

1.2.2 Need

The project is needed to improve fish passage. The existing bridge and its downstream concrete apron are classified as depth and jump barriers to adult and juvenile salmonids. During low flows, the water depth within Ritchie Creek can become impassable. The depth barrier within the culvert is due to the smooth, wide, and flat surface crossing; the jump barrier is the result of ongoing erosion and scouring over time at the concrete apron just downstream of the bridge crossing. Additionally, this project is needed so Caltrans can continue to comply with the Caltrans NPDES Statewide Stormwater Permit (Order No. 2012-0011-DWQ, NPDES Number CAS000003). Caltrans would receive 42 compliance unit credits for completion of this project.

1.2.3 Independent Utility And Logical Termini

FHWA regulations (23 Code of Federal Regulations [CFR] 771.111 [f]) require that the action evaluated do the following:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope.
2. Have independent utility or independent significance (be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made).
3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The proposed project includes logical starting and ending points, or termini, that are centered around the replacement of the existing bridge. The project would have independent utility, which means that the proposed improvements can be implemented within the project limits, and completion of other projects would not be required to gain the operational benefits of the proposed improvements. The project would not preclude consideration of alternatives for other reasonable, foreseeable transportation improvements in the area. The project would improve fish migration, regardless of whether other transportation improvement projects in the area are implemented. In addition, the project would not be a segment of a larger project or a commitment to a larger project with significant environmental effects. Therefore, the project would have independent need and utility.

1.3 Project Description

Caltrans proposes to replace the existing Ritchie Creek Bridge with a new bridge at PM 33.13, located on SR 29 in Napa County. Replacing the bridge would remove the fish

passage barriers and allow Caltrans to obtain 42 TMDL compliance unit credits to meet the requirements of the Caltrans Statewide NPDES Permit.

1.3.1 Project Alternatives

This section describes the proposed alternatives that were developed to meet the purpose and need of the project. The Build Alternative and the No-Build Alternative are considered, as described below.

