

Riparian and Stream Assessment
For
Showers Creek
Kneeland, CA

April 26th, 2017

Prepared for:
Timberland Resource Consultants
Fortuna, CA

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1.0 Introduction

On April 07, 2017, Jack Henry, Timberland Resources Consultants conducted a site review of a proposed construction site located in Section 26, T3N, R4E, HB&M for the purpose of assessing potential effects of the proposed bridge construction project on riparian-dependent resources. This report is the result of the site assessment, review of relevant scientific literature, and professional knowledge.

The proposed project is to install a 74 feet long by 8 feet wide bridge across Showers Creek where a log stringer bridge once existed.

2.0 Methods

A. Field Observation and Studies

All field data was collected by a wildlife biologist (J. Henry) using direct observations, measurements and ocular estimation during a site review conducted on April 07, 2017. A 75 feet logger's tape and Forestry Pro (Nikon Laser Range Finder) was used for recording distances to the nearest tenth of a foot. Slope percent was measured using a Suunto PM-5/360 PC Clinometer to the nearest degree. Stream flow data was gathered from <http://streamstatsags.cr.usgs.gov/streamstats/>. The following analysis of project effects is based on information obtained from the landowner and the consulting forester, Chris Carroll. This analysis relies on the accuracy of information provided by the landowner to the consulting biologist preparing this report.

B. Agency Consultation

No other agency has been consulted during the preparation of this report. This report contains fisheries information on Showers Creek ascertained on April 26th, 2017 from Section III of the Timber Harvest Plan 1-99-417-HUM.

C. Document and Report Review

The County of Humboldt will receive a copy of this report accompanied with a copy of the grading and construction plan. The landowner will also review a draft of this report prior to submission to the County of Humboldt.

3.0 Existing Conditions

A. Project Site

The proposed bridge construction will occur on private property, APN 317-033-002, owned by RH Emmerson & Son LLC. The bridge will cross Showers Creek, a Class I tributary to the Mad River. The proposed bridge is located approximately 2,900' upstream of the confluence with the Mad River (Map Attached). The riparian vegetation present consists of Red Alder (*Alnus rubra*), Big-leaf Maple (*Acer macrophyllum*), Douglas-fir (*Pseudotsuga menziesii*), Willow (*Sallix* spp.), California Bay Laurel (*Umbellularia californium*), Sword Fern (*Polystichum munitum*), Deer Fern (*Lomaria spicant*), Miner's Lettuce (*Claytonia perfoliata*), Trillium (*Trillium ovata*), as well as other various graminoids and forbes including: *Geranium dissectum*, *Viola glabella*, *Iris douglasiana*, *Oxalis oergana*, *Ribes sanguineum*, and *Erythorium americanum*. Land use in the project area consists primarily of timber management, cattle crazing, road construction and domestic homesteading.

The existing rock ford crossing is used by 15-20 landowners to access a subdivision on the opposing side of Showers Creek. Although the stream bed substrate consists of gravel, cobbles and even some large boulders sediment discharge and an increase in

turbidity was observed with every crossing of a vehicle. The installation of this bridge will mitigate all impacts associated with the use of this ford crossing.

B. Physical Characteristics

The reach of Showers Creek which is to be crossed was assessed on April 07, 2017. The following is a description of the physical characteristics of the watercourse within 100' up and downstream of the project site. The wetted channel was measured 40 feet across at the project location and showed uniform width approximately 100' up and downstream of the project. The 100-year peak flow at the site is 2,400 cfs with a prediction error of 44.3 cfs. This results in an expected maximum flow depth of 3.5 feet with a minimum of 15' freeboard to the bridge deck. Distance between the top of the embankments was measured to be approximately 80 feet with the bank slope varying. The western bank slope was measured at approximately 35% and the eastern slope is at least 75%. Stream banks consist of fine silt loam soils, perched fill from prior bridge abutments, and a small percentage of rock substrate and large woody debris (LWD) from the stream bed. Both stream banks, East and West, show signs of erosion. This scour is a result of the exposed fill prism of the past bridge abutments. The channel bed was slightly entrenched (<3') with a low gradient, less than 5%, and low sinuosity. Stream substrate consisted of gravel, cobbles, boulders, and LWD. LWD is the primary source of bank stability with riparian vegetation supplementing. Instream habitat within the project area consisted of primarily low gradient riffle and glide habitat with scattered small pools tailing behind boulders. Stream depth ranged from 0.5 inches to 36 inches throughout the channel bed. The overhead canopy was open along the center of the stream becoming denser up on the banks.

