

CATALOG OF SONOMA COUNTY STREAM CROSSINGS WITH CULVERTS LOCATED ON FISH-BEARING STREAM REACHES WITHIN THE RUSSIAN RIVER BASIN

By
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NOTE: This catalog contains two pages for each crossing inventoried. The first page consists of location information, site-specific data, habitat notes, and a map. The second page has inlet and outlet photographs, with the inlet photo on the top and the outlet photo on the bottom. Because all inventoried sites were located within the Russian River, they are generally ordered from south to north in an upstream direction, and from lowermost to uppermost road/stream intersection within within any given sub-watershed.



Site ID# S-001: Unnamed Tributary/Willow Creek Road; Willow Creek; Russian River **Road Ownership** County

County Ranking: #44 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 70015; County Map Sheet #3J45. USGS Quad: Duncans Mills. T7N, R11W. Lat/Long: 38° 25' 27.67" 123° 03' 5.42" Milepost = 3.9 miles to Highway 1.

Culvert Type: Circular, Concrete. **Corrugations:** None. **Dimensions:** diameter = 6.0' **Length:** 64.8'

Slope: 2.47% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.3'

Fill Estimate: 253 cubic yards. **Overall Condition:** Good.

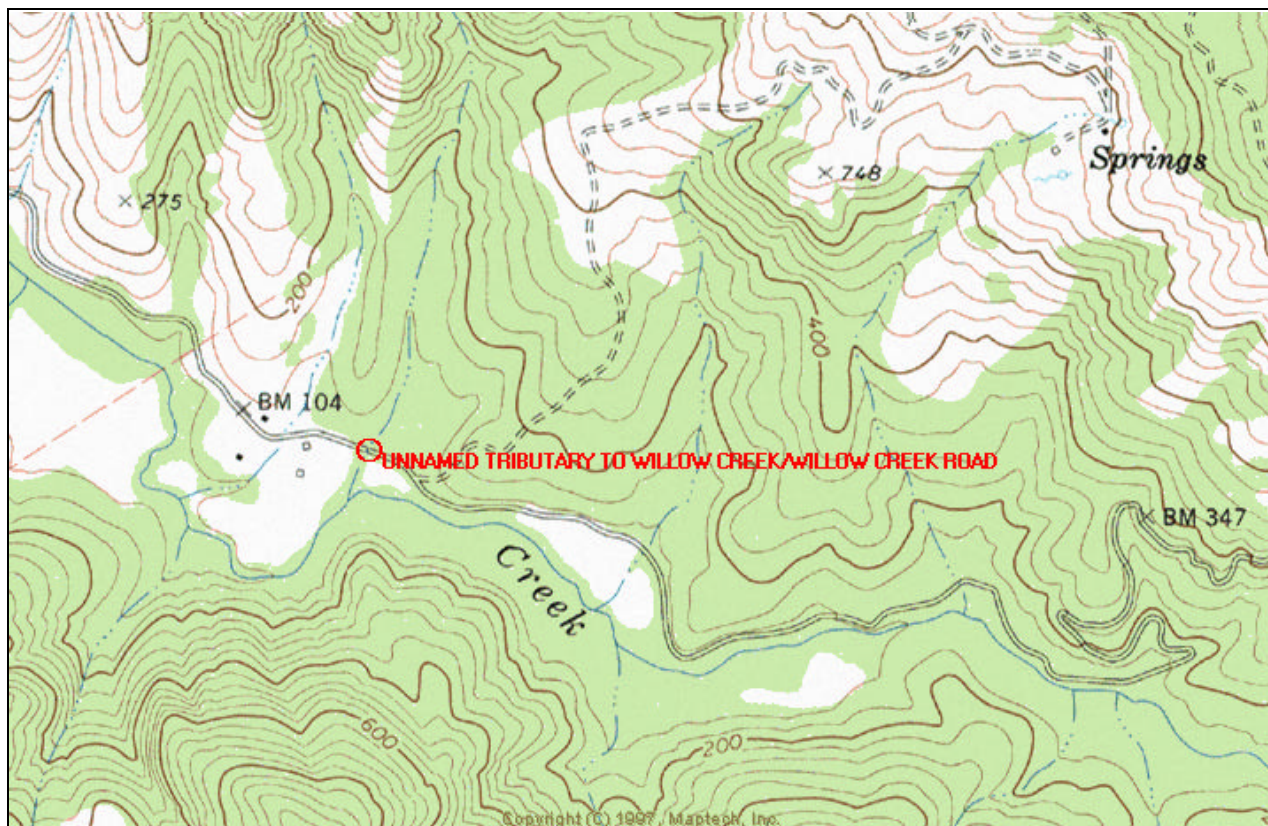
Sizing: Adequately sized; HW/D = 1 on a storm flow with approximately an 84-year recurrence interval. Willow Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing estimated this crossing meets the 8-16-16 passage criteria for adult steelhead on 35% of the range of migration flows and fails to meet criteria for all age classes of juveniles. There is a lack-of-depth for adults on lower migration flows and also excessive velocities on most flows for juveniles.

Additional Stream Crossings: Downstream = (~ 1.55, 2.69, and 3.59 miles) three bridges on mainstem of Willow Creek. Upstream = none were evident within the fish-bearing stream reach on the USGS topographic map.

Habitat: Quantity = approximately 2,050' of potential fish-bearing habitat upstream of #S-001. Quality = rated as "fair" by CDFG (Coey, pers. comm.). No current habitat typing or fisheries surveys were available for this unnamed tributary of Willow Creek. The crossing was surveyed by Taylor and Assoc. on 1/17/02 at 1:30PM, the water temp = 7°C and the water temp = 10°C. The culvert survey crew described the habitat near the crossing as "fair" with a dense riparian zone of conifers and hardwoods. At the time of the survey there was conituous flow in the channel, yet no fish were observed.

Preferred Treatment: When needed, replace with a properly-sized open-bottom arch or a bridge.





Site ID# S-002: Kohute Gulch/Austin Creek Road; Austin Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #20 = Moderate-Priority **Basin-wide Ranking:** Tied for #26 = Moderate-Priority

Location: Road ID# 7101; County Map Sheet #3J45. USGS Quad: Duncans Mills. T7N, R11W, Section 2.
Lat/Long: 38° 29' 1.05" 123° 03' 9.42" Milepost = 11.3

Culvert Type: Pipe Arch, Concrete. **Corrugations:** None. **Dimensions:** 4.9' rise x 7.3' span **Length:** 36.5'
Slope: 1.95% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.0'

Fill Estimate: 221 cubic yards. **Overall Condition:** Good.

Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. Austin Creek Road is overtopped on approximately a nine-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 18% of the range of migration flows and fails to meet criteria for all age classes of juveniles. There is a lack-of-depth for adults on lower migration flows and also excessive velocities on most flows for juveniles.

Additional Stream Crossings: Downstream = none indicated on the USGS topographic map, approximately 900' to the confluence with Austin Creek. Upstream = none evident within the fish-bearing stream reach on the USGS topographic map.

Habitat: Quantity = approximately 3,000' of potential fish-bearing habitat upstream of Site ID# S-002. Quality = rated as "good" for the ranking matrix by CDFG (Coe, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/07/01 at 8:40AM and the channel was dry. The culvert survey crew described the habitat near the crossing as "fair" with a dense riparian zone of conifers and hardwoods. The crew talked to a local who said upstream landowners had moved channel with heavy equipment and were also logging which had caused increased erosion and aggradation.

Preferred Treatment: Because the current culvert is extremely undersized a full replacement is the only option to improve fish passage and increase storm flow conveyance. Replace with a properly sized open-bottom arch on concrete footings or with a bridge.





Site ID #S-003: Pole Mountain Creek/Fort Ross Road; Ward Creek; Austin Creek; Russian River

Road Ownership: County

County Ranking: Tied for #16 = Moderate-Priority **Basin-wide Ranking:** Tied for #21 = Moderate-Priority

Location: Road ID# 8102C; County Map Sheet #3J, 3K. USGS Quad: Fort Ross. T8N, R12W, Section 13.
Lat/Long: 38° 31' 52.04" 123° 08' 12.25" Milepost = 3.1 miles to Cazadero Highway.

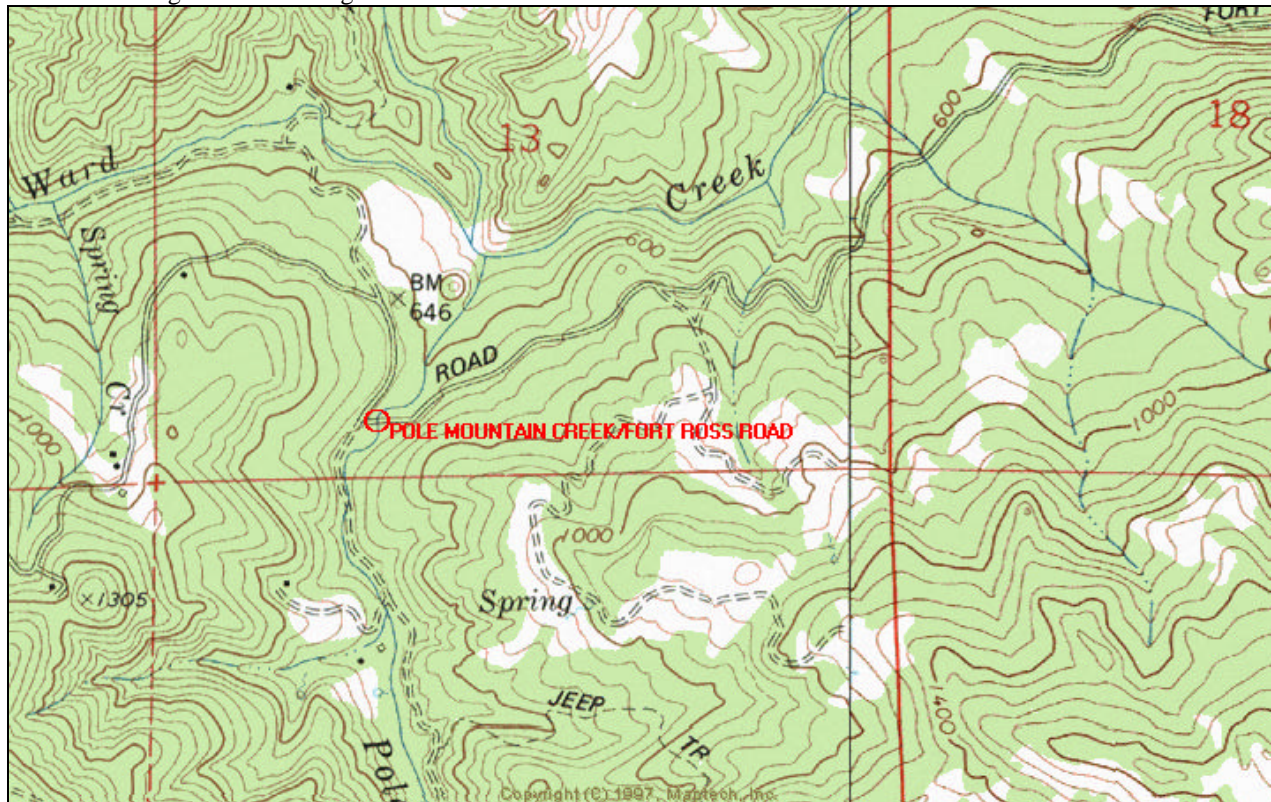
Culvert Type: Two Circular Pipes, SSP. **Corrugations:** 6" x 2" **Dimensions:** diameters = 9.0' **Lengths:** 76.6'
Slopes: LB pipe = 0.05%; RB pipe = 0.38% **Modifications:** None. **Rustline Height:** LB = 2.2'; RB = 2.0'
Average Active Channel Width: 12.4' **Fill Estimate:** 1,037 cubic yards. **Overall Condition:** Rusted through.
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 32-year recurrence interval. Fort Ross Road is overtopped on more than a 250-year storm flow.

Barrier Status: Both pipes =**GRAY**: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 50% of the range of estimated migration flows and fails to meet passage criteria all age classes of juveniles. For adults, the perched outlets are leap barriers until stream discharge is greater than 50 c.f.s.

Additional Stream Crossings: Downstream = none indicated on the USGS topographic map, approximately 900' to the confluence with Austin Creek. Upstream = (~ 800') to private bridge, (~1,650') to private bridge, and (~6,400') to a third private bridge. All private sites identified as bridges by CDFG's habitat typing survey.