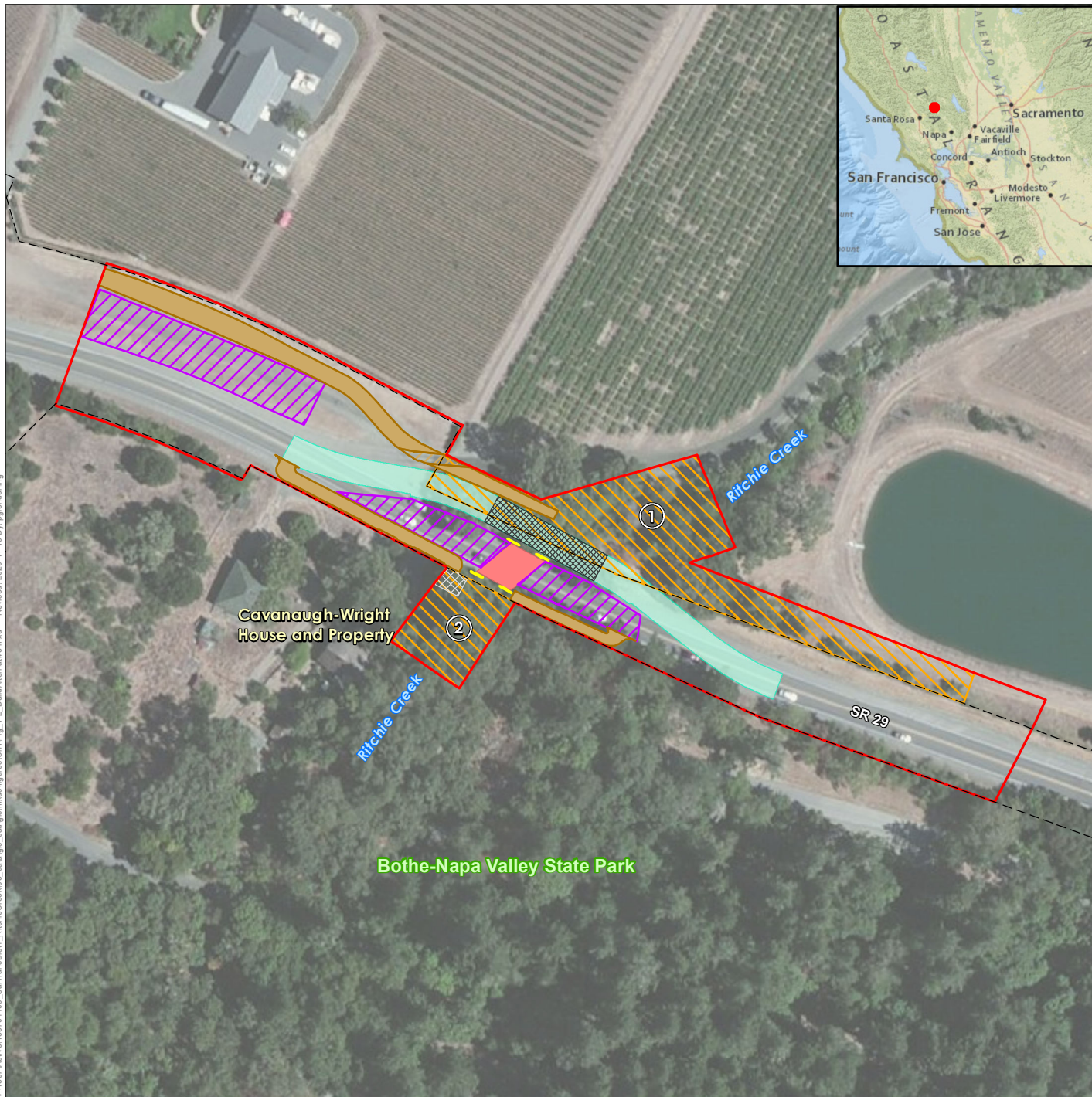
1.3.1.1 BUILD ALTERNATIVE

The Build Alternative would replace the existing Ritchie Creek Bridge to improve fish passage. The project limits extend from PM 32.98 to PM 33.28. The project footprint includes the realignment of two lanes to divert traffic from the existing bridge to a temporary detour bridge, temporary access roads to the creek, and staging areas (Figure 1-2).

The existing Ritchie Creek Bridge is 16.4 feet long and 43.3 feet wide. The bridge accommodates two, 12-foot travel lanes and 8-foot shoulders in each direction with concrete barrier rails. Figure 1-3 depicts the existing northbound view on SR 29 from the bridge; Figure 1-4 depicts the upstream view of the bridge opening. The new bridge would be 35 feet long and 44 feet wide with a 12-foot travel lane and 8-foot shoulder in each direction. Accordingly, the channel would be wider under the Build Alternative. The new bridge railing would include an architectural surface treatment that matches the immediate surroundings to the maximum extent feasible and would use one of the four approved *Manual for Assessing Safety Hardware* compliant railings, as approved by FHWA for the State of California (AASHTO 2016).

A two-lane temporary detour bridge would be constructed parallel to the northbound lane of the existing bridge to detour traffic during construction. The temporary detour bridge would be constructed outside the Caltrans right of way and would include Type K rails. The Build Alternative would also involve temporary relocation of existing aboveground and underground utilities.

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Legend

- Project Limits
- Caltrans Right-of-Way
- Permanent Right of Way Easement

Project Components

- New Bridge
- Wing Wall
- Temporary Construction Easement
- ① Private Property
- ② Bothe-Napa State Park Property
- Staging Area
- Access
- Access to Private Property
- Temporary Modular Steel Bridge
- Temporary Roadway Detour

Service Layer Credits:
 ESRI, National Geographic, DigitalGlobe, GeoEye

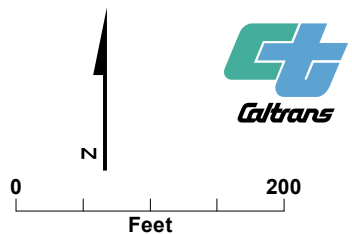


Figure 1-2
Build Alternative
 Ritchie Creek Bridge Replacement Project
 for Fish Passage Improvement
 EA 04-4J990, NAPA-29 PM 33.13
 Napa County, California

Figure 1-3 Northbound View of Existing Bridge



Figure 1-4 Upstream View of Bridge Opening



The Build Alternative would include restoring the creek. The proposed Ritchie Creek streambed restoration would improve fish passage at the downstream reach. Replacement of the existing bridge would allow for the creek to be regraded and roughened to improve conditions for fish. The total project boundary area is 3.11 acres.