C. Sensitive Species & Habitats

1. Northern Spotted Owl (*Strix occidentalis caurina*)

Status: CDF&G "Species of Special Concern" and Federally Threatened

Key Habitat: Requires mature forest patches with permanent water and suitable nesting trees and snags.

Status within Project Area: The closest NSO activity center is HUM 479 which is approximately 0.7 miles northeast on the opposite side of the Mad River.

Mitigations: None. The crossing location is existing and there shall be no alteration of NSO habitat. No loss of habitat or disturbance impacts shall occur.

2. Coho Salmon (*Oncorhynchus kisutch*)

Status: Federally Threatened and State Candidate

Key Habitat: Coho salmon utilize a variety of freshwater habitats and tolerances and requirements changes with season and age. Each of the four distinct life stages, Adult, Spawning/embryo/alevin, Parr, and Smolt, require specific habitat quality.

Status within Project Area: The crossing is located 2,900 feet above the Mad River, which provides habitat for this species.

Mitigations: This project improves downstream habitat to all fish and amphibian species by lowering sediment yields that are presently occurring by use of the low water crossing

3. Steelhead Trout (*Onchorynchus mykiss*)

Status: Federally Threatened

Key Habitat: Migrating fish requires deep holding pools with cover. Spawn in cool, clear, and well-oxygenated streams. Preferred temperatures are 10-15 degrees C. Juveniles migrate out to sea in 1 to 3 years.

Status within Project Area: The crossing is located 2,900 feet above the Mad River, which provides habitat for this species.

Mitigations: This project improves downstream habitat to all fish and amphibian species by lowering sediment yields that are presently occurring by use of the low water crossing

4. Chinook Salmon (*Oncorhynchus tshawytscha*)

Status: Federally Threatened

Key Habitat: Require pools 1-3 m deep with bedrock bottoms and cover in the form of underwater rocky ledges or large rocks. The pools usually have bubble curtains and shade provided throughout the day. Stream temperatures must be below 27° C. Suitable spawning areas are gravel beds with an optimum mixture of gravel and cobble of mean diameter 1-4 cm with less than 25% under 6.4 mm in diameter.

Status within Project Area: The crossings are located between 500-900 feet above the Mad River, which provides habitat for this species.

Mitigations: This project improves downstream habitat to all fish and amphibian species by lowering sediment yields that are presently occurring by use of the low water crossing

4. Southern Torrent Salamander (*Rhyacotriton variegatus*)

Status: CDF&G "Species of Special Concern"

Key Habitat: Found in coastal forests of northwestern California, relatively common in preferred habitats of cold, well shaded permanent streams and spring seepages within redwood, Douglas-fir, mixed conifer, montane riparian, and montane hardwood-conifer forests.

Status within Project Area: This species is assumed to occur within Showers Creek which is subject to this permit.

Mitigations: The project mitigates existing and potential sediment impacts and therefore is considered restoration for fishery and aquatic resources.

5. Northern Red-Legged Frog (*Rana aurora aurora*)

Status: CDF&G "Species of Special Concern" and Category 2 Candidate for Federal Listing.

Key Habitat: Found in riparian areas and permanent bodies of relatively quiet water such as ponds, pools along streams, reservoirs, springs, lakes and marshes.

Status within Project Area: This species is assumed to occur within Showers Creek which is subject to this permit.

Mitigations: The project mitigates existing and potential sediment impacts and therefore is considered restoration for fishery and aquatic resources.

6. Foothill Yellow-legged Frog (*Rana boylei*)

Status: CDF&G "Species of Special Concern"

Key Habitat: Prefers watercourses with bedload materials composed primarily of sand and gravels while larger rocks are sought out for cover. Regardless of season this ranid frog is

rarely found far from permanent water. Tadpoles require water for at least three to four months while completing aquatic development.

Status within Project Area: This species is assumed to occur within Showers Creek which is subject to this permit.

Mitigations: The project mitigates existing and potential sediment impacts and therefore is considered restoration for fishery and aquatic resources.

