to make an appointment at our museum to do any research on material we may have in Fairfax.

Marcie Miller
Research Dept
Marin History Museum
415 382 1182