This project contains a number of standardized project features, which are employed on most, if not all, Caltrans projects and were not developed in response to any specific environmental impact resulting from the proposed project. These measures are addressed in more detail in the Environmental Consequences sections found in Chapter 2 and included as Appendix D.

Build Alternative Features

Pre-Construction

Site Preparation

Site preparation would include delineating construction work areas, installing environmentally sensitive area (ESA) fencing around sensitive habitats and cultural resource areas, installing wildlife exclusion fencing around staging areas, installing best management practices (BMPs) in accordance with the project's Stormwater Pollution Prevention Plan (SWPPP), and removing vegetation.

Vegetation clearing would be required and would be confined to the area within the project footprint, including construction access routes. Vegetation removal and clearing would be completed with hand tools where possible. Chainsaws, grinders, and excavators would be used for vegetation that cannot be removed by hand.

Staging Areas and Temporary Construction Access Roads

Staging areas for equipment storage and maintenance, construction materials, fuels, lubricants, solvents, and other possible contaminants would be located within the Caltrans right of way on the north side of SR 29 (0.24 acre) and on SR 29 (0.17 acre) as depicted on Figure 1-2. ESA fencing would be used to delineate sensitive areas during construction. The total area of temporary disturbance of construction staging areas would be 0.41 acre.

The existing bridge would continue to be used to carry traffic during the installation of the temporary detour bridge. Traffic would be diverted to the two-lane temporary detour bridge while the existing bridge is removed and the new bridge is constructed. Minor roadway widening would be required to allow for alignment of the temporary detour bridge with the existing roadway. The existing pavement would be conformed to match the elevation of the new temporary detour bridge structure.

A temporary 16-foot-wide access road would be created on the north side of SR 29 to provide access to the creek during construction. While the access road would intersect with an existing driveway, access to the private property would be maintained during construction, as shown in Figure 1-2. On the south side of the SR 29, two temporary 12-foot-wide access roads would be created. The temporary access road southwest of the bridge would allow for continued access to a residential driveway and the work area within the creek, and the temporary access road on the southeast side would also allow for access to the creek.

Right of Way and Temporary Construction Easements

The project would be located almost entirely within Caltrans right of way. The project would not result in the displacement of residents or businesses. Two temporary construction easements (TCEs), totaling 0.83 acre would be required for construction; these easements would be located on both sides of the existing bridge. The TCE 1 on the north side of SR 29 would be approximately 0.66 acre on private property, and the TCE 2 on the south side of SR 29 would be approximately 0.17 acre in Bothe-Napa Valley State Park. Caltrans would coordinate with State Parks to obtain a permanent right of way easement on State Parks property within TCE 2 to access and maintain the retaining walls. Figure 1-2 shows the permanent right of way easement (0.01 acre) within TCE 2.

Utility Relocation

Pacific Gas and Electric (PG&E) and Comcast overhead facilities are located within the Caltrans right of way. Two overhead poles are located on either side of Ritchie Creek on the north side of SR 29. These poles convey an overhead PG&E 12 kV distribution line and Comcast cable to the local community. There is a 6-inch PG&E gas pipeline on the north side of the existing bridge. The gas line is supported on either end of the creek by a cylindrical metal structure. The gas line is not attached to the existing bridge. A 4-inch telephone conduit is also located on the north side of the existing bridge.

Prior to construction, the existing overhead poles, Comcast cable, gas line, and telephone conduit would be temporarily relocated within the project footprint.