7. Tailed Frog (*Ascaphus truei*)

Status: CDF&G "Species of Special Concern"

Key Habitat: Found in riparian areas where there are clear, cold swift-flowing mountain streams; sometimes found near water in damp forests or in more open areas in cold, wet weather. Key habitat component within cold swift-flowing streams are plunge pools and rocky substrates where tadpoles cling to surfaces with large sucker like mouth while eggs are attached to downstream side of rocks.

Status within Project Area: This species is assumed to occur within Showers Creek which is subject to this permit.

Mitigations: The project mitigates existing and potential sediment impacts and therefore is considered restoration for fishery and aquatic resources.

4.0 Project Effects

A. Direct

Direct impacts to the riparian corridor will consist of reductions in large woody debris (LWD) inputs, canopy cover, and a loss of vegetation within the immediate construction area. All of these impacts will occur on insignificant scales relevant to overall riparian and stream value throughout Showers Creek watershed.

The installation of this bridge will require the removal of eight Douglas-fir trees > 8" DBH, four Douglas-fir trees < 8" DBH, two Willows, and 5 Red alders. The removal of these trees will reduce a percentage of indirect canopy cover along the channel. Considering the existing canopy cover over the creek the loss of these trees will have an insignificant impact on temperature control within the riparian corridor. The loss of these trees will also reduce the source of LWD inputs in the immediate area of the bridge installation. However, the majority of trees slated for removal are less than 8" DBH and will not significantly impact LWD inputs along the riparian corridor.

Both approaches will require earth work to remediate their current condition. The western approach will be reconstructed by removing all perched fill from the failed abutment. Old logs remnant from the previous stringer bridge shall be removed. Sound logs may be re-used; otherwise they will be disposed of at the designated spoils site. The eastern approach will have approximately 3' of fill removed from the top. Both stream banks will be contoured to a minimum 1.5:1 slope and rock armored with at least ¼ ton riprap. Riprap shall be built up to a minimum 4' above the stream bed. All materials placed below the high water mark shall not constrict the width of the channel. Abutments shall be constructed of rock, log, or prefabricated materials that will withstand erosion within the watercourse. No native soils will be excavated as a part of this project.

B. Indirect

The risk of indirect impacts to riparian and aquatic resources is primarily related to the potential for sediment delivery. The proposed action involves ground disturbance; thus erosion may increase in the immediate project area on an acute time scale. Construction

timing will minimize the potential for impacts to aquatic habitat: ground-disturbing activities will occur during the dry season/summer period. The completion of the bridge will decrease sediment discharge entering the watercourse overtime due to the remediation of the eroding stream banks and reduced operations of the ford crossing downstream. Drainage structures will be installed on both approaches to prevent sediment from reaching Showers Creek. The loss of riparian vegetation will not significantly affect the buffers ability to filter overland flows. A new road corridor will be graded to reach the western approach. This will result in the loss of native grass species and soil productivity for an approximate 3,360 square feet area north of the bridge construction. This project will not significantly increase sedimentation within the watercourse or impact the riparian buffer's ability to function.

C. Cumulative

The construction of this bridge across Showers Creek will not affect the stream banks ability to manage high flows. This will result in no net loss of floodplain. There is an existing subdivision on the opposite side of Showers Creek which is currently accessed by ford crossing. This area is currently being accessed, used and developed by landowners regardless of the ford crossing. The construction of this bridge is unlikely to increase the frequency of these activities as they have been occurring without the bridge crossing since the most recent THP in 1999. The road leading to the bridge is locked behind a private gate and allows limited access only to those with easement. This bridge will not result in a cumulative increase of human activities or development and will cumulatively reduce environmental impacts in the project area.

5.0 Mitigation and Monitoring

A. Mitigation

The proposed bridge installation will result in direct impacts such as reductions in LWD inputs, overhead canopy cover, and loss of vegetation. Indirect effects will primarily take shape as a decrease in local surface erosion. Although the impacts of this project will be insignificant in affecting the overall function of Showers Creek it will affect the immediate area where construction will take place. These impacts to the project area will be best mitigated by seasonal limitations and implementation of Better Management Practices during operations.