Habitat: Quantity = approximately 7,900' of potential fish-bearing habitat upstream of Site ID# S-003. Quality = rated as "fair" for the ranking matrix (quality score = 0.58) as determined by CDFG's 1996 habitat typing survey. The habitat survey noted two partial migration barriers downstream of Fort Ross Road, two natural falls with drops of five to seven feet. The crossing was surveyed by Taylor and Assoc. on 8/06/01 at 5PM and the air temp = 20°C and the water temp = 17°C. The culvert survey crew described the habitat as "good" and noted a dense riparian canopy of hardwoods and conifers. Young-of-year and 1+ juvenile salmonids were observed upstream and downstream of the crossing in moderate abundance (10 to 50 fish).

Preferred Treatment: Because both culverts are in poor condition with completed rusted-through inverts, a full replacement is the best long-term option to improve fish passage. Replace with a properly sized open-bottom arch on concrete footings or with a bridge.





Site ID #S-004: Tyrone Gulch/Tyrone Road; Dutch Bill Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #47 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 70043; County Map Sheet #4J41. USGS Quad: Camp Meeker. T7N, R10W, Section 19.
Lat/Long: 38° 26' 53.80" 122° 59' 57.40" Milepost = 0.2 miles to Main Street.

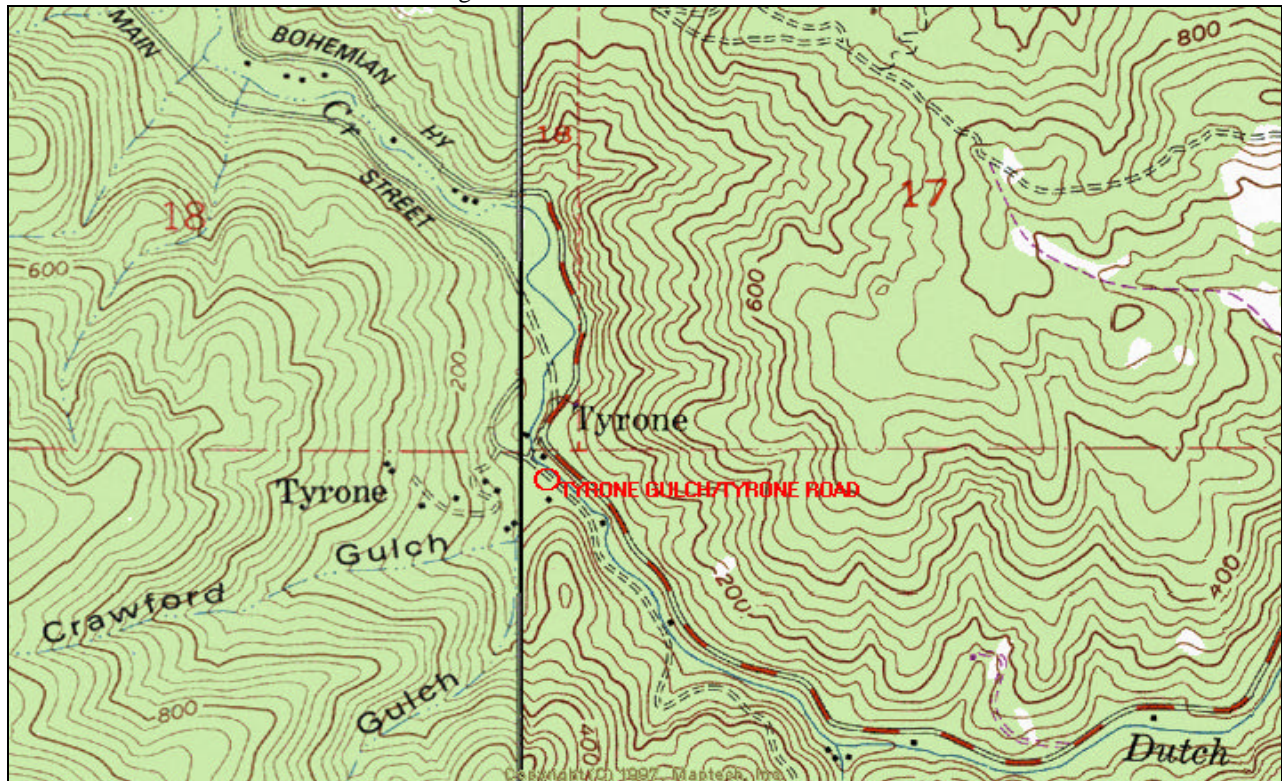
Culvert Type: Two Circular Pipes, CSP. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** LB pipe diameter = 3.5'; RB pipe diameter = 3.0' **Lengths:** LB pipe = 40.2'; RB pipe = 30.3' **Slopes:** LB pipe = 4.60%; RB pipe = 5.12% **Modifications:** None. **Rustline Height:** LB = 0.6'; RB = 1.2' **Average Active Channel Width:** 7.5' **Fill Estimate:** 111 cubic yards. **Overall Condition:** Abraded. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval. Tyrone Road is overtopped on approximately a five-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined the RB culvert fails to meet passage criteria for adult steelhead and all age classes of juveniles due to the steep slope. **GRAY:** FishXing determined the LB culvert meets the 8-16-16 ft/sec passage criteria for adult steelhead on 89% of the range of estimated migration flows and fails to meet passage criteria all age classes of juveniles.

Additional Stream Crossings: Downstream = none indicated on the USGS topographic map, less than 100' to the confluence with Dutch Bill Creek. Upstream = none indicated on the USGS topographic map within the fish-bearing stream reach.

Habitat: Quantity = approximately 1,050' of potential fish-bearing habitat upstream of Site ID# S-004. Quality = rated as "good" for the ranking matrix (quality score = 0.79) as determined by CDFG's 1996 habitat typing survey of 1,640 feet of channel. The crossing was surveyed by Taylor and Assoc. on 8/07/01 at 12:00PM and the air temp = 23°C and the water temp = 15°C. The culvert survey crew described the habitat as "good" and noted a dense riparian canopy of hardwoods and conifers. Several young-of-year juvenile salmonids were observed upstream of the crossing. There was continuous flow in the channel upstream of Tyrone Road, but went sub-surface at the crossing.

Preferred Treatment: Because both culverts are extremely undersized and the inverts are starting to rust-through, this crossing is probably due for a full replacement. Replace with a properly sized open-bottom arch on concrete footings or with a bridge. The limited reach of upstream salmonid habitat makes this site a poor candidate for treatment with fisheries restoration funding.





Site ID #S-005: Devoul Creek/Bohemian Highway; Dutch Bill Creek; Russian River **Road Ownership:** County

County Ranking: Tied #54 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 6002D; County Map Sheet #4J41. USGS Quad: Camp Meeker. T7N, R10W, Section 21.
Lat/Long: 38° 26' 34.45" 122° 58' 28.41" Milepost = 2.2 miles to Tyrone Road.

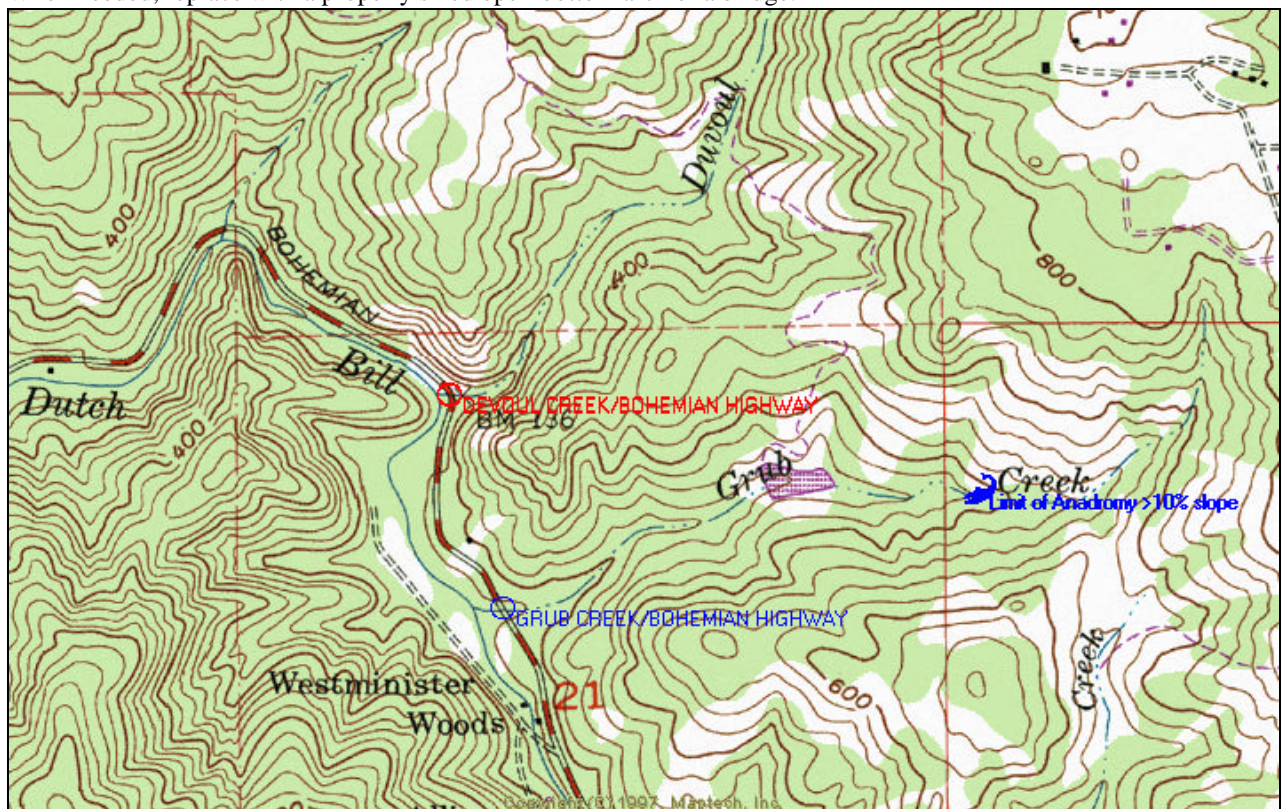
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.1' height x 6.0' width **Length:** 66.8'
Slope: 3.10% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 7.9'
Fill Estimate: 867 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a seven-year recurrence interval. The Bohemian Highway is overtopped on more than a 250-year flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 80% of the range of estimated migration flows, meets passage criteria for resident/2+ juveniles on 20% of the range of estimated migration flows, and fails to meet passage criteria for 1+/young-of-year juveniles. Actual passage of adults and older juveniles may be higher than predicted because the main violation was lack-of-depth.

Additional Stream Crossings: Downstream = none indicated on the USGS topographic map, less than 100' to the confluence with Dutch Bill Creek. Upstream = none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: Quantity = approximately 800' of potential fish-bearing habitat upstream of Site ID# S-005, channel slope exceeds 10% at limit of anadromy. Quality = rated as "fair" for the ranking matrix (quality score = 0.61) as determined by CDFG's 1997 habitat typing survey of 750 feet of channel. Pools suitable for rearing were scarce and comprised only 18% of the length of habitat surveyed. The crossing was surveyed by Taylor and Assoc. on 8/07/01 at 1:00PM and the air temp = 25°C and the water temp = 16.5°C. The culvert survey crew described the habitat as "fair" and noted a moderately dense riparian canopy of hardwoods and brush. Numerous young-of-year salmonids were observed upstream and downstream of the crossing.

Preferred Treatment: None recommended because the current box culvert provides adequate passage. However, the crossing is sized to overtop on less than a 10-year storm flow. Periodically inspect for condition and maintenance. When needed, replace with a properly sized open-bottom arch or a bridge.





Site ID #S-006: Grub Creek/Bohemian Highway; Dutch Bill Creek; Russian River **Road Ownership:** County

County Ranking: #43 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 6002D; County Map Sheet #4J41. USGS Quad: Camp Meeker. T7N, R10W, Section 21.
Lat/Long: 38° 26' 19.16" 122° 58' 23.83" Milepost = 2.5 miles to Tyrone Road.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.0' height x 6.0' width **Length:** 85.2'
Slope: 1.36% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.6'
Fill Estimate: 1,108 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 135-year recurrence interval. The Bohemian Highway is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 43% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juveniles. Actual passage of adults and older juveniles may be higher than predicted because the main violation was lack-of-depth.

Additional Stream Crossings: Downstream = none indicated on the USGS topographic map, less than 100' to the confluence with Dutch Bill Creek. Upstream = none indicated on the USGS topographic map within the fish-bearing stream reach.

Habitat: Quantity = approximately 4,000' of potential fish-bearing habitat upstream of Site ID# S-006, channel slope exceeds 10% at limit of anadromy. Quality = rated as "fair" for the ranking matrix (quality score = 0.45) as determined by CDFG's 1997 habitat typing survey of 6,200 feet of channel. Pools suitable for rearing were scarce and comprised only 4% of the length of habitat surveyed. The crossing was surveyed by Taylor and Assoc. on 8/08/01 at 12:45PM and there were isolated pools of surface water - the air temp = 24°C and the water temp = 16°C. The culvert survey crew described the habitat as "fair" and noted a moderately dense riparian canopy of hardwoods and brush. No fish were observed in the isolated pools.

Preferred Treatment: Because the current box culvert is sized to pass more than a 100-year storm flow, a retrofit is recommended to improve fish passage. Two or three boulder weirs downstream of the crossing will raise tail-water elevation and corner baffles within the box culvert will increase depths and decrease velocities.





Site ID #S-007: Dutch Bill Creek #1/Market Street; Russian River **Road Ownership:** County

County Ranking: #5 = High-Priority

Basin-wide Ranking: #5 = High-Priority

Location: Road ID# 70037; County Map Sheet #4J41. USGS Quad: Camp Meeker. T7N, R10W, Section 27.
Lat/Long: 38° 25' 30.00" 122° 57' 29.91" Milepost = 10.26

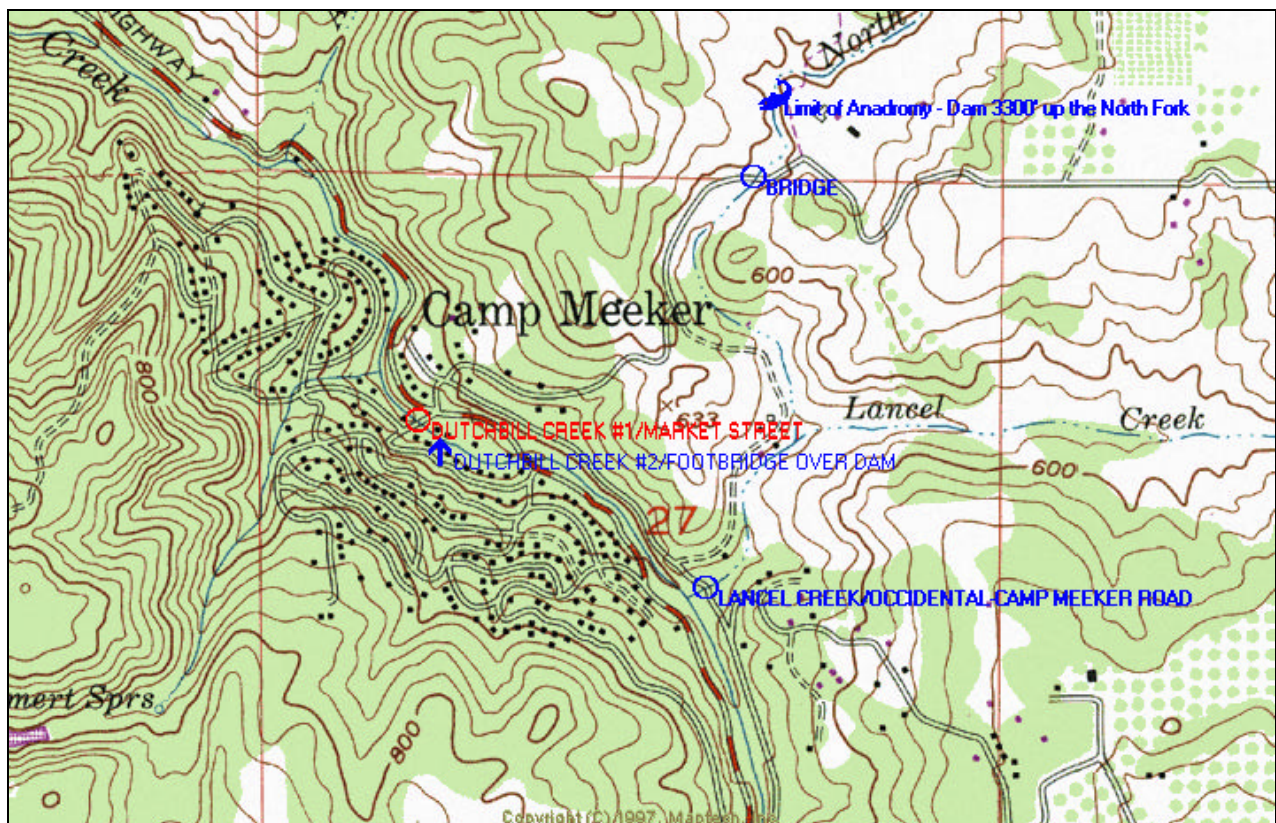
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 12.1' height x 25.0' width
Length: 98.5' **Slope:** 1.37% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 12.1'
Fill Estimate: 4,783 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Market Street is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for all species of adult salmonids and all age classes of juveniles due to the extremely perched outlet (~ 5 feet).

Additional Stream Crossings: Downstream = nine bridges and three splash-board dams were identified during CDFG's 1997 habitat typing survey. Upstream = (~ 200') to Site ID #S-008.

Habitat: Quantity = approximately 18,000' of potential fish-bearing habitat upstream of Site ID# S-007. Quality = rated as "fair" for the ranking matrix (quality score = 0.57) as determined by CDFG's 1997 habitat typing survey of approximately 40,000 feet of mainstem channel. CDFG considers Dutch Bill Creek a high-priority tributary to the Russian River because of the current presence of coho salmon. The crossing was surveyed by Taylor and Assoc. on 10/09/01 at 2:15PM and there were isolated pools of surface water - the air temp = 13°C and the water temp = 10.5°C. The culvert survey crew described the habitat as "fair" and noted a moderately dense riparian canopy of hardwoods, conifers, and brush. A single young-of-year salmonid was observed in an isolated pool upstream of the box culvert.

Preferred Treatment: Because the current box culvert is sized to pass more than a 250-year storm flow, a retrofit is recommended to improve fish passage. Consider the feasibility of constructing a series of eight to ten concrete weirs attached to the culvert's outlet, designed to function as a fishway. It may be appropriate to divert lower flows into one of the bays with a weir across the inlet of one of the bays. Concrete weirs (sloped with v-notch) within the box culvert will increase depths and decrease velocities. Due to the complexity of the project, the County should consult with CDFG and NMFS hydraulic engineers with assistance in the retrofit's design.





Site ID #S-008: Dutch Bill Creek #2/Footbridge over Dam; Russian River **Ownership:** County

County Ranking: #2 = High-Priority

Basin-wide Ranking: #2 = High-Priority

Location: County Map Sheet #4J41. USGS Quad: Camp Meeker. T7N, R10W, Section 27. Lat/Long: 38° 25' 28.94" 122° 57' 27.87" Milepost = 0.05 miles to Bohemian Highway.

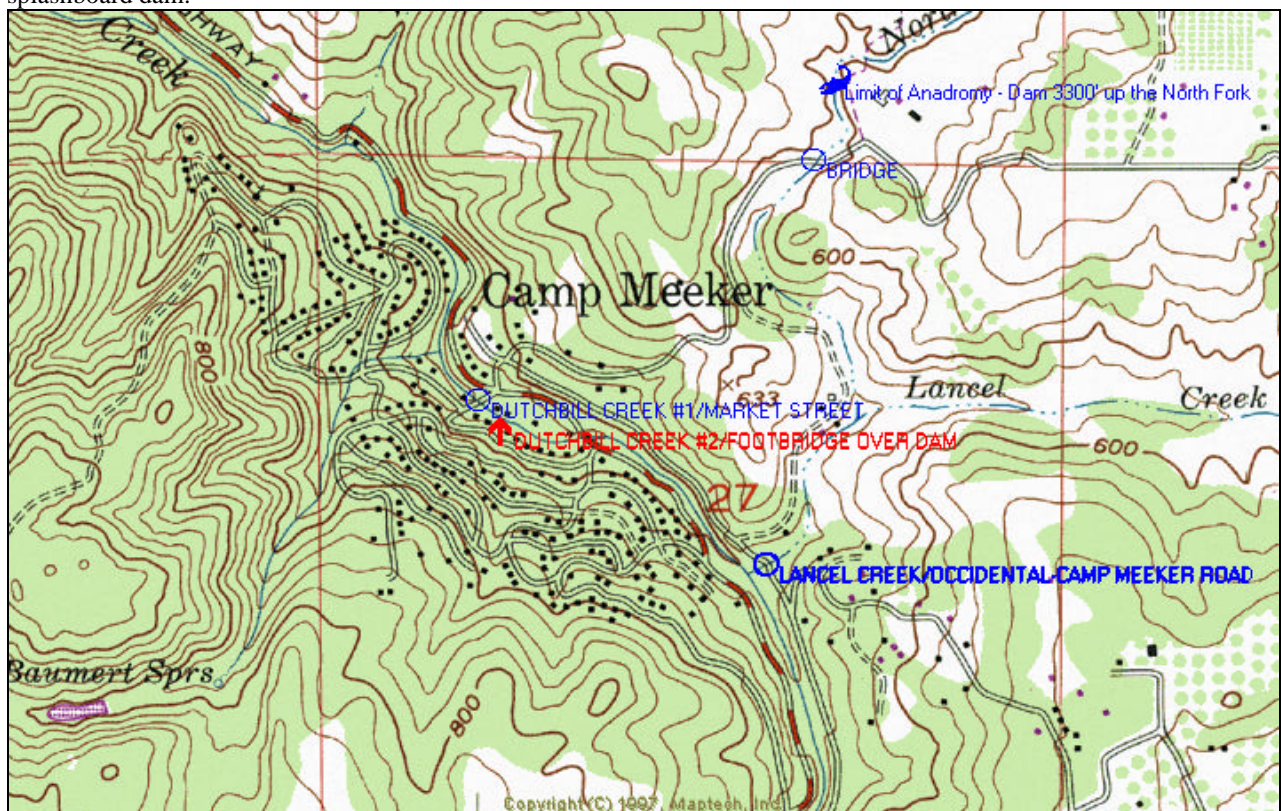
Culvert Type: Splashboard Dam, Concrete. **Corrugations:** None. **Dimensions:** 11.8' height x 6.0' width
Length: 11.6' **Slope:** 3.71% **Modifications:** Four notched concrete weirs after outlet. **Rustline Height:** N/A
Average Active Channel Width: 25.8' **Fill Estimate:** 1,097 cubic yards. **Overall Condition:** Good.
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 10-year recurrence interval. The dam is overtopped on approximately an 18-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for all species of adult salmonids and all age classes of juveniles due to the perched outlet. It is probable that some adult steelhead and coho are able to negotiate the three-foot high leap over the lowermost weir.

Additional Stream Crossings: Downstream = (~200') to Site ID #S-007 and nine bridges and three splash-board dams were identified during CDFG's 1997 habitat typing survey. Upstream = none indicated on the USGS map or identified by the CDFG habitat typing survey.

Habitat: Quantity = approximately 17,800' of potential fish-bearing habitat upstream of Site ID# S-008. Quality = rated as "fair" for the ranking matrix (quality score = 0.57) as determined by CDFG's 1997 habitat typing survey of approximately 40,000 feet of mainstem channel. CDFG considers Dutch Bill Creek a high-priority tributary to the Russian River because of the current presence of coho salmon. The crossing was surveyed by Taylor and Assoc. on 2/07/02 at 11:15AM and there was a continuous flow of surface water - the air temp = 10°C and the water temp = 8°C. The culvert survey crew described the habitat as "fair" and noted a moderately dense riparian canopy of hardwoods, conifers, and brush. No fish observed in the channel adjacent to Site ID #S-008.

Preferred Treatment: The interim treatment should be the construction of two more concrete weirs below the third existing weir so that all leaps are no more than one foot in height. County should consider removal of the dam as the best long-term solution to provide unimpeded fish passage. Consider treatment of Dutch Bill #1 prior to treating this splashboard dam.



Site ID #S-008: Dutch Bill Creek #2/Footbridge over Dam; Russian River



Site ID #S-009: Lancel Creek/Occidental Camp -Meeker Road; Dutch Bill Creek; Russian River **Road Ownership:** County

County Ranking: #4 = High-Priority

Basin-wide Ranking: #4 = High-Priority

Location: Road ID# 70013; County Map Sheet #4J41. USGS Quad: Camp Meeker. T7N, R10W, Section 27. Lat/Long: 38° 25' 18.45" 122° 57' 4.26" Milepost = 0.1 miles to Acreage Lane.

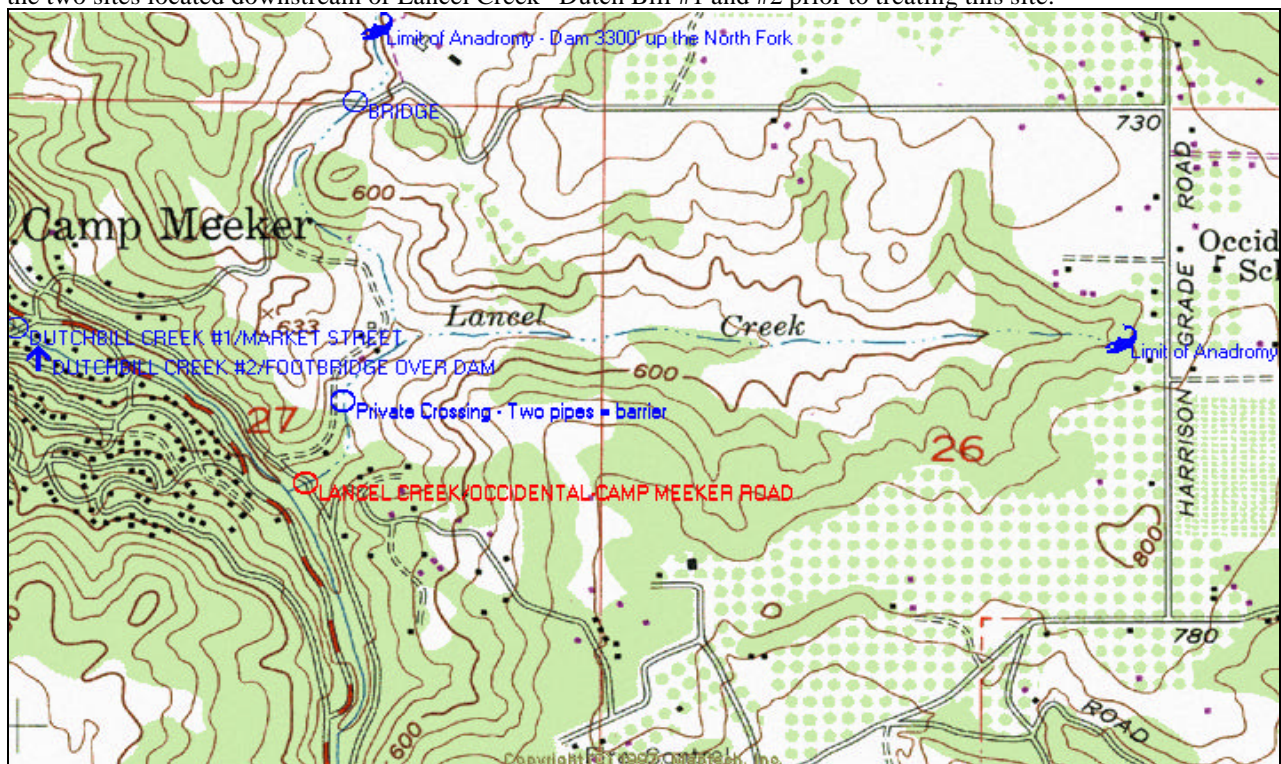
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 8.0' height x 8.0' width **Length:** 63.7' **Slope:** 1.84% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 12.8' **Fill Estimate:** 799 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 29-year recurrence interval. Occidental Camp -Meeker Road is overtopped on more than a 250-year storm flow.

Barrier Status: GRAY: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 13% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juveniles. For adults, lack-of-depth is the only violation of the passage criteria, whereas for all age classes of juveniles the primary violation of the criteria is excessive velocities.

Additional Stream Crossings: Downstream = (~200') to Site ID #S-007 and nine bridges and three splash-board dams were identified during CDFG's 1997 habitat typing survey. Upstream = (~700') to private crossing of two pipes that CDFG identified as a barrier and (~3,300') to an impassable dam/reservoir on private property.

Habitat: Quantity = approximately 12,250' of potential fish-bearing habitat upstream of Site ID# S-009. Quality = rated as "fair" for the ranking matrix (quality score = 0.53) as determined by CDFG's 1997 habitat typing survey of approximately 7,200 feet of channel. CDFG survey noted evidence of cattle within the riparian zone and stream channel, especially in North Fork Lancel Creek. The crossing was surveyed by Taylor and Assoc. on 8/07/01 at 3:45PM and there were isolated areas of surface water - the air temp = 20°C and the water temp = 14°C. The culvert survey crew described the habitat as "fair" and noted a moderately dense riparian canopy of mostly hardwoods. No fish observed in the outlet pool downstream of Site ID #S-009.

Preferred Treatment: Consider the construction of two downstream boulder weirs to raise tail-water elevation. Corner baffles within the culvert would increase depths and decrease velocities, however consider the potential impacts of the reduction of storm flow conveyance through a moderately undersized culvert. Consider treatment of the two sites located downstream of Lancel Creek - Dutch Bill #1 and #2 prior to treating this site.





Site ID #S-010: Mission Creek #1/Camino Del Arroyo; Hubert Creek; Russian River **Road Ownership:** Private

County Ranking: #6 = High-Priority

Basin-wide Ranking: #6 = High-Priority

Location: County Map Sheet #3J35. USGS Quad: Cazadero. T8N, R11W, Section 25. Lat/Long: 38° 30' 14.03" 123° 01' 43.17" Milepost = 0.05 miles to Old Cazadero Road.

Culvert Type: Circular, Concrete. **Corrugations:** None. **Dimensions:** diameter = 5.4' **Length:** 48.1' **Slope:** 1.60% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.0' **Fill Estimate:** 384 cubic yards. **Overall Condition:** Abraded.

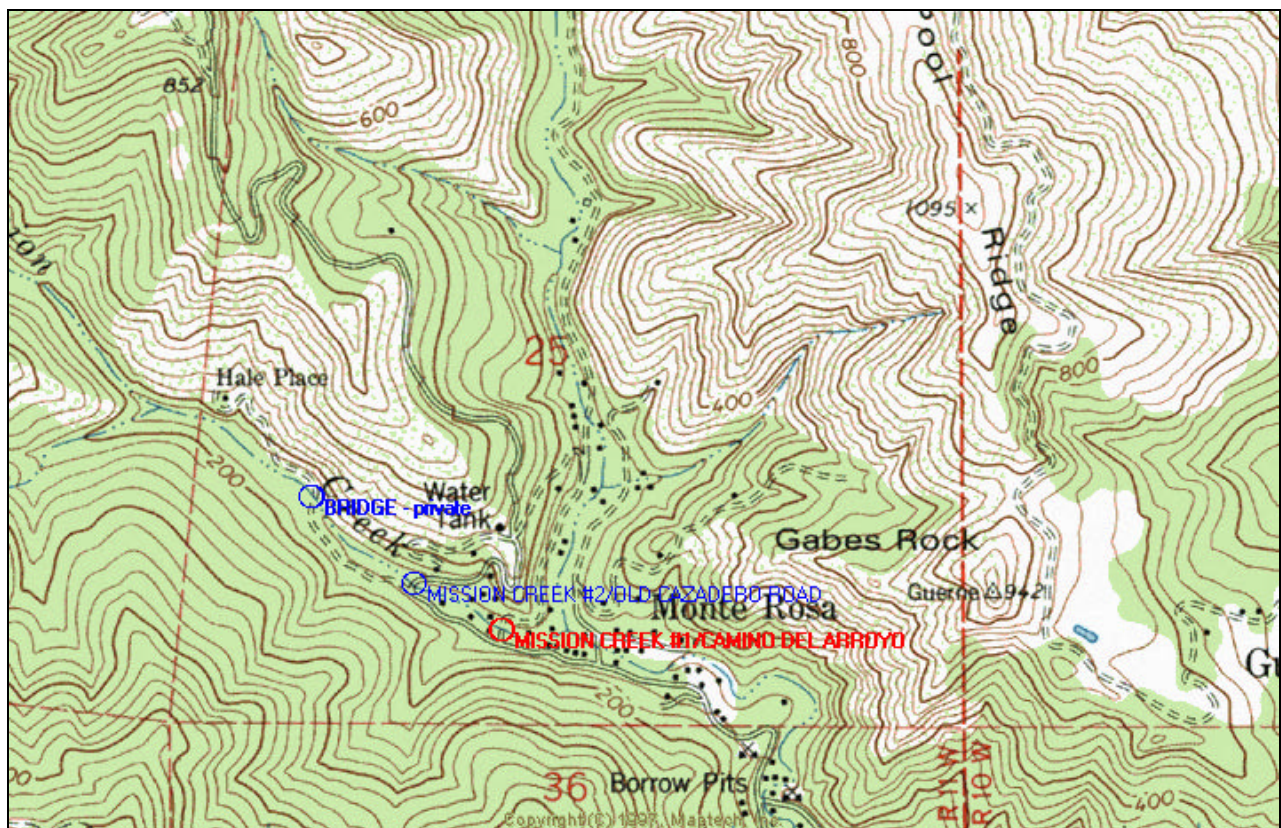
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a four-year recurrence interval. Camino Del Arroyo is overtopped on approximately a 23-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for all species of adult salmonids on 42% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juveniles. The main violation in passage criteria for all age classes of salmonids is excessive velocities.

Additional Stream Crossings: Downstream = (~900') to bridge crossing on Hulburt Creek and (~4,000') to second bridge crossing on Hulburt Creek. Upstream = (~900') to Site ID #S-011 and (~2,100') to a bridge on private property.

Habitat: Quantity = approximately 9,150' of potential fish-bearing habitat upstream of Site ID# S-010. Quality = rated as "fair" for the ranking matrix by CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/08/01 at 10:00AM and the channel was dry. The culvert survey crew described the habitat as "fair" and noted a moderately dense riparian canopy of mostly hardwoods. CDFG and NMFS list Mission Creek as historically supporting runs of coho salmon.

Preferred Treatment: A full replacement with an open-bottom arch or a bridge is the only feasible option for improving fish passage at this site because the current crossing is extremely undersized. Due to the potential effects of headwall cutting when the new crossing is installed, the County should consider the use of grade control weirs to minimize the impacts of potentially rapid and severe downcutting of the upstream channel.





Site ID #S-011: Mission Creek #2/Old Cazadero Road; Hubert Creek; Russian River **Road Ownership:** County

County Ranking: #8 = High-Priority

Basin-wide Ranking: #8 = High-Priority

Location: Road ID# 80110; County Map Sheet #3J35. USGS Quad: Cazadero. T8N, R11W, Section 25. Lat/Long: 38° 30' 17.37" 123° 01' 50.90" Milepost = 1.7 miles to Highway 116.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 8.0' height x 16.1' width **Length:** 66.9'
Slope: 1.27% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 9.3'
Fill Estimate: 311 cubic yards. **Overall Condition:** Good.

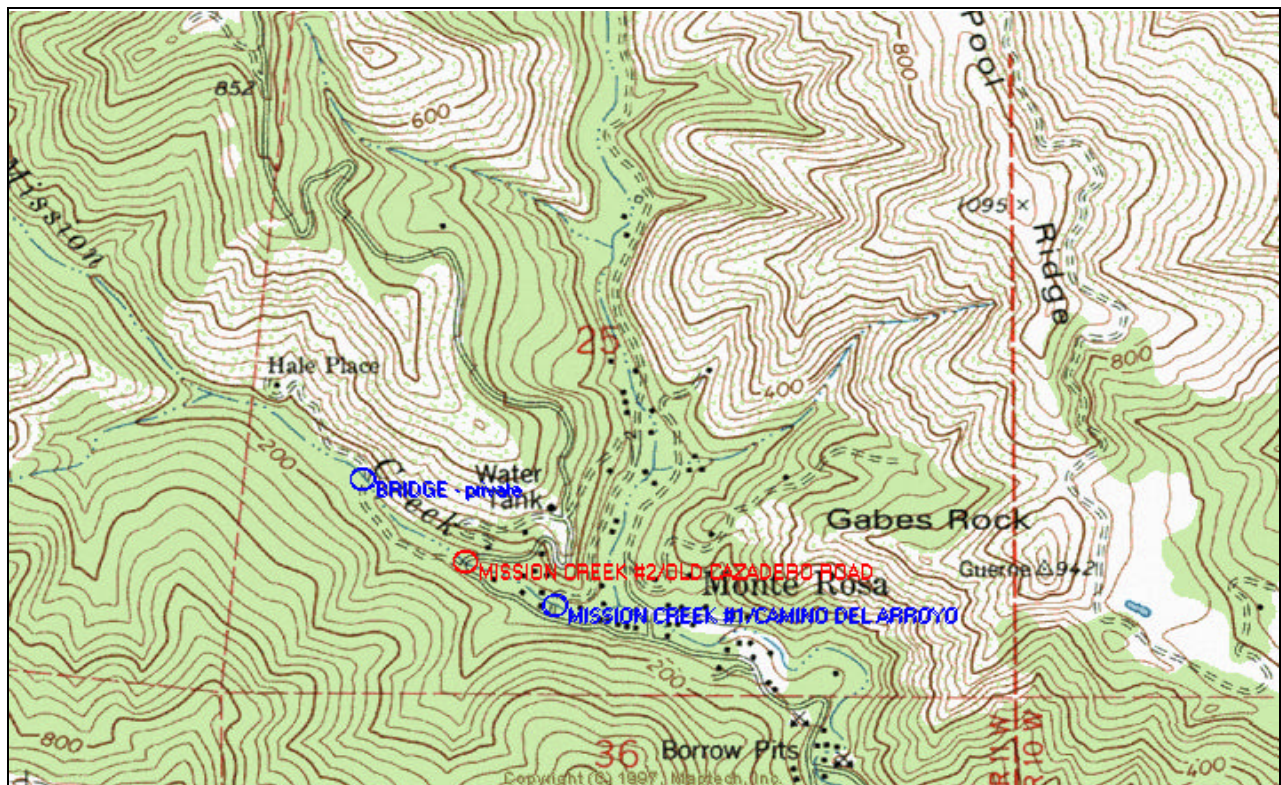
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Old Cazadero Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for all species of adult salmonids and all age classes of juveniles due to the extremely perched outlet. Although not evaluated with FishXing, if an adult salmonid were able to enter the culvert there would be impediments to migration caused by lack-of-depth and, depending on amount of flow, possibly excessive velocities too.

Additional Stream Crossings: Downstream = (~900') to Site ID #S-011, (~ 1,800') to bridge crossing on Hulburt Creek, and (~ 4,900') to second bridge crossing on Hulburt Creek. Upstream = (~1,200') to a bridge on private property.

Habitat: Quantity = approximately 8,200' of potential fish-bearing habitat upstream of Site ID# S-011. Quality = rated as "fair" for the ranking matrix by CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/08/01 at 9:00AM and the channel was dry. The culvert survey crew described the habitat as "fair" and noted a dense riparian canopy of hardwoods and redwoods. CDFG and NMFS list Mission Creek as historically supporting runs of coho salmon.

Preferred Treatment: Because the current box culvert is sized for more than a 250-year discharge, the construction of three or four downstream boulder weirs to raise tail-water elevation is a feasible treatment option. Corner baffles or sloped, v-notched concrete weirs within the culvert would also increase depths and decrease velocities. Treatment of Site ID #S-010 should occur prior to treating this site.





Site ID #S-012: Fife Creek/Watson Road; Russian River **Road Ownership:** County

County Ranking: #70 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 80127; County Map Sheet #4J31. USGS Quad: Guerneville. T8N, R10W, Section 20.
Lat/Long: 38° 30' 59.65" 122° 59' 49.66" Milepost = 10.67

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.0' height x 23.6' width **Length:** 36.3'
Slope: -1.57% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 20.4
Fill Estimate: 221 cubic yards. **Overall Condition:** Good.

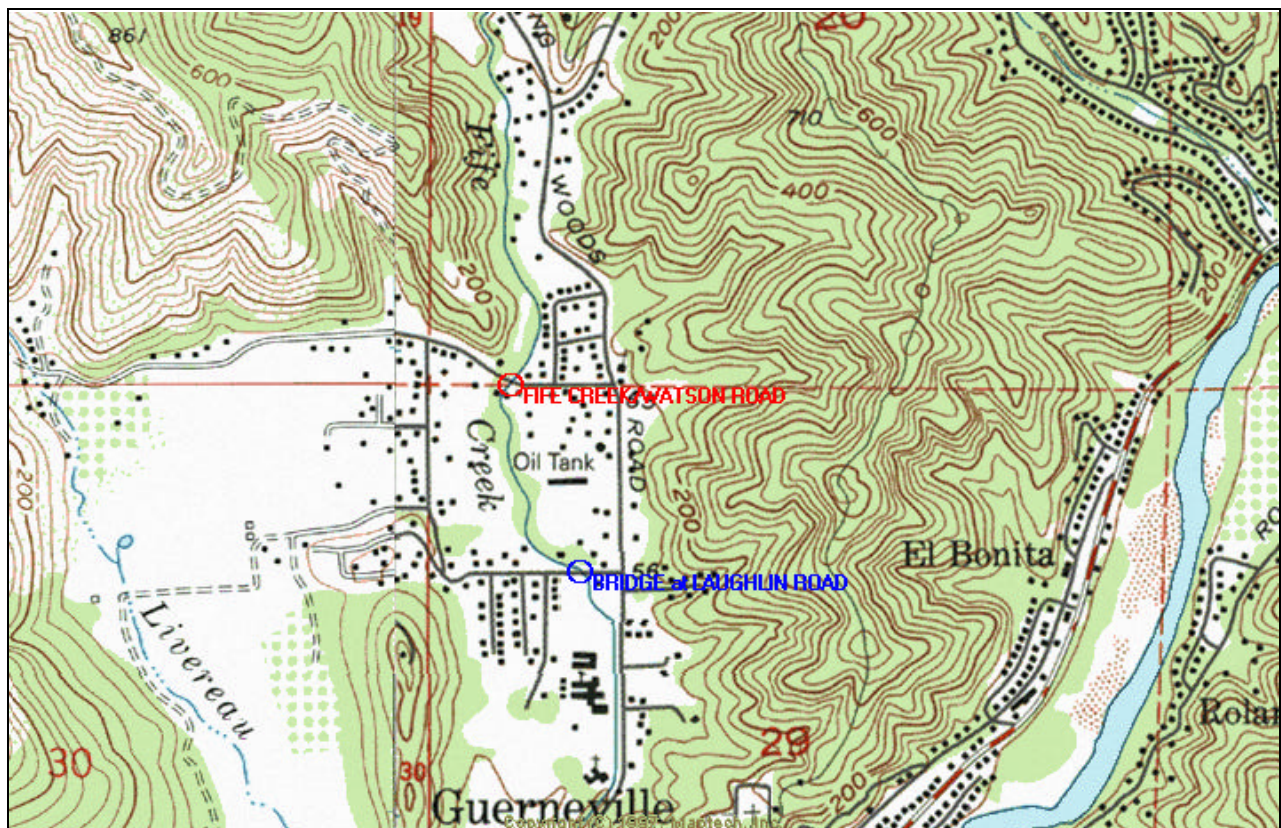
Sizing: Properly sized; HW/D = 1 on a storm flow with approximately a 158-year recurrence interval. Watson Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for all species of adult salmonids and all age classes of juveniles.

Additional Stream Crossings: Downstream = (~1,900') to bridge at Laughlin Road and (~ 7,100') to bridge at River Road. Upstream = the CDFG habitat typing survey identified five bridges on private property and 34 concrete and/or sandbag weirs in Fife Creek – none were deemed as potential migration barriers.

Habitat: Quantity = approximately 32,350' of potential fish-bearing habitat upstream of Site ID# S-012, of which nearly 24,000' is within mainstem Fife Creek. Quality = rated as "fair" for the ranking matrix (quality score = 0.53) by CDFG's 1997 habitat typing survey of nearly 24,000' of Fife Creek channel. Spawning surveys conducted by CDFG in 1997-98 indicated that some spawning of steelhead still occurs in Fife Creek. The crossing was surveyed by Taylor and Assoc. on 10/09/01 and the channel was dry. The culvert survey crew described the habitat as "fair" and noted a moderate riparian canopy of hardwoods. The channel was described as "featureless and confined on both sides by residential development".

Preferred Treatment: No treatment is required because the current box culvert provides unimpeded passage, is in good condition, and is properly sized. Recommend periodic inspection for condition and maintenance.





Site ID #S-013: Redwood Creek/Armstrong Woods Road; Fife Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #24 = Moderate -Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 80131; County Map Sheet #4J31. USGS Quad: Guerneville. T8N, R10W, Section 19.
Lat/Long: 38° 31' 37.92" 122° 59' 58.28" Milepost= 11.86

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 8.0' height x 24.0' width **Length:** 45.9'
Slope: 0.41% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 13.5'
Fill Estimate: 437 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Armstrong Woods Road is overtopped with more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for all species of adult salmonids and all age classes of juveniles due to the perched outlet and the riprap placed below the outlet. Although not evaluated with FishXing, if an adult salmonid were able to enter the culvert there would be impediments to migration caused by lack-of-depth and, depending on amount of flow, possibly excessive velocities too.

Additional Stream Crossings: Downstream = (~4,800') to Site ID #S-012 on Fife Creek, (~6,700') to bridge at Laughlin Road, and (~11,900') to bridge at River Road. Upstream = (~5,250') to private crossing on Sweetwater Creek – status unknown, (~5,750') to private crossing on Sweetwater Creek – status unknown, (~6,450') to Site ID #S-014 on Sweetwater Creek, and (~7,450') to a third private crossing on Sweetwater Creek – status unknown.

Habitat: Quantity = approximately 16,550' of potential fish-bearing habitat upstream of Site ID# S-013. Quality = rated as “fair” for the ranking matrix by CDFG’s professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/13/01 and the channel was dry. The culvert survey crew described the habitat as “fair” and noted a moderate riparian canopy of hardwoods. The channel substrate upstream of the crossing was comprised of cobbles and gravels.

Preferred Treatment: Because the current box culvert is sized for more than a 250-year discharge, the construction of three or four downstream boulder weirs to raise tail-water elevation is a feasible treatment option. Corner baffles or sloped, v-notched concrete weirs within the culvert would also increase depths and decrease velocities.





Site ID #S-014: Sweetwater Creek/Sweetwater Springs Road; Redwood Ck; Fife Creek; Russian River
Road Ownership: County

County Ranking: Tied for #23 = Moderate-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 8902A; County Map Sheet #4J31. USGS Quad: Guerneville. T8N, R10W, Section 17.
Lat/Long: 38° 32' 11.94" 122° 59' 13.24" Milepost = 11.16

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 5.2' height x 36.5' width
Length: 59.0' **Slope:** -0.19% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.5'
Fill Estimate: 89 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Sweetwater Springs Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juveniles due primarily to the drop at the outlet over a steeply-sloped (24%) concrete apron. Lack-of-depth and excessive velocities within the box culvert may occur too.

Additional Stream Crossings: Downstream = (~700') to private crossing – status unknown, (~1,200') to private crossing – status unknown, (~6,450') to Site ID #S-013 on Redwood Creek, (~11,250') to Site ID #S-012 on Fife Creek, (~13,150') to bridge at Laughlin Road, and (~18,350') to bridge at River Road. Upstream = (~1,000') to private crossing right at fork in Sweetwater Creek – status unknown.

Habitat: Quantity = approximately 5,350' of potential fish-bearing habitat upstream of Site ID# S-014. Quality = rated as “fair” for the ranking matrix by CDFG’s professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/13/01 and the channel was dry. The culvert survey crew described the habitat as “fair” and noted a moderate riparian canopy of hardwoods. The channel substrate upstream of the crossing was comprised of cobbles and gravels.

Preferred Treatment: Because the current box culvert is sized for more than a 250-year discharge, the construction of three or four downstream boulder weirs to raise tail-water elevation is a feasible treatment option. Corner baffles or sloped, v-notched concrete weirs within the culvert would also increase depths and decrease velocities. A thorough assessment of the three private crossings on Sweetwater Creek is recommended prior to treating Site ID #S-014.





Site ID #S-015: Mays Canyon/Neeley Road; Russian River **Road Ownership:** County

County Ranking: #56 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 80120; County Map Sheet #4J41. USGS Quad: Camp Meeker. T8N, R10W, Section 32.
Lat/Long: 38° 29' 54.51" 122° 59' 38.13" Milepost = 0.1 miles to Highway 116.

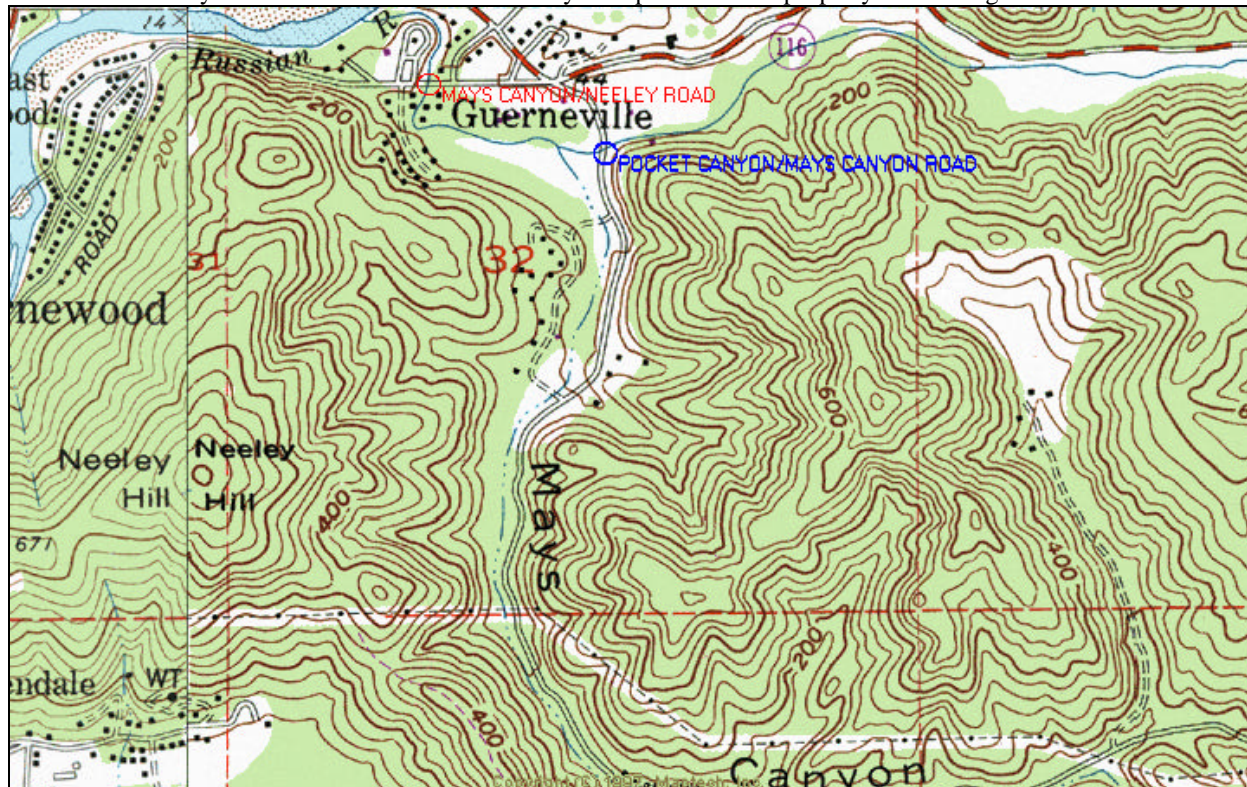
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.2' height x 9.9' width **Length:** 50.5'
Slope: 0.87% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 12.3'
Fill Estimate: 740 cubic yards. **Overall Condition:** Good. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a five-year recurrence interval. Neeley Road is overtopped on approximately a 36-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 92% of the range of estimated migration flows, meets passage criteria for resident/2+ fish on 27% of the range of estimated migration flows, and meets criteria on 8% of the range of migration flows for 1+/young-of-year juveniles. Main violation of passage criteria for all age classes of juveniles is excessive velocities.

Additional Stream Crossings: Downstream = none indicated on USGS map, (~ 1,000') to confluence with Russian River. Upstream = On Mays Canyon Creek - (~ 2,250') to private crossing - status unknown, (~3,800') to private crossing - status unknown, (~7,600') to private crossing - status unknown, (~10,000') to 4th private crossing - status unknown. On Pocket Canyon Creek - (~2,000') to Site ID #S-016, (~9,800') to private crossing - status unknown, (~12,300') to private crossing - status unknown, (~14,050') to private crossing - status unknown, (15,350') to bridge on Mays Canyon Road, (~ 18,600') to Highway 116 crossing - status unknown, (~ 23,500') to 2nd Highway 116 crossing - status unknown, and (~29,350') to private crossing - status unknown.

Habitat: Quantity = approximately 45,900' of potential fish-bearing habitat upstream of Site ID# S-015. Quality = rated as "poor" for the ranking matrix by CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/09/01 and there were isolated areas of surface water. At 8:30AM, the air temp = 15°C and water temp = 14°C. The culvert survey crew described the habitat as "fair" and noted a moderate riparian canopy of hardwoods. No fish were observed in the isolated pools near Site ID #S-015.

Preferred Treatment: None recommended because current box culvert provides adequate passage. However, the culvert is extremely undersized and should eventually be replaced with a properly sized bridge.





Site ID #S-016: Pocket Canyon/Mays Canyon Road; Mays Canyon; Russian River **Road Ownership:** County

County Ranking: Tied for #71 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 70105; County Map Sheet #4J41. USGS Quad: Camp Meeker. T8N, R10W, Section 32.
Lat/Long: 38° 29' 49.49" 122° 59' 22.07" Milepost= 12.78

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.0' height x 10.0' width **Length:** 42.3'
Slope: -1.99% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 15.0'
Fill Estimate: 396 cubic yards. **Overall Condition:** Good.

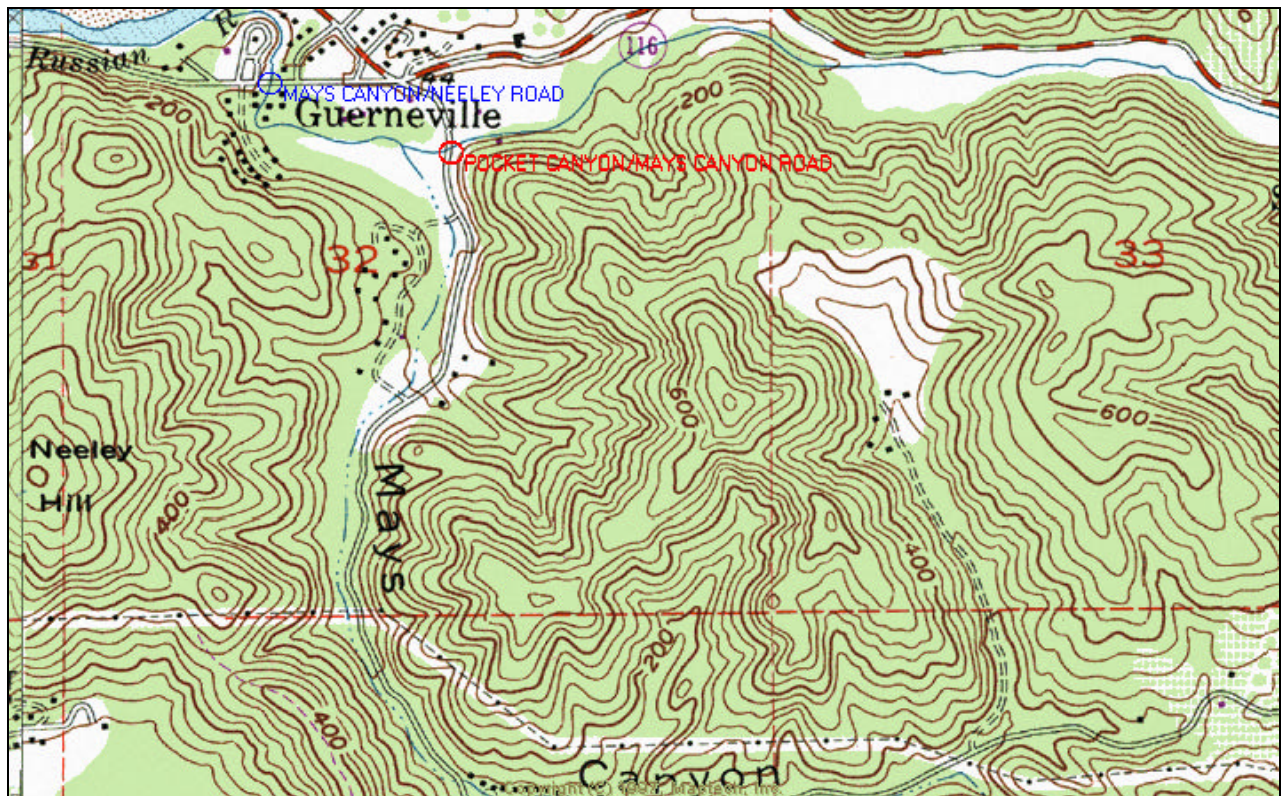
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a one-year recurrence interval. Mays Canyon Road is overtopped on approximately an eight-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for all species of adult salmonids and all age classes of juveniles. Box culvert is fully embedded with substrate.

Additional Stream Crossings: Downstream = (~2,000') to Site ID #S-015 on Mays Canyon Creek. Upstream = (~7,800') to private crossing – status unknown, (~10,300') to private crossing – status unknown, (~12,050') to private crossing – status unknown, (13,350') to bridge on Mays Canyon Road, (~16,600') to Highway 116 crossing – status unknown, (~21,500') to 2nd Highway 116 crossing – status unknown, and (~27,350') to private crossing – status unknown.

Habitat: Quantity = approximately 34,800' of potential fish-bearing habitat upstream of Site ID# S-016. Quality = rated as “poor” for the ranking matrix by CDFG’s professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/09/01 and the channel was dry. The culvert survey crew described the habitat as “fair” and noted a moderate riparian canopy of hardwoods and a highly aggraded channel. The culvert survey crew talked to locals who said this culvert backs-up and the road is overtopped almost every winter, that they usually observe adult steelhead in the winter, and that this section of creek dries up every summer.

Preferred Treatment: None recommended because current box culvert provides adequate passage. However, the culvert is extremely undersized and should eventually be replaced with a properly sized bridge. County want to assess the potential for private property damage caused by annual flooding and replace crossing on a timelier basis.





Site ID #S-017: Korbel Tributary/River Road; Russian River

Road Ownership: County

County Ranking: #66 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 8802B; County Map Sheet #4J31. USGS Quad: Guerneville. T8N, R10W, Section 28.
Lat/Long: 38° 30' 35.58" 122° 57' 54.39" Milepost = 12.70

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 9.35' height x 14.05' width **Length:** 49.2'
Slope: -0.28% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 6.4'
Fill Estimate: 149 cubic yards. **Overall Condition:** Good.

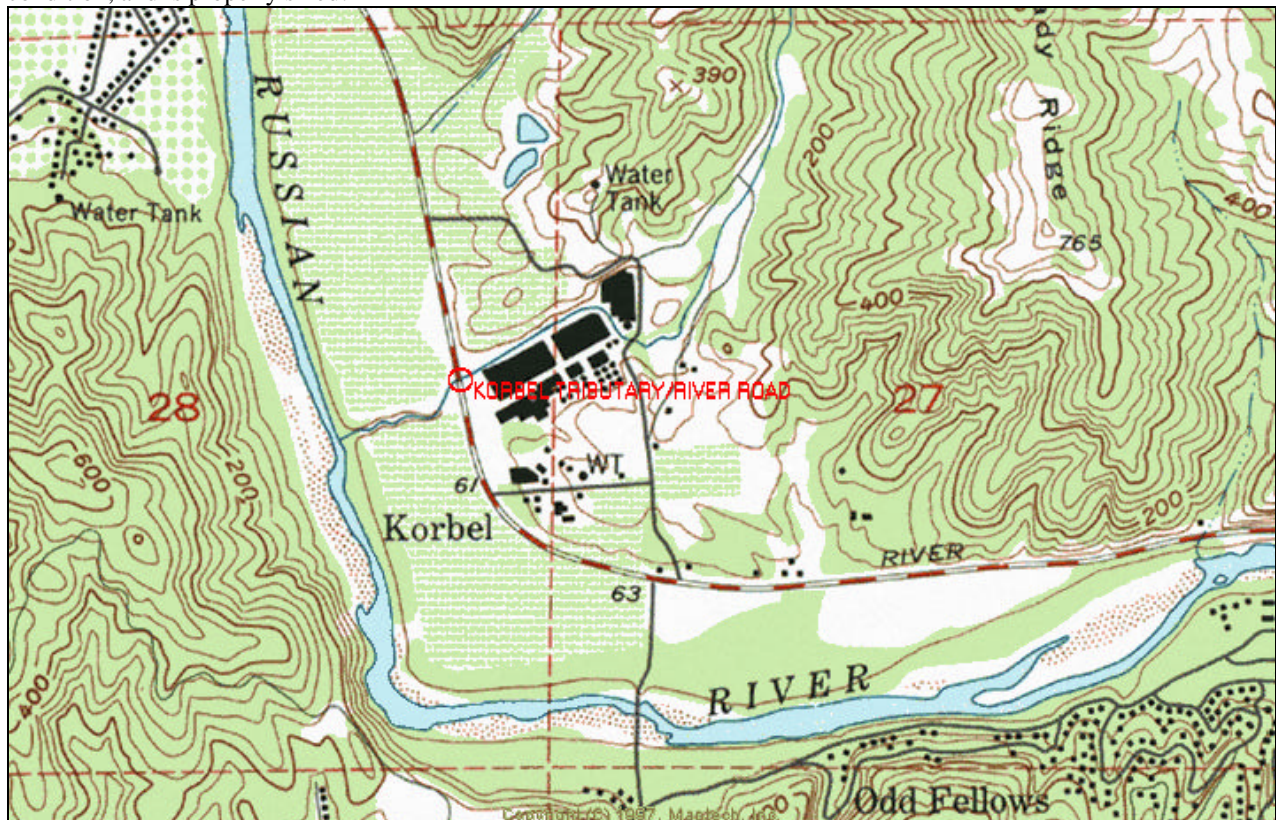
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. River Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 79% of the range of estimated migration flows, meets passage criteria for resident/2+ age classes on 61% of the range of estimated migration flows, and meets criteria for 1+/young-of-year juvenile salmonids on 86% of the estimated migration flows. At some flows there is a lack-of-depth violation for adults and older juveniles.

Additional Stream Crossings: Downstream = none indicated on USGS map, (~ 1,300') to confluence with Russian River. Upstream = (~ 1,700') to private crossing – status unknown, (~3,450') to 2nd private crossing – status unknown, and (~5,750') to a 3rd private crossing – status unknown.

Habitat: Quantity = approximately 9,350' of potential fish-bearing habitat upstream of Site ID# S-017. Quality = rated as “fair” for the ranking matrix by CDFG’s professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/14/01 and there was continuous flow in the channel. At 9:00AM the air temp = 13°C and the water temp = 14°C. The culvert survey crew described the habitat as “fair” and noted a sparse riparian canopy of hardwoods and a highly aggraded channel surrounded by vineyards. The culvert survey crew also noted that the winery was using the creek bed and culvert as a wet ford – that is, they were driving through the culvert (note truck tracks in inlet photo).

Preferred Treatment: None recommended because current box culvert provides adequate passage, is in good condition, and is properly sized.





Site ID #S-018: Hobson Creek/Westside Road; Russian River

Road Ownership: County

County Ranking: Tied for #41 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 8001; County Map Sheet #4J31. USGS Quad: Guerneville. T8N, R10W, Section 26. Lat/Long: 38° 30' 29.45" 122° 55' 42.58" Milepost= 10.06

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 11.5' height x 12.0' width **Length:** 53.0'
Slope: 0.60% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 13.1'
Fill Estimate: 1,724 cubic yards. **Overall Condition:** Good.

Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Westside Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 67% of the range of estimated migration flows and fails to meet passage criteria all age classes of juvenile salmonids. Actual adult passage may be higher than the FishXing estimate because the only violation of the criteria is lack-of-depth. However, for all juvenile age classes the primary violation of the passage criteria is excessive velocities.

Additional Stream Crossings: Downstream = (<100') to bridge on River Road. Upstream = (~ 2,600') to non-County bridge, (~ 5,800') to private crossing – status unknown, and (~ 56,050') to private crossing – status unknown.

Habitat: Quantity = approximately 10,750' of potential fish-bearing habitat upstream of Site ID# S-018. Quality = rated as “fair” for the ranking matrix by CDFG’s professional judgment (Coe, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 10/10/01 and the channel was dry. The culvert survey crew described the habitat as “pretty good” and noted a moderately dense riparian canopy of hardwoods and redwoods.

Preferred Treatment: None recommended because current box culvert provides adequate adult passage, is in good condition, and is properly sized. One or two downstream boulder weirs and corner baffles within the culvert would cost-effectively improve passage conditions for juveniles if CDFG deemed this a vital concern.





Site ID #S-019: Jonive Creek #1/Bodega Highway; Atascadero Creek; Green Valley Creek; Russian River

Road Ownership: County

County Ranking: #61 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 6904; County Map Sheet #4J52. USGS Quad: Camp Meeker. T6N, R9W. Lat/Long: 38° 23' 33.67" 122° 52' 34.91" Milepost = 17.45

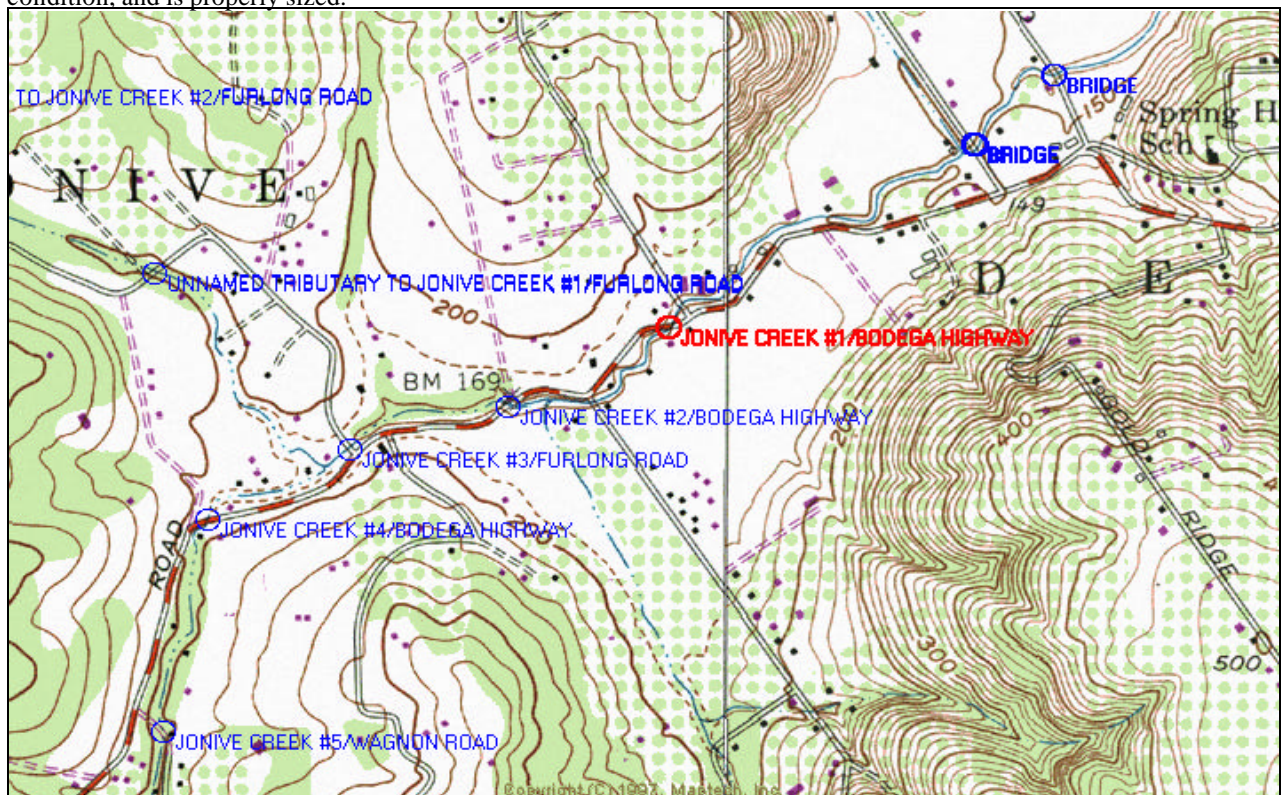
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 11.0' height x 23.9' width **Length:** 34.5' **Slope:** -0.46% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 9.2' **Fill Estimate:** 160 cubic yards. **Overall Condition:** Abraded. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Bodega Highway is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 90% of the range of estimated migration flows, meets passage criteria for resident/2+ age classes on 59% of the range of estimated migration flows, and meets criteria for 1+/young-of-year juveniles on 80% of the range of estimated migration flows. The floor of the box culvert is partially concrete and partially natural bedrock.

Additional Stream Crossings: Downstream = as indicated on the USGS map, there are two bridges on Jonive Creek, five bridges on Atascadero Creek, and seven bridges on Green Valley Creek. Upstream = (~1,100') to bridge at Sexton Road, (~ 1,750') to Site ID #S-020, (~ 3,150') to Site ID #S-021, (~4,600') to Site ID #S-024, (~ 6,550') to Site ID #S-025, and (~ 11,250') to private crossing – status unknown. Unnamed tributary to Jonive Creek – (~ 5,700') to Site ID #S-022, (~ 8,100') to private crossing – status unknown, and (~9,200') to Site ID #S-023.

Habitat: Quantity = approximately 28,850' of potential fish-bearing habitat upstream of Site ID# S-019. Quality = rated as "fair" for the ranking matrix by CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 9/24/01 and there was continuous flow in the channel. At 1:45PM the air temp = 20°C and the water temp = 13°C. The culvert survey crew described the habitat as "good" and noted a moderately dense riparian canopy of hardwoods and redwoods. Two young-of-year salmonids were observed in a pool upstream of Site ID #S-019.

Preferred Treatment: None recommended because current boxculvert provides adequate passage, is in good condition, and is properly sized.





Site ID #S-020: Jonive Creek #2/Bodega Highway; Atascadero Creek; Green Valley Creek; Russian River

Road Ownership: County

County Ranking: Tied for #71 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 6904; County Map Sheet #4J52. USGS Quad: Camp Meeker. T6N, R9W. Lat/Long: 38° 23' 27.88" 122° 52' 49.25" Milepost = 17.22

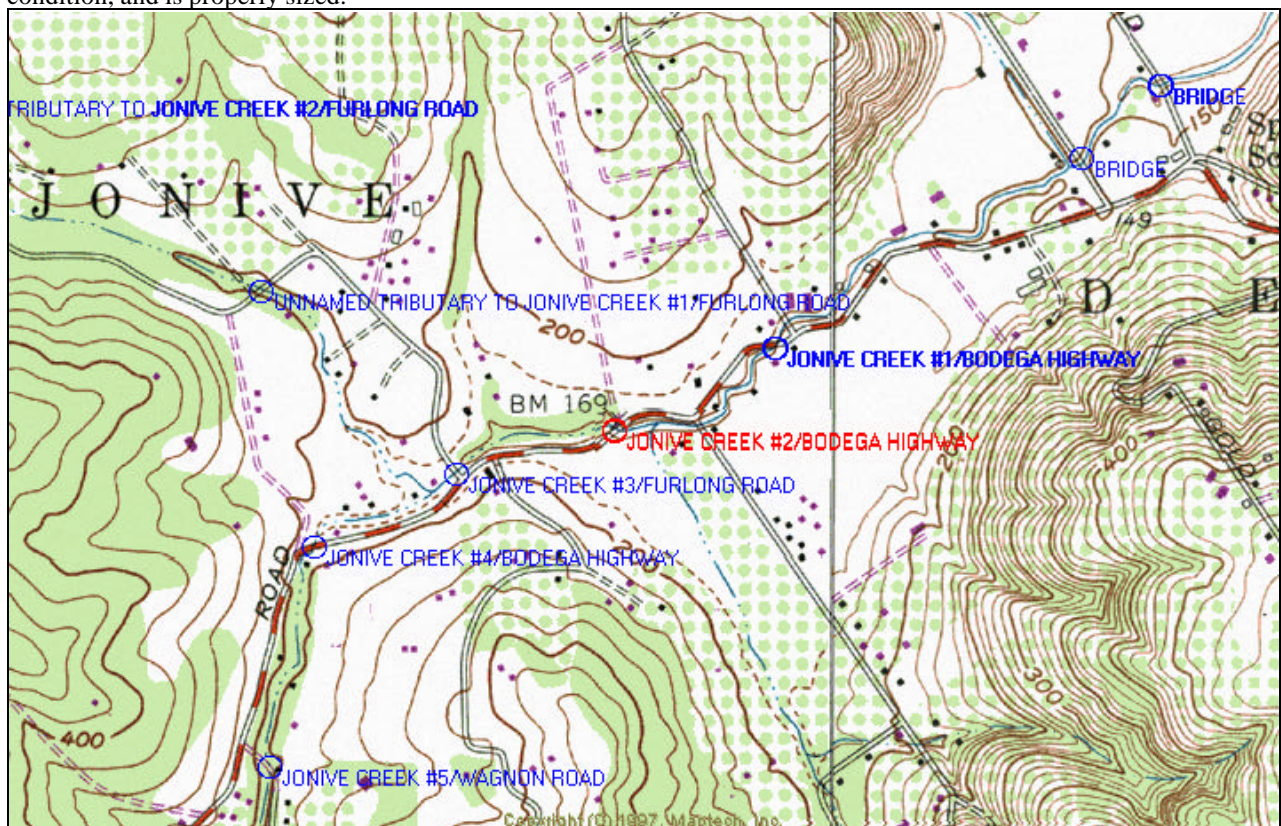
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.6' height x 24.0' width **Length:** 35.9' **Slope:** -0.81% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 15.7' **Fill Estimate:** 481 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Bodega Highway is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for adult steelhead and all age classes of juveniles. The box culvert is fully embedded approximately 1.5' deep with gravels and fines.

Additional Stream Crossings: Downstream = (~650') to bridge at Sexton Road and (~1,750') to Site ID #S-019. Then, two bridges on Jonive Creek, five bridges on Atascadero Creek, and seven bridges on Green Valley Creek. Upstream = (~1,400') to Site ID #S-021, (~2,850') to Site ID #S-024, (~4,800') to Site ID #S-025, and (~9,500') to private crossing – status unknown. Unnamed tributary to Jonive Creek – (~3,950') to Site ID #S-022, (~6,350') to private crossing – status unknown, and (~7,450') to Site ID #S-023.

Habitat: Quantity = approximately 16,000' of potential fish-bearing habitat upstream of Site ID# S-020. Quality = rated as “fair” for the ranking matrix by CDFG’s professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 9/24/01 and there was continuous flow in the channel. At 4:00PM the air temp = 14°C and the water temp = 13°C. The culvert survey crew described the habitat as “good” and noted several deep pools near the crossing and a moderately dense riparian canopy of mostly hardwoods. No fish were observed.

Preferred Treatment: None recommended because current box culvert provides unimpeded passage, is in good condition, and is properly sized.





Site ID #S-021: Jonive Creek #3/Furlong Road; Atascadero Creek; Green Valley Creek; Russian River

Road Ownership: County

County Ranking: Tied for #34 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 69052; County Map Sheet #4J52. USGS Quad: Camp Meeker. T6N, R9W. Lat/Long: 38° 23' 24.73" 122° 53' 3.30" Milepost= 10.06

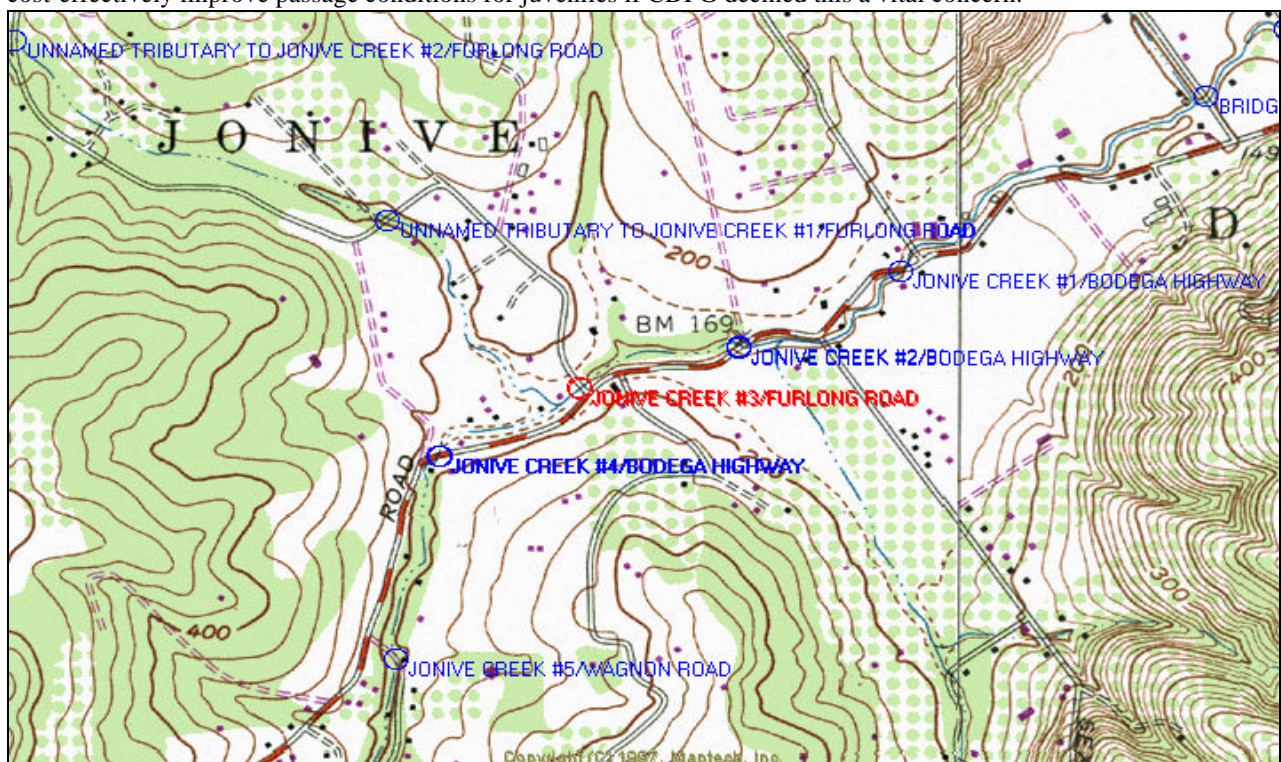
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 9.2' height x 12.0' width **Length:** 27.8' **Slope:** 0.65% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 12.3' **Fill Estimate:** 167 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Furlong Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 74% of the range of estimated migration flows and fails to meet passage criteria all age classes of juvenile salmonids. Actual adult passage may be higher than the FishXing estimate because the only violation of the criteria is lack-of-depth. For all juveniles the primary violation of the criteria is the excessive drop at the outlet.

Additional Stream Crossings: Downstream = (~1,400') to Site ID #S-020, (~2,050') to bridge at Sexton Road and (~3,150') to Site ID #S-019. Then, two bridges on Jonive Creek, five bridges on Atascadero Creek, and seven bridges on Green Valley Creek. Upstream = (~1,450') to Site ID #S-024, (~3,400') to Site ID #S-025, and (~8,100') to private crossing – status unknown. Unnamed tributary to Jonive Creek – (~2,550') to Site ID #S-022, (~4,950') to private crossing – status unknown, and (~6,050') to Site ID #S-023.

Habitat: Quantity = approximately 14,750' of potential fish-bearing habitat upstream of Site ID# S-021. Quality = rated as "fair" for the ranking matrix by CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/15/01 and there was continuous flow in the channel. At 9:30AM the air temp = 13°C and the water temp = 12°C. The culvert survey crew described the habitat as "good" and noted several deep pools near the crossing and a moderately dense riparian canopy of mostly hardwoods and some conifers. Between 10 to 20 young-of-year and 1+ salmonids were observed both upstream and downstream of Site ID #S-021.

Preferred Treatment: None recommended because current box culvert provides adequate adult passage, is in good condition, and is properly sized. One or two downstream boulder weirs and corner baffles within the culvert would cost-effectively improve passage conditions for juveniles if CDFG deemed this a vital concern.





Site ID #S-022: Unnamed Tributary #1/Furlong Road; Jonive Creek; Atascadero Creek; Green Valley Creek; Russian River **Road Ownership** County

County Ranking: #75 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 69052; County Map Sheet #4J52. USGS Quad: Camp Meeker. T6N, R9W. Lat/Long: 38° 23' 37.57" 122° 53' 20.48" Milepost = 0.4 miles to Bodega Highway.

Culvert Type: Pipe Arch, SSP. **Corrugations:** 6' x 2" **Dimensions:** 8.0' rise x 14.5' span **Length:** 43.0' **Slope:** 1.19% **Modifications:** None. **Rustline Height:** 2.0' **Average Active Channel Width:** 9.5' **Fill Estimate:** 210 cubic yards. **Overall Condition:** Good.

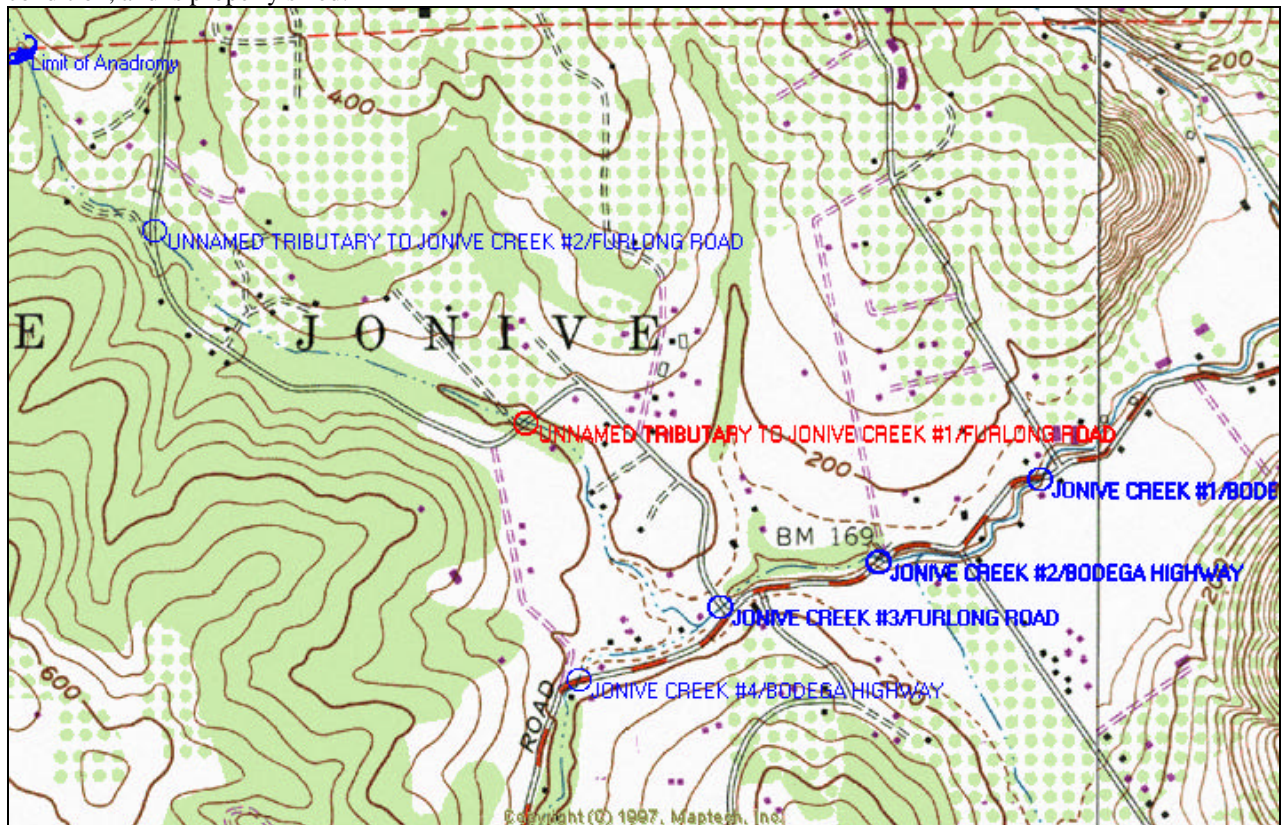
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Furlong Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for adult steelhead and all age classes of juvenile salmonids. Crossing is fully embedded with a natural stream bed meander developed through the crossing. The arch is also wider than the active channel width.

Additional Stream Crossings: Downstream = (~2,750') to Site ID #S-021, (~4,200') to Site ID #S-020, (~4,850') to bridge at Sexton Road and (~5,850') to Site ID #S-019. Then, two bridges on Jonive Creek, five bridges on Atascadero Creek, and seven bridges on Green Valley Creek. Upstream = (~2,450') to private crossing – status unknown, and (~3,550') to Site ID #S-023.

Habitat: Quantity = approximately 5,100' of potential fish-bearing habitat upstream of Site ID# S-022. Quality = rated as "fair" for the ranking matrix by CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 9/24/01 and there was continuous flow in the channel. At 3:30PM the air temp = 15.5°C and the water temp = 12.5°C. The culvert survey crew described the habitat as "good" and noted several deep pools near the crossing and a moderately dense riparian canopy of mostly hardwoods and some conifers. The crew noted that there were good-quality spawning gravels in the pool tails. No fish were observed.

Preferred Treatment: None recommended because current crossing provides unimpeded passage, is in good condition, and is properly sized.



Site ID #S-022: Unnamed Tributary #1/Furlong Road; Jonive Creek; Atascadero Creek; Green Valley Creek; Russian River



Site ID #S-023: Unnamed Tributary #2/Furlong Road; Jonive Creek; Atascadero Creek; Green Valley Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #51 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 69052; County Map Sheet #4J52. USGS Quad: Camp Meeker. T6N, R9W. Lat/Long: 38° 23' 51.18" 122° 53' 53.48" Milepost = 1.0 miles to Bodega Highway.