Construction

Temporary Creek Diversion System

A temporary creek diversion system would be installed to divert creek flow around the work area during the dry season. The temporary creek diversion system would use diversion plastic pipes with temporary cofferdams located at the upstream and downstream ends. The cofferdams would be assembled before the beginning of any work in the creek and removed at the end of construction. Timber mat systems are often used to create a flat working surface for construction activities. Construction activities within the creek would be limited to the

dry season between June 1 and October 31 to reduce the potential for work during high water flows in Ritchie Creek.

Channel Widening

Grading in the creek would be necessary to accommodate the new wider crossing, both upstream and downstream, of the proposed bridge. The embankment toe along both sides of the channel, both upstream and downstream of the new bridge, would be lined with rock slope protection (RSP) and appropriate filter material. The RSP would extend up the embankment slopes 3 feet above the toe of the slope and 5 feet below the toe of slope. Rocks from the existing channel would be removed and replaced after the channel is realigned. A total of 0.24 acre of the creek would be graded and temporarily impacted. The creek bed and surrounding vegetation temporarily affected during construction would be restored after construction.

Construct Temporary Detour Bridge

A two-lane temporary detour bridge would be installed on the north side, immediately adjacent, 6 feet (edge-to-edge), to the existing bridge to maintain traffic flow and construction clearance (Figure 1-5). The temporary detour bridge would be a prefabricated modular-steel bridge measuring approximately 28 feet wide and 120 feet long and would include two lanes with no shoulder. The temporary detour bridge would be assembled on-site at a temporary staging area located just northeast of the northbound approach to the existing bridge. A temporary concrete abutment would be installed at the approaches of the temporary detour bridge. It would take 1 to 3 months to construct the temporary detour bridge.

Traffic Management

Traffic would be diverted to the two-lane, temporary detour bridge during bridge construction. Various Transportation Management Plan elements such as portable Changeable Message Signs and California Highway Patrol Construction Zone Enhanced Enforcement Program would be used to minimize delays to the traveling public. After the permanent bridge is constructed, traffic would be shifted back from the temporary detour bridge to the new permanent bridge, and the temporary detour bridge would be removed. Flaggers would be used to divert traffic from-and-to the existing bridge to the temporary detour bridge during low peak times.

Demolish Existing Bridge

Bridge demolition would begin in the middle of the bridge and work backwards toward the abutments. Breakers or hoe rams would be used to break the deck into smaller pieces. A timber mat would be constructed to contain any construction debris that would fall outside of the existing concrete apron. Access to the creek bed for bridge demolition would be via the

temporary construction access roads within the Caltrans right of way along southbound SR 29. The remaining portions of the bridge abutments would be removed to 10 feet below the existing channel grade and hauled away.

Construct Abutment and Bridge

The foundations for the abutments would be constructed first. Caltrans would install a seating-type abutment on spread footings at the SR 29 crossing over Ritchie Creek. After excavating 15 feet below existing channel grade, placing formworks at the perimeters, and setting the steel reinforcements, concrete would be poured to form the spread footing.

The seat-type abutments would be built with reinforced concrete to provide support to the bridge deck and would extend 5 to 10 feet beyond the edge of the bridge on each side. The main components of a seat-type abutment are back wall, stem, wing walls, and foundation. Wing walls would be constructed from reinforced concrete on each side of the abutment to act as retaining walls to the dirt embankment around the abutment. Once the abutments are constructed, the new cast-in-place slab bridge deck would be installed. Construction of the new bridge abutment and bridge would occur over 2 to 6 months.

Fish Passage Improvements

Removing the barriers would require elimination of the bottom concrete portions of the existing culvert, grading approximately 100 feet of the channel to a longitudinal 2.5 percent slope, and constructing a roughened channel by incorporating half-ton rocks within a mix of natural creek bed material. A step-pool system would be included if a 2.5-percent slope is not possible to achieve. Along the proposed channel bottom, the side slope would match the existing bank slopes.

Remove Temporary Bridge

The temporary detour bridge would be disassembled and removed after the existing bridge is operating. Additional roadway pavement would be removed, and the terrain would be regraded prior to construction completion.