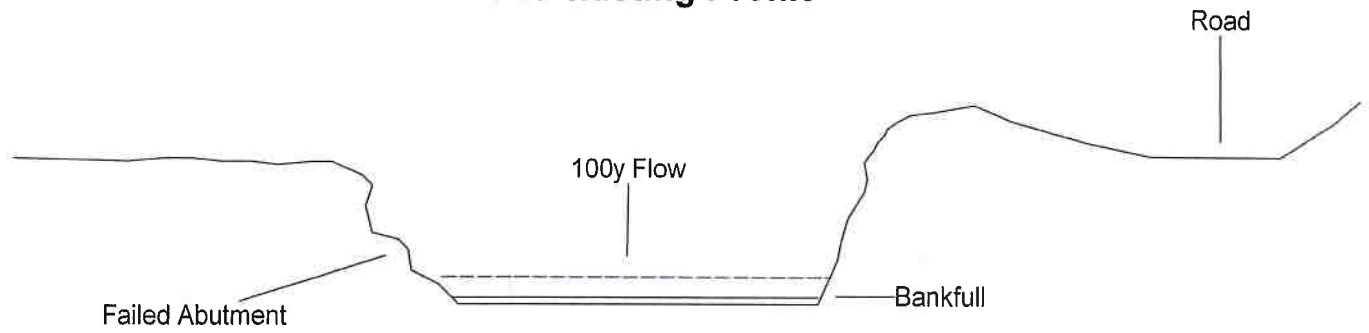
B. Monitoring

The cumulative effects of this project will not adversely impact the riparian corridor's value. However the development in streamside areas can result in the need for further bank protection measures, which can cumulatively degrade instream habitat quality and quantity in a stream. The bridge abutments are not expected to impact the stability of either stream bank. It is suggested that the banks at this location are monitored in the wet season to assure they remain stable. If any instability is observed the abutments shall be rock armored and stabilized.

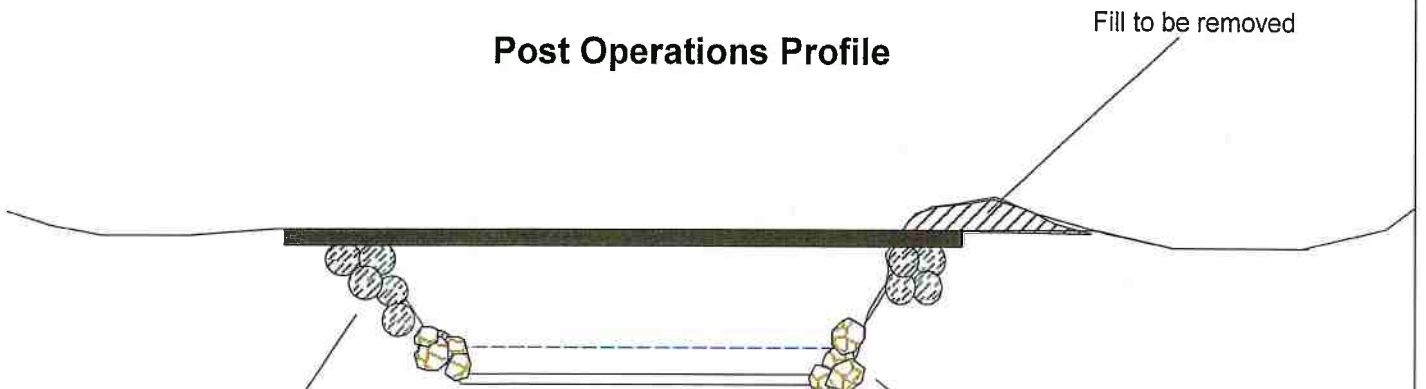
Showers Creek Bridge Diagram

Scale: 1" = 20'

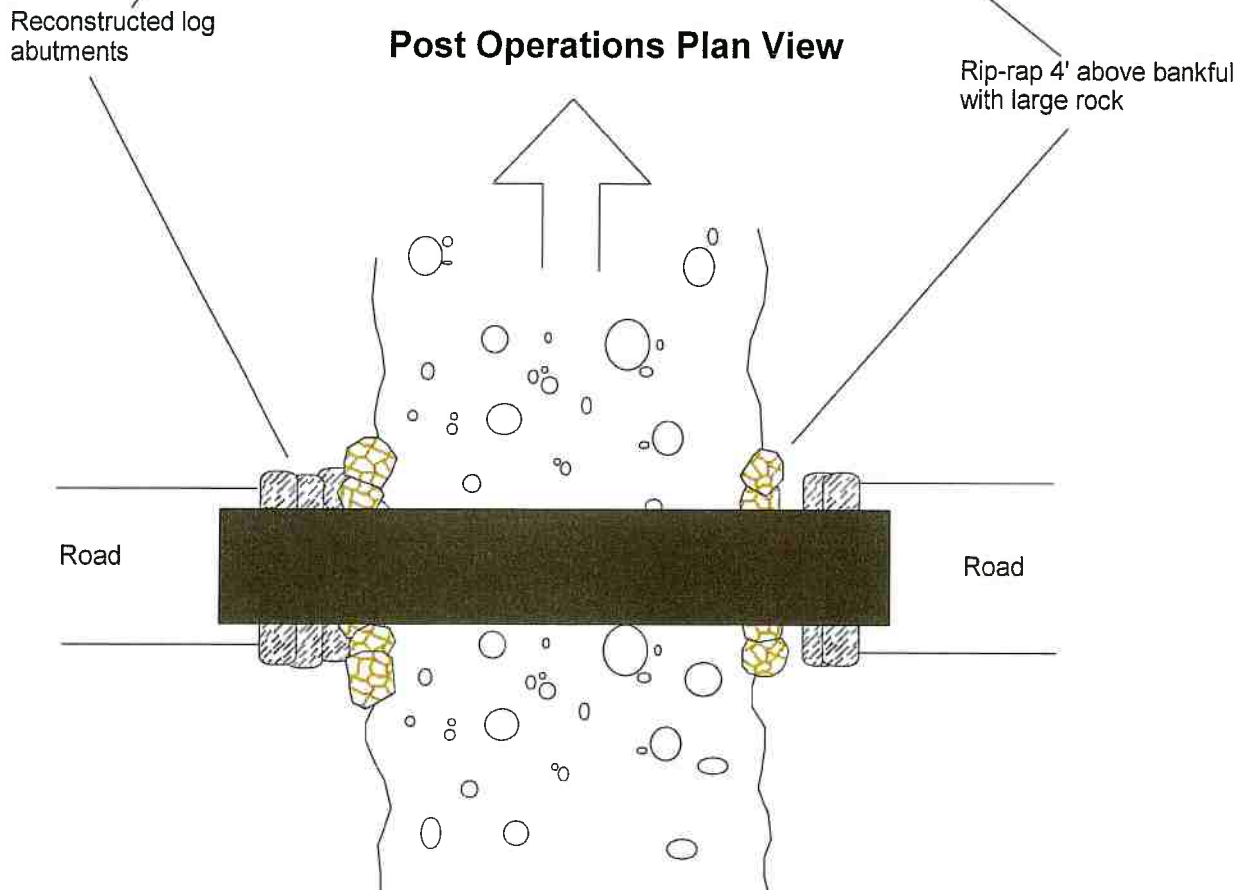
Pre-existing Profile



Post Operations Profile



Post Operations Plan View



6.0 Photographs



Picture 1: This is a photograph facing downstream towards the proposed bridge location. Photo date: 04/07/2017

Photographs



Picture 2: This is a photograph of the western stream bank. Note the log which marks the legacy bridge abutment at the bottom of the bank. Photo date: 04/07/2017

Photographs



Picture 3: This is a photograph of the eastern stream bank. Photo date: 04/07/2017

Photographs



Picture 4: This is a photograph of the western approach looking towards Showers Creek. A road surface will be graded through this small meadow. Vegetation seen in the center of this photograph will be removed as a part of the project. Photo date: 04/07/2017

Photographs



Picture 5: This is a photograph of eastern approach looking towards Showers Creek. This road will continue through the Douglas-fir trees straight to the proposed bridge installation. Photo date: 04/07/2017

Photographs



Picture 6: This is a photograph of the existing rock ford crossing downstream of the project area. Turbidity can be seen in the photo from recent vehicle traffic. The completion of the bridge installation will negate the use of this crossing. Photo date: 04/07/2017

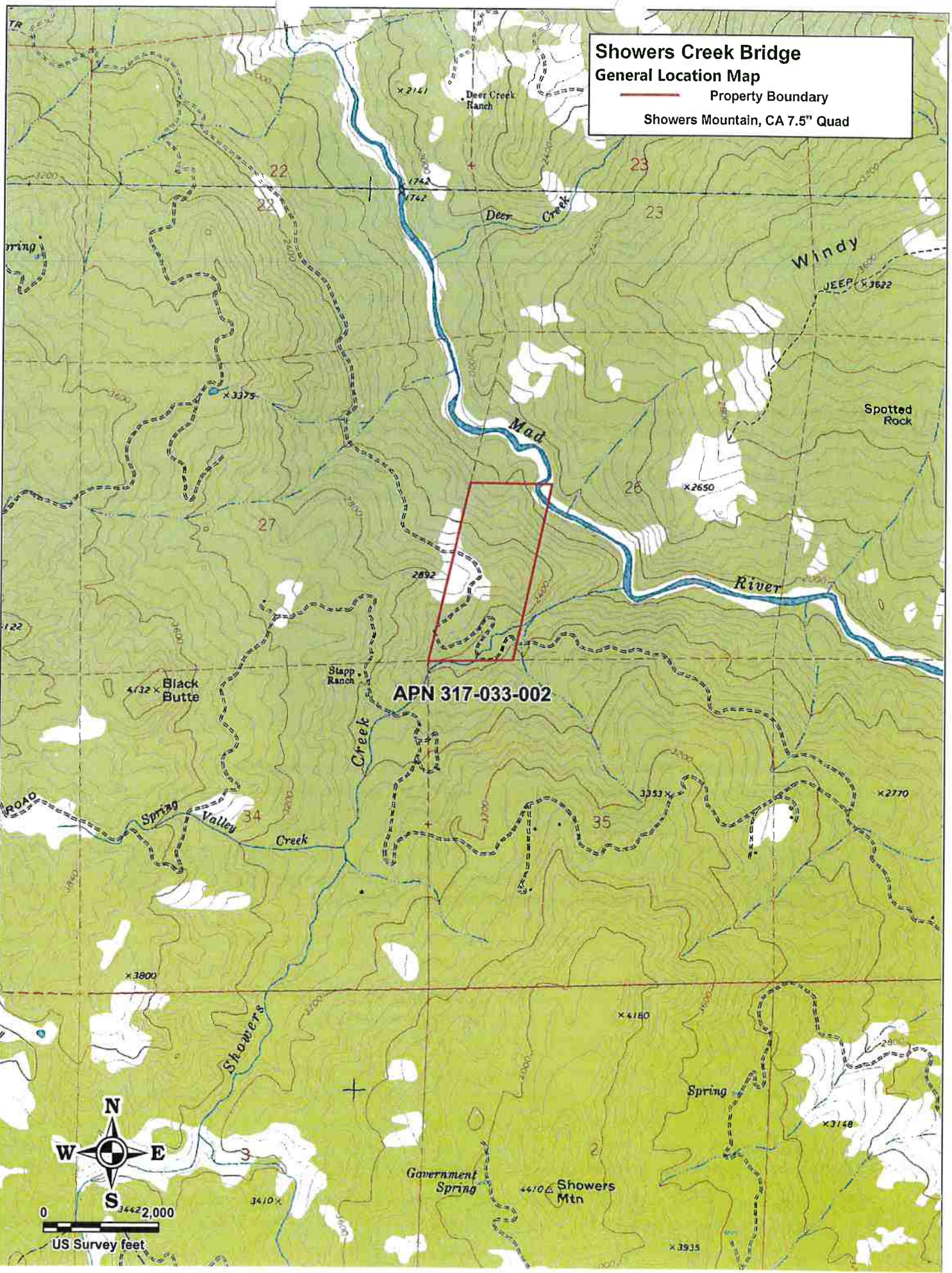
Showers Creek Bridge

General Location Map

Property Boundary

Showers Mountain, CA 7.5" Quad

APN 317-033-002



APN 317-033-002



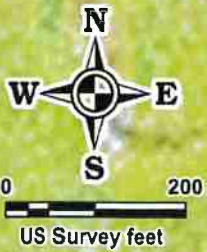
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US Survey feet

**Showers Creek Bridge
2016 DOQ Site Map**






- Property Boundary
- Stapp Road
- Proposed Bridge
- Showers Creek (Class I)
- Class III Tributary

Showers Mountain, CA 7.5" Quad

APN 317-033-002



**Showers Creek Bridge
USGS Site Map**

-  Property Boundary
-  Stapp Road
-  Proposed Bridge
-  Showers Creek (Class I)
-  Class III Tributary

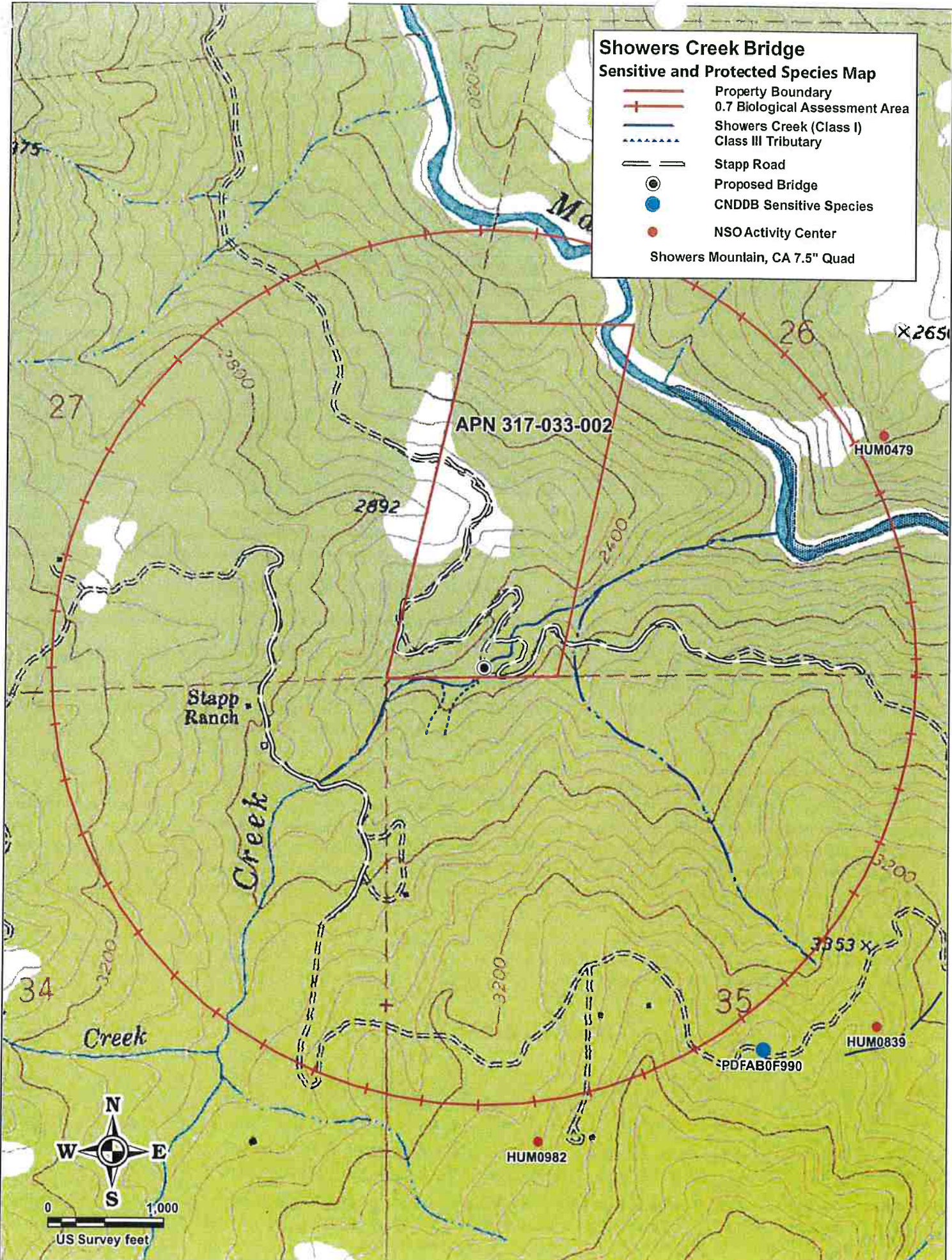
Showers Mountain, CA 7.5" Quad

Showers Creek Bridge

Sensitive and Protected Species Map

- Property Boundary
- 0.7 Biological Assessment Area
- Showers Creek (Class I)
- Class III Tributary
- Stapp Road
- Proposed Bridge
- CNDBB Sensitive Species
- NSO Activity Center

Showers Mountain, CA 7.5" Quad



7.0 References

Section III, Showers Creek THP, 1-99-417-HUM

Spence, B.C., G.A. Lomnický, R.M. Hughes and R.P. Novitzki. 1996. *An Ecosystem Approach to Salmonid Conservation*. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, OR.

United States Geological Survey. April 26th, 2017. *StreamStats Report for Showers Creek, CA*. Retrieved from <http://streamstatsags.cr.usgs.gov/streamstats/>