APPENDIX A – Mitigation Monitoring and Reporting Program

Project Summary

The project includes replacing existing Freestone Flat Road Bridge over Salmon Creek (Bridge Number 20C0440) with a new bridge 24 feet south of the existing bridge location. The bridge is located in an unincorporated area of southwestern Sonoma County, approximately 0.6 mile northwest of the community of Freestone, and 5 miles west of the City of Sebastopol. The project would involve construction of a new parallel two-lane bridge adjacent to and downstream of the existing bridge. The new bridge would be approximately 106 feet long and would fully span the creek channel. The bridge would have a total width of approximately 26 feet, composed of two 9-foot-wide lanes and 2-foot-wide shoulders, and approximately 2-foot-wide concrete bridge barriers with rails on each side of the bridge. The bridge barriers would be constructed of concrete with a galvanized tubular metal handrail mounted on top. Concrete bridge abutments would be supported on cast-in-drilled-hole concrete piles, which would be approximately 24 inches in diameter, with approximately 8 piles per abutment. Freestone Flat Road and Scott Robin Road would be realigned to connect with the new bridge location. The existing bridge would be left in place to maintain traffic flow and access during construction. Once the new bridge is constructed, traffic would be routed onto the new bridge and the existing bridge would be removed.

This Mitigation Monitoring and Reporting Program (MMRP) outlines procedures for the implementation of mitigation measures identified in the Freestone Flat Road Bridge Replacement Project Initial Study/Mitigation Negative Declaration (IS/MND) to avoid or reduce all potential environmental effects of the project to less than significant levels. Sonoma County Department of Transportation and Public Works (the County) and its contractors must fully comply with the conditions and measures described in this MMRP.

Mitigation Monitoring and Reporting Requirements

The County prepared an IS to identify and evaluate potential environmental impacts associated with the Freestone Flat Road Bridge Replacement Project. Mitigation measures are defined in the Is to reduce potentially significant impacts of project construction and operation. All

measures designated as mitigation measures reduce potential impacts to the associated resource to less than significant levels.

Approval of the project will require implementation and monitoring of all the mitigation measures identified in the IS. The California Environmental Quality Act (CEQA) Section 15097(a) requires that:

> "… In order to ensure that the mitigation measures and project revisions identified in the EIR or negative declaration are implemented, the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

CEQA Section 15097(c) defines monitoring and reporting responsibilities of the lead agency.

> "(c) The public agency may choose whether its program will monitor mitigation, report on mitigation, or both. "Reporting" generally consists of a written compliance review that is presented to the decision making body or authorized staff person. A report may be required at various stages during project implementation or upon completion of the mitigation measure. "Monitoring" is generally an ongoing or periodic process of project oversight. There is often no clear distinction between monitoring and reporting and the program best suited to ensuring compliance in any given instance will usually involve elements of both. The choice of program may be guided by the following:
>
> > (1) Reporting is suited to projects which have readily measurable or quantitative mitigation measures or which already involve regular review. For example, a report may be required upon issuance of final occupancy to a project whose mitigation measures were confirmed by building inspection.
> >
> > (2) Monitoring is suited to projects with complex mitigation measures, such as wetlands restoration or archeological protection, which may exceed the expertise of the local agency to oversee, are expected to be implemented over a period of time, or require careful implementation to assure compliance.
> >
> > (3) Reporting and monitoring are suited to all but the most simple projects. Monitoring ensures that project compliance is checked on a regular basis during and, if necessary after, implementation. Reporting ensures that the approving agency is informed of compliance with mitigation requirements."

This MMRP is meant to facilitate implementation and monitoring of the mitigation measures to ensure that measures are executed. This process protects against the risk of non-compliance.

The purpose of the MMRP is to:

- Summarize the mitigation required for the project
- Comply with requirements of CEQA and the CEQA Guidelines
- Clearly define parties responsible for implementing and monitoring the mitigation measures
- Provide a plan for how to organize the measures into a format that can be readily implemented by the County and monitored

MMRP Components

The MMRP provides a summary of all mitigation measures that will be implemented for the project. The mitigation measures are organized into three tables based on the timeframe for implementation:

- Table A-1: Mitigation Measures – Prior to Construction
- Table A-2: Mitigation Measures – During Construction
- Table A-3: Mitigation Measures – After Construction

Mitigation measures could be applicable during one or more implementation phase. Each mitigation measure is accompanied with identification of:

- Application Locations – locations where the mitigation measures will be implemented.
- Monitoring/Reporting Action – the monitoring and/or reporting actions to be undertaken to ensure the measure is implemented.
- Responsible and Involved Parties – the party or parties that will undertake the measure and will monitor the measure to ensure it is implemented in accordance with this MMRP

The responsible and involved parties will utilize the MMRP to identify actions that must take place to implement each mitigation measures, the time of those actions and the parties responsible for implementing and monitoring the actions.

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Table A-1 Mitigation Measures – Prior to Construction

Mitigation Measures	Applicable Locations	Monitoring/Reporting Action	Responsible and Involved Parties
Mitigation Measure BIO-1: Worker Environmental Awareness Program (WEAP) A Service-approved biologist will conduct employee education training for employees working on earthmoving and/or construction activities. Personnel will be required to attend the presentation, which will describe the Federal and State statutes protecting threatened, endangered, and special-status species that may be encountered on site; minimization and conservation measures; legal protection of species; and other related issues. All attendees will sign an attendance sheet along with their printed name, company or agency, email address, and telephone number. The original sign-in sheet will be sent to the Service within seven (7) calendar days of the completion of the training.	N/A	• Approved biologist provides education training to construction personnel • Construction personnel attends training • The County submits sign-in sheet to the Service	• Approved biologist • The County • Construction personnel • The Service
Mitigation Measure BIO-2: Qualified Biologist A biologist(s) approved by the United States Fish and Wildlife Service and CDFW will monitor ground disturbance activities (e.g., grading, excavation, and exclusion fence installation) and any vegetation removal that may result in take of state or federally threatened and endangered species. The qualified biologist need not monitor work that occurs inside the exclusion fence (refer to MM BIO-4). The qualified biologist must have experience with identifying all federal and state-listed species, as well as special-status species, with potential to occur as determined in Table 7 of this IS/MND. The biologist shall have specific experience identifying western yellow-billed cuckoo and California red-legged frog during all distinct life stages and experience with implementing conservation and other avoidance and minimization measures for these species and interacting with contractors and construction workers to ensure these measures are enforced. The qualifications of the biologist(s) will be submitted to the Service for review and written approval at least thirty (30) calendar days prior to the date earthmoving is initiated at the project site.	N/A	• The County submits the biologist(s) qualification to the Service for review	• Approved biologist • The County • The Service
Mitigation Measure BIO-3: California Red-Legged Frog Avoidance, Pre-Construction Survey and Biological Monitoring	All project areas	• Approved biologist conducts Pre-Construction survey	• Approved biologist • The County

The County and their contractor shall implement the following measures to reduce or avoid impacts to California red-legged frog: • Pre-Construction Survey. No more than twenty-four (24) hours prior to the date of initial ground disturbance, a pre-construction survey for the California red-legged frog will be conducted by a Service-approved biologist at the project site. The survey will consist of walking the project limits and within the project site to ascertain the possible presence of the species. The Service-approved biologist will investigate all potential areas that could be used by the California red-legged frog for feeding, breeding, sheltering, movement, and other essential behaviors. This includes an adequate examination of mammal burrows, such as California ground squirrels or gophers. If any adults, sub-adults, juveniles, tadpoles, or eggs are found, the Service-approved biologist will contact the Service to determine if moving any of the individuals is appropriate. In making this determination the Service will consider if an appropriate relocation site exists. If the Service approves moving animals, the County will ensure the Service-approved biologist is given sufficient time to move the animals from the work site before ground disturbance is initiated. Relocation would be completed in accordance with the procedures defined in this mitigation measure, below. Only Service-approved biologists will capture, handle, and monitor the California red-legged frog. • Construction Timing. To the extent practicable, initial ground-disturbing activities will be avoided between November 1 and March 31 because that is the time period when California red-legged frogs are most likely to be moving through upland areas. When ground-disturbing activities must take place between November 1 and March 31, Sonoma County will ensure that daily monitoring by the Service-approved biologist is completed for the California red-legged frog. To the maximum extent practicable, no construction activities will occur during rain events or within 24-hours following a rain event (with greater than 0.1 inch of rainfall). Prior to construction activities resuming after a rain event non-work period, a Service- approved biologist will inspect the action area and all equipment/materials for the presence of California red-legged frogs. Any California red-legged frog encountered will be allowed to move away from the project site of their own volition or moved only by the Service-approved biologist in accordance with the procedures for California red-legged frog relocation defined below. • California Red-Legged Frog Relocation. Each encounter with the California red-legged frog will be treated on a case-by-case basis in coordination with the	for California red-legged frog no more than 24 hours prior to the date of initial ground disturbance	• Construction contractor • The Service

Service, but the general procedure is as follows: (1) the animal will not be disturbed if it is not in danger; or (2) the animal will be moved to a secure location if it is in any danger. These procedures are further described below:

a. When a California red-legged frog is encountered in the action area, all activities which have the potential to result in the harassment, injury, or death of the individual will be immediately halted. The Service-approved biologist will then assess the situation in order to select a course of action that will avoid or minimize adverse effects to the animal. To the maximum extent possible, contact with the frog will be avoided and the applicant will allow it to move out of the potentially hazardous situation to a secure location on its own volition. This procedure applies to situations where a California red-legged frog is encountered while it is moving to another location. It does not apply to animals that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the species should the individual move away from the hazardous location.

b. California red-legged frogs that are in danger will be relocated and released by the Service- approved biologist outside the construction area within the same riparian area or watershed. If relocation of the frog outside the fence is not feasible (i.e., there are too many individuals observed per day), the biologist will relocate the animals to a Service pre- approved location. Prior to the initial ground disturbance, Sonoma County will obtain approval of the relocation protocol from the Service in the event that a California red- legged frog is encountered and needs to be moved away from the project site. Under no circumstances will a California red-legged frog be released on a site unless the written permission of the landowner has been obtained by Sonoma County.

   The Service-approved biologist will limit the duration of the handling and captivity of the California red-legged frog to the minimum amount of time necessary to complete the task. If the animal must be held in capacity, it will be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge. The container used for holding or transporting the individual will not contain any standing water.

c. Sonoma County will immediately notify the Service once the California red-legged frog and the site is secure. The contact for this situation is the Coast

Bay Division Chief of the Endangered Species Program by email and at telephone (916) 414-6623. • Avoid Entrapment – Plastic monofilament netting (erosion control matting), loosely woven netting, or similar material in any form will not be used at the project site because California red-legged frogs can become entangled and trapped in them. Any such material found on site will be immediately removed by the Service-approved biologist, construction personnel, or the applicant. Materials utilizing fixed weaves (strands cannot move), polypropylene, polymer or other synthetic materials will not be used. – Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of California red-legged frog. – Trenches or pits one (1) foot or deeper that are going to be left unfilled for more than forty- eight (48) hours will be securely covered with boards or other material to prevent the California red-legged frog from falling into them. If this is not possible, Sonoma County and their contractor will ensure wooden ramps or other structures of suitable surface that provide adequate footing for the California red-legged frog are placed in the trench or pit to allow for their unaided escape. Auger holes or fence post holes that are greater than 0.10 inch in diameter will be immediately filled or securely covered so they do not become pitfall traps for the California red-legged frog. The Service-approved biologist will inspect the trenches, pits, or holes prior to their being filled to ensure there are no California red-legged frogs in them. The trench, pit, or hole also will be examined by the Service-approved biologist each workday morning at least one hour prior to initiation of work and in the late afternoon no more than one hour after work has ceased to ascertain whether any individuals have become trapped. If the escape ramps fail to allow the animal to escape, the Service-approved biologist will remove and transport it to a safe location, or contact the Service for guidance.			
Mitigation Measure BIO-4: Exclusion Fencing Temporary exclusion fencing shall be installed around the limits of work areas and access routes to avoid disturbance in unauthorized areas and ensure California red-legged frog or western pond turtle cannot enter the work area after construction commences. Installation of exclusion fencing shall occur under the	All project areas	• Install exclusion fencing	• Construction contractor

supervision of the qualified biologist and immediately following a clearance survey of the area. The exclusion fencing shall have a minimum aboveground height of 30 inches, and the bottom of the fence shall be keyed in at least 4 inches deep and backfilled with soil to prevent wildlife from passing under the fencing. Exclusion fencing shall be installed to prevent species entry into active work areas and to mark the limits of construction disturbance at equipment staging areas, site access routes, construction equipment and personnel parking areas, debris storage areas, and any other areas that may be disturbed. The exclusion fencing shall specifically exclude any areas within the limits of the Salmon Creek ordinary high-water mark.			
Mitigation Measure BIO-5: Pre-Construction Survey and Biological Monitoring for Western Pond Turtle The County and their contractor shall implement the following measures to reduce or avoid impacts to western pond turtle: • A preconstruction survey for western pond turtle shall occur within 48 hours prior to the start of construction activities within the riparian and aquatic habitat in the BSA. • A qualified biologist will be present during grubbing and clearing activities in the riparian and aquatic habitat in the BSA to monitor for western pond turtle. • If a western pond turtle is observed in areas of active construction, construction will cease and a qualified biologist will be notified. Construction may resume when the biologist has either relocated the western pond turtle to nearby suitable habitat outside the limits of project construction, or, after thorough inspection, determined that the western pond turtle has moved away from the area of active construction.	Riparian and aquatic habitat in the BSA	• Qualified biologist conducts pre-construction survey for western pond turtle within 48 hours prior to start of construction activities	• Qualified biologist • Construction contractor
Mitigation Measure BIO-7: Discourage Bird Nesting on Bridge To discourage bird nesting on the existing bridge during construction, existing inactive bird nests on the Freestone Flat Road Bridge shall be removed prior to the onset of construction, between September 1 and February 14 (outside of the nesting season). Following removal of inactive nests, nest deterrent measures shall be installed on the existing bridge to prevent establishment of new nests. Techniques to prevent nest establishment include using exclusion devices (see below), removing and disposing of partially constructed and unoccupied nests of migratory or nongame birds on a regular basis to prevent their occupation, or performing any combination of these techniques.	Existing bridge	• Remove existing inactive bird nests • Install nest deterrent measures • If nests cannot be removed prior to the nesting season, a qualified biologist will determines the status of the nest and	• Qualified biologist • The County • The Service and/or CDFW

• *Exclusion Device:* Install bird netting from the bridge prior to start of nesting season (i.e. before February 15). If this technique is used, netting shall be in place from mid-February until the bridge is removed. If a nesting deterrent is used, the deterrent shall be monitored for integrity and effectiveness until the bridge is removed. • *Nest Removal.* Starting before the nesting season (i.e., prior to February 15), the County or its contractor shall visit the site weekly and remove partially completed nests on the bridge using either hand tools or high pressure water. Disturbance or removal of active nests (i.e., nests containing eggs or young) shall not be conducted without the appropriate authorization(s) from the Service and/or the CDFW. If nests cannot be removed prior to the nesting season (i.e., before February 15), a qualified biologist shall determine if nests are inactive and can be removed before construction begins without disturbing nesting activity. If active nests are identified, construction in the vicinity of the bridge may need to be postponed until nests are determined by a qualified biologist to be inactive or the Service and/or CDFW authorizes the removal of active nests. An effective deterrent to bird nesting shall be installed on the bridge once the nests are removed.		implement appropriate measures to discourage bird nesting	
Mitigation Measure BIO-8: Pre-Construction Surveys and Construction Monitoring for Western Yellow-Billed Cuckoo Preconstruction surveys for western yellow-billed cuckoo and construction monitoring shall be conducted by a qualified biologist (see Measure BIO-2) in all project areas within suitable habitat and a 500-foot buffer from suitable habitat. In the event that western yellow-billed cuckoo(s) are detected within the work area (the area of active equipment uses), all construction activities in the area shall halt and Caltrans and the Service and CDFW shall be notified by no later than noon of the next business day. Project activities in the area may not proceed until the cuckoo(s) have left the work area. Where cuckoo(s) are detected within 500 feet of the construction area, project activities in the area may proceed with caution under the direction of the qualified biologist who is monitoring the activity of the western yellow-billed cuckoo in the area and has the ability to halt work.	All project areas within suitable habitat and a 500-foot buffer from suitable habitat	• Qualified biologist conducts pre-construction survey for western yellow-billed cuckoo	• Qualified biologist • Construction contractor
Mitigation Measure BIO-9: Riparian Mitigation and Monitoring Plan The County shall enhance or restore 0.021 acre of riparian habitat. The County shall prepare a Riparian Mitigation and Monitoring Plan that addresses mitigation and	N/A	• The County submits a Riparian Mitigation and Monitoring Plan	• The County • CDFW

monitoring for riparian habitat that shall be impacted by the project. The Riparian Mitigation and Monitoring Plan will be provided to CDFW for review and approval and will also address mitigation requirements contained in the CDFW Streambed Alteration Agreement. The plan shall include, at a minimum: • The location of the mitigation site; • A schematic depicting the mitigation area including initial site photographs; • The species to be seeded and planted and the ratio of seed mix and/or plantings for each species; • A work schedule, including names, titles and companies for all individuals who are involved in preparing the plan and conducting activities; • Specific success criteria; • A maintenance and monitoring program for 5 years, unless success criteria are met prior to 5 years, in which case maintenance and monitoring would cease; and • Contingency measures should the success criteria not be met.		to CDFW for review and approval	
Mitigation Measure BIO-10: Protection of Badgers Prior to construction in badger denning habitat, which is characterized by herbaceous, shrub, and open stages of most habitats with dry, friable soils, a qualified wildlife biologist shall conduct a survey to identify any American badger burrows/dens. No less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities, a qualified biologist shall conduct a survey to determine if American badger den sites are present at the site. If dens are found, they will be monitored for badger activity. If the qualified biologist determines that dens may be active, the entrances of the dens will be blocked with soil, sticks, and debris for 3 to 5 days to discourage the use of these dens prior to project disturbance activities. The den entrances will be blocked to an incrementally greater degree over the 3- to 5-day period. After the qualified biologist determines that badgers have stopped using active dens, the dens will be hand-excavated with a shovel to prevent re-use during construction. No disturbance of active dens will take place when cubs may be present and dependent on parental care, as determined by a qualified biologist.	Badger denning habitat	• Qualified biologist conducts a survey for American badger den no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities	• Qualified biologist • Construction contractor
Mitigation Measure BIO-11: Roosting Bat Protection Plan	All project areas	• Qualified biologist conducts a pre-construction survey	• Qualified biologist • The County

A qualified biologist shall conduct a pre-construction survey 14 days prior to tree removal and construction and demolition of the existing bridge. If any active bat roosts are observed within 50 feet of the construction area or on the existing bridge a Roosting Bat Protection Plan shall be prepared and implemented. If no active bat roosts are observed, no further measures would be required. The Roosting Bat Protection Plan will be prepared in accordance with guidance from the California Bat Mitigation Techniques Solutions, and Effectiveness (Johnston, Tatarian, & Pierson, 2004).		for roosting bat 14 days prior to tree removal and construction and demolition of the exiting bridge • Prepare a Roosting Bat Protection Plan if active bat roosts are observed within 50 feet of the construction area or on the existing bridge	• Construction contractor
Mitigation Measure BIO-12: Special-Status Plants Pre-Construction Survey A qualified botanist shall conduct a pre-construction survey for rare plants within all areas of project disturbance prior to project start. The qualified botanist shall either mark the species for avoidance and Environmental Sensitive Area (ESA) fencing shall be installed to protect the plant or if the plant cannot be avoided, the plant shall be transplanted under the direction of a qualified botanist. Transplanting would only occur if avoidance is not feasible and any transplanted special-status plants would be replanted within a suitable habitat area within the project area under the direction of a qualified botanist.	All project area	• Qualified botanist conducts a pre-construction survey for rare plants prior to project starts • Qualified botanist marks the species for avoidance or install ESA fencing • Transplanting would only occur if avoidance is not feasible and would occur under the direction of a qualified botanist	• Qualified botanist • The County
Mitigation Measure BIO-13: Tree Replacement and Monitoring Plan Prior to the start of construction, the County shall determine whether the trees identified for removal would fall under protection of the Tree Protection Ordinance. If any protected tree would be removed, the County shall adhere to the requirements of the Sonoma County Tree Protection Ordinance (Section 26-88-010(m)), including by implementing replacement plantings in accordance with the	N/A	• The County determines whether the trees identified for removal are protected trees	• The County

standards set forth therein. Protocols for the installation, monitoring, and successful establishment of replacement plantings shall be specified in a Tree Replacement and Monitoring Plan. The Tree Replacement and Monitoring Plan shall include protocols for replanting of trees removed prior to or during construction, and management and monitoring of the trees to ensure replanting success. Where it is infeasible to replant the total number of trees required on the project site due to size constraints or repeated failure to thrive, the County may replant a selected number of trees off-site or make in-lieu payment fees in accordance with the terms of the Ordinance.		• If protected tree would be removed, the County shall adhere to the Tree Protection Ordinance requirements and prepare a Tree Replacement and Monitoring Plan	
Mitigation Measure CUL-1: Cultural Resources Sensitivity Training and Inadvertent Discovery A professional archeologist shall provide sensitivity training to supervisory staff (County staff, biological monitor, and construction foreman) prior to initiation of site preparation and/or construction, to alert construction workers to the possibility of exposing significant historic and/or prehistoric archaeological resources within the project area. The training shall include a discussion of the types of prehistoric or historic objects that could be exposed and how to recognize them, the need to stop excavation at a discovery, and protection and notification. The archaeologist shall coordinate with a Tribal Cultural Monitor to appropriately describe tribal cultural resources within the project area and the values to local tribes. An "Alert Sheet" shall be posted in staging areas, such as in construction trailers, to alert personnel to the procedures and protocols to follow for the discovery of a potentially significant historic and/or prehistoric archaeological resource. In the event of an unanticipated discovery of archaeological and/or historical deposits during project implementation, the County shall ensure that construction crews shall stop all work within 100 feet of the discovery until a qualified archaeologist can assess the previously unrecorded discovery and provide recommendations. A qualified cultural resource specialist/archaeologist shall inspect the discovery and determine whether further investigation is required. If the discovery can be avoided and no further impacts shall occur, the resource shall be documented on California State Department of Parks and Recreation cultural resource record forms and no further effort shall be required. If work must commence in the sensitive area, it can only be performed using hand tools or powered hand tools, cannot include ground disturbance below the topsoil layer,	N/A	• Professional archeologist provides sensitivity training supervisory staff	• Qualified archeologist • Cultural resources specialist • The County • Biological monitor • Construction contractor

and can only be accessed on foot. Alternatively, the cultural resource specialist/archaeologist shall evaluate the resource and determine whether it is: • Eligible for the CRHR (and a historical resource for purposes of CEQA), or • A unique archaeological resource as defined by CEQA. If the resource meets the criteria for either a historical resource or unique archaeological resource, work shall remain halted and the cultural resources specialist/archaeologist shall consult with the County staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA Guidelines Section 15064.5(b). Avoidance of the area, or avoidance of impacts on the resource, is the preferred method of mitigation for impacts on cultural resources and shall be required unless there are other equally effective methods. Other methods to be considered shall include evaluation, collection, recordation, and analysis of any significant cultural materials in accordance with a Cultural Resources Management Plan prepared by the qualified cultural resource specialist/archaeologist. The methods and results of evaluation or data recovery work at an archaeological find shall be documented in a professional level technical report to be filed with California Historical Resources Information System. Work may commence upon completion of evaluation, collection, recordation, and analysis, as approved by the qualified archeologist.			
Mitigation Measure GEO-2: Paleontological Resources Sensitivity Training and Inadvertent Discovery A professional paleontologist shall provide sensitivity training to supervisory staff (County staff, biological monitor, and construction foreman) to alert construction workers to the possibility of exposing significant paleontological resources within the project area. The training shall be conducted to recognize fossil materials in the event that any are uncovered during construction. In the event that a paleontological resource is uncovered during project implementation, all ground-disturbing work within a 50-foot radius shall be halted. A qualified paleontologist shall inspect the discovery and determine whether further investigation is required. If the discovery can be avoided and no further impacts shall occur, no further effort shall be required. If the resource cannot be avoided and may be subject to further impact, a qualified paleontologist shall evaluate the resource and determine whether it is “unique” under CEQA, Appendix	N/A	• Professional paleontologist provides sensitive training to supervisory staff	• Qualified paleontologist • The County • Biological monitor • Construction contractor

G, part V. If the resource is determined not to be unique, work may commence in the area. If the resource is determined to be a unique paleontological resource, work shall remain halted, and the paleontologist shall consult with County staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA. Preservation-in-place (i.e., avoidance) is the preferred method of mitigation for impacts to paleontological resources. If preservation-in-place is not feasible and avoidance is not possible, the fossils shall be recovered, prepared, identified, catalogued, and analyzed according to current professional standards under the direction of a qualified paleontologist. All recovered fossils shall be curated at an accredited and permanent scientific institution according to Society of Vertebrate Paleontology (SVP) standard guidelines. Work may commence upon completion of treatment.			
Mitigation Measure HAZ-1: Debris Collection and Containment Program Sonoma County shall ensure that a Debris Collection and Containment Program is developed and implemented during project construction. The Program shall include a Lead Compliance Plan and shall ensure that painted bridge materials are treated as a hazardous material and handled in accordance with applicable provisions of Caltrans Standard Special Provisions (2018 or most recent) for the removal of lead paint, Provision 14-11.13, Disturbance of Existing Paint Systems on Bridges. The Program shall also require provisions to protect worker safety and health in compliance with Title 8 California Code of Regulations, including § 1532.1., and provisions for the proper handling and disposal of debris in accordance with all applicable Federal State and local hazardous waste laws. The contractor shall be required to prepare and submit drawings to the County of the containment systems to be used. The containment system may include the following containment procedure or similar procedure that adequately prevents accidental release of lead paint into the environment: • Local containment shall be installed prior to removing the bridge for the purpose of containing all paint flakes. Containment shall consist of using tarps to enclose the sides and bottoms of the existing trusses within 10 feet of the support locations and bridge pick-up points (i.e., locations that are used to connect equipment for the purpose of lifting the bridge). • Where the existing paint is not flaking, the contractor shall have the option of applying a clear coat of paint instead of enclosing the trusses with tarps.	N/A	• The County develops a Debris Collection and Containment Program	• The County • Construction contractor

• Following installation of containment tarps and/or clear coat of paint, the existing bridge shall be lifted in one piece from its supports at the abutments and interior pier. Further truss disassembly, removal, transport and disposal shall be subject to existing laws and regulations.			
Mitigation Measure HAZ-3: Fire Prevention Procedures Sonoma County and their contractor shall implement the following fire prevention procedures to reduce the potential risk of fire ignitions during construction: • Prior to ground disturbing activities, all workers on the project site shall be trained regarding the proper handling and/or storage of materials posing a fire hazards, potential ignition sources (such as cigarettes or sparking equipment), and appropriate types and use of fire protection equipment. • Fire suppression equipment, including fire extinguishers, water, and shovels, shall be available on-site at all times. • All ignitions shall warrant a call to the fire department to ensure the ignition is fully extinguished. • Vehicles shall not be parked in vegetated areas. If vegetated areas must be used for parking, vegetation shall be mowed to a height of less than 4 inches to avoid contact with the underside of vehicles. • Smoking shall be allowed only inside fully-enclosed vehicles with closed windows. Cigarette butts shall be thoroughly extinguished, properly contained, and transported off-site for disposal. • Hot work (welding, grinding, cutting, or any other activity that produces flame, sparks, or embers) shall be restricted during red flag warnings or potentially dangerous fire conditions, as determined by the County and communicated to the contractor.	N/A	• Provide fire hazards training to all workers	• The County • Construction contractor
Mitigation Measure NOI-1: Noise Reduction Techniques Sonoma County and their contractor shall implement the following noise reduction measures to reduce construction noise at nearby receptors: • The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities and distribute this plan to adjacent noise sensitive receptors.	N/A	• Construction contractor prepares construction plan to identify schedule for major noise-generating activities and distribute plan to	• The County • Construction contractor

• Noise generating construction activities shall be restricted to between hours of 7:00 am to 7:00 pm Monday through Friday, 9:00 am to 7:00 pm Saturday. The contractor shall request of the Engineer at least 48 hours in advance of the contractor's intent to work on Sundays or holidays. The contractor shall notify the County if work is necessary outside of these hours. The County shall require the contractor to implement a construction noise monitoring program and, if feasible, provide additional mitigation as necessary (in the form of noise control blankets or other temporary noise barriers, etc.) for affected receptors. • Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment. • Unnecessary idling of internal combustion engines shall be strictly prohibited. • Locate stationary noise generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area. Utilize "quiet" air compressors and other "quiet" equipment where such technology exists.		adjacent sensitive receptors • Provide advanced notification when construction activity is required outside specified hours	
Mitigation Measure TRA-1: Construction Traffic Control Measures The contractor shall prepare and implement a Traffic Control Plan that includes the traffic safety measures listed below. The contractor shall submit the Traffic Control Plan to the County for review at least 14 days prior to construction. • Traffic safety guidelines compatible with Section 12, "Temporary Traffic Control," of the Caltrans Standard Specifications, and the California Manual on Uniform Traffic Control Devices (California MUTCD) shall be implemented during construction. Project plans and specifications shall require provision of adequate signage and other precautions for public safety during project construction. • Prior to temporary closures or lengthy delays, signs shall be placed at all entrances to the project site and on major intersecting roads (e.g., Bohemian Highway and Freestone Flat Road) to notify motorists and bicyclists that traffic shall be subject to delay. • Local emergency service providers (i.e., fire departments, police departments, ambulance, and paramedic services) shall be notified of the construction schedule and potential for delays prior to the start of construction. • Emergency service providers and parcels along Freestone Flat Road and Scott Robin Road shall be notified of any temporary closures at least 5 days in advance	N/A	• Construction contractor prepares Traffic Control Plan and submit the plan to the County at least 14 days prior to construction	• The County • Construction contractor

of the closures. The contractor shall provide proof of the notification to the Sonoma County construction staff. • The contractor shall allow passage of emergency vehicles through the project site at all times. • The contractor shall maintain access to all driveways to parcels off the project site throughout project construction. The contractor shall determine the construction schedule for local roadway improvement projects along the truck routes to and from the project site, particularly any lane and road closures. The contractor shall time large haul and material delivery truck trips to avoid traveling along routes where conflicts could occur due to ongoing roadway improvements.			
Mitigation Measure TCR-1: Tribal Cultural Resources Inadvertent Discovery The training and Alert Sheet identified under Mitigation Measure CUL-1 shall also encompass tribal cultural resources. In the event that an archaeological resource is discovered, ground-disturbing work shall be halted within 100 feet of the find, and a qualified Tribal Cultural Monitor shall be brought to the site. The qualified Tribal Cultural Monitor shall evaluate the resource and determine whether it is of special importance to a California Native American Tribe. If the resource is determined to not be of importance to the tribe, work may commence in the area. If the resource meets the criteria for an important tribal resource, work shall remain halted within 100 feet of the find, and the qualified Tribal Cultural Monitor shall evaluate the resource and determine whether it is an important resource to the local Native American Tribe. If the resource is important to the tribe, work shall remain halted within 100 feet of the area of the find and the qualified Tribal Cultural Monitor shall consult with County staff regarding methods to ensure that no substantial adverse change would occur to the significance of the tribal cultural resource pursuant to PRC section 21084.3. Methods may include the following: • Preservation-in-place (i.e., avoidance) is the preferred method of mitigation for impacts on tribal cultural resources. • Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following: • Protecting the cultural character and integrity of the resource	N/A	• Professional archeologist provides sensitivity training supervisory staff per Mitigation Measure CUL-1	• Qualified archeologist • Qualified Trial Cultural Monitor • The County • Biological monitor • Construction contractor

- Protecting the traditional use of the resource
- Protecting the confidentiality of the resource
- Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
- Protecting the resource.

Work in the area may commence upon completion of treatment, as approved by the County.

Table A-2 Mitigation Measures – During Construction

Mitigation Measures	Applicable Locations	Monitoring/Reporting Action	Responsible and Involved Parties
Mitigation Measure AIR-1: Dust and Engine Emissions Control Measures The County or their contractor shall implement the following dust and engine emissions control measures during construction: 1. Water or dust palliatives shall be applied to all exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) and other surfaces that could give rise to airborne dust as needed to control dust. 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered. 3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers or other effective method as necessary to control project-related dust on public roads. The use of dry power sweeping is prohibited. 4. All vehicle speeds on unpaved roads shall be limited to 15 mph. 5. 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 [CCR]). Clear signage shall be provided for construction workers at all access points. 6. Construction equipment will be properly maintained by a certified mechanic.	All project areas	• Exposed surfaces are watered • Haul trucks are adequately covered • Vehicle speeds limits are maintained • Idling times are minimized • All construction equipment is checked by a certified mechanic	• The County • Construction constructor

Mitigation Measure BIO-1: Worker Environmental Awareness Program (WEAP) A Service-approved biologist will conduct employee education training for employees working on earthmoving and/or construction activities. Personnel will be required to attend the presentation, which will describe the Federal and State statutes protecting threatened, endangered, and special-status species that may be encountered on site; minimization and conservation measures; legal protection of species; and other related issues. All attendees will sign an attendance sheet along with their printed name, company or agency, email address, and telephone number. The original sign-in sheet will be sent to the Service within seven (7) calendar days of the completion of the training.	N/A	• Approved biologist provides education training to construction personnel • Construction personnel attends training • The County submits sign-in sheet to the Service	• Approved biologist • The County • Construction personnel • The Service
Mitigation Measure BIO-2: Qualified Biologist A biologist(s) approved by the United States Fish and Wildlife Service and CDFW will monitor ground disturbance activities (e.g., grading, excavation, and exclusion fence installation) and any vegetation removal that may result in take of state or federally threatened and endangered species. The qualified biologist need not monitor work that occurs inside the exclusion fence (refer to MM BIO-4). The qualified biologist must have experience with identifying all federal and state-listed species, as well as special-status species, with potential to occur as determined in Table 7 of this IS/MND. The biologist shall have specific experience identifying western yellow-billed cuckoo and California red-legged frog during all distinct life stages and experience with implementing conservation and other avoidance and minimization measures for these species and interacting with contractors and construction workers to ensure these measures are enforced. The qualifications of the biologist(s) will be submitted to the Service for review and written approval at least thirty (30) calendar days prior to the date earthmoving is initiated at the project site.	Areas where ground disturbance and vegetation removal activities occur	• Approved biologist monitors ground disturbance and vegetation removal activities	• Approved biologist • The County • The Service
Mitigation Measure BIO-3: California Red-Legged Frog Avoidance, Pre-Construction Survey and Biological Monitoring The County and their contractor shall implement the following measures to reduce or avoid impacts to California red-legged frog: • Pre-Construction Survey. No more than twenty-four (24) hours prior to the date of initial ground disturbance, a pre-construction survey for the California red-legged frog will be conducted by a Service-approved biologist at the project site. The	All project areas	• Initial ground-disturbing activities will be avoided between November 1 and March 31 • No construction activities will occur	• Approved biologist • The County • Construction contractor • The Service

survey will consist of walking the project limits and within the project site to ascertain the possible presence of the species. The Service-approved biologist will investigate all potential areas that could be used by the California red-legged frog for feeding, breeding, sheltering, movement, and other essential behaviors. This includes an adequate examination of mammal burrows, such as California ground squirrels or gophers. If any adults, sub-adults, juveniles, tadpoles, or eggs are found, the Service-approved biologist will contact the Service to determine if moving any of the individuals is appropriate. In making this determination the Service will consider if an appropriate relocation site exists. If the Service approves moving animals, the County will ensure the Service-approved biologist is given sufficient time to move the animals from the work site before ground disturbance is initiated. Relocation would be completed in accordance with the procedures defined in this mitigation measure, below. Only Service-approved biologists will capture, handle, and monitor the California red-legged frog.

- Construction Timing. To the extent practicable, initial ground-disturbing activities will be avoided between November 1 and March 31 because that is the time period when California red-legged frogs are most likely to be moving through upland areas. When ground-disturbing activities must take place between November 1 and March 31, Sonoma County will ensure that daily monitoring by the Service-approved biologist is completed for the California red-legged frog.

  To the maximum extent practicable, no construction activities will occur during rain events or within 24-hours following a rain event (with greater than 0.1 inch of rainfall). Prior to construction activities resuming after a rain event non-work period, a Service- approved biologist will inspect the action area and all equipment/materials for the presence of California red-legged frogs. Any California red-legged frog encountered will be allowed to move away from the project site of their own volition or moved only by the Service-approved biologist in accordance with the procedures for California red-legged frog relocation defined below.
- California Red-Legged Frog Relocation. Each encounter with the California red-legged frog will be treated on a case-by-case basis in coordination with the Service, but the general procedure is as follows: (1) the animal will not be disturbed if it is not in danger; or (2) the animal will be moved to a secure location if it is in any danger. These procedures are further described below:

  d. When a California red-legged frog is encountered in the action area, all activities which have the potential to result in the harassment, injury, or

during rain events or within 24 hours following a rain event

- Implement appropriate measures if California red-legged frogs are observed on site
- Implement appropriate measures to prevent California red-legged frogs entrapment

death of the individual will be immediately halted. The Service-approved biologist will then assess the situation in order to select a course of action that will avoid or minimize adverse effects to the animal. To the maximum extent possible, contact with the frog will be avoided and the applicant will allow it to move out of the potentially hazardous situation to a secure location on its own volition. This procedure applies to situations where a California red-legged frog is encountered while it is moving to another location. It does not apply to animals that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the species should the individual move away from the hazardous location.

e. California red-legged frogs that are in danger will be relocated and released by the Service- approved biologist outside the construction area within the same riparian area or watershed. If relocation of the frog outside the fence is not feasible (i.e., there are too many individuals observed per day), the biologist will relocate the animals to a Service pre- approved location. Prior to the initial ground disturbance, Sonoma County will obtain approval of the relocation protocol from the Service in the event that a California red- legged frog is encountered and needs to be moved away from the project site. Under no circumstances will a California red-legged frog be released on a site unless the written permission of the landowner has been obtained by Sonoma County.

   The Service-approved biologist will limit the duration of the handling and captivity of the California red-legged frog to the minimum amount of time necessary to complete the task. If the animal must be held in capacity, it will be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge. The container used for holding or transporting the individual will not contain any standing water.

f. Sonoma County will immediately notify the Service once the California red-legged frog and the site is secure. The contact for this situation is the Coast Bay Division Chief of the Endangered Species Program by email and at telephone (916) 414-6623.

- Avoid Entrapment
  - Plastic monofilament netting (erosion control matting), loosely woven netting, or similar material in any form will not be used at the project site because

California red-legged frogs can become entangled and trapped in them. Any such material found on site will be immediately removed by the Service-approved biologist, construction personnel, or the applicant. Materials utilizing fixed weaves (strands cannot move), polypropylene, polymer or other synthetic materials will not be used. – Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of California red-legged frog. – Trenches or pits one (1) foot or deeper that are going to be left unfilled for more than forty- eight (48) hours will be securely covered with boards or other material to prevent the California red-legged frog from falling into them. If this is not possible, Sonoma County and their contractor will ensure wooden ramps or other structures of suitable surface that provide adequate footing for the California red-legged frog are placed in the trench or pit to allow for their unaided escape. Auger holes or fence post holes that are greater than 0.10 inch in diameter will be immediately filled or securely covered so they do not become pitfall traps for the California red-legged frog. The Service-approved biologist will inspect the trenches, pits, or holes prior to their being filled to ensure there are no California red-legged frogs in them. The trench, pit, or hole also will be examined by the Service-approved biologist each workday morning at least one hour prior to initiation of work and in the late afternoon no more than one hour after work has ceased to ascertain whether any individuals have become trapped. If the escape ramps fail to allow the animal to escape, the Service-approved biologist will remove and transport it to a safe location, or contact the Service for guidance.			
Mitigation Measure BIO-5: Pre-Construction Survey and Biological Monitoring for Western Pond Turtle The County and their contractor shall implement the following measures to reduce or avoid impacts to western pond turtle: • A preconstruction survey for western pond turtle shall occur within 48 hours prior to the start of construction activities within the riparian and aquatic habitat in the BSA. • A qualified biologist will be present during grubbing and clearing activities in the riparian and aquatic habitat in the BSA to monitor for western pond turtle.	Riparian and aquatic habitat in the BSA	• Qualified biologist monitors grubbing and clearing activities • Implement appropriate measures if western pond turtles are observed on site	• Qualified biologist • Construction contractor

• If a western pond turtle is observed in areas of active construction, construction will cease and a qualified biologist will be notified. Construction may resume when the biologist has either relocated the western pond turtle to nearby suitable habitat outside the limits of project construction, or, after thorough inspection, determined that the western pond turtle has moved away from the area of active construction.			
Mitigation Measure BIO-6: Nesting Bird Season Avoidance, Pre-Construction Surveys, and Monitoring The County and their contractor shall implement the following measures to reduce or avoid impacts to nesting birds during construction: • Avoid Tree Removal during Nesting Season. Tree removal and trimming activities shall avoid the bird nesting season (typically February 15 through August 31). Trees that have been identified for removal shall be removed prior to the bird nesting season to avoid impacts to nesting birds. Trees shall be cut at ground level and removed from the site. The stump shall remain in place until after the end of the rainy season (April 15). Tree stumps within the roadway prism or in conflict with new bridge foundations may be completely removed during road and bridge construction. • Activities During Nesting Season. If construction commences during the nesting season, the following shall be implemented: – A preconstruction survey for nesting birds shall be conducted within 7 days prior to construction within 500 feet of work areas to ensure that no nest shall be disturbed during construction. – If active nests of migratory bird species (listed in the MBTA) are found within the project site, or in areas subject to disturbance from construction activities, an avoidance buffer to avoid nest disturbance shall be constructed. The buffer size shall be determined by a qualified biologist and shall be based on the nest location, topography, cover and species' tolerance to disturbance. – If an avoidance buffer is not achievable, a qualified biologist shall monitor the nest(s) to document that no take of the nest (nest failure) has occurred. Active nests shall not be taken or destroyed under the MBTA and, for raptors, under the CDFW Code. If it is determined that construction activity is resulting in nest disturbance, work shall cease immediately and the County shall consult with the qualified biologist and appropriate regulatory agencies.	All project areas	• Avoid tree removal and trimming during nesting season • Implement appropriate measures if active nests are observed on site	• Qualified biologist • The County • Construction contractor

– If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further action is required. Trees and shrubs within the construction footprint that have been determined to be unoccupied by special-status birds or that are located outside the avoidance buffer for active nests may be removed. Nests initiated during construction (while significant disturbance from construction activities persist) may be presumed to be unaffected, and only a minimal buffer, determined by a qualified biologist, would be necessary.			
Mitigation Measure BIO-7: Discourage Bird Nesting on Bridge To discourage bird nesting on the existing bridge during construction, existing inactive bird nests on the Freestone Flat Road Bridge shall be removed prior to the onset of construction, between September 1 and February 14 (outside of the nesting season). Following removal of inactive nests, nest deterrent measures shall be installed on the existing bridge to prevent establishment of new nests. Techniques to prevent nest establishment include using exclusion devices (see below), removing and disposing of partially constructed and unoccupied nests of migratory or nongame birds on a regular basis to prevent their occupation, or performing any combination of these techniques. • *Exclusion Device:* Install bird netting from the bridge prior to start of nesting season (i.e. before February 15). If this technique is used, netting shall be in place from mid-February until the bridge is removed. If a nesting deterrent is used, the deterrent shall be monitored for integrity and effectiveness until the bridge is removed. • *Nest Removal*. Starting before the nesting season (i.e., prior to February 15), the County or its contractor shall visit the site weekly and remove partially completed nests on the bridge using either hand tools or high pressure water. Disturbance or removal of active nests (i.e., nests containing eggs or young) shall not be conducted without the appropriate authorization(s) from the Service and/or the CDFW. If nests cannot be removed prior to the nesting season (i.e., before February 15), a qualified biologist shall determine if nests are inactive and can be removed before construction begins without disturbing nesting activity. If active nests are identified, construction in the vicinity of the bridge may need to be postponed until nests are determined by a qualified biologist to be inactive or the Service and/or	Existing bridge	• Implement appropriate measures to discourage bird nesting	• Qualified biologist • The County • The Service and/or CDFW

CDFW authorizes the removal of active nests. An effective deterrent to bird nesting shall be installed on the bridge once the nests are removed.			
Mitigation Measure BIO-8: Pre-Construction Surveys and Construction Monitoring for Western Yellow-Billed Cuckoo Preconstruction surveys for western yellow-billed cuckoo and construction monitoring shall be conducted by a qualified biologist (see Measure BIO-2) in all project areas within suitable habitat and a 500-foot buffer from suitable habitat. In the event that western yellow-billed cuckoo(s) are detected within the work area (the area of active equipment uses), all construction activities in the area shall halt and Caltrans and the Service and CDFW shall be notified by no later than noon of the next business day. Project activities in the area may not proceed until the cuckoo(s) have left the work area. Where cuckoo(s) are detected within 500 feet of the construction area, project activities in the area may proceed with caution under the direction of the qualified biologist who is monitoring the activity of the western yellow-billed cuckoo in the area and has the ability to halt work.	All project areas within suitable habitat and a 500-foot buffer from suitable habitat	• Qualified biologist monitors construction activities • Implement appropriate measures if western yellow-billed cuckoos are observed on site	• Qualified biologist • Construction contractor
Mitigation Measure BIO-10: Protection of Badgers Prior to construction in badger denning habitat, which is characterized by herbaceous, shrub, and open stages of most habitats with dry, friable soils, a qualified wildlife biologist shall conduct a survey to identify any American badger burrows/dens. No less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities, a qualified biologist shall conduct a survey to determine if American badger den sites are present at the site. If dens are found, they will be monitored for badger activity. If the qualified biologist determines that dens may be active, the entrances of the dens will be blocked with soil, sticks, and debris for 3 to 5 days to discourage the use of these dens prior to project disturbance activities. The den entrances will be blocked to an incrementally greater degree over the 3- to 5-day period. After the qualified biologist determines that badgers have stopped using active dens, the dens will be hand-excavated with a shovel to prevent re-use during construction. No disturbance of active dens will take place when cubs may be present and dependent on parental care, as determined by a qualified biologist.	Badger denning habitat	• Implement appropriate measures if active dens are observed on site	• Qualified biologist • Construction contractor
Mitigation Measure BIO-11: Roosting Bat Protection Plan A qualified biologist shall conduct a pre-construction survey 14 days prior to tree removal and construction and demolition of the existing bridge. If any active bat	All project areas	• Implement a Roosting Bat Protection Plan if active bat roosts are	• Qualified biologist • The County

roosts are observed within 50 feet of the construction area or on the existing bridge a Roosting Bat Protection Plan shall be prepared and implemented. If no active bat roosts are observed, no further measures would be required. The Roosting Bat Protection Plan will be prepared in accordance with guidance from the California Bat Mitigation Techniques Solutions, and Effectiveness (Johnston, Tatarian, & Pierson, 2004).		observed within 50 feet of the construction area or on the existing bridge	• Construction contractor
Mitigation Measure BIO-12: Special-Status Plants Pre-Construction Survey A qualified botanist shall conduct a pre-construction survey for rare plants within all areas of project disturbance prior to project start. The qualified botanist shall either mark the species for avoidance and Environmental Sensitive Area (ESA) fencing shall be installed to protect the plant or if the plant cannot be avoided, the plant shall be transplanted under the direction of a qualified botanist. Transplanting would only occur if avoidance is not feasible and any transplanted special-status plants would be replanted within a suitable habitat area within the project area under the direction of a qualified botanist.	All project area	• Transplanting would only occur if avoidance is not feasible and would occur under the direction of a qualified botanist	• Qualified botanist • The County
Mitigation Measure BIO-13: Tree Replacement and Monitoring Plan Prior to the start of construction, the County shall determine whether the trees identified for removal would fall under protection of the Tree Protection Ordinance. If any protected tree would be removed, the County shall adhere to the requirements of the Sonoma County Tree Protection Ordinance (Section 26-88-010(m)), including by implementing replacement plantings in accordance with the standards set forth therein. Protocols for the installation, monitoring, and successful establishment of replacement plantings shall be specified in a Tree Replacement and Monitoring Plan. The Tree Replacement and Monitoring Plan shall include protocols for replanting of trees removed prior to or during construction, and management and monitoring of the trees to ensure replanting success. Where it is infeasible to replant the total number of trees required on the project site due to size constraints or repeated failure to thrive, the County may replant a selected number of trees off-site or make in-lieu payment fees in accordance with the terms of the Ordinance.	N/A	• The County replants trees off-site or make in-lieu payment fees if replacing on site is infeasible	• The County
Mitigation Measure CUL-1: Cultural Resources Sensitivity Training and Inadvertent Discovery A professional archeologist shall provide sensitivity training to supervisory staff (County staff, biological monitor, and construction foreman) prior to initiation of site	All project areas where ground disturbance occurs	• Professional archeologist provides sensitivity training supervisory staff	• Qualified archeologist • Cultural resources specialist • The County

preparation and/or construction, to alert construction workers to the possibility of exposing significant historic and/or prehistoric archaeological resources within the project area. The training shall include a discussion of the types of prehistoric or historic objects that could be exposed and how to recognize them, the need to stop excavation at a discovery, and protection and notification. The archaeologist shall coordinate with a Tribal Cultural Monitor to appropriately describe tribal cultural resources within the project area and the values to local tribes. An "Alert Sheet" shall be posted in staging areas, such as in construction trailers, to alert personnel to the procedures and protocols to follow for the discovery of a potentially significant historic and/or prehistoric archaeological resource. In the event of an unanticipated discovery of archaeological and/or historical deposits during project implementation, the County shall ensure that construction crews shall stop all work within 100 feet of the discovery until a qualified archaeologist can assess the previously unrecorded discovery and provide recommendations. A qualified cultural resource specialist/archaeologist shall inspect the discovery and determine whether further investigation is required. If the discovery can be avoided and no further impacts shall occur, the resource shall be documented on California State Department of Parks and Recreation cultural resource record forms and no further effort shall be required. If work must commence in the sensitive area, it can only be performed using hand tools or powered hand tools, cannot include ground disturbance below the topsoil layer, and can only be accessed on foot. Alternatively, the cultural resource specialist/archaeologist shall evaluate the resource and determine whether it is: • Eligible for the CRHR (and a historical resource for purposes of CEQA), or • A unique archaeological resource as defined by CEQA. If the resource meets the criteria for either a historical resource or unique archaeological resource, work shall remain halted and the cultural resources specialist/archaeologist shall consult with the County staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA Guidelines Section 15064.5(b). Avoidance of the area, or avoidance of impacts on the resource, is the preferred method of mitigation for impacts on cultural resources and shall be required unless there are other equally effective methods. Other methods to be considered shall include evaluation, collection, recordation, and analysis of any significant cultural materials in accordance with a Cultural Resources Management Plan prepared by	• Construction crews stop work within 100 feet of discovery • Qualified archaeologist assesses the discovery and provides recommendations • Implement appropriate measures to document and/or mitigate impacts on cultural resources	• Biological monitor • Construction contractor	

the qualified cultural resource specialist/archaeologist. The methods and results of evaluation or data recovery work at an archaeological find shall be documented in a professional level technical report to be filed with California Historical Resources Information System. Work may commence upon completion of evaluation, collection, recordation, and analysis, as approved by the qualified archeologist.			
Mitigation Measure CUL-2: Human Remains In the event of an unanticipated discovery of human remains during project implementation, the County shall ensure that construction crews stop all work within 100 feet of the discovery. The County shall treat any human remains and associated or unassociated funerary objects discovered during soil-disturbing activities according to applicable State laws. Such treatment includes work stoppage and immediate notification of the Sonoma County Coroner, requisition of a qualified archaeologist, and in the event that the Coroner's determination that the human remains are Native American, notification of the Native American Heritage Commission (NAHC), according to the requirements in Public Resources Code (PRC) Section 5097.98. The NAHC would appoint a Most Likely Descendant (MLD). A qualified archaeologist, the County, and the MLD shall make all reasonable efforts to develop an agreement for the treatment, with appropriate dignity, of any human remains and associated or unassociated funerary objects (CEQA Guidelines Section 15064.5[d]). The agreement would take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, and final disposition of the human remains and associated or unassociated funerary objects. The PRC allows 48 hours to reach agreement on these matters. Work may recommence in the area of discovery following treatment of remains and any associated funerary objects.	All project areas where ground disturbance occurs	• Construction crews stop work within 100 feet of discovery • Implements procedures for discovery of human remains per state law	• The County • Construction contractor • County Coroner
Mitigation Measure GEO-1: Fill Material Testing and Standards The fill material recommendations in the final geotechnical evaluation conducted for the project foundations shall be implemented. Fill material recommendations include but are not limited to the following: • Soils excavated on the project site shall be tested prior to use as fill • Fill soils used shall have a low expansion potential (expansion index of equal to or greater than 50; sand equivalent of equal to or less than 20), 100 percent passing 3-inch sieve, as approved by a soils engineer	All project areas where soil excavation occurs	• Implement fill material recommendations in the final geotechnical evaluation	• The County • Construction contractor

Mitigation Measure GEO-2: Paleontological Resources Sensitivity Training and Inadvertent Discovery A professional paleontologist shall provide sensitivity training to supervisory staff (County staff, biological monitor, and construction foreman) to alert construction workers to the possibility of exposing significant paleontological resources within the project area. The training shall be conducted to recognize fossil materials in the event that any are uncovered during construction. In the event that a paleontological resource is uncovered during project implementation, all ground-disturbing work within a 50-foot radius shall be halted. A qualified paleontologist shall inspect the discovery and determine whether further investigation is required. If the discovery can be avoided and no further impacts shall occur, no further effort shall be required. If the resource cannot be avoided and may be subject to further impact, a qualified paleontologist shall evaluate the resource and determine whether it is "unique" under CEQA, Appendix G, part V. If the resource is determined not to be unique, work may commence in the area. If the resource is determined to be a unique paleontological resource, work shall remain halted, and the paleontologist shall consult with County staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA. Preservation-in-place (i.e., avoidance) is the preferred method of mitigation for impacts to paleontological resources. If preservation-in-place is not feasible and avoidance is not possible, the fossils shall be recovered, prepared, identified, catalogued, and analyzed according to current professional standards under the direction of a qualified paleontologist. All recovered fossils shall be curated at an accredited and permanent scientific institution according to Society of Vertebrate Paleontology (SVP) standard guidelines. Work may commence upon completion of treatment.	All project areas where ground disturbance occurs	• Professional paleontologist provides sensitive training to supervisory staff • Construction crews stop ground-disturbing work within 50 feet of discovery • Qualified paleontologist inspects the discovery and provides recommendations • Implement appropriate measures for discovery of paleontological resources	• Qualified paleontologist • The County • Biological monitor • Construction contractor
Mitigation Measure HAZ-1: Debris Collection and Containment Program Sonoma County shall ensure that a Debris Collection and Containment Program is developed and implemented during project construction. The Program shall include a Lead Compliance Plan and shall ensure that painted bridge materials are treated as a hazardous material and handled in accordance with applicable provisions of Caltrans Standard Special Provisions (2018 or most recent) for the removal of lead paint, Provision 14-11.13, Disturbance of Existing Paint Systems on Bridges. The	All project areas	• Implement the Debris Collection and Containment Program	• The County • Construction contractor

Program shall also require provisions to protect worker safety and health in compliance with Title 8 California Code of Regulations, including § 1532.1., and provisions for the proper handling and disposal of debris in accordance with all applicable Federal State and local hazardous waste laws. The contractor shall be required to prepare and submit drawings to the County of the containment systems to be used. The containment system may include the following containment procedure or similar procedure that adequately prevents accidental release of lead paint into the environment: • Local containment shall be installed prior to removing the bridge for the purpose of containing all paint flakes. Containment shall consist of using tarps to enclose the sides and bottoms of the existing trusses within 10 feet of the support locations and bridge pick-up points (i.e., locations that are used to connect equipment for the purpose of lifting the bridge). • Where the existing paint is not flaking, the contractor shall have the option of applying a clear coat of paint instead of enclosing the trusses with tarps. • Following installation of containment tarps and/or clear coat of paint, the existing bridge shall be lifted in one piece from its supports at the abutments and interior pier. Further truss disassembly, removal, transport and disposal shall be subject to existing laws and regulations.			
Mitigation Measure HAZ-2: Contaminated Soil Disposal If the County is responsible for removing and/or relocating existing utility poles during project construction, all soil that is excavated during the removal of existing utility poles shall be treated as hazardous materials and shall be transported and disposed of in compliance with federal, state, and local regulations. Excavated holes shall be backfilled with certified clean fill material.	Existing utility poles	• Treat excavated soil from existing utility poles as hazardous materials, transport and dispose soil in compliance with federal, state, and local regulations • Backfill excavated holes with certified clean fill material	• The County • Construction contractor
Mitigation Measure HAZ-3: Fire Prevention Procedures Sonoma County and their contractor shall implement the following fire prevention procedures to reduce the potential risk of fire ignitions during construction:	All project areas	• Provide fire hazards training to all workers	• The County • Construction contractor

• Prior to ground disturbing activities, all workers on the project site shall be trained regarding the proper handling and/or storage of materials posing a fire hazards, potential ignition sources (such as cigarettes or sparking equipment), and appropriate types and use of fire protection equipment. • Fire suppression equipment, including fire extinguishers, water, and shovels, shall be available on-site at all times. • All ignitions shall warrant a call to the fire department to ensure the ignition is fully extinguished. • Vehicles shall not be parked in vegetated areas. If vegetated areas must be used for parking, vegetation shall be mowed to a height of less than 4 inches to avoid contact with the underside of vehicles. • Smoking shall be allowed only inside fully-enclosed vehicles with closed windows. Cigarette butts shall be thoroughly extinguished, properly contained, and transported off-site for disposal. • Hot work (welding, grinding, cutting, or any other activity that produces flame, sparks, or embers) shall be restricted during red flag warnings or potentially dangerous fire conditions, as determined by the County and communicated to the contractor.		• Provide fire suppression equipment on-stie at all time • Call fire department if ignition occurs • Limit parking in vegetated areas • Smoking only inside fully-enclosed vehicles • Restrict hot work during red flag warnings	
Mitigation Measure NOI-1: Noise Reduction Techniques Sonoma County and their contractor shall implement the following noise reduction measures to reduce construction noise at nearby receptors: • The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities and distribute this plan to adjacent noise sensitive receptors. • Noise generating construction activities shall be restricted to between hours of 7:00 am to 7:00 pm Monday through Friday, 9:00 am to 7:00 pm Saturday. The contractor shall request of the Engineer at least 48 hours in advance of the contractor's intent to work on Sundays or holidays. The contractor shall notify the County if work is necessary outside of these hours. The County shall require the contractor to implement a construction noise monitoring program and, if feasible, provide additional mitigation as necessary (in the form of noise control blankets or other temporary noise barriers, etc.) for affected receptors. • Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.	All project areas	• Provide advanced notification when construction activity is required outside specified hours • Implement construction equipment practices to reduce noise • Implement noise-reducing construction activity practices	• The County • Construction contractor

• Unnecessary idling of internal combustion engines shall be strictly prohibited. • Locate stationary noise generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area. Utilize "quiet" air compressors and other "quiet" equipment where such technology exists.			
Mitigation Measure TRA-1: Construction Traffic Control Measures The contractor shall prepare and implement a Traffic Control Plan that includes the traffic safety measures listed below. The contractor shall submit the Traffic Control Plan to the County for review at least 14 days prior to construction. • Traffic safety guidelines compatible with Section 12, "Temporary Traffic Control," of the Caltrans Standard Specifications, and the California Manual on Uniform Traffic Control Devices (California MUTCD) shall be implemented during construction. Project plans and specifications shall require provision of adequate signage and other precautions for public safety during project construction. • Prior to temporary closures or lengthy delays, signs shall be placed at all entrances to the project site and on major intersecting roads (e.g., Bohemian Highway and Freestone Flat Road) to notify motorists and bicyclists that traffic shall be subject to delay. • Local emergency service providers (i.e., fire departments, police departments, ambulance, and paramedic services) shall be notified of the construction schedule and potential for delays prior to the start of construction. • Emergency service providers and parcels along Freestone Flat Road and Scott Robin Road shall be notified of any temporary closures at least 5 days in advance of the closures. The contractor shall provide proof of the notification to the Sonoma County construction staff. • The contractor shall allow passage of emergency vehicles through the project site at all times. • The contractor shall maintain access to all driveways to parcels off the project site throughout project construction. The contractor shall determine the construction schedule for local roadway improvement projects along the truck routes to and from the project site, particularly any lane and road closures. The contractor shall time large haul and	All project areas	• Implement the Traffic Control Plan	• The County • Construction contractor

material delivery truck trips to avoid traveling along routes where conflicts could occur due to ongoing roadway improvements.			
Mitigation Measure TCR-1: Tribal Cultural Resources Inadvertent Discovery The training and Alert Sheet identified under Mitigation Measure CUL-1 shall also encompass tribal cultural resources. In the event that an archaeological resource is discovered, ground-disturbing work shall be halted within 100 feet of the find, and a qualified Tribal Cultural Monitor shall be brought to the site. The qualified Tribal Cultural Monitor shall evaluate the resource and determine whether it is of special importance to a California Native American Tribe. If the resource is determined to not be of importance to the tribe, work may commence in the area. If the resource meets the criteria for an important tribal resource, work shall remain halted within 100 feet of the find, and the qualified Tribal Cultural Monitor shall evaluate the resource and determine whether it is an important resource to the local Native American Tribe. If the resource is important to the tribe, work shall remain halted within 100 feet of the area of the find and the qualified Tribal Cultural Monitor shall consult with County staff regarding methods to ensure that no substantial adverse change would occur to the significance of the tribal cultural resource pursuant to PRC section 21084.3. Methods may include the following: • Preservation-in-place (i.e., avoidance) is the preferred method of mitigation for impacts on tribal cultural resources. • Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following: • Protecting the cultural character and integrity of the resource • Protecting the traditional use of the resource • Protecting the confidentiality of the resource • Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places. • Protecting the resource. Work in the area may commence upon completion of treatment, as approved by the County.	All project areas where ground disturbance occurs	• Professional archeologist provides sensitivity training supervisory staff per Mitigation Measure CUL-1 • Construction crews stop ground-disturbing work within 100 feet of discovery • Qualified Tribal Cultural Monitor evaluates the discovered resource and provides recommendations • Implement appropriate measures to document and/or mitigate impacts on tribal cultural resources	• Qualified paleontologist/Cultural specialist • Qualified Trial Cultural Monitor • The County • Biological monitor • Construction contractor

Table A-3 Mitigation Measures – After Construction

Mitigation Measures	Applicable Locations	Monitoring/Reporting Action	Responsible and Involved Parties
Mitigation Measure BIO-9: Riparian Mitigation and Monitoring Plan The County shall enhance or restore 0.021 acre of riparian habitat. The County shall prepare a Riparian Mitigation and Monitoring Plan that addresses mitigation and monitoring for riparian habitat that shall be impacted by the project. The Riparian Mitigation and Monitoring Plan will be provided to CDFW for review and approval and will also address mitigation requirements contained in the CDFW Streambed Alteration Agreement. The plan shall include, at a minimum: • The location of the mitigation site; • A schematic depicting the mitigation area including initial site photographs; • The species to be seeded and planted and the ratio of seed mix and/or plantings for each species; • A work schedule, including names, titles and companies for all individuals who are involved in preparing the plan and conducting activities; • Specific success criteria; • A maintenance and monitoring program for 5 years, unless success criteria are met prior to 5 years, in which case maintenance and monitoring would cease; and • Contingency measures should the success criteria not be met.	N/A	• Monitor the mitigation site for 5 years unless success criteria are met prior to 5 years	• The County • CDFW
Mitigation Measure BIO-13: Tree Replacement and Monitoring Plan Prior to the start of construction, the County shall determine whether the trees identified for removal would fall under protection of the Tree Protection Ordinance. If any protected tree would be removed, the County shall adhere to the requirements of the Sonoma County Tree Protection Ordinance (Section 26-88-010(m)), including by implementing replacement plantings in accordance with the standards set forth therein. Protocols for the installation, monitoring, and successful establishment of replacement plantings shall be specified in a Tree Replacement and Monitoring Plan. The Tree Replacement and Monitoring Plan shall include protocols for replanting of trees removed prior to or during construction, and management and monitoring of the trees to ensure replanting success. Where it is infeasible to replant the total number of trees required on the	N/A	• The County replants trees off-site or make in-lieu payment fees if replacing on site is infeasible	• The County

project site due to size constraints or repeated failure to thrive, the County may replant a selected number of trees off-site or make in-lieu payment fees in accordance with the terms of the Ordinance.	

APPENDIX B – BIOLOGICAL SUPPORTING INFORMATION

SNAME	CNAME	TAXONGROUP	ACCURACY	PRESENCE	OCCTYPE	OCCRANK	FEDLIST	CALLIST	GRANK	SRANK	RPLANT RANK	CDFWSTATUS	OTHRSTATUS	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL
Rana draytonii	California red-legged frog	Amphibians	nonspecific area	Presumed Extant	Natural/Native occurrence	Good	Threatened	None	G2G3	S2S3		SSC	IUCN_VU			HABITAT CONSISTS OF CREEK BANKS LINED BY FORBS AND GRASSES; SITE IS LOCATED ADJACENT TO GRAZED PASTURE.	POSSIBLY THREATENED BY CATTLE GRAZING.	
Chorizanthe cuspidata var. villosa	woolly-headed spineflower	Dicots	1/10 mile	Presumed Extant	Natural/Native occurrence	Good	None	None	G2T2	S2	1B.2					DUNES, PARTIALLY STABILIZED BY AMMOPHILA ARENARIA, LUPINUS ARBOREUS VAR. ARBOREUS, AND BACCHARIS PILULARIS. CHORIZANTHE OCCURS IN OPENINGS WITH GILIA MILLEFOLIATA, ERICAMERIA, CARDIONEMA, AND CAMISSONIA CHERIANTHIFOLIA.	AMMOPHILA INVASION. RESIDENTIAL DEVELOPMENT.	
Gilia millefoliata	dark-eyed gilia	Dicots	1/10 mile	Presumed Extant	Natural/Native occurrence	Fair	None	None	G2	S2	1B.2		BLM_S			DUNES, PARTIALLY STABILIZED. AMMOPHILA ARENARIA AND LUPINUS ARBOREUS VAR. ARBOREUS ARE DOMINANT PLANT SPECIES. GILIA MILLEFOLIATA, CHORIZANTHE CUSPIDATA VAR. VILLOSA, ERICAMERIA ERICOIDES, AND CARDIONEMA RAMOSISSIMUM PRESENT IN OPENINGS.	AMMOPHILA INVASION. RESIDENTIAL DEVELOPMENT.	
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	Monocots	80 meters	Presumed Extant	Natural/Native occurrence	Good	Endangered	Endangered	G5T1	S1	1B.1		SB_BerrySB; SB_RSABG; SB_USDA			IN AZALEA THICKETS, UNDER OAKS, AND IN OPEN, DAMP GROUND NEAR THE CREEK. ASSOCIATED WITH QUERCUS LOBATA, RHODODENDRON OCCIDENTALE, RUBUS PROCERUS, R. URSINUS, TRITELEIA PEDUNCULARIS, STACHYS CHAMISSONIS, TOXICODENDRON, AND SEVERAL GRASSES.	COLLECTING, NON-NATIVES, SURFACE WATER DIVERSION, FERAL PIGS, RUNOFF. PAST THREATS: CATTLE GRAZING & TRAMPLING.	
Rana draytonii	California red-legged frog	Amphibians	1 mile	Presumed Extant	Natural/Native occurrence	Good	Threatened	None	G2G3	S2S3		SSC	IUCN_VU			HABITAT CONSISTED OF A SHALLOW BLUE-LINE CREEK, TRIBUTARY TO ESTERO AMERICANO, WITH BANKS LINED BY JUNCUS, GRASSES, AND MISCELLANEOUS ANNUALS; SITE IS LOCATED ADJACENT TO GRAZED PASTURE.	POSSIBLY THREATENED BY CATTLE GRAZING.	
Rana draytonii	California red-legged frog	Amphibians	80 meters	Presumed Extant	Natural/Native occurrence	Good	Threatened	None	G2G3	S2S3		SSC	IUCN_VU			HABITAT CONSISTS OF A SHALLOW POOL WITH MUD BANKS FOR BASKING AND EMERGENT VEGETATION FOR BREEDING. SITE IS VEGETATED BY RIPARIAN / WETLAND PLANTS AND POOL MARGINS LINED WITH JUNCUS. SURROUNDING LAND IS PASTURE.	POTENTIAL THREAT FROM GRAZING CATTLE AND SEDIMENTATION.	
Trifolium amoenum	two-fork clover	Dicots	80 meters	Presumed Extant	Natural/Native occurrence	Good	Endangered	None	G1	S1	1B.1		SB_RSABG; SB_USDA			COASTAL BLUFF GRASSLAND WITH ERIGERON GLAUCUS, ARMERIA MARITIMA, HORDEUM BRACHYANTHERUM, LOLIUM MULTIFLORUM, DANTHONIA CALIFORNICA, AND BROMUS CARINATUS.	EROSION, AND POSSIBLY DEVELOPMENT ARE THREATS.	
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	Monocots	specific area	Presumed Extant	Natural/Native occurrence	Good	Endangered	Endangered	G5T1	S1	1B.1		SB_BerrySB; SB_RSABG; SB_USDA			GRASSLAND UNDER OAKS & IN MARSH AT EDGE OF SHRUBS. ASSOCIATED WITH CORNUS STOLONIFERA, RHODODENDRON, RUBUS, GENTIANA SCEPTRUM, TOFIELDIA OCCIDENTALIS, HELENIUM BIGLOVII, PRUNELLA VULGARIS, MENTHA PULEGIUM, SISYRINCHIUM, JUNCUS, & CAREX.	PREVIOUSLY OVER-COLLECTED AND NEAR EXTIRPATION AT THIS SITE. AREA BEING ENCROACHED UPON BY CORNUS, RUBUS, AND WILLOW.	
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	Monocots	specific area	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	Endangered	G5T1	S1	1B.1		SB_BerrySB; SB_RSABG; SB_USDA				GRAZING, INTRODUCED SPECIES ARE THREATS.	
Erigeron greenei	Greene's narrow-leaved daisy	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3	S3	1B.2			2 MILES EAST OF OCCIDENTAL.	MAPPED AS BEST GUESS BY CNDDB AROUND 2 ROAD MILES EAST OF OCCIDENTAL ALONG MAIN ROADS HEADING IN THIS DIRECTION (GRATON RD AND OCCIDENTAL RD). BASED ON COLLECTIONS FROM "BETWEEN OCCIDENTAL AND GRATON" AND "2 MI E OF OCCIDENTAL."	SERPENTINE.		BASED ON 1936 HOWELL COLLECTION AND 1946 MASON COLLECTION. DS SPECIMEN FOR MASON COLLECTION ANNOTATED TO E. REDUCTUS VAR. ANGUSTATUS BY NESOM IN 1992, THOUGH UC RECORD AND CITATION IN 1992 NESOM PAPER GIVE E. ANGUSTATUS (E. GREENEI).

Agelaius tricolor	tricolored blackbird	Birds	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	Threatened	G2G3	S1S2		SSC	BLM_S; IUCN_EN; NABCI_RWL; USFWS_BCC	SEBASTOPOL, VICINITY OF HWY 12 & HWY 116 INTERSECTION.	LOCATION DESCRIBED ONLY AS "SEBASTOPOL." MAPPED GENERALLY TO SEBASTOPOL. FURTHER RESEARCH NEEDED TO DETERMINE STATUS OF COLONIES IN THE AREA. COLONY DATA STORED IN THE UC DAVIS TRICOLORED BLACKBIRD PORTAL; SITE NAME WAS "SEBASTOPOL."	NO HABITAT INFORMATION PROVIDED.	A BREEDING COLONY OF ABOUT 500-700 BIRDS OBSERVED IN LATE APR OF 1976. UNKNOWN IF COLONY FLEDGED YOUNG.
Rana boylii	foothill yellow-legged frog	Amphibians	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	Candidate Threatened	G3	S3		SSC	BLM_S; IUCN_NT; USFS_S	VICINITY OF CAMP MEEKER AND OCCIDENTAL, WEST OF SEBASTOPOL.			COLLECTED IN 1905, 1911, AND 1967.
Bombus caliginosus	obscure bumble bee	Insects	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G4?	S1S2			IUCN_VU	TOWN OF OCCIDENTAL.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB IN THE GENERAL VICINITY OF OCCIDENTAL.		COLLECTED IN THIS VICINITY ON 3 JUN 1969.
Trifolium hydrophilum	saline clover	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G2	S2	1B.2			NEAR OCCIDENTAL.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB IN GENERAL VICINITY OF OCCIDENTAL.		PLANTS NOT FOUND IN 1995. ONLY SOURCE OF INFORMATION IS AN UNDATED CAS SPECIMEN CITATION BY R. MORGAN. NEEDS FIELDWORK.
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Monocots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	None	G5T1	S1	1B.1		SB_RSABG	BLOOMFIELD, SONOMA COUNTY.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB IN THE GENERAL VICINITY OF BLOOMFIELD.		ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1880 COLLECTION BY CONGDON. NEEDS FIELDWORK.
Ceanothus foliosus var. vineatus	Vine Hill ceanothus	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3T1	S1	1B.1			ALONG ROAD TO OCCIDENTAL WEST OF GREEN VALLEY.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS AROUND THE ROADS BETWEEN OCCIDENTAL AND GREEN VALLEY. EXACT LOCATION OF 1950 COLLECTION UNKNOWN. MAPPED BY CNDDB IN THE		ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1938 ROBBINS COLLECTION. NEEDS FIELDWORK.
Bombus occidentalis	western bumble bee	Insects	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G2G3	S1			USFS_S; XERCES_IM	FREESTONE.	GENERAL VICINITY OF THE COMMUNITY OF FREESTONE, ADJACENT TO SALMON CREEK.	ADDITIONAL DATABASE NOTE "IPOMOEA;" PRESUMABLY THE HOST PLANT ON WHICH THE SPECIMEN WAS FOUND.	1 COLLECTED 7 SEP 1950.
Dicamptodon ensatus	California giant salamander	Amphibians	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3	S2S3		SSC	IUCN_NT	FREESTONE.	LOCALITY ONLY STATED AS FREESTONE. ACCORDING TO HIS MVZ FIELD NOTES, CAMP & FERRIS SPENT SEVERAL DAYS TRAPPING IN THIS AREA. 1973 COLLECTION FROM 1/2 MI N OF FREESTONE, LIKELY IN THE VICINITY OF SALMON CREEK.		TWO COLLECTED ON 10 JUN AND ONE COLLECTED ON 19 JUN, 1913. ONE COLLECTED ON 23 FEB 1973.
Rana boylii	foothill yellow-legged frog	Amphibians	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	Candidate Threatened	G3	S3		SSC	BLM_S; IUCN_NT; USFS_S	VICINITY OF FREESTONE.			2 COLLECTED ON 16 JUN 1913. COLLECTED IN 1935. DETECTED IN 1991 & 1992; DETECTIONS EXTEND W ALONG ESTERO RD & S ALONG VALLEY FORD RD.
Speyeria zerene myrtleae	Myrtle's silverspot butterfly	Insects	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	None	G5T1	S1			XERCES_CI	VICINITY OF ESTERO RD & VALLEY FORD FRANKLIN SCHOOL ROAD INTERSECTION, BETWEEN ESTERO AMERICANO AND ESTERO SAN ANTONIO.	REFERRED TO AS "VALLEY FORD" IN 1935 COLLECTION.1991-92 DETECTIONS MADE AT ABOUT "1 MILE NE OF MCGR SITE, 0.5 MILES FROM ESTERO RD AND VALLEY FORD FRANKLIN SCHOOL ROAD INTERSECTION." POPULATION EXISTS JUST "SW OF THE TOWN OF VALLEY FORD."	CONSIDERED A SEPARATE POPULATION FROM THE MARIN COAST GOLF RANCH (MCGR) POPULATION.	SURVEYED DURING SPRING AND SUMMER OF 2002-2003; ESTIMATES NOT PROVIDED. POPULATION APPEARS MORE DENSE THAN ORIGINALLY DESCRIBED.
Lasthenia californica ssp. bakeri	Baker's goldfields	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3T1	S1	1B.2			NEAR BODEGA.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB IN THE GENERAL VICINITY OF THE TOWN OF BODEGA.		ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1934 YATES COLLECTION. NEEDS FIELDWORK.

Fritillaria liliacea	fragrant fritillary	Monocots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G2	S2	1B.2	USFS_S	BODEGA.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB IN THE GENERAL VICINITY OF THE TOWN OF BODEGA.			ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A COLLECTION BY KRAGER. LABEL READS "SENT FROM BODEGA, MAR. 1924." NEEDS FIELDWORK. TYPE LOCALITY. MANY HISTORIC COLLECTIONS FROM THIS AREA; LAST COLLECTED IN 1946. SITE SHOULD BE CHECKED.
Delphinium bakeri	Baker's larkspur	Dicots	1 mile	Extirpated	Natural/Native occurrence	None	Endangered	Endangered	G1	S1	1B.1	SB_UCBBG	HEDRIN RANCH IN COLEMAN VALLEY, WEST OF OCCIDENTAL.		FENCE ROWS AND HEAVY LOWBRUSH. ASSOCIATED WITH POTENTILLA ELATA.	THREATENED BY GRAZING AND FARMING.	EXTIRPATED ACCORDING TO GUGGOLZ, 1986.
Sidalcea calycosa ssp. rhizomata	Point Reyes checkerbloom	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G5T2	S2	1B.2		VALLEY FORD.				ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1886 COLLECTION BY BRANDEGEE. NEEDS FIELDWORK.
Trifolium amoenum	two-fork clover	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	None	G1	S1	1B.1	SB_RSABG; SB_USDA	FREESTONE.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS CENTERED ON THE TOWN OF FREESTONE.			1940 BAKER COLLECTION FROM "O'FARRELL HILL REGION, EAST SLOPE, NEAR WAGNON HOME" ATTRIBUTED TO THIS SITE AS IT IS IN THE REGION OF CANADA DE JONIVE.
Delphinium luteum	golden larkspur	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	Rare	G1	S1	1B.1	SB_UCBBG	GRATON.				SITE BASED ON 1925 AND 1927 HALLETT COLLECTIONS. SITE IS BASED ON A 1907 DOWS COLLECTION. AT 1996 RECOVERY WORKSHOP, PARTICIPANTS AGREED THAT IT'S UNLIKELY PLANTS STILL OCCUR HERE.
Chorizanthe valida	Sonoma spineflower	Dicots	1 mile	Possibly Extirpated	Natural/Native occurrence	None	Endangered	Endangered	G1	S1	1B.1	SB_RSABG	SEBASTOPOL.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB IN THE GENERAL VICINITY OF SEBASTAPOL.			OCCURRENCE IS BASED ON TWO BAKER COLLECTIONS FROM 1899 AND 1939. NEEDS FIELDWORK.
Lasthenia californica ssp. bakeri	Baker's goldfields	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3T1	S1	1B.2		MARSH ON GRAVENSTEIN HWY, SOUTH OF MOLINA NEAR SEBASTOPOL.	EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDB IN THE VICINITY OF SEBASTOPOL.	MARSH AREA.		TYPE LOCALITY. COLLECTIONS FROM "LAGUNA OF SANTA ROSA CREEK", "NEAR THE LAGUNA ON THE FORESTVILLE ROAD", AND "NEAR SEBASTSOPOL" ATTRIBUTED TO THIS OCCURRENCE.
Horkelia tenuiloba	thin-lobed horkelia	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G2	S2	1B.2	BLM_S; SB_RSABG	NEAR SEBASTOPOL SCHOOL.	UNABLE TO LOCATE "SEBASTOPOL SCHOOL". MAPPED BY CNDDB IN THE GENERAL VICINITY OF SEBASTOPOL.			ONLY SOURCE OF INFORMATION FOR THIS SITE IS A FIELD OBSERVATION FROM KUHN (DATE OF OBSERVATION UNKNOWN; MENTIONED IN MADRONO, 1916) THAT THIS PLANT HAS BEEN FOUND NEAR SEBASTOPOL. NEEDS FIELDWORK.
Viburnum ellipticum	oval-leaved viburnum	Dicots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G4G5	S3?	2B.3		NEAR SEBASTOPOL.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS IN VICINITY OF SEBASTOPOL.			

Fritillaria liliacea	fragrant fritillary	Monocots	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G2	S2	1B.2		USFS_S	NEAR SEBASTOPOL.	EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS IN THE VICINITY OF SEBASTOPOL.				SITE BASED ON A 1940 NOLDEKE COLLECTION. A 1927 HUFFINE COLLECTION FROM "ON ROAD FROM OCCIDENTAL TO SEBASTOPOL" IS ALSO ATTRIBUTED TO THIS OCCURRENCE. NEEDS FIELDWORK.
Arctostaphylos bakeri ssp. bakeri	Baker's manzanita	Dicots	specific area	Presumed Extant	Natural/Native occurrence	Good	None	Rare	G2T1	S1	1B.1			NORTH AND EAST OF CAMP MEEKER AND OCCIDENTAL, ABOUT 0.5 TO 6.6 AIR MILES SOUTHEAST OF MONTE RIO.	EXTENSIVE OCCURRENCE MAPPED ALONG RIDGES EAST OF BOHEMIAN HIGHWAY AND NORTH OF OCCIDENTAL ROAD. MOSTLY MAPPED ACCORDING TO 1978 SOIL & VEGETATION MAP AND 1983 RAICHE MAP.	ON SERPENTINE AND PERIDOTITE. OUTCROPS, ROADSIDE, CHAPARRAL, OPEN AREAS. ASSOCIATED WITH CUPRESSUS SARGENTII, CEANOTHUS JEPSONII, ADENOSTOMA, POLYGALA CALIFORNICA, CAREX GLOBOSA, CALAMAGROSTIS KOELERIOIDES, CORDYLANTHUS, ETC.	ROADS RUNNING THROUGH POPULATION, ILLEGAL DUMPING, URBANIZATION, EXOTIC SPECIES.	TYPE LOCALITY. 14,100+ PLANTS ESTIMATED FOR MAJORITY OF OCC IN 1983. PARTS OF OCC: 1000+ PLANTS IN 1978, 100S IN 1987, "MANY" AT NW END IN 2004. NUMEROUS COLLECTIONS AND OBSERVATIONS FROM 1933 THROUGH 2015. INCLUDES FORMER OC #4, 5, 7-10.
Arborimus pomo	Sonoma tree vole	Mammals	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3	S3		SSC	IUCN_NT	ALONG BOHEMIAN HWY, FROM ABOUT 0.75 MI SOUTH OF OCCIDENTAL TO ABOUT 0.75 MI NORTH OF CAMP MEEKER.					1 NEST OBSERVED BY WOOSTER, 1995. 10 SPECIMENS AT UNIVERSITY OF PUGET SOUND; 7 AT MUSEUM OF VERTEBRATE ZOOLOGY, UC BERKELEY, 2 SPECIMENTS AT THE LA COUNTY MUSEUM OF NATURAL HISTORY. ALL COLLECTION DATES UNKNOWN.
Oncorhynchus kisutch pop. 4	coho salmon - central California coast ESU	Fish	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	Endangered	G4	S2?			AFS_EN	ABOUT 8.25 MILES OF GREEN VALLEY CREEK, TRIBUTARY TO THE RUSSIAN RIVER, NW OF SEBASTOPOL.		2011: SMOLT DETECTED WERE OF HATCHERY ORIGIN.			BROOD YEAR 1993-2003 FISH DOCUMENTED. DETECTED IN OUTMIGRANT FISH TRAP, 5 MAY 2011. 1 SPAWNED-OUT CARCASS OBSERVED 29 JAN; 3,529 JUVENILES OBSERVED IN SNORKEL SURVEYS IN MAY, JUN, JUL & AUG 2015.
Taxidea taxus	American badger	Mammals	3/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G5	S3		SSC	IUCN_LC	FREESTONE.	MAPPED ACCORDING TO LAT/LONG GIVEN BY MVZ; MAX ERROR DISTANCE: 0.25 MI.				MALE (MVZ #19746) COLLECTED BY CHARLES L. CAMP ON 19 JUN 1913. ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1947 HOFFMAN COLLECTION. NEEDS FIELDWORK.
Erigeron greenei	Greene's narrow-leaved daisy	Dicots	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3	S3	1B.2			DUTCH BILL CREEK.	EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDB ALONG THE MAIN STEM OF DUTCH BILL CREEK.	SERPENTINE SOIL.			
Syncaris pacifica	California freshwater shrimp	Crustaceans	specific area	Presumed Extant	Natural/Native occurrence	Good	Endangered	Endangered	G2	S2			IUCN_EN	SALMON CREEK, FROM ABOUT 2.25 MILES UPSTREAM OF MOUTH TO JUST NORTH OF BODEGA ROAD AT FREESTONE, NE OF BODEGA BAY.	2004 SURVEY EXTENDED FROM 2.25 TO 2.75 MILES UPSTREAM. 2009 DETECTION ABOUT 0.3 MILES WEST OF BODEGA HWY AT FREESTONE VALLEY FORD RD. 2010 DETECTIONS JUST EAST OF BODEGA.	BEST HABITAT IN AREAS W/70-100% CANOPY & UNDERCUT BANKS. LITTLE OR NO CANOPY IN 1988/89 SURVEY; HIGHEST DENSITY BETWEEN BODEGA & WATSON SCHOOL. CATTLE USE POOLS. POPULATION & DISTRIBUTION HAVE FLUCTUATED DUE TO POLLUTION & DROUGHT.	OVER-GRAZING (1997), POLLUTION, EROSION, DEVELOPMENT, WATER DIVERSION & DROUGHT (2004), CATTLE (2010).	574 OBSERVED IN 1988-89 SURVEY. 1 ADULT & 3 JUVENILES OBS, 1 OCT 1997. 3-4 ADULTS & 23 JUVS OBS 4 JUN 2004. 5 OBS 2 JUN, 5 ADULTS ON 1 AUG & 33 ON 18 NOV 2005. 8 ADULTS OBS 28 AUG 2009. 55 ADULTS & 15 JUVS ON 7 OCT 2010.

Syncaris pacifica	California freshwater shrimp	Crustaceans	nonspecific area	Presumed Extant	Natural/Native occurrence	Good	Endangered	Endangered	G2	S2		IUCN_EN	PORTION OF GREEN VALLEY CREEK, TRIBUTARY TO THE LOWER RUSSIAN RIVER, FROM ABOUT 0.75 TO 5 MI UPSTREAM OF ITS CONFLUENCE.	UNKNOWN HOW FAR UPSTREAM AND DOWNSTREAM THIS POPULATION EXTENDS. MAPPED TO INCLUDE FURTHEST UPSTREAM & DOWNSTREAM DETECTIONS.	4TH ORDER STREAM WITH POOLS & MATURE RIPARIAN CANOPY. STREAMBED MOSTLY SILT/SAND, W/SOME GRAVEL/BOULDERS. STEELHEAD & COHO REARING AREA. 2017: FLOODING NECESSITATED EMERGENCY ROAD REPAIR (SEDIMENT EXCAVATION & CREEK RE-DIRECTION).	LOGGING, BARRIERS, DEVELOPMENT, DAIRY FARMS, DIVERSIONS, FLOOD CONTROL, SEWAGE, INVASIVE PREDATORS, SILTATION, ROADWORK.	DETECTED IN 1982-83. 28 OBSERVED IN 1988-89, 29 IN 1999, 4 IN 2000, 18 IN 2001, 3 ADULTS & 6 JUVS IN 2010. 44 INCL. GRAVID FEMALES OBS MAY 2011. 10 OBS IN 2013, 24+ IN 2015, 34+ IN 2016. 121+ INCL. GRAVID FEMALES OBS MAR-JUL 2017.
Oncorhynchus kisutch pop. 4	coho salmon - central California coast ESU	Fish	nonspecific area	Presumed Extant	Natural/Native occurrence	Good	Endangered	Endangered	G4	S2?		AFS_EN	ABOUT 4 MILES OF DUTCH BILL CREEK, FROM MONTE RIO UPSTREAM TO ABOUT ALLIANCE REDWOOD, NORTH (DOWNSTREAM) OF CAMP MEEKER.	MAPPED TO INCLUDE COORDINATES GIVEN FOR DOWNSTREAM TRAPPING STATIONS, SEINING SURVEYS & SNORKEL SURVEYS.	2013: "SPECIES BEING RELOCATED AS PART OF HABITAT ENHANCEMENT PROJECT WITHIN THE CREEK."		BROOD YEAR 1995 & 2001 FISH DETECTED. 532 CAUGHT & RELEASED IN SEINING SURVEYS 15 JUL - 16 SEP 2013. 201 SMOLT COUNTED IN DAILY TRAP CHECKS 23 MAR-7 MAY; 1092 JUVENILES OBS IN SNORKEL SURVEYS IN MAY & JUL 2015.
Coastal Brackish Marsh	Coastal Brackish Marsh	Marsh	specific area	Possibly Extirpated	Natural/Native occurrence	None	None	None	G2	S2.1			ESTERO AMERICANO, SW OF VALLEY FORD.	ABOUT 30 ACRES. DRAINED AND FILLED FOR AG, UNKNOWN IF SMALL REMNANTS REMAIN.	SEASONAL BRACKISH MARSH; SALICORNIA, JAUMEA & DISTICHLIS DOMINATE NEAR SHORELINE W/FRANKENIA IN BETTER DRAINED AREAS.		HABITAT FOR SEVERAL IMPORTANT ANIMAL TAXA. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.
Oncorhynchus mykiss irideus pop. 8	steelhead - central California coast DPS	Fish	nonspecific area	Possibly Extirpated	Natural/Native occurrence	None	Threatened	None	G5T2T3Q	S2S3		AFS_TH	ESTERO AMERICANO, FROM ITS MOUTH IN BODEGA BAY TO THE VALLEY FORD FRANKLIN SCHOOL RD BRIDGE SW OF VALLEY FORD.	FORMER EXTENT IN WATERSHED UNKNOWN. DETECTED AT TRAWL STATION E-2 STATIONED 1 MILE UPSTREAM FROM OCEAN, AND AT TRAWL STATION E-5 STATIONED ABOUT 5.5 MILES UPSTREAM AT BRIDGE.	ANECDOTAL REPORTS CLAIM THIS WATERSHED ONCE SUPPORTED SPAWNING; POP NOW PRESUMED EXTIRPATED BY SOME. AS OF 1996, THERE WAS NO SALMONID SPAWNING HABITAT REMAINING IN THE ESTERO AMERICANO WATERSHED, THOUGH IT IS LISTED AS CRITICAL HABITAT.	SILTATION, FISH PASSAGE BARRIERS, VEGETATION REMOVAL, POOR WATER QUALITY (2014).	FISH SAMPLED ON 21 OCCASIONS FROM 1988-1990. ONE INDIVIDUAL EACH CAPTURED DURING GILLNET SURVEYS ON 21 DEC 1988 (E-5), 28 NOV 1989 (E-2), AND ON 9 MAR 1990 (E-2). THESE WERE PRESUMED "STRAYS" FROM OTHER WATERSHEDS; ONE WAS HATCHERY-REARED.
Eucyclogobius newberryi	tidewater goby	Fish	nonspecific area	Presumed Extant	Natural/Native occurrence	Poor	Endangered	None	G3	S3	SSC	AFS_EN; IUCN_VU	ESTERO AMERICANO, FROM ITS MOUTH IN BODEGA BAY TO THE VALLEY FORD FRANKLIN SCHOOL RD BRIDGE SW OF VALLEY FORD.	1945 COLLECTION FROM "BODEGA BAY, ESTERO AMERICANO BAY." FOUND UPSTREAM TO VALLEY FORD FRANKLIN SCHOOL RD CROSSING, AND UP TO STATION E-5 IN 1989-1990, JUST UPSTREAM OF THE CROSSING.	LARGE (750-1000AC) COASTAL LAGOON HIGHLY IMPACTED BY AGRICULTURE & GRAZING AS OF 2005. LITTLE OR NO GENETIC EXCHANGE BETWEEN POPS. SANDBAR NOT COMPLETELY CLOSED, ESTUARY PARTIALLY TIDAL; UPPER PORTION OF ESTUARY WAS HYPERSALINE IN 1997.	POOR WATER QUALITY FROM EXCESS NUTRIENTS & SEDIMENTATION/SILTATION DUE TO GRAZING, RUNOFF; EXOTIC FISH SPECIES (2005).	4 COLLECTED ON 26 JUN 1945. 30 COLLECTED ON 12 OCT 1977. EXTANT MID-1984. UNKNOWN NUMBER COLLECTED 1988 & 1990. LARVAE FOUND IN NETS & 4 ADULTS IN OTTER TRAWLS, NOV 1989-SEP 1990. POP CONFIRMED EXTANT IN 1996 & 1997. COLLECTED OCT 1999.
Arborimus pomo	Sonoma tree vole	Mammals	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3	S3	SSC	IUCN_NT	0.5 MI NORTH OF FREESTONE, 0.5 MI NORTHWEST OF FREESTONE, AND FREESTONE.				14 SPECIMENS AT UNIVERSITY OF PUGET SOUND, COLLECTION DATE UNKNOWN.
Rana draytonii	California red-legged frog	Amphibians	2/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	Threatened	None	G2G3	S2S3	SSC	IUCN_VU	ABOUT 1.8 MILES NW OF CARROLL RD AT VALLEY FORD RD, 1.6 MILES NE OF THE TOWN OF VALLEY FORD.	MAPPED TO INCLUDE LOCATIONS GIVEN FOR PONDS A & B. INDIVIDUAL WAS DETECTED IN ONE OF THESE TWO PONDS.		MANY BULLFROGS ALSO DETECTED IN SAME POND.	ONE LARGE ADULT FOUND DURING NIGHT SURVEY ON 14 SEP 1994.

Ardea alba	great egret	Birds	2/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G5	S4		CDF_S; IUCN_LC	VICINITY OF VALLEY FORD.	MAPPED CENTERED ON GIVEN COORDINATES.			ABOUT 21 ACTIVE NESTS OBSERVED 6 MAY 2011. DOWNY YOUNG AND INCUBATION OBSERVED.
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Monocots	2/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	None	G5T1	S1	1B.1	SB_RSABG	NEAR GREEN VALLEY SCHOOL, WEST OF GRATON.	EXACT LOCATION UNKNOWN, MAPPED BY CNDDB IN VICINITY OF GREEN VALLEY SCHOOL. 1932 COLLECTION FROM "3 MI W GRATON, <SCHACKLEY> FLAT, 150 FT" ATTRIB HERE, UNABLE TO LOCATE FLAT; SCHOOL IS <3 MI W OF GRATON, BUT IS CLOSER TO GIVEN ELEVATION.	FLAT, DAMP, MOIST PLACE.		MAIN SOURCE OF INFORMATION FOR THIS SITE IS A 1936 YATES COLLECTION. A 1932 ARMSTRONG COLLECTION IS ALSO ATTRIBUTED HERE. NEEDS FIELDWORK.
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Dicots	2/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G5T2	S2	1B.2		CIRCA 1.5 MILES NORTHWEST OF BODEGA AT RANCHO BODEGA.				ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1994 COLLECTION BY ROCKWOOD AND ESPOSITO. 1000-10,000 PLANTS IN 1978; 10,000+ IN 1981; 5000+ IN 1987. 300-500 IN 2001. 1000S ALONG STOETZ LN IN 2009.
Cordylanthus tenuis ssp. capillaris	Pennell's bird's-beak	Dicots	specific area	Presumed Extant	Natural/Native occurrence	Good	Endangered	Rare	G4G5T1	S1	1B.2	SB_RSABG	ALONG STOETZ LANE ABOUT 0.5-1.0 MI NW OF JUNCTION WITH HARRISON GRADE ROAD, 2 MILES NE OF OCCIDENTAL.	PORTION OF SITE IS WITHIN HARRISON GRADE ECOLOGICAL RESERVE. SOME PRIVATE LANDOWNERS WORKING WITH TNC TO PROTECT PLANTS ON THEIR LAND. MAPPED ACCORDING TO A 1987 HORENSTEIN MAP.	IN OPENINGS ON SERPENTINE ISLAND WITH REDDISH ROCKY SOIL. MOST VIGOROUS IN DISTURBED AREAS. WITH ERIOPHYLLUM AND LOMATIUM. ASSOCIATED SURROUNDING VEG INCLUDES ARCTOSTAPHYLOS BAKERI, CEANOTHUS JEPSONII, CUPRESSUS SARGENTII. 500-800 FT.	DUMPING, OFF-ROAD VEHICLE USE, DEVELOPMENT THREATEN. TAENIATHERUM CAPUT-MEDUSAE ENCROACHING ON POPULATION.	SEVERAL COLONIES OF 70-300 PLANTS SEEN AT HARRISON GRADE IN 2011; COLONIES ALONG STOETZ LN REPORTED AS DENSE.
Syncaris pacifica	California freshwater shrimp	Crustaceans	nonspecific area	Presumed Extant	Natural/Native occurrence	Good	Endangered	Endangered	G2	S2		IUCN_EN	JONIVE CREEK (TRIBUTARY TO ATASCADERO CREEK) & TRIBUTARIES INCLUDING REDWOOD & HUDSPETH CREEKS, 3.5 MI W OF SEBASTOPOL.	LOWER RUSSIAN RIVER WATERSHED. 1988-89 SURVEYS IN 0.75-MI REACH OF JONIVE CREEK, FROM JUST D/S OF FERGUSON RD TO SEXTON RD. 1994, 2001, 2017: IN REDWOOD CK. 2015: IN JONIVE & HUDSPETH CKS. 2017-18: IN UNNAMED DRAINAGE TO REDWOOD CK.	JONIVE CK POOLS LINED W/SAND & GRAVEL, TYPICAL RIPARIAN VEG W/NEARLY COMPLETE CANOPY COVER. REDWOOD CK LINED W/ALDER RIPARIAN. STEELHEAD ALSO FOUND. 2017-18 SURVEYS FOR CULVERT REPLACEMENT PROJECT ON UNNAMED DRAINAGE W/UNDERCUT BANKS.	RIPARIAN HABITAT REDUCTION, WATER DIVERSION, ROADS, BANK PROTECTION, DEVELOPMENT. BARRIERS, CONSTRUCTION, RUNOFF (2018).	227 DETECTED IN 1988-89 SURVEYS. 7 ADULTS & 3 JUVENILES DET 29 MAR 1994. 4 DET 19 OCT 2001. 72 DET IN JONIVE CK & 10 IN HUDSPETH CK, 2 JUN 2015. 9 DET 1 MAY & 8 ON 9 AUG 2017. 55 RELOCATED AWAY FROM CONSTRUCTION, JUL 2018.
Athene cunicularia	burrowing owl	Birds	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G4	S3		SSC	BLM_S; IUCN_LC; USFWS_BCC	NORTH SIDE OF ESTERO AMERICANO ABOUT 1.3 MILES SE OF HWY 1 AT BODEGA HWY, 2 MILES W OF VALLEY FORD.	MAPPED TO PROVIDED MAPS.	NUMEROUS BADGER BURROWS IN OPEN GRASSLAND APPEARED TO PROVIDE OVERWINTERING HABITAT. PROPERTY UNDER CONSERVATION EASEMENT. SITE OF PROPOSED NATURE/RECREATION TRAIL.		1 OBSERVED ON 4 MAR 2011. SIGN INCLUDING PELLETS AND WHITEWASH OBSERVED AROUND NUMEROUS BURROWS DURING WINTER SEASON SURVEYS 2010-2012. OLD PELLETS OBSERVED NEAR COLLAPSED BURROW IN APR-JUN 2014.
Rana draytonii	California red-legged frog	Amphibians	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	Threatened	None	G2G3	S2S3		SSC	IUCN_VU	THURSTON CREEK, TRIBUTARY TO NOLAN CREEK; NE OF BODEGA.	EXACT DETECTION LOCATIONS NOT PROVIDED. EXACT LOCATION UNKNOWN.	ISOLATED POOLS IN EPHEMERAL STREAM, STEEP BANKS & GRAVEL BARS WITH SOME EROSION. IN AGRICULTURAL/RURAL RESIDENTIAL AREA. TEMPORARY DISTURBANCE NOTED DUE TO INSTALLATION OF STREAM ENHANCEMENT PROJECT.	POSSIBLE PREDATION FROM DOMESTIC OR FERAL DOGS AND CATS.	10 JUVENILES OBSERVED ON 27 AUG 2014.
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Dicots	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G5T2	S2	1B.2		STOETZ LANE, 2 MILES NE OF OCCIDENTAL.	MAPPED AS BEST GUESS ALONG ENTIRE LENGTH OF STOETZ LANE BASED ON 2015 PHOTOS BY DOYEN.	ON SERPENTINE SUBSTRATE.		SITE BASED ON 2015 DOYEN PHOTOS IN CALPHOTOS. NEEDS FIELDWORK.

Anodonta oregonensis	Oregon floater	Mollusks	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G5Q	S2?			SALMON CREEK, SOUTH OF FREESTONE.	EXACT COLLECTION LOCATION UNKNOWN. LOCALITY IS "SALMON CREEK BETWEEN FREESTONE AND VALLEY FORD." VALLEY FORD IS NOT ON SALMON CREEK, BUT FREESTONE VALLEY FORD ROAD IS; MAPPED BETWEEN FREESTONE & INTXN OF BODEGA HWY & VALLEY FORD RD.	AN ANODONTA CALIFORNIENSIS WITH THE SAME LOCALITY WAS COLLECTED BEFORE 1948 (OCC #5), IT IS POSSIBLE THESE WERE TAKEN BY THE SAME COLLECTOR; DOCUMENTATION IS INCOMPLETE.		1 COLLECTED ON 27 MAR 1932.
Anodonta californiensis	California floater	Mollusks	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3Q	S2?		USFS_S	SALMON CREEK, SOUTH OF FREESTONE.	EXACT COLLECTION LOCATION UNKNOWN. LOCALITY REPORTED AS "SALMON CREEK BETWEEN FREESTONE AND VALLEY FORD." VALLEY FORD IS NOT ON SALMON CREEK, BUT FREESTONE VALLEY FORD ROAD IS; MAPPED BETWEEN FREESTONE & INTXN OF BODEGA HWY & VALLEY FORD RD	AN ANODONTA OREGONENSIS WITH THE SAME LOCALITY WAS COLLECTED ON 27 MAR 1932 (OCC #1), IT IS POSSIBLE THESE WERE TAKEN BY THE SAME COLLECTOR; DOCUMENTATION IS INCOMPLETE.		COLLECTED ON UNKNOWN DATE, AS REPORTED IN 1948 ARTICLE BY W.M. INGRAM.
Taxidea taxus	American badger	Mammals	nonspecific area	Presumed Extant	Natural/Native occurrence	Good	None	None	G5	S3	SSC	IUCN_LC	NORTH SIDE OF ESTERO AMERICANO RIVER, ABOUT 1.4 MILES SE OF HWY 1 AT BODEGA HWY & 1.7 MILES WEST OF VALLEY FORD.	MAPPED TO INCLUDE PROVIDED LOCATIONS.	GRASSLAND USED FOR GRAZING. PROPERTY WAS PROPOSED FOR SUBDIVISION IN 2007, BUT WAS PROTECTED BY A CONSERVATION EASEMENT IN 2012. SITE OF PROPOSED RECREATION/NATURE TRAIL (2014).	TRAIL CONSTRUCTION POSES POTENTIAL THREAT (2014).	OBSERVED ON 11 JUN 2007. LAND OWNER INDICATED A LONG HISTORY OF BADGER PRESENCE. OLD AND FRESH BURROWS OBSERVED IN 2014.
Rana boylii	foothill yellow-legged frog	Amphibians	nonspecific area	Presumed Extant	Natural/Native occurrence	Good	None	Candidate Threatened	G3	S3	SSC	BLM_S; IUCN_NT; USFS_S	GREEN VALLEY CREEK, NW OF MOUNT PISGAH, ABOUT 3 MILES WEST OF GRATON.	MAPPED TO 2018 SURVEY STREAM REACH, FROM 0.5 MILE UPSTREAM TO 0.8 MILE DOWNSTREAM OF THE CROSSING OF GREEN VALLEY ROAD.		POSSIBLE THREAT FROM WATER PUMPING BY ADJACENT LANDOWNERS.	1 INDIVIDUAL OBSERVED ON 23 AUG 2001. ADULTS DETECTED DURING A SNORKEL SURVEY ON 27 JUN 2018.
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Monocots	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	None	G5T1	S1	1B.1	SB_RSABG	1.5 MILES EAST OF OCCIDENTAL.	EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDB ALONG GRATON ROAD TO ENCOMPASS GIVEN ELEVATION OF 300 FT AND PORTION OF ROAD THAT IS 1.5 ROAD MILES EAST OF OCCIDENTAL.	SWAMP.		ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1937 COLLECTION BY YATES. NEEDS FIELDWORK.
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Dicots	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G5T2	S2	1B.2		ROAD TO PETALUMA, 1 MILE EAST OF VALLEY FORD.				ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1966 COLLECTION BY FULLER.
Arctostaphylos bakeri ssp. bakeri	Baker's manzanita	Dicots	specific area	Presumed Extant	Natural/Native occurrence	Good	None	Rare	G2T1	S1	1B.1		ABOUT 1 MILE EAST OF OCCIDENTAL; ALONG GRATON ROAD AND OCCIDENTAL ROAD NEAR TANUDA RD AND FACENDINI LANE.	4 POLYGONS MAPPED BY CNDDB ACCORDING TO A 1983 MAP BY RAICHE. INCLUDES COLLECTIONS FROM "1 MI E OF OCCIDENTAL, SEC 35," "GRATON RD 1 MI E OF OCCIDENTAL," "GRATON RD NEAR INTERSECTION WITH TANUDA ROAD," ETC.	ON SERPENTINE AND NON-SERPENTINE SOILS. OPEN GRASSY BANK, THIN FOREST OPENING. ASSOCIATED WITH QUERCUS SPP., PSEUDOTSUGA MENZIESII, ARBUTUS MENZIESII, AND ARCTOSTAPHYLOS MANZANITA SSP. MANZANITA.	DIRT ROAD, NEARBY RESIDENTIAL AREA, HEAVY GRAZING & BULLDOZING, INVASION BY CYTISUS, WASTEWATER PLANT EXPANSION.	2006 HERRICK COMMUNICATION MENTIONS WASTEWATER EXPANSION THREAT, INDICATES THAT PLANTS LIKELY SEEN HERE MORE RECENTLY THAN 1983. INCLUDES FORMER OCCURRENCES 6 & 13.
Rana draytonii	California red-legged frog	Amphibians	1/5 mile	Presumed Extant	Natural/Native occurrence	Good	Threatened	None	G2G3	S2S3		SSC	IUCN_VU	EBABIAS CREEK, ABOUT 0.9 AIR MILES SSE OF THE JUNCTION OF BODEGA HWY AT FREESTONE VALLEY FORD RD, 3 MILES E OF BODEGA.	MAPPED TO PROVIDED LOCATION.	INDIVIDUAL DETECTED ON SURFACE OF POOL IN CREEK ATOP EMERGENT VEGETATION. RIPARIAN HABITAT DOMINATED BY WILLOW & MIX OF UNDERSTORY SPECIES SURROUNDED BY GRAZED PASTURE AND OPEN SPACE. DISTURBANCE FROM STREAMBANK EROSION NOTED.	PROXIMITY TO ROAD.	1 ADULT OBSERVED BASKING ON 2 JUL 2009.

Trifolium amoenum	two-fork clover	Dicots	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	None	G1	S1	1B.1		SB_RSABG; SB_USDA	HIGHWAY 1, 2 MILES WEST OF VALLEY FORD.	ALONG ROADSIDE. MAPPED BY CNDDB 1.5-2.5 MILES WEST OF VALLEY FORD ON HIGHWAY 1.	GROWING IN CLAY SOIL.		ONLY SOURCE OF INFORMATION IS A 1940 HELLER COLLECTION. A 1900 CHANDLER COLLECTION FROM "BODEGA" IS ATTRIBUTED TO THIS SITE.
Antrozous pallidus	pallid bat	Mammals	1/5 mile	Presumed Extant	Natural/Native occurrence	Poor	None	None	G5	S3		SSC	BLM_S; IUCN_LC; USFS_S; WBWG_H	0.2 MILE WEST OF JOY ROAD, 0.6 MILE NNW OF JOY SCHOOL, ABOUT 2 MILES SW OF OCCIDENTAL.	PRIVATE HOMEOWNER, IN A RURAL RESIDENTIAL AREA.	MIXED CONIFER/ NON-NATIVE TREES/ GRASS.	EVICTION FROM HOUSE.	30 - 50 BATS (BREEDING POPULATION) EVICTED FROM STRUCTURE; ~30 ADULTS AND ~20 JUVENILES, 1996.
Emys marmorata	western pond turtle	Reptiles	1/5 mile	Presumed Extant	Natural/Native occurrence	Good	None	None	G3G4	S3		SSC	BLM_S; IUCN_VU; USFS_S	ALONG SALMON CREEK, 0.6 MILE WNW OF THE TOWN OF BODEGA.	LOCATED ALONG SALMON CREEK AND IN A SMALL FARM POND ADJACENT TO THE CREEK.	HABITAT CONSISTS OF BAY/ALDER RIPARIAN ALONG SALMON CREEK; CREEK IS DEEPLY INCISED, WITH STEEP, WELL-VEGETATED BANKS. CREEK GOES NEARLY DRY DURING SUMMER. LIGHTLY GRAZED PASTURE ADJACENT TO CREEK AND POND. CREEK SUPPORTS SYNCARIS PACIFICA.	SOME CREEK AREAS ARE THREATENED BY SEVERE BANK EROSION.	LANDOWNER REPORTED SEEING 4-INCH JUVENILE TURTLES IN 1995. IN 1996, LANDOWNER REPORTED SEEING 3-INCH JUVENILES; 16 ADULTS WERE OBSERVED ON 12 AUGUST 1996.
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Monocots	1/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	None	G5T1	S1	1B.1		SB_RSABG	OCCIDENTAL MARSH, ABOUT 0.75 MILE NORTHEAST OF OCCIDENTAL ON GRATON ROAD. SOUTH OF ROAD.		OPEN, MARSHY GROUND.	MODERATELY GRAZED.	SITE IS BASED ON A 1957 RUBTZOFF COLLECTION. NO PLANTS FOUND BY FELLERS IN 1987, BUT SUITABLE HABITAT STILL EXISTS.
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Monocots	1/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	None	G5T1	S1	1B.1		SB_RSABG	FREESTONE MARSH, APPROXIMATELY 1 MILE NORTHWEST OF FREESTONE ON BOHEMIAN HIGHWAY.	EXACT LOCATION UNKNOWN, MAPPED BY CNDDB AS A BEST GUESS.		AREA IS ONLY MODERATELY GRAZED AND HABITAT STILL EXISTS.	COLLECTED HERE BY RUBTZOFF IN 1959 AND 1962. NO PLANTS FOUND IN 1987 SEARCH BUT FELLERS STILL THINKS OCC MAY BE EXTANT.
Trifolium amoenum	two-fork clover	Dicots	1/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	None	G1	S1	1B.1		SB_RSABG; SB_USDA	1 MILE NORTH OF VALLEY FORD.	MAPPED 1 MILE NORTH OF VALLEY FORD ALONG FREESTONE VALLEY FORD ROAD.			ONLY SOURCE OF INFORMATION IS A 1941 HOOVER COLLECTION. NEEDS FIELDWORK.
Emys marmorata	western pond turtle	Reptiles	1/5 mile	Presumed Extant	Natural/Native occurrence	Good	None	None	G3G4	S3		SSC	BLM_S; IUCN_VU; USFS_S	UNNAMED TRIBUTARY TO REDWOOD CREEK, TRIBUTARY TO JONIVE CREEK, 4 MILES WEST OF SEBASTOPOL.	FOUND IN A SMALL POND ON AN UNNAMED CREEK THAT IS A TRIBUTARY TO REDWOOD CREEK.	HABITAT SURROUNDING CREEK/POND IS PASTURE ON ONE SIDE AND REDWOOD FOREST ON THE OTHER.		5 ADULTS OBSERVED ON 29 MARCH 1994; NO JUVENILES OBSERVED.
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Dicots	1/5 mile	Possibly Extirpated	Natural/Native occurrence	None	None	None	G5T2	S2	1B.2			PERRY MARSH.		DRIER GROUND OF MARSH.	DEVELOPMENT.	OCCURRENCE KNOWN ONLY FROM TWO 1945 COLLECTIONS FROM HOWELL AND BAKER. MARSH WAS DESTROYED BY DEVELOPMENT IN THE 1970S. NO PLANTS OBSERVED IN 1988. OCCURRENCE IS PROBABLY EXTIRPATED.
Rhynchospora californica	California beaked-rush	Monocots	1/5 mile	Extirpated	Natural/Native occurrence	None	None	None	G1	S1	1B.1		BLM_S	PERRY MARSH, TWIN PINE RANCH, ABOUT 2 MILES NORTH OF SEBASTOPOL ON THE GRAVENSTEIN HIGHWAY.		FOUND IN MARSH AREA.	AREA SOLD IN 1971 AND MARSH DESTROYED SAME YEAR.	SPECIES LAST SEEN IN 1945. NOT FOUND IN 1977, 1988 SEARCHES.

Rhynchospora capitellata	brownish beaked-rush	Monocots	1/5 mile	Possibly Extirpated	Natural/Native occurrence	None	None	None	G5	S1	2B.2			PERRY MARSH.	EXACT LOCATION UNKNOWN, MAPPED BY CNDDB AS A BEST GUESS.			ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1945 HOWELL COLLECTION. ACCORDING TO GUGGOLZ (1998), HABITAT HAS BEEN SEVERELY DEGRADED WITH ONLY A SMALL AMOUNT OF WETLAND REMAINING. NEEDS FIELDWORK.
Rhynchospora globularis	round-headed beaked-rush	Monocots	1/5 mile	Possibly Extirpated	Natural/Native occurrence	None	None	None	G4	S1	2B.1			PERRY MARSH, TWIN PINE RANCH, ABOUT 2 MILES NORTH OF SEBASTOPOL ON THE GRAVENSTEIN HIGHWAY.		FOUND IN MARSH AREA.		OCCURRENCE KNOWN ONLY FROM TWO COLLECTIONS BY BAKER AND HOWELL, BOTH FROM 1945. MARSH HAS BEEN DESTROYED BY DEVELOPMENT. OCCURRENCE IS PROBABLY EXTIRPATED.
Campanula californica	swamp harebell	Dicots	1/5 mile	Possibly Extirpated	Natural/Native occurrence	None	None	None	G3	S3	1B.2		BLM_S	PERRY MARSH, 1 MI NW OF SEBASTOPOL.			DEVELOPMENT IS A THREAT. SPRAY FIELD, SEE BELOW.	MARSH DESTROYED IN THE 1970'S BY APPLE TIME FACTORY USING IT AS A SPRAY FIELD FOR THEIR EFFLUENT. NO HABITAT WAS SEEN IN 1988. LACK OF ACCESS HAS PREVENTED FURTHER FIELDWORK FROM BEING CONDUCTED.
Delphinium luteum	golden larkspur	Dicots	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	Endangered	Rare	G1	S1	1B.1		SB_UCBBG	1.5 TO 2.0 MILES WEST OF BODEGA ON BODEGA BAY ROAD.		ON ROCK OUTCROP AND LOOSE ROCK ON OPEN HILLSIDE.		SITE BASED ON HISTORIC COLLECTIONS. ACCORDING TO B. LOVELL, THIS SITE VISITED IN 1983 AND NO HABITAT EXISTS HERE; COLLECTIONS MAY BE REFERENCING EO #5 OR #11. VAGUE COLLECTIONS FROM "BODEGA" AND "W OF BODEGA" ARE ALSO ATTRIBUTED HERE.
Agelaius tricolor	tricolored blackbird	Birds	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	Threatened	G2G3	S1S2		SSC	BLM_S; IUCN_EN; NABCI_RWL; USFWS_BCC	AMERICANO CREEK, ALONG THE SONOMA/MARIN COUNTY LINE, EAST OF VALLEY FORD.				BREEDING COLONY OBSERVED ON 13 JUNE 1977; FLEDGING SUCCESS UNKNOWN. 200 PLANTS SEEN IN 1987. 2011 POP NUMBERS AND HABITAT DESCRIBED AS "SIGNIFICANTLY REDUCED" FROM PREVIOUS YEARS. ALSO SEEN 1990-1992, 1994, 1997, 2013. MOST OF SITE NOW PROTECTED BY ECOLOGICAL PRESERVE AND CONSERVATION EASEMENT.
Cordylanthus tenuis ssp. capillaris	Pennell's bird's-beak	Dicots	specific area	Presumed Extant	Natural/Native occurrence	Good	Endangered	Rare	G4G5T1	S1	1B.2		SB_RSABG	ALONG EAST SIDE OF BOHEMIAN HIGHWAY, FROM 1.0-2.2 MILES NW OF CAMP MEEKER.	MAPPED AS 6 POLYGONS BASED PRIMARILY ON A 1994 GUGGOLZ MAP, IN THE SE 1/4 SEC 17, SW 1/4 SEC 16, AND N 1/2 SECTION 21. PLANTS MAY BE EXTIRPATED IN S-MOST POLY: 12 PLANTS IN 1986, AREA REVISITED IN 2005 BUT NO SUITABLE HABITAT FOUND.	IN MEADOWS AND BARREN AREAS ON STEEP SLOPES ON HENNEKE GRAVELLY LOAM UNDERLAIN BY SERPENTINE BEDROCK. POPULATION IS SURROUNDED BY FOREST DOMINATED BY REDWOOD AND DOUGLAS-FIR.	SLOPE EROSION, EVIDENCE OF TARGET SHOOTING. ORVS, CAMPING/HIKING SEVERELY IMPACTING SITE IN 1997. ROAD MAINTENANCE.	

Dicamptodon ensatus	California giant salamander	Amphibians	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3	S2S3	SSC	IUCN_NT	CONFLUENCE OF GRAB CREEK AT DUTCH BILL CREEK, BOHEMIAN HIGHWAY, ABOUT 3.5 ROAD MILES SSE OF MONTE RIO / RUSSIAN RIVER.		PART OF THIS AREA APPEARS TO BE OWNED BY A PRIVATE CAMP THAT ADVERTISES ENVIRONMENTAL EDUCATION PROGRAMS FOR CHILDREN: WESTMINSTER WOODS CAMP AND CONFERENCE CENTER. STEELHEAD ALSO FOUND IN THIS AREA.		DICAMPTODON DETECTED DURING ELECTROFISHING SURVEYS IN GRAB CREEK ON 30 OCT 1997. 12 SEINED AND RELEASED IN DUTCH BILL CREEK ON 15 JUL 2013.
Oncorhynchus mykiss irideus pop. 8	steelhead - central California coast DPS	Fish	nonspecific area	Possibly Extirpated	Natural/Native occurrence	None	Threatened	None	G5T2T3Q	S2S3		AFS_TH	UNNAMED TRIBUTARY OF AMERICANO CREEK, ABOUT 1.6 MI NNW OF CARROLL ROAD AT VALLEY FORD RD, 2.5 MI NE OF VALLEY FORD.	FORMER EXTENT IN WATERSHED UNKNOWN. MAPPED TO VICINITY OF 1994 DETECTION.	PERENNIAL POOLS IN STREAM THROUGH NARROW SANDSTONE GORGE. ABOVE & BELOW THE GORGE, PATCHES OF DENSE RIPARIAN GROWTH WERE INTERSPERSED WITH DENUDED AREAS OF SLUMPED BANKS & GULLIES; HEAVY SILTATION THROUGHOUT.	WATER AND HABITAT QUALITY WERE HEAVILY IMPACTED BY CATTLE GRAZING AND TRAMPLING (1994).	3 O. MYKISS UP TO 15" IN LENGTH OBSERVED IN POOLS, SEP 1994. THE FISH MAY HAVE BEEN STRANDED "HALF-POUNDER" STEELHEAD OR RESIDENT RAINBOWS. ANECDOTAL REPORTS CLAIM THIS WATERSHED ONCE SUPPORTED SPAWNING; POPULATION NOW PRESUMED EXTIRPATED.
Dicamptodon ensatus	California giant salamander	Amphibians	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3	S2S3	SSC	IUCN_NT	TANNERY CREEK, ABOUT 1 MILE NORTH OF SALMON CREEK, NE OF BODEGA BAY.	A SHORT SECTION OF THE CREEK WAS SURVEYED BY ELECTROFISHING.	STEELHEAD WERE ALSO FOUND HERE.		DICAMPTODON DETECTED DURING ELECTROFISHING SURVEYS ON 26 JUL 2002.
Rana draytonii	California red-legged frog	Amphibians	specific area	Presumed Extant	Natural/Native occurrence	Good	Threatened	None	G2G3	S2S3	SSC	IUCN_VU	EBABIAS CREEK AND AN UNNAMED TRIBUTARY, TRIBUTARY TO ESTERO AMERICANO, 2 MILES NNE OF VALLEY FORD.		HABITAT CONSISTS OF CREEKS AND A FARM POND; SURROUNDED BY FALLOW GRASSLAND / PASTURE.	THREATENED BY CONVERSION TO VINEYARDS.	1 JUVENILE FOUND IN A WETLAND ASSOCIATED WITH EBABIAS CREEK AND 5 ADULTS FOUND IN A FARM POND ON 12 MAR 2001. 1 JUVENILE OBSERVED ON 13 MAR 2001.
Dicamptodon ensatus	California giant salamander	Amphibians	nonspecific area	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3	S2S3	SSC	IUCN_NT	PURRINGTON CREEK, ABOUT 0.5 MILE UPSTREAM OF GREEN VALLEY CREEK, SE OF MOUNT PISGAH, 4 MILES NW OF SEBASTOPOL.	ACCESSIBLE BY GRATON ROAD. A SHORT SECTION OF THE CREEK WAS SURVEYED BY ELECTROFISHING.	STEELHEAD WERE ALSO FOUND HERE.		DICAMPTODON DETECTED DURING ELECTROFISHING SURVEYS IN AUG 1992.
Emys marmorata	western pond turtle	Reptiles	1/10 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3G4	S3	SSC	BLM_S; IUCN_VU; USFS_S	ALONG ESTERO AMERICANO, AT THE MOUTH OF AN UNNAMED CREEK 2 MILES WEST OF THE TOWN OF VALLEY FORD, NE OF BODEGA BAY.		PROPERTY UNDER CONSERVATION EASEMENT. NATURE/RECREATION TRAIL CONSTRUCTION PLANNED FOR SITE.	TRAIL CONSTRUCTION, MAINTENANCE, AND RECREATIONAL USE POSE POSSIBLE THREATS.	1 DETECTED ON 15 APR 2014.
Syncaris pacifica	California freshwater shrimp	Crustaceans	1/10 mile	Presumed Extant	Natural/Native occurrence	Good	Endangered	Endangered	G2	S2		IUCN_EN	EBABIAS CREEK, ABOUT 0.7 MILES NE OF FREESTONE VALLEY FORD RD AT FREESTONE RANCH RD AND 1.6 MILES SSE OF FREESTONE.	MAPPED TO PROVIDED MAP.	LOW GRADIENT STREAM, MODERATE-SIZED POOLS SEPARATED BY RIFFLES; SUBSTRATE MAINLY FINE W/SOME GRAVEL; CHANNEL BOTTOM LINED W/VEGETATION IN SHALLOW AREAS; IN WILLOW-DOMINATED RIPARIAN WOODLAND SURROUNDED BY GRAZED PASTURE & OPEN SPACE.	STREAMBANK EROSION.	3 ADULTS OBSERVED ON 5 JUN 2008.
Rana draytonii	California red-legged frog	Amphibians	1/10 mile	Presumed Extant	Natural/Native occurrence	Good	Threatened	None	G2G3	S2S3	SSC	IUCN_VU	SALMON CREEK, ABOUT 0.25 MILES SW OF BODEGA HWY AT FREESTONE VALLEY FORD RD, 2.7 MILES ENE OF BODEGA.	MAPPED TO PROVIDED COORDINATES, LOCATION IS APPROXIMATE.	LOW GRADIENT CHANNEL CHARACTERIZED BY LONG, DEEP POOLS WITH DENSE CANOPY OF WILLOW AND ALDER. SURROUNDING LAND USES INCLUDED GRAZING, RURAL RESIDENTIAL, OPEN SPACE, & HIGHWAY.	TRAFFIC FROM LOCAL ROAD, RUNOFF.	1 ADULT OBSERVED BASKING ON 26 JUL AND 1 SEP, 2011.
Athene cunicularia	burrowing owl	Birds	1/10 mile	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G4	S3	SSC	BLM_S; IUCN_LC; USFWS_BCC	VICINITY OF CARROLL RD ABOUT 0.75 MILES N OF THE VALLEY FORD RD INTERSECTION, W OF BLOOMFIELD.	MAPPED TO VICINITY OF CENSUS BLOCK 4240-510 FROM 1997 DATABASE.			2 PAIRS DETECTED DURING 1981-1985 SURVEYS. 1 PAIR DETECTED DURING 1986-1990 SURVEYS.

Pleuropogon hooverianus	North Coast semaphore grass	Monocots	1/10 mile	Possibly Extirpated	Natural/Native occurrence	None	None	Threatened	G2	S2	1B.1		BLM_S; SB_BerrySB; SB_RSABG	FREESTONE AREA, ON NORTH SIDE OF FREESTONE FLAT ROAD ON ROAD TO OCCIDENTAL (BOHEMIAN HIGHWAY), N OF FREESTONE.	IN DITCH ON N SIDE OF ROAD. A 1981 CLIFTON COLLECTION FROM "SALMON CREEK" AND A 1977 BUT REPORT LOCATION FROM "THE HEADWATERS OF SALMON CREEK NEAR FREESTONE" ALSO ATTRIBUTED TO THIS SITE.	IN A STAGNANT WATER DITCH ALONG HIGHWAY. ASSOCIATED WITH EQUISETUM AND RUBUS IN 1974.	POSSIBLY EXTIRPATED BY ROAD CONSTRUCTION/TELEGRAPH POLE WORK, DITCH MAINTENANCE.	FEW PLANTS IN 1974; ALSO SEEN IN 1975 & 1976. SITE VISITED, BUT PLANTS NOT SEEN IN 8/79. PLANTS SEEN IN 1981 BY CLIFTON, BUT UNCLEAR WHERE. GUGGOLZ & GUGGOLZ SEARCHED SITE & SURR AREA IN 1998 & 2000 AND FOUND NO PLANTS; HABITAT DEGRADED.
Rana draytonii	California red-legged frog	Amphibians	specific area	Presumed Extant	Natural/Native occurrence	Excellent	Threatened	None	G2G3	S2S3		SSC	IUCN_VU	ALONG UNNAMED DRAINAGE ON N SIDE OF ESTERO AMERICANO, 1.2-1.6 MI SE OF HWY 1 AT BODEGA HWY & 2.0 MI W OF VALLEY FORD.	MAPPED TO PROVIDED DETECTION SITES: "POND 1" AT (38.32517, -122.96217), IN SEEP TO S, AND IN THE CREEK BELOW.	PRIVATE LAND UNDER EASEMENT, USED FOR CATTLE GRAZING. BULLFROGS NOT FOUND IN THIS DRAINAGE DURING SURVEY, BUT WERE FOUND NEARBY. PROPERTY PROVIDED BREEDING AND ESTIVATION HABITAT.	OVERGRAZING, BULLFROG COLONIZATION (2014).	1 JUVENILE OBSERVED ON 15 APR; 4 ADULTS & 2 JUVENILES FOUND IN POND, 1 ADULT IN ADJACENT SEEP, 2 UNIDENTIFIED FROGS & 3 RED LEGGED FROG TADPOLES IN THE CREEK BELOW ON 23 JUN 2014.
Rana draytonii	California red-legged frog	Amphibians	specific area	Presumed Extant	Natural/Native occurrence	Good	Threatened	None	G2G3	S2S3		SSC	IUCN_VU	W SIDE OF NOLAN CREEK ABOUT 0.4 MILES SE OF JOY RD AT BURL LN AND 1.1 MILES N OF BODEGA HWY AT JOY RD, NE OF BODEGA.	MAPPED TO PROVIDED COORDINATES. SOUTH POLYGON REPRESENTS DETECTION LOCATION, NORTH POLYGON REPRESENTS RELOCATION SITE.	OBSERVED IN WETTED DITCH CONNECTED TO EPHEMERAL, SPRING-FED DRAINAGE EMPTYING INTO NOLAN CREEK, TRIBUTARY TO SALMON CREEK. SURROUNDING AREA USED FOR SHEEP RANCHING, RURAL RESIDENTIAL. DISTURBANCE FROM HABITAT ENHANCEMENT/ROAD CONSTRUCTION.	DISTURBANCE FROM VEGETATION REMOVAL AND ROAD CONSTRUCTION.	1 ADULT OBSERVED DURING ROAD CONSTRUCTION ON 28 SEP 2011 AND WAS RELOCATED TO A NEARBY PERENNIAL POND.
Emys marmorata	western pond turtle	Reptiles	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3G4	S3		SSC	BLM_S; IUCN_VU; USFS_S	EBABIAS CREEK AT CROSSING OF HIGHWAY 1, ON NW SIDE OF THE TOWN OF VALLEY FORD, NE OF BODEGA BAY.	MAPPED TO PROVIDED COORDINATES.	PERENNIAL PLUNGE POOL AT OUTLET OF CULVERT BENEATH HIGHWAY 1 CROSSING OF EBABIAS CREEK. SURROUNDING LAND USE WAS DAIRY CATTLE GRAZING. DISTURBANCE FROM VEHICLE TRAFFIC ON HWY 1.		4 ADULTS OBSERVED BASKING ON A GRASSY BANK ON 17 JUN 2008.
Emys marmorata	western pond turtle	Reptiles	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	None	None	G3G4	S3		SSC	BLM_S; IUCN_VU; USFS_S	POND IN UNNAMED DRAINAGE, ABOUT 1.8 MILES NW OF CARROLL RD AT VALLEY FORD RD & 2.1 MILES NE OF THE TOWN OF VALLEY FORD.	MAPPED TO LOCATION PROVIDED FOR "POND B."	RED-LEGGED FROG AND BULLFROGS ALSO FOUND ON PROPERTY.	BULLFROGS.	1 ADULT AND 2 OR MORE HATCHLINGS OBSERVED ON 26 MAY 1995.
Oncorhynchus kisutch pop. 4	coho salmon - central California coast ESU	Fish	80 meters	Presumed Extant	Natural/Native occurrence	Good	Endangered	Endangered	G4	S2?			AFS_EN	NOLAN CREEK, UPSTREAM (NE) OF THURSTON CREEK AND DOWNSTREAM (S) OF JOY RD, ABOUT 0.9 MILES NE OF BODEGA.	MAPPED TO COORDINATES GIVEN FOR 2011 DETECTION.	ROCKY PERENNIAL STREAM DOMINATED BY COBBLE & GRAVEL. WILLOW RIPARIAN. STREAM FENCED AGAINST GRAZING CATTLE (2011).		25 CAUGHT DURING SEINING SURVEYS ON 16 NOV 2011.
Rana boylii	foothill yellow-legged frog	Amphibians	80 meters	Presumed Extant	Natural/Native occurrence	Good	None	Candidate Threatened	G3	S3		SSC	BLM_S; IUCN_NT; USFS_S	NOLAN CREEK, UPSTREAM (NE) OF THURSTON CREEK AND DOWNSTREAM (S) OF JOY RD, ABOUT 0.9 MILES NE OF BODEGA.	MAPPED TO PROVIDED COORDINATES.	ROCKY PERENNIAL STREAM, MAINLY COBBLE AND GRAVEL SUBSTRATE WITH ALDER AND WILLOW-DOMINATED CANOPY. AREA GRAZED, BUT FENCING EXCLUDED CATTLE FROM STREAM. COHO, STEELHEAD, AND CA FRESHWATER SHRIMP ALSO FOUND.		2 METAMORPHS OBSERVED ON 16 NOV 2011 DURING SEINING SURVEYS FOR COHO SALMON.
Oncorhynchus mykiss irideus pop. 8	steelhead - central California coast DPS	Fish	80 meters	Presumed Extant	Natural/Native occurrence	Good	Threatened	None	G5T2T3Q	S2S3			AFS_TH	NOLAN CREEK, UPSTREAM (NE) OF THURSTON CREEK AND DOWNSTREAM (S) OF JOY RD, ABOUT 0.9 MILES NE OF BODEGA.	EXACT LOCATIONS OF 2003 DETECTIONS UNKNOWN. MAPPED TO COORDINATES GIVEN FOR 2011 DETECTION.	ROCKY PERENNIAL STREAM DOMINATED BY COBBLE & GRAVEL. WILLOW RIPARIAN. STREAM FENCED AGAINST GRAZING CATTLE (2011).		DETECTED 5-6 AUG 2003. 34 CAUGHT DURING SEINING SURVEY FOR COHO ON 16 NOV 2011.
Syncaris pacifica	California freshwater shrimp	Crustaceans	80 meters	Presumed Extant	Natural/Native occurrence	Good	Endangered	Endangered	G2	S2			IUCN_EN	NOLAN CREEK, UPSTREAM (NE) OF THURSTON CREEK AND DOWNSTREAM (S) OF JOY RD, ABOUT 0.9 MILES NE OF BODEGA.	MAPPED TO PROVIDED COORDINATES.	ROCKY PERENNIAL STREAM, MAINLY COBBLE AND GRAVEL SUBSTRATE WITH ALDER AND WILLOW-DOMINATED CANOPY. AREA GRAZED, BUT FENCING EXCLUDED CATTLE FROM STREAM. COHO, STEELHEAD, & YELLOW-LEGGED FROG ALSO FOUND.		3 ADULTS OBSERVED ON 16 NOV 2011 DURING SEINING SURVEY FOR COHO SALMON.

Rana draytonii	California red-legged frog	Amphibians	80 meters	Presumed Extant	Natural/Native occurrence	Good	Threatened	None	G2G3	S2S3		SSC	IUCN_VU	SALMON CREEK, ABOUT 0.1 MILES SE OF BODEGA HWY AT BODEGA LN IN BODEGA.	2010 DETECTION BETWEEN BODEGA HWY & NOLAN CREEK, EXACT LOCATION UNKNOWN. MAPPED TO COORDINATES GIVEN FOR 2016 DETECTION.	2010: PERENNIAL STREAM DOMINATED BY WILLOW; DISTURBANCE FROM CATTLE XING. 2016: INCISED STREAM ADJACENT TO 3' DEEP POOL W/MUCH LWD, SANDY SILT BOTTOM, MUD BANKS & GRAVEL BAR; PRESUMED BREEDING HABITAT IN STOCK PONDS ON BOTH SIDES OF CREEK.	CATTLE (2010). PROBABLE PRESENCE OF BULLFROGS (2016).	3 JUVENILES OBSERVED ON 30 AUG 2010. 1 JUVENILE OBSERVED ON 4 SEP 2016. A FROG HAD BEEN SPOTTED THE DAY BEFORE AT SAME SITE BUT NOT IDED; POSSIBLY THE SAME INDIVIDUAL.
Lasthenia conjugens	Contra Costa goldfields	Dicots	80 meters	Presumed Extant	Natural/Native occurrence	Excellent	Endangered	None	G1	S1	1B.1		SB_UCBBG	ALONG HIGHWAY 1, 0.35 MILE SOUTH OF AMERICANO CREEK, NORTHWEST MARIN COUNTY, NEAR SONOMA COUNTY BORDER.	MAPPED WITHIN THE WEST HALF OF THE SW 1/4 OF SECTION 36.	SEASONAL (CREEKSIDE) WETLAND WITH FLAT TOPOGRAPHY. AT TIME OF VISIT LASTHENIA AND PLAGIOBOTHRYS DOMINANT.	SHEEP PASTURE, ALTHOUGH SHEEP DO NOT APPEAR TO IMPACT THE LASTHENIA AND MAY MITIGATE GROWTH OF NON-NATIVE WEEDY GRASSES.	THIS POPULATION WAS INITIALLY DISCOVERED BY BETTY GUGGOLZ, AND LATER REDISCOVERED (IN 2002) BY RANDY MORGAN. 1000S OF PLANTS SEEN BY SMITH IN 2003, SURVEYED FROM ROADSIDE RIGHT-OF-WAY. 100S OF PLANTS SEEN IN 2011. SEEN IN 2013.
Emys marmorata	western pond turtle	Reptiles	80 meters	Presumed Extant	Natural/Native occurrence	Good	None	None	G3G4	S3		SSC	BLM_S; IUCN_VU; USFS_S	SALMON CREEK, JUST EAST OF BODEGA.		HABITAT CONSISTS OF A COASTAL STREAM CONTAINING POOLS UP TO 5' DEEP, RIFFLES WITH A GRAVEL/COBBLE SUBSTRATE, AND AN INSTREAM SHELTER OF ROOTWADS, LEDGES, AND LARGE WOODY DEBRIS; MATURE CANOPY OF RED ALDER, ABOUT 75% SHADE.	THREATENED BY EXCESSIVE SEDIMENT, DECREASING CHANNEL DEPTH; LOW SUMMER FLOWS DUE TO DIVERSIONS; EROSION FROM FARMLANDS.	1 ADULT MALE (~8" CARAPACE LENGTH) OBSERVED BASKING ON 12 NOV 2005.
Usnea longissima	Methuselah's beard lichen	Lichens	80 meters	Presumed Extant	Natural/Native occurrence	Fair	None	None	G4	S4	4.2		BLM_S	COLEMAN VALLEY RD, 9.6 KM E OF HWY 1. EBABIAS CREEK AND VICINITY,	MAPPED BASED ON UTM COORDINATES PROVIDED BY WRIGHT.	IN 2004, SEEN IN LARGE FRAXINUS, AT MARGIN OF MEADOW AND NORTH COAST CONIFEROUS FOREST.		UNKNOWN NUMBER OF LICHENS OBSERVED BY WRIGHT. ALSO SEEN HERE IN 2004 BY PRESTON.
Emys marmorata	western pond turtle	Reptiles	80 meters	Presumed Extant	Natural/Native occurrence	Good	None	None	G3G4	S3		SSC	BLM_S; IUCN_VU; USFS_S	TRIBUTARY TO ESTERO AMERICANO, 2 MILES NNE OF VALLEY FORD.		HABITAT CONSISTS OF THE CREEK, FARM POND, AND SURROUNDING FALLOW GRASSLAND/PASTURE.	THREATENED BY UPLAND CONVERSION TO VINEYARDS.	1 INDIVIDUAL OBSERVED ON 12 MAR 2001. MANY INDIVIDUALS OBSERVED BY KJELDSEN IN 2002. PRESTON VISITED THIS SITE IN 2004 AND FOUND NO USNEA LONGISSIMA, BUT DID SEE RAMALINA MENZIESII. POSSIBLE MIS-IDENTIFICATION? NEEDS ADDITIONAL SURVEYS.
Usnea longissima	Methuselah's beard lichen	Lichens	80 meters	Presumed Extant	Natural/Native occurrence	Fair	None	None	G4	S4	4.2		BLM_S	2 MILES WEST OF THE TOWN OF OCCIDENTAL ALONG COLEMAN CALLEY ROAD.	ON EAST SIDE OF ROAD ON WEST SIDE OF HAIRPIN TURN. JUST WEST OF COLEMAN VALLEY CREEK.	IN SECOND GROWTH REDWOOD/FIR FOREST.	ALONGSIDE COLEMAN VALLEY ROAD. SURROUNDING AREA IS OPEN SPACE TIMBERLANDS.	
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Birds	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	Threatened	Endangered	G5T2T3	S1			BLM_S; NABCI_RWL; USFS_S; USFWS_BCC	0.7 MILE NW OF SALMON CREEK ROAD AT TANNERY CREEK ROAD, OCCIDENTAL.	DETECTED AT HOUSE ALONG THE EAST SIDE OF AN UNNAMED STREAM BETWEEN FAY CREEK AND TANNERY CREEK. MAPPED TO PROVIDED COORDINATES.	HABITAT GENERALLY CONSISTS OF ROLLING GRASSLAND HILLS WITH STEEP WOODED CANYONS. SEVERAL GOOD RIPARIAN CORRIDORS ALONG FAY, TANNERY, & SALMON CREEKS IN IMMEDIATE VICINITY.	THREATENED BY COLLISIONS WITH UN-MARKED WINDOWS.	1 ADULT COLLIDED WITH THE WINDOW OF A HOUSE AND DIED ON 6 JUL 1996. BIRD GIVEN TO DFG (BILL COX). SPECIMEN SAVED, APPEARS TO HAVE A BROOD PATCH, AND WILL LIKELY BE DEPOSITED IN A MUSEUM COLLECTION.

Dirca occidentalis	western leatherwood	Dicots	80 meters	Presumed Extant	Natural/Native occurrence	Good	None	None	G2	S2	1B.2		SB_RSABG	SALMON CREEK ROAD, 2.25 MILES WEST OF JUNCTION WITH BODEGA HIGHWAY IN THE VILLAGE OF BODEGA.	ON NW-FACING SLOPE ON NORTH (EAST) SIDE OF ROAD (UPSLOPE, OPPOSITE SIDE OF ROAD FROM SALMON CREEK); LOWERMOST 2 PLANTS WITHIN ~5 M OF ROAD SURFACE (SITE OF WARNER'S COORDINATES MAPPED BY CNDDB), REMAINDER UPSLOPE, MOSTLY IN FOREST.	NW-FACING. PSEUDOTSUGA MENZIESII-UMBELLULARIA CALIFORNICA ASSOCIATION, ADJACENT TO SMALL PATCH OF HOLODISCUS DISCOLOR-CORYLUS CORNUTA-BACCHARIS PILULARIS SHRUBLAND & COASTAL GRASSLAND. SALIX LASIOLEPIS-ALNUS RUBRA RIPARIAN WOODLAND UPSLOPE.	REPORTED DISTURBANCES (NOT REPORTED AS THREATS): MYOSOTIS LATIFOLIA IN ADJACENT FOREST, SOME HUMAN FOOTPATHS NEAR POP.	~15 INDIVIDUALS OBSERVED IN 2001: 3 NEAR ROAD, ~12 UPSLOPE. UNKNOWN # IN 2010. 30 PLANTS IN 2011; POPULATION SCATTERED ACROSS ~300 SQ M; TRUE # UNKNOWN (ROOT SPROUTING & POTENTIALLY CLONAL GROUPS). NEED MORE DATA TO MAP TRUE EXTENT OF POP.
Syncaris pacifica	California freshwater shrimp	Crustaceans	80 meters	Presumed Extant	Natural/Native occurrence	Fair	Endangered	Endangered	G2	S2			IUCN_EN	EBABIAS CREEK, TRIBUTARY TO ESTERO AMERICANO, EAST SIDE OF HIGHWAY 1, 1.6 MILES NORTH OF VALLEY FORD.	THE SHRIMP POPULATION IN THE WILLOW RIPARIAN AREA WAS MUCH LOWER DUE TO LACK OF AN UNDERCUT BANK THAT PROVIDES A WINTER REFUGIUM. THE LOWER STREAM WHERE SHRIMP WERE FOUND SEEMED TO BE RECOVERING AND RIPARIAN COVER IMPROVING.	HABITAT CONSISTS OF A DEEPLY-INCISED (4' DEEP) POOL WITHIN THE STREAM CHANNEL, WITH VERTICAL BANKS AND OVERHANGING GRASSES; POOL COVERED BY DUCKWEED (VERY ATYPICAL HABITAT). A SMALL NUMBER OF STEELHEAD TROUT PRESENT.	THREATENED BY SEVERE CREEK DISTURBANCE IN THE WATERSHED FROM HISTORIC DAIRY USE.	120 INDIVIDUALS OBSERVED ON 30 NOV 2006.
Taxidea taxus	American badger	Mammals	80 meters	Presumed Extant	Natural/Native occurrence	Good	None	None	G5	S3		SSC	IUCN_LC	0.4 MI ENE BODEGA HWY AT SR 1, JUST S OF BODEGA.	MAPPED TO PROVIDED COORDINATES.	GRASSY HILLTOP FORMERLY GRAZED BY CATTLE. DARK LOAMY SOIL. MIXTURE OF NATIVE PERENNIAL AND INTRODUCED ANNUAL GRASSES. ABUNDANT PREY BASE OF POCKET GOPHERS AND CALIFORNIA VOLES.	INTRODUCED GORSE MAY EVENTUALLY COVER ALL OPEN SPACE.	THREE SEPARATE CLUSTERS OF BADGER BURROWS AROUND THE EDGES OF THE HILL, WITH 6-10 OPENINGS PER CLUSTER. EACH CLUSTER WITHIN 50 FT OF COORDINATES. BASED ON RAINFALL, AT LEAST 2 BURROWS SHOW ACTIVITY WITHIN 24 HOURS OF 25 FEB 2008.
Fritillaria liliacea	fragrant fritillary	Monocots	80 meters	Presumed Extant	Natural/Native occurrence	Good	None	None	G2	S2	1B.2		USFS_S	NORTH END OF ACREAGE LANE, SOUTHEAST OF CAMP MEEKER.	SOUTH SIDE OF ACREAGE LANE JUST EAST OF STEPPS ROAD; BETWEEN OCCIDENTAL AND CAMP MEEKER, EAST OF THE BOHEMIAN HIGHWAY. WITHIN THE NE 1/4 OF THE SE 1/4 OF SECTION 27.	IN SERPENTINE GRASSLAND WITHIN CHAPARRAL. ASSOCIATED WITH DANTHONIA CALIFORNICA, CHLOROGALUM POMERIDIANUM, CALOCHORTUS AMABILIS, DICHELOSTEMMA PULCHELLA, TRITELIA LAXA, PLANTAGO LANCEOLATA, PICKERINGIA MONTANA, AND ADENOSTOMA FASCICULATUM.	AREA SURROUNDED BY HOMES, FRENCH BROOM INVADING (1986). IN 2012, OWNER REMOVED MUCH OF THE BROOM & ACACIA.	500 PLANTS IN 1986, UNKNOWN HOW MANY SEEN IN 1994, 97 FOUND IN 1998. ABOUT 1000 PLANTS (57 CAPSULES) COUNTED IN 2005. ~1000 PLANTS OBSERVED IN 2013. 1933 COLLECTION BY ARMSTRONG FROM "CAMP MEEKER" ATTRIBUTED TO THIS SITE.
Trifolium amoenum	two-fork clover	Dicots	80 meters	Presumed Extant	Natural/Native occurrence	Good	Endangered	None	G1	S1	1B.1		SB_RSABG; SB_USDA	NORTH OF BODEGA, 1.5 KM (0.9 MILE) SE OF SUGARLOAF.	OFF OF FITZPATRICK ROAD, 0.6 MILE SOUTH OF JUNCTION WITH DOCS RANCH ROAD.	ON EDGE OF DIRT ROAD IN DISTURBED GRASSLAND WITH SOME NATIVES. ASSOCIATES INCLUDE AVENA BARBATA, BROMUS SPP, VULPIA SPP, DANTHONIA CALIFORNICA, LINUM, CARDUUS PYCNOCEPHALUS, AND AIRA CARYOPHYLLEA WITH SCATTERED DOUGLAS-FIR AND COYOTE BUSH.	OCCURS ON VACANT RURAL RESIDENTIAL HOMESITE WHICH IS PRESENTLY FOR SALE. SURROUNDING AREA IS LIGHT RURAL RESIDENTIAL.	ONLY ONE PLANT OBSERVED IN 1993. LOCATED IN AREA WHERE ROAD WAS GRADED AT ONE TIME (WITHIN 5 YEARS); SEED MAY HAVE GERMINATED DUE TO THIS DISTURBANCE. UNDOUBTEDLY THERE ARE MORE SEEDS IN THE SEEDBANK.

Dirca occidentalis	western leatherwood	Dicots	specific area	Presumed Extant	Natural/Native occurrence	Good	None	None	G2	S2	1B.2		SB_RSABG	SALMON CREEK ROAD, BETWEEN 0.3 AND 0.4 MILE WEST OF JUNCTION WITH FITZPATRICK LANE.	NORTH SIDE OF SALMON CREEK ROAD. MAPPED TO INCLUDE MAPPED AREA ON A 1993 MAP AND 2011 WARNER COORDINATES.	PSEUDOTSUGA MENZIESII-UMBELLULARIA CALIFORNICA ASSOCIATION, UPSLOPE (ACROSS ROAD) FROM SALIX LASIOLEPIS-ALNUS RUBRA RIPARIAN WOODLAND. ASSOCIATED WITH HOLODISCUS DISCOLOR, CORYLUS CORNUTA, LONICERA HISPIDULA, SATUREJA DOUGLASII, ETC.	POSSIBLY THREATENED BY LOGGING, OVERGRAZING, OR HOME CONSTRUCTION (1993).	FEWER THAN 50 PLANTS OBSERVED IN 1982, 35 IN 1993, APPROXIMATELY 35 OBSERVED IN 1996, 25 PLANTS IN 2011. INCLUDES FORMER OCCURRENCE #33. DISTURBANCES INCLUDE SOME HUMAN FOOTPATHS AND GAME TRAILS, AND ROADSIDE WEEDS.

X = Present on the Quadrangle		ESA ANADROMOUS FISH (E) = Endangered, (T) = Threatened												ESA ANADROMOUS FISH CRITICAL HABITAT										ESA MARINE INVERTEBRATES		ESA MARINE INVERT. CRITICAL HABITAT	ESA SEA TURTLES				ESA WHALES	ESA PINNIPEDS	ESA PINNIPEDS CRITICAL HABITAT	ESSENTIAL FISH HABITAT				MMPA SPECIES	
		COHO		CHINOOK			STEELHEAD					Eulachon (T)	Southern DPS Green Sturgeon (T)	COHO		CHINOOK			STEELHEAD					Eulachon	Southern DPS Green Sturgeon	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	SALMON		Groundfish	Coastal Pelagic	Highly Migratory Species	MMPA Cetaceans (see "MMPA Species" tab for list)	MMPA Pinnipeds (see "MMPA Species" tab for list)
Quad Name	Quad Number	SONCC (T)	CCC (E)	CC (T)	CVSR (T)	SRWR (E)	NC (T)	CCC (T)	SCCC (T)	SC (E)	CCV (T)			SONCC	CCC	CC	CVSR	SRWR	NC	CCC	SCCC	SC	CCV													Coho	Chinook					
Camp Meeker	38122-D8		X	X			X								X	X			X																X	X					

Species List - Intersection of USGS Topographic Quadrangles with NOAA Fisheries ESA Listed Species, Critical Habitat, Essential Fish Habitat, and MMPA Species Data

November 2016

Data Sources

Quads - 1:24,000 USGS Topograp http://viewer.nationalmap.gov/basic/

ESU / DPS - Boundary files for sp http://www.westcoast.fisheries.noaa.gov/maps_data/species_population_boundaries.html

Critical Habitat - spatial or narrat http://www.westcoast.fisheries.noaa.gov/maps_data/endangered_species_act_critical_habitat.html

SONCC Coho
CC Coho
NC Steelhead
CCC Steelhead
SCCC Steelhead
SC Steelhead
CCV Steelhead
CC Chinook
CVSR Chinook
SRWR Chinook
Green Sturgeon
Black Abalone
Leatherback Sea Turtle
Eulachon

Distribution

Coho Salmon	http://www.calfish.org/
Steelhead	http://www.calfish.org/
Chinook Salmon	http://www.calfish.org/
Cetaceans	http://marinecadastre.gov/ : http://www.nmfs.noaa.gov/pr/species/mammals/
Green Sea Turtle	http://www.nmfs.noaa.gov/pr/species/turtles/green.html
Leatherback Sea Turtle / Critical Habitat	http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.html
North Pacific DPS Loggerhead Sea Turtle	http://www.nmfs.noaa.gov/pr/species/turtles/loggerhead.html
Olive Ridley Sea Turtle	http://www.nmfs.noaa.gov/pr/species/turtles/oliveridley.html
Black Abalone	http://www.fisheries.noaa.gov/pr/species/invertebrates/abalone/black-abalone.html
White Abalone	http://www.fisheries.noaa.gov/pr/species/invertebrates/abalone/white-abalone.html
Eulachon	http://www.fisheries.noaa.gov/pr/species/fish/eulachon.html
Green Sturgeon	http://www.fisheries.noaa.gov/pr/species/fish/green-sturgeon.html
Steller Sea Lion	http://www.fisheries.noaa.gov/pr/species/mammals/sealions/steller-sea-lion.html
Guadalupe Fur Seal	http://www.fisheries.noaa.gov/pr/species/mammals/seals/guadalupe-fur-seal.html
Other Pinnipeds	http://www.nmfs.noaa.gov/pr/species/mammals/

Essential Fish Habitat	http://www.westcoast.fisheries.noaa.gov/habitat/fish_habitat/efh_consultations_go.html
Salmon	http://www.westcoast.fisheries.noaa.gov/habitat/fish_habitat/efh_consultations_go.html
Groundfish	http://www.westcoast.fisheries.noaa.gov/habitat/fish_habitat/efh_consultations_go.html
Coastal Pelagics	http://www.westcoast.fisheries.noaa.gov/habitat/fish_habitat/efh_consultations_go.html
Highly Migratory Species	http://www.westcoast.fisheries.noaa.gov/habitat/fish_habitat/efh_consultations_go.html

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: July 30, 2019
Consultation Code: 08ESMF00-2019-SLI-2616
Event Code: 08ESMF00-2019-E-08334
Project Name: Freestone Flat Road Bridge Replacement 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-2616

Event Code: 08ESMF00-2019-E-08334

Project Name: Freestone Flat Road Bridge Replacement Project

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Sonoma County Public Works Department (County), in cooperation with the Federal Highway Administration (FHWA) and the California Department of Transportation (Caltrans), proposes to replace the Freestone Flat Road Bridge at Salmon Creek (Bridge No. 20C0440). The primary objective of this project is to replace the existing functionally obsolete (narrow) bridge with a new wider structure.

The County intends to construct a new two-lane bridge to replace the narrow existing bridge. The total length of the project is approximately 620 feet, which includes approximately 515 feet of roadway work beyond the bridge abutments. Roadway work consists of shifting the roadway alignment slightly downstream and reconstructing the roadway approaches leading up to the bridge to accommodate traffic staging/ handling, and provide for a 40 mph design speed with lane and shoulder widths that meet the County's minimum design standard. The California Department of Transportation (Caltrans), on behalf of the Federal Highway Administration (FHWA), is providing project oversight. All roadway approach work is expected to be eligible for federal funding pending approval by Caltrans/FHWA.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.379031843152035N122.9231943269603W

Counties: Sonoma, CA

Endangered Species Act Species

There is a total of 14 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.

Birds

NAME	STATUS
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
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	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

Insects

NAME	STATUS
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

Crustaceans

NAME	STATUS
California Freshwater Shrimp *Syncaris pacifica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7903	Endangered

Flowering Plants

NAME	STATUS
Baker's Larkspur *Delphinium bakeri* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5031	Endangered
Pennell's Bird's-beak *Cordylanthus tenuis ssp. capillaris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3175	Endangered
Sebastopol Meadowfoam *Limnanthes vinculans* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/404	Endangered
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered
Sonoma Alopecurus *Alopecurus aequalis var. sonomensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/557	Endangered
Yellow Larkspur *Delphinium luteum* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3578	Endangered

Critical habitats

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

APPENDIX C – CONSTRUCTION NOISE ASSESSMENT

FREESTONE FLAT ROAD BRIDGE REPLACEMENT PROJECT CONSTRUCTION NOISE AND VIBRATION ASSESSMENT SONOMA COUNTY, CALIFORNIA

August 8, 2019

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Project: 18-079

Introduction and Findings Summary

This report presents the results of the construction noise and vibration assessment completed for the Freestone Flat Road Bridge Replacement Project in Sonoma County, California. The proposed project will replace the existing bridge with a new, two-lane, single-span bridge.

The fundamentals of environmental noise and vibration are presented first for those who may not be familiar with acoustical terminology or concepts. The report then provides an evaluation of noise and vibration levels resulting from project construction activities. Measures to reduce construction noise levels are recommended. Based on the analyses presented herein, project construction activities would result in short-term periods of elevated noise levels and ground vibration at receptors in the project vicinity. With the incorporation of the noise reduction measures included at the conclusion of the noise analysis, no construction noise impacts have been identified for this project. Also, this analysis found that vibration generated from construction activities would not exceed the 0.3 in/sec Peak Particle Velocity threshold.

SETTING

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the *sound level meter*. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 p.m. - 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. - 7:00 a.m.) noise levels. The *Day/Night Average Sound Level* (L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous vibration levels produce.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m.to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

TABLE 3 Reactions of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Project Description

The proposed project will replace the existing bridge with a new, single-span, bridge on Freestone Flat Road, south of the existing bridge. The new bridge will cross Salmon Creek parallel to the existing bridge. Once the new bridge is constructed, the old bridge would be demolished. This method of bridge construction will ensure local traffic is not impacted. The existing bridge is one lane wide and is considered structurally deficient. The new bridge is expected to be a cast-in-place prestressed concrete girder bridge constructed on falsework across the creek channel.

Construction is expected to take no more than six months. The seasons for construction could begin in May and end in October.
Construction is expected to occur in 5 distinct stages. Theses stages are summarized as follows:

Stage 1: Stage 1 is expected to consist of the construction of the bridge. Excavation of earth material will take place as well as the installation of cast-in-drilled-hole piling. Concrete girder stems will be used to form the bridge, where the concrete platform will be cast in sequence.

Stage 2: This stage will consist of grading the new abutment areas as well as installing concrete bridge approach slabs. Metal beam guard rails and crash guards will also be installed.

Stage 3: Road preparation will take place to ready the new bridge for traffic. The existing asphalt will be removed and a new road base and asphalt surface will be placed on the roadway.

Stage 4: The existing bridge will be demolished. Final asphalt paving and striping along with the installation of remaining hardware will be completed.

Stage 5: Construction equipment will be removed from the site and heavy construction will be complete. Finishing project duties will take place such as the sealing of exposed slopes and the installation of roadside hardware.

Anticipated construction phasing and equipment are as follows:

Stage 1:

Bridge Abutments
1. Excavator or Backhoe
2. Tractor Trailer
3. Drilling Equipment
4. Crane
5. Concrete Pump/Boom truck
6. Concrete Mixing Trucks
7. Loader
8. Roller/Sheep's Foot
9. Plate Tamper/Wacker/Ram
10. Pick-Up Trucks
11. Water Trucks
12. Dump Trucks
13. Street Sweepers 14. Generators
15. Air Compressors
16. Telescopic Forklift
17. Cutting torch, circular saw, drill, grinder

Temporary Works

1. Crane
2. Loader
3. Engine Powered Boom Lift
4. Roller/Sheep's Foot
5. Plate Tamper/Wacker/Ram
6. Generators
7. Air Compressors
8. Pick-Up Trucks
9. Water Trucks
10. Street Sweepers
11. Tractor Trailer
12. Telescopic Forklift
13. Cutting torch, circular saw, drill, grinder

Concrete Bridge Construction

1. Crane
2. Generators
3. Air Compressors

4. Concrete Pumps/Boom Truck
5. Engine Powered Boom Lift
6. Roller/Sheep's Foot
7. Plate Tamper/Wacker/Ram
8. Pick-Up Trucks
9. Water Trucks
10. Street Sweepers
11. Excavator or Backhoe
12. Loader
13. Tractor Trailer
14. Telescopic Forklift
15. Cutting torch, circular saw, drill, grinder

Stage 2

Approach Roadways & Tie-Ins

1. Loader
2. Profile Grinder
3. Paver
4. Dump Trucks
5. Roller
6. Plate Tamper/Wacker/Ram
7. Street Sweepers
8. Generators
9. Air Compressors
10. Pick-Up Trucks
11. Water Trucks
12. Tractor Trailer
13. Telescopic Forklift
14. Cutting torch, circular saw, drill, grinder

Stage 3

Approach Tie-Ins

1. Excavator or Backhoe
2. Loader
3. Paver
4. Dump Trucks
5. Roller
6. Plate Tamper/Wacker/Ram
7. Street Sweepers 8. Generators
9. Air Compressors
10. Pick-Up Trucks
11. Water Trucks
12. Tractor Trailer

13. Telescopic Forklift
14. Cutting torch, circular saw, drill, grinder

Stage 4

Bridge Demolition and New Bridge Wingwall

1. Excavator or Backhoe
2. Excavator mounted jackhammer
3. Tractor Trailer
4. Crane
5. Concrete Pump/Boom truck
6. Concrete Mixing Trucks
7. Loader
8. Roller/Sheep's Foot
9. Plate Tamper/Wacker/Ram
10. Pick-Up Trucks
11. Water Trucks
12. Dump Trucks
13. Street Sweepers 14. Generators
15. Air Compressors
16. Paver
17. Telescopic Forklift
18. Cutting torch, circular saw, drill, grinder

Stage 5

Project Completion

1. Thermoplastic Applicator
2. Auger for Wood Sign Post
3. Street Sweeper
4. Water Truck
5. Pick-up Trucks
6. Dump Trucks
7. Telescopic Forklift
8. Cutting torch, circular saw, drill, grinder

Construction Noise Assessment

Regulatory Criteria

The County currently has no quantitative noise thresholds for construction noise, however, construction noise must be considered in the noise analysis in some cases, and is required for any construction activity that extends for more than one year. Although there is often little that can be done to reduce noise levels generated by construction equipment, this study recommends measures that should be considered in cases where sensitive receptors may be impacted.

Construction Noise Levels

Noise impacts 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.

FHWA's Roadway Construction Noise Model (RCNM) was used to calculate the maximum and average noise levels anticipated during each phase of construction. This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power. Vehicles and equipment anticipated during each phase of construction were input into RCNM to calculate noise levels at a reference distance of 50 feet. Levels calculated in RCNM represent an upper bound of possible construction noise. Construction noise levels would range 5-10 dBA below these upper bound levels.

All receptor measurements and projections were made from an assumed project site center as shown in Figure 1. For the nearest residence at a distance of about 220 feet from the bridge site center, a 30-foot site center from Freestone Flat Road would also be considered during stages 2 and 3. These stages incorporate the new road development associated with the project. Table 4 presents the construction noise levels calculated for each major construction phase of the project using RCNM. At distances greater than 100 feet, actual noise levels would be expected to be lower than Table 4 due to shielding and ground absorption. Stage 1 represents an average noise level from bridge abutments, temporary work, and bridge construction. Stage 2 represents construction of approach roadways and tie-ins, Stage 3 represents the construction of tie-ins, Stage 4 represents bridge demolition, and Stage 5 represents bridge completion. In some instances, maximum instantaneous noise levels are calculated to be slightly lower than hourly average noise levels. This occurs because the model reports the maximum instantaneous noise level generated by the loudest single piece of construction equipment, while alternatively, the model reports the hourly average noise levels resulting from the additive effect of multiple pieces of construction equipment operating simultaneously.

TABLE 4 Noise Levels by Construction Phase at Distances of Nearest Receptors

Construction Phase	Maximum Noise Level (L_{max}, dBA)				Hourly Average Noise Level ($L_{eq[h]}$, dBA)			
	30 ft.	220 ft.	250 ft.	500 ft.	30 ft.	220 ft.	250 ft.	500 ft.
Stage 1	N/A	71	70	64	N/A	74	74	68
Stage 2	88	71	70	64	91	74	73	67
Stage 3	88	71	70	64	92	74	73	67
Stage 4	N/A	76	75	69	N/A	76	75	69
Stage 5	N/A	71	70	64	N/A	72	71	65

Noise generated by construction equipment drops off at a rate of 6 dB per doubling of distance between the noise source and receptor. The potential for the highest noise levels received at any nearby residence will occur during the construction of the north approach road adjacent to the bordering northern residence. This construction activity is expected to occur during Stages 2 and 3. This residence exists as close as 30 feet from the center of proposed roadway construction on Freestone Flat Road as well as 220 feet from the bridge construction site center. At a distance of 30 feet from roadway construction, noise levels would be expected to reach up to 92 dBA L_{eq}. At a distance of 220 feet from bridge construction, noise levels would be expected to reach up to 76 dBA L_{eq}. Similar residential living spaces exist at distances of 250 to 600 feet away from the bridge project site center.

At 250 feet, noise levels at the nearby southern residence are calculated to be 71 to 75 L_{eq} however shielding provided by foliage and elevation changes would be expected to reduce these levels. All other nearby residential buildings exist at distances of 500 feet or greater. At these distances, construction noise would not be considered an impact. Although there is no County established threshold for construction noise, noise levels can be considered a nuisance to nearby residents, and measures to reduce the noise levels are proposed below.

Construction Noise Reduction Measures

To reduce the potential for noise impacts resulting from the construction of the project, the following measures should be implemented during all project construction activities:

- The contractor should prepare a detailed construction plan identifying the schedule for major noise-generating construction activities and distribute this plan to adjacent noise-sensitive receptors. The construction plan should also list the construction noise reduction measures identified in this study.

- Noise-generating construction activities should be restricted to between the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday. On weekends and holidays, the Contractor will restrict noise generating activities to the period between 9:00 am and 7:00 pm. The Contractor will request of the Engineer at least 48 hours in advance of the Contractor's intent to work on weekends or holidays. However, it is not typical that the Contractor will intend on working weekend and holidays. If work is necessary outside of these hours, the County should require the contractor to implement a construction noise monitoring

program and, if feasible, provide additional mitigation as necessary (in the form of noise control blankets or other temporary noise barriers, etc.) for affected receptors.

- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Unnecessary idling of internal combustion engines should be strictly prohibited.

- Locate stationary noise generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.

- Utilize "quiet" air compressors and other "quiet" equipment where such technology exists.

Construction Vibration Assessment

Regulatory Criteria

Sonoma County does not have established quantitative vibration limits to regulate construction-related vibration. For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec 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, groundborne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in a vibration impact at residential structures in the project vicinity (see Figure 1).

Construction Vibration Levels

The construction of the project would generate perceptible vibration in the immediate vicinity of the project site when heavy equipment or impact tools are used. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Table 5 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Vibration levels are highest close to the source, and then attenuate with increasing distance at the rate $(D_{ref}/D)^{1.1}$, where D is the distance from the source in feet and D_{ref} is the reference distance of 25 feet.

The potential for the highest vibration levels would occur during construction at the northern approach road when these activities occur at the nearest point to the residential structure located approximately 220 feet to the north of the bridge site center (see Figure 1) and 30 feet from the center of Freestone Flat Road. At this residence, there could be a risk of damage to plastered walls or ceilings if vibration levels were to exceed 0.3 in/sec PPV. At 30 feet, vibratory rolling would typically produce vibration levels of 0.17 in/sec PPV, below the 0.3 in/sec PPV threshold. Clam shovel drops as close as 30 feet away from the nearest northern residence would also be expected to result in vibration levels of 0.17 in/sec PPV, below the 0.3 in/sec PPV threshold. Vibration

levels from all other sources of vibration, including large bulldozers, would be well below the 0.3 in/sec PPV impact threshold for sound structures. All other structures in the neighboring area have setback distances greater than 200 feet from the proposed construction area.

People can also be adversely affected by excessive vibration levels. The level at which humans begin to perceive vibration is 0.015 inches per second. Vibrations at 0.2 inches per second are considered bothersome to most people, while continuous exposure to long-term PPV is considered unacceptable at 0.12 inches per second. At a distance of 30 feet from the center of Freestone Flat Road, the bordering northern residence may experience bothersome perceived vibration during short-term road work activities. At a distance of 220 feet from the site center, vibration levels at this residence would typically be 0.02 in/sec PPV. Although vibration may at times be perceptible and/or annoying to occupants of nearby residential buildings, this would not be considered an impact due to the short duration and relative infrequency of events.

TABLE 5 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)
Clam shovel drop		0.202
Hydromill (slurry wall)	in soil	0.008
	in rock	0.017
Vibratory Roller		0.210
Hoe Ram		0.089
Large bulldozer		0.089
Caisson drilling		0.089
Loaded trucks		0.076
Jackhammer		0.035
Small bulldozer		0.003

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

FIGURE 1 Aerial Photo Showing Project Site and Residences in Project Vicinity

APPENDIX D – AIR QUALITY CALCULATIONS

Freestone Flat

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	0.43	Acre	0.43	18,687.24	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Freestone Flat - San Francisco Bay Area Air Basin, Annual

Project Characteristics - Jan 1, 2022 start of construction

Land Use - 0.429 acre paving

Construction Phase - Refer to PD for details

Off-road Equipment - Incorporated drill rig, air compressor, and pump/generator per activities proposed

Off-road Equipment - Added crane, air compressor, and generators per proposed activities

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Trips and VMT - Refer to PD for number of workers, haul trucks estimated based on cut/fill (!6 cy trucks), average commute distance for workers 14.9 for sonoma county

Demolition - 1,263 sf of bridge

Grading - Default grading, total of 1750 cy cut and 1750 cy fill

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	1.00	15.00
tblConstructionPhase	NumDays	1.00	15.00
tblConstructionPhase	NumDays	100.00	120.00
tblConstructionPhase	NumDays	5.00	32.00
tblConstructionPhase	NumDays	1.00	10.00
tblConstructionPhase	PhaseEndDate	1/17/2022	1/21/2022
tblConstructionPhase	PhaseEndDate	1/18/2022	4/30/2022
tblConstructionPhase	PhaseEndDate	6/8/2022	10/15/2022
tblConstructionPhase	PhaseEndDate	6/15/2022	11/15/2022
tblConstructionPhase	PhaseEndDate	1/14/2022	10/29/2022
tblConstructionPhase	PhaseEndDate	1/19/2022	10/29/2022
tblConstructionPhase	PhaseStartDate	1/15/2022	1/1/2022

Freestone Flat - San Francisco Bay Area Air Basin, Annual

tblConstructionPhase	PhaseStartDate	1/18/2022	4/10/2022
tblConstructionPhase	PhaseStartDate	1/20/2022	5/1/2022
tblConstructionPhase	PhaseStartDate	6/9/2022	10/1/2022
tblConstructionPhase	PhaseStartDate	1/1/2022	10/16/2022
tblConstructionPhase	PhaseStartDate	1/19/2022	10/16/2022
tblGrading	MaterialExported	0.00	1,000.00
tblGrading	MaterialExported	0.00	500.00
tblGrading	MaterialExported	0.00	250.00
tblGrading	MaterialImported	0.00	1,000.00
tblGrading	MaterialImported	0.00	500.00
tblGrading	MaterialImported	0.00	250.00
tblLandUse	LandUseSquareFeet	18,730.80	18,687.24
tblTripsAndVMT	HaulingTripNumber	250.00	0.00
tblTripsAndVMT	HaulingTripNumber	125.00	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	125.00
tblTripsAndVMT	HaulingTripNumber	6.00	63.00
tblTripsAndVMT	HaulingTripNumber	63.00	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	250.00
tblTripsAndVMT	WorkerTripLength	10.80	14.90
tblTripsAndVMT	WorkerTripLength	10.80	14.90
tblTripsAndVMT	WorkerTripLength	10.80	14.90
tblTripsAndVMT	WorkerTripLength	10.80	14.90
tblTripsAndVMT	WorkerTripLength	10.80	14.90
tblTripsAndVMT	WorkerTripLength	10.80	14.90
tblTripsAndVMT	WorkerTripNumber	5.00	8.00
tblTripsAndVMT	WorkerTripNumber	5.00	12.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00

tblTripsAndVMT	WorkerTripNumber	18.00	8.00
tblTripsAndVMT	WorkerTripNumber	5.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	12.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1306	1.2429	1.2734	2.7200e-003	0.0312	0.0574	0.0885	6.5800e-003	0.0545	0.0610	0.0000	238.5359	238.5359	0.0478	0.0000	239.7297
Maximum	**0.1306**	**1.2429**	**1.2734**	**2.7200e-003**	**0.0312**	**0.0574**	**0.0885**	**6.5800e-003**	**0.0545**	**0.0610**	**0.0000**	**238.5359**	**238.5359**	**0.0478**	**0.0000**	**239.7297**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1306	1.2429	1.2734	2.7200e-003	0.0312	0.0574	0.0885	6.5800e-003	0.0545	0.0610	0.0000	238.5357	238.5357	0.0478	0.0000	239.7295
Maximum	**0.1306**	**1.2429**	**1.2734**	**2.7200e-003**	**0.0312**	**0.0574**	**0.0885**	**6.5800e-003**	**0.0545**	**0.0610**	**0.0000**	**238.5357**	**238.5357**	**0.0478**	**0.0000**	**239.7295**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2022	3-31-2022	0.0568	0.0568
2	4-1-2022	6-30-2022	0.4226	0.4226
3	7-1-2022	9-30-2022	0.5516	0.5516
		Highest	0.5516	0.5516

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.8600e-003	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.8600e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.8600e-003	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.8600e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition of existing bridge	Demolition	10/16/2022	10/29/2022	5	10	
2	Tree removal	Site Preparation	1/1/2022	1/21/2022	5	15	
3	Site prep and utilities	Site Preparation	4/10/2022	4/30/2022	5	15	
4	Site restoration	Site Preparation	10/16/2022	10/29/2022	5	10	
5	Bridge construction	Building Construction	5/1/2022	10/15/2022	5	120	
6	Roadway realignment	Paving	10/1/2022	11/15/2022	5	32	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.43

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Freestone Flat - San Francisco Bay Area Air Basin, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Tree removal	Graders	1	8.00	187	0.41
Tree removal	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site prep and utilities	Graders	1	8.00	187	0.41
Site prep and utilities	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Bridge construction	Air Compressors	1	6.00	78	0.48
Bridge construction	Bore/Drill Rigs	1	6.00	221	0.50
Bridge construction	Cranes	1	4.00	231	0.29
Bridge construction	Forklifts	2	6.00	89	0.20
Bridge construction	Generator Sets	1	6.00	84	0.74
Bridge construction	Pumps	1	6.00	84	0.74
Bridge construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition of existing bridge	Air Compressors	1	6.00	78	0.48
Demolition of existing bridge	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition of existing bridge	Cranes	1	4.00	231	0.29
Demolition of existing bridge	Generator Sets	1	6.00	84	0.74
Demolition of existing bridge	Rubber Tired Dozers	1	1.00	247	0.40
Demolition of existing bridge	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site restoration	Graders	1	8.00	187	0.41
Site restoration	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Roadway realignment	Cement and Mortar Mixers	4	6.00	9	0.56
Roadway realignment	Pavers	1	7.00	130	0.42
Roadway realignment	Rollers	1	7.00	80	0.38
Roadway realignment	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Tree removal	2	8.00	0.00	0.00	14.90	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site prep and utilities	2	12.00	0.00	0.00	14.90	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bridge construction	9	16.00	3.00	125.00	14.90	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition of existing bridge	7	8.00	0.00	63.00	14.90	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site restoration	2	4.00	0.00	0.00	14.90	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Roadway realignment	7	12.00	0.00	250.00	14.90	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition of existing bridge - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.2000e-004	0.0000	6.2000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.7400e-003	0.0606	0.0649	1.1000e-004		3.0800e-003	3.0800e-003		2.9700e-003	2.9700e-003	0.0000	9.8704	9.8704	1.5500e-003	0.0000	9.9092
Total	**6.7400e-003**	**0.0606**	**0.0649**	**1.1000e-004**	**6.2000e-004**	**3.0800e-003**	**3.7000e-003**	**9.0000e-005**	**2.9700e-003**	**3.0600e-003**	**0.0000**	**9.8704**	**9.8704**	**1.5500e-003**	**0.0000**	**9.9092**

3.2 Demolition of existing bridge - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.3000e-004	7.8100e-003	1.7800e-003	2.0000e-005	5.3000e-004	2.0000e-005	5.5000e-004	1.5000e-004	2.0000e-005	1.7000e-004	0.0000	2.3507	2.3507	1.2000e-004	0.0000	2.3536
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.0000e-004	1.0800e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3522	0.3522	1.0000e-005	0.0000	0.3524
Total	**3.8000e-004**	**7.9100e-003**	**2.8600e-003**	**2.0000e-005**	**9.7000e-004**	**2.0000e-005**	**9.9000e-004**	**2.7000e-004**	**2.0000e-005**	**2.9000e-004**	**0.0000**	**2.7029**	**2.7029**	**1.3000e-004**	**0.0000**	**2.7060**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.2000e-004	0.0000	6.2000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.7400e-003	0.0606	0.0649	1.1000e-004		3.0800e-003	3.0800e-003		2.9700e-003	2.9700e-003	0.0000	9.8704	9.8704	1.5500e-003	0.0000	9.9092
Total	**6.7400e-003**	**0.0606**	**0.0649**	**1.1000e-004**	**6.2000e-004**	**3.0800e-003**	**3.7000e-003**	**9.0000e-005**	**2.9700e-003**	**3.0600e-003**	**0.0000**	**9.8704**	**9.8704**	**1.5500e-003**	**0.0000**	**9.9092**

3.2 Demolition of existing bridge - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.3000e-004	7.8100e-003	1.7800e-003	2.0000e-005	5.3000e-004	2.0000e-005	5.5000e-004	1.5000e-004	2.0000e-005	1.7000e-004	0.0000	2.3507	2.3507	1.2000e-004	0.0000	2.3536
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.0000e-004	1.0800e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3522	0.3522	1.0000e-005	0.0000	0.3524
Total	**3.8000e-004**	**7.9100e-003**	**2.8600e-003**	**2.0000e-005**	**9.7000e-004**	**2.0000e-005**	**9.9000e-004**	**2.7000e-004**	**2.0000e-005**	**2.9000e-004**	**0.0000**	**2.7029**	**2.7029**	**1.3000e-004**	**0.0000**	**2.7060**

3.3 Tree removal - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.0900e-003	0.0000	4.0900e-003	4.5000e-004	0.0000	4.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3500e-003	0.0520	0.0297	7.0000e-005		1.9300e-003	1.9300e-003		1.7800e-003	1.7800e-003	0.0000	6.4128	6.4128	2.0700e-003	0.0000	6.4646
Total	**4.3500e-003**	**0.0520**	**0.0297**	**7.0000e-005**	**4.0900e-003**	**1.9300e-003**	**6.0200e-003**	**4.5000e-004**	**1.7800e-003**	**2.2300e-003**	**0.0000**	**6.4128**	**6.4128**	**2.0700e-003**	**0.0000**	**6.4646**

3.3 Tree removal - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6200e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5283	0.5283	1.0000e-005	0.0000	0.5286
Total	**2.2000e-004**	**1.5000e-004**	**1.6200e-003**	**1.0000e-005**	**6.5000e-004**	**0.0000**	**6.6000e-004**	**1.7000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5283**	**0.5283**	**1.0000e-005**	**0.0000**	**0.5286**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.0900e-003	0.0000	4.0900e-003	4.5000e-004	0.0000	4.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3500e-003	0.0520	0.0297	7.0000e-005		1.9300e-003	1.9300e-003		1.7800e-003	1.7800e-003	0.0000	6.4128	6.4128	2.0700e-003	0.0000	6.4646
Total	**4.3500e-003**	**0.0520**	**0.0297**	**7.0000e-005**	**4.0900e-003**	**1.9300e-003**	**6.0200e-003**	**4.5000e-004**	**1.7800e-003**	**2.2300e-003**	**0.0000**	**6.4128**	**6.4128**	**2.0700e-003**	**0.0000**	**6.4646**

3.3 Tree removal - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6200e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5283	0.5283	1.0000e-005	0.0000	0.5286
Total	**2.2000e-004**	**1.5000e-004**	**1.6200e-003**	**1.0000e-005**	**6.5000e-004**	**0.0000**	**6.6000e-004**	**1.7000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5283**	**0.5283**	**1.0000e-005**	**0.0000**	**0.5286**

3.4 Site prep and utilities - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.0300e-003	0.0000	4.0300e-003	4.4000e-004	0.0000	4.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3500e-003	0.0520	0.0297	7.0000e-005		1.9300e-003	1.9300e-003		1.7800e-003	1.7800e-003	0.0000	6.4128	6.4128	2.0700e-003	0.0000	6.4646
Total	**4.3500e-003**	**0.0520**	**0.0297**	**7.0000e-005**	**4.0300e-003**	**1.9300e-003**	**5.9600e-003**	**4.4000e-004**	**1.7800e-003**	**2.2200e-003**	**0.0000**	**6.4128**	**6.4128**	**2.0700e-003**	**0.0000**	**6.4646**

3.4 Site prep and utilities - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.3000e-004	2.4300e-003	1.0000e-005	9.8000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.7925	0.7925	2.0000e-005	0.0000	0.7929
Total	**3.3000e-004**	**2.3000e-004**	**2.4300e-003**	**1.0000e-005**	**9.8000e-004**	**1.0000e-005**	**9.9000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.7925**	**0.7925**	**2.0000e-005**	**0.0000**	**0.7929**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.0300e-003	0.0000	4.0300e-003	4.4000e-004	0.0000	4.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3500e-003	0.0520	0.0297	7.0000e-005		1.9300e-003	1.9300e-003		1.7800e-003	1.7800e-003	0.0000	6.4128	6.4128	2.0700e-003	0.0000	6.4646
Total	**4.3500e-003**	**0.0520**	**0.0297**	**7.0000e-005**	**4.0300e-003**	**1.9300e-003**	**5.9600e-003**	**4.4000e-004**	**1.7800e-003**	**2.2200e-003**	**0.0000**	**6.4128**	**6.4128**	**2.0700e-003**	**0.0000**	**6.4646**

3.4 Site prep and utilities - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.3000e-004	2.4300e-003	1.0000e-005	9.8000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.7925	0.7925	2.0000e-005	0.0000	0.7929
Total	**3.3000e-004**	**2.3000e-004**	**2.4300e-003**	**1.0000e-005**	**9.8000e-004**	**1.0000e-005**	**9.9000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.7925**	**0.7925**	**2.0000e-005**	**0.0000**	**0.7929**

3.5 Site restoration - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.6800e-003	0.0000	2.6800e-003	2.9000e-004	0.0000	2.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9000e-003	0.0347	0.0198	5.0000e-005		1.2900e-003	1.2900e-003		1.1800e-003	1.1800e-003	0.0000	4.2752	4.2752	1.3800e-003	0.0000	4.3098
Total	**2.9000e-003**	**0.0347**	**0.0198**	**5.0000e-005**	**2.6800e-003**	**1.2900e-003**	**3.9700e-003**	**2.9000e-004**	**1.1800e-003**	**1.4700e-003**	**0.0000**	**4.2752**	**4.2752**	**1.3800e-003**	**0.0000**	**4.3098**

3.5 Site restoration - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.4000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1761	0.1761	0.0000	0.0000	0.1762
Total	**7.0000e-005**	**5.0000e-005**	**5.4000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1761**	**0.1761**	**0.0000**	**0.0000**	**0.1762**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.6800e-003	0.0000	2.6800e-003	2.9000e-004	0.0000	2.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9000e-003	0.0347	0.0198	5.0000e-005		1.2900e-003	1.2900e-003		1.1800e-003	1.1800e-003	0.0000	4.2752	4.2752	1.3800e-003	0.0000	4.3098
Total	**2.9000e-003**	**0.0347**	**0.0198**	**5.0000e-005**	**2.6800e-003**	**1.2900e-003**	**3.9700e-003**	**2.9000e-004**	**1.1800e-003**	**1.4700e-003**	**0.0000**	**4.2752**	**4.2752**	**1.3800e-003**	**0.0000**	**4.3098**

3.5 Site restoration - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.4000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1761	0.1761	0.0000	0.0000	0.1762
Total	**7.0000e-005**	**5.0000e-005**	**5.4000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1761**	**0.1761**	**0.0000**	**0.0000**	**0.1762**

3.6 Bridge construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0942	0.8734	0.9632	1.8800e-003		0.0441	0.0441		0.0421	0.0421	0.0000	163.5714	163.5714	0.0350	0.0000	164.4464
Total	**0.0942**	**0.8734**	**0.9632**	**1.8800e-003**		**0.0441**	**0.0441**		**0.0421**	**0.0421**	**0.0000**	**163.5714**	**163.5714**	**0.0350**	**0.0000**	**164.4464**

3.6 Bridge construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.6000e-004	0.0155	3.5300e-003	5.0000e-005	1.0600e-003	4.0000e-005	1.1000e-003	2.9000e-004	4.0000e-005	3.3000e-004	0.0000	4.6640	4.6640	2.4000e-004	0.0000	4.6699
Vendor	5.3000e-004	0.0178	4.4100e-003	5.0000e-005	1.1800e-003	4.0000e-005	1.2200e-003	3.4000e-004	3.0000e-005	3.8000e-004	0.0000	4.6224	4.6224	2.2000e-004	0.0000	4.6279
Worker	3.5200e-003	2.4200e-003	0.0259	9.0000e-005	0.0105	6.0000e-005	0.0105	2.7800e-003	6.0000e-005	2.8400e-003	0.0000	8.4535	8.4535	1.7000e-004	0.0000	8.4578
Total	**4.5100e-003**	**0.0357**	**0.0338**	**1.9000e-004**	**0.0127**	**1.4000e-004**	**0.0129**	**3.4100e-003**	**1.3000e-004**	**3.5500e-003**	**0.0000**	**17.7399**	**17.7399**	**6.3000e-004**	**0.0000**	**17.7556**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0942	0.8734	0.9632	1.8800e-003		0.0441	0.0441		0.0421	0.0421	0.0000	163.5712	163.5712	0.0350	0.0000	164.4462
Total	**0.0942**	**0.8734**	**0.9632**	**1.8800e-003**		**0.0441**	**0.0441**		**0.0421**	**0.0421**	**0.0000**	**163.5712**	**163.5712**	**0.0350**	**0.0000**	**164.4462**

3.6 Bridge construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.6000e-004	0.0155	3.5300e-003	5.0000e-005	1.0600e-003	4.0000e-005	1.1000e-003	2.9000e-004	4.0000e-005	3.3000e-004	0.0000	4.6640	4.6640	2.4000e-004	0.0000	4.6699
Vendor	5.3000e-004	0.0178	4.4100e-003	5.0000e-005	1.1800e-003	4.0000e-005	1.2200e-003	3.4000e-004	3.0000e-005	3.8000e-004	0.0000	4.6224	4.6224	2.2000e-004	0.0000	4.6279
Worker	3.5200e-003	2.4200e-003	0.0259	9.0000e-005	0.0105	6.0000e-005	0.0105	2.7800e-003	6.0000e-005	2.8400e-003	0.0000	8.4535	8.4535	1.7000e-004	0.0000	8.4578
Total	**4.5100e-003**	**0.0357**	**0.0338**	**1.9000e-004**	**0.0127**	**1.4000e-004**	**0.0129**	**3.4100e-003**	**1.3000e-004**	**3.5500e-003**	**0.0000**	**17.7399**	**17.7399**	**6.3000e-004**	**0.0000**	**17.7556**

3.7 Roadway realignment - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0104	0.0947	0.1126	1.8000e-004		4.7400e-003	4.7400e-003		4.4100e-003	4.4100e-003	0.0000	15.0350	15.0350	4.3800e-003	0.0000	15.1444
Paving	5.6000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0109**	**0.0947**	**0.1126**	**1.8000e-004**		**4.7400e-003**	**4.7400e-003**		**4.4100e-003**	**4.4100e-003**	**0.0000**	**15.0350**	**15.0350**	**4.3800e-003**	**0.0000**	**15.1444**

3.7 Roadway realignment - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.3000e-004	0.0310	7.0600e-003	1.0000e-004	2.1100e-003	9.0000e-005	2.2000e-003	5.8000e-004	9.0000e-005	6.7000e-004	0.0000	9.3280	9.3280	4.7000e-004	0.0000	9.3398
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-004	4.8000e-004	5.1800e-003	2.0000e-005	2.0900e-003	1.0000e-005	2.1100e-003	5.6000e-004	1.0000e-005	5.7000e-004	0.0000	1.6907	1.6907	3.0000e-005	0.0000	1.6916
Total	**1.6300e-003**	**0.0315**	**0.0122**	**1.2000e-004**	**4.2000e-003**	**1.0000e-004**	**4.3100e-003**	**1.1400e-003**	**1.0000e-004**	**1.2400e-003**	**0.0000**	**11.0187**	**11.0187**	**5.0000e-004**	**0.0000**	**11.0313**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0104	0.0947	0.1126	1.8000e-004		4.7400e-003	4.7400e-003		4.4100e-003	4.4100e-003	0.0000	15.0349	15.0349	4.3800e-003	0.0000	15.1444
Paving	5.6000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0109**	**0.0947**	**0.1126**	**1.8000e-004**		**4.7400e-003**	**4.7400e-003**		**4.4100e-003**	**4.4100e-003**	**0.0000**	**15.0349**	**15.0349**	**4.3800e-003**	**0.0000**	**15.1444**

3.7 Roadway realignment - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.3000e-004	0.0310	7.0600e-003	1.0000e-004	2.1100e-003	9.0000e-005	2.2000e-003	5.8000e-004	9.0000e-005	6.7000e-004	0.0000	9.3280	9.3280	4.7000e-004	0.0000	9.3398
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-004	4.8000e-004	5.1800e-003	2.0000e-005	2.0900e-003	1.0000e-005	2.1100e-003	5.6000e-004	1.0000e-005	5.7000e-004	0.0000	1.6907	1.6907	3.0000e-005	0.0000	1.6916
Total	**1.6300e-003**	**0.0315**	**0.0122**	**1.2000e-004**	**4.2000e-003**	**1.0000e-004**	**4.3100e-003**	**1.1400e-003**	**1.0000e-004**	**1.2400e-003**	**0.0000**	**11.0187**	**11.0187**	**5.0000e-004**	**0.0000**	**11.0313**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.578638	0.038775	0.193686	0.110919	0.015677	0.005341	0.018293	0.026358	0.002641	0.002200	0.005832	0.000891	0.000749

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.8600e-003	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Unmitigated	1.8600e-003	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	6.5000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Total	**1.8600e-003**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	6.5000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Total	**1.8600e-003**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX E – TREE REMOVAL EXHIBIT

LEGEND:

- EXISTING R/W
- PROPOSED R/W
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT (TCE)
- TREE REMOVAL
- PROJECT FOOTPRINT

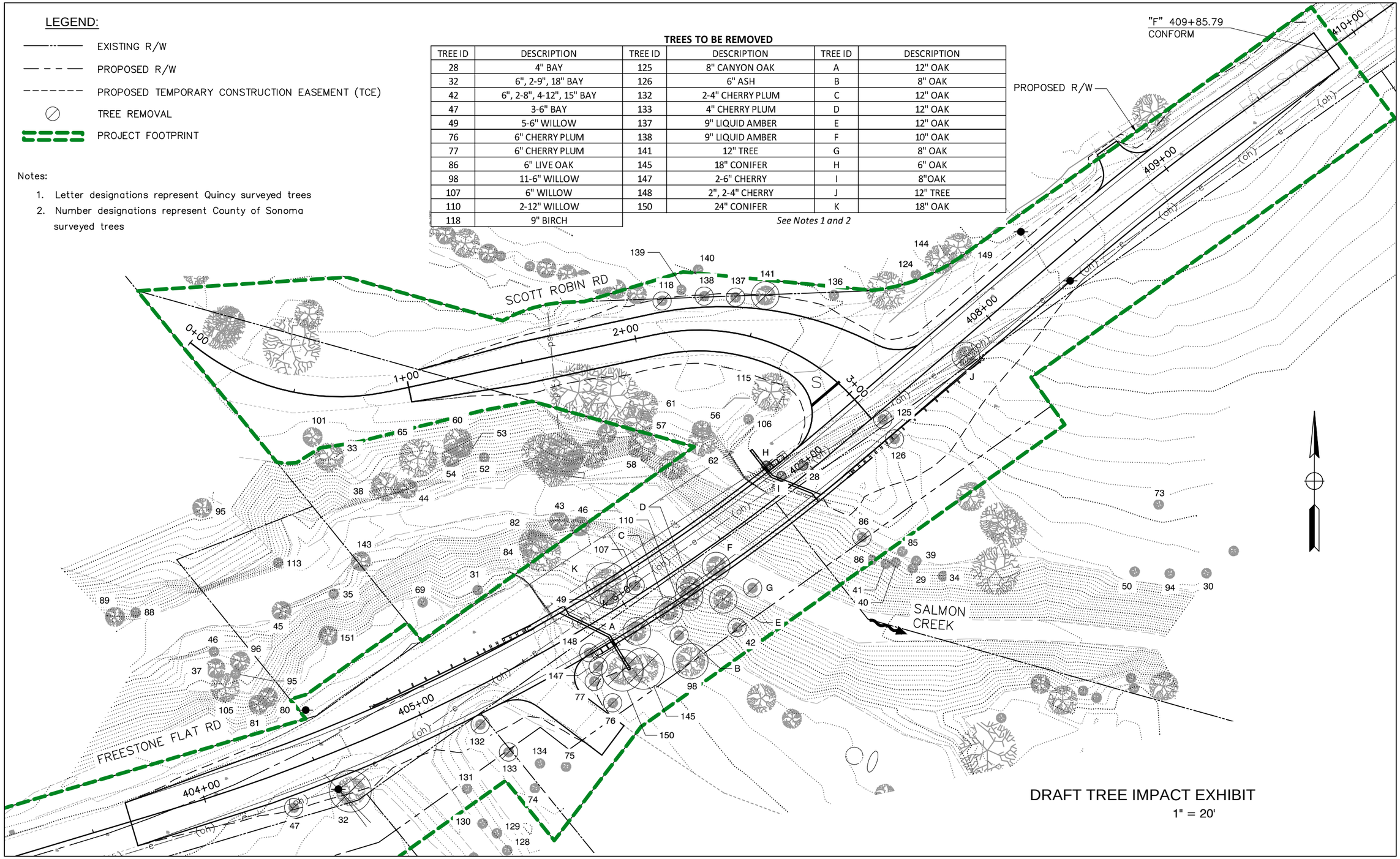
Notes:

1. Letter designations represent Quincy surveyed trees
2. Number designations represent County of Sonoma surveyed trees

TREES TO BE REMOVED

TREE ID	DESCRIPTION	TREE ID	DESCRIPTION	TREE ID	DESCRIPTION
28	4" BAY	125	8" CANYON OAK	A	12" OAK
32	6", 2-9", 18" BAY	126	6" ASH	B	8" OAK
42	6", 2-8", 4-12", 15" BAY	132	2-4" CHERRY PLUM	C	12" OAK
47	3-6" BAY	133	4" CHERRY PLUM	D	12" OAK
49	5-6" WILLOW	137	9" LIQUID AMBER	E	12" OAK
76	6" CHERRY PLUM	138	9" LIQUID AMBER	F	10" OAK
77	6" CHERRY PLUM	141	12" TREE	G	8" OAK
86	6" LIVE OAK	145	18" CONIFER	H	6" OAK
98	11-6" WILLOW	147	2-6" CHERRY	I	8"OAK
107	6" WILLOW	148	2", 2-4" CHERRY	J	12" TREE
110	2-12" WILLOW	150	24" CONIFER	K	18" OAK
118	9" BIRCH				

See Notes 1 and 2



DRAFT TREE IMPACT EXHIBIT

1" = 20'

DESIGN BY	B.GRIMM
DRAWING BY	B.GRIMM
CHECKED BY	M. SANCHEZ

REGISTERED CIVIL ENGINEER

5/22/2018

PLANS APPROVAL DATE

S:\CLIENT\SONOMA COUNTY - S22\FREESTONE FLAT ROAD\S22-200\CAD\ROADWAY\Z_TREE EXHIBIT_S22-200_L-1 (1)_20180521.DWG 5/22/2018 4:44 PM

REGISTERED PROFESSIONAL ENGINEER — XXXXXXX — No. X — Exp. XXXXXX — CIVIL — STATE OF CALIFORNIA

"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

AS BUILT DRAWINGS BY:

DATE		BY	APPROVED

QUINCY ENGINEERING, INC.
11017 Cobblerock Drive, Suite 100
Sacramento, CA 95670

COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
SUSAN KLASSEN, DIRECTOR

LAYOUT ALT 1

FREESTONE FLAT ROAD BRIDGE REPLACEMENT

ROAD NUMBER	XXX
BUDGET NUMBER	XXX
FISCAL YEAR	2015-16
SHEET NUMBER	----
TOTAL SHEETS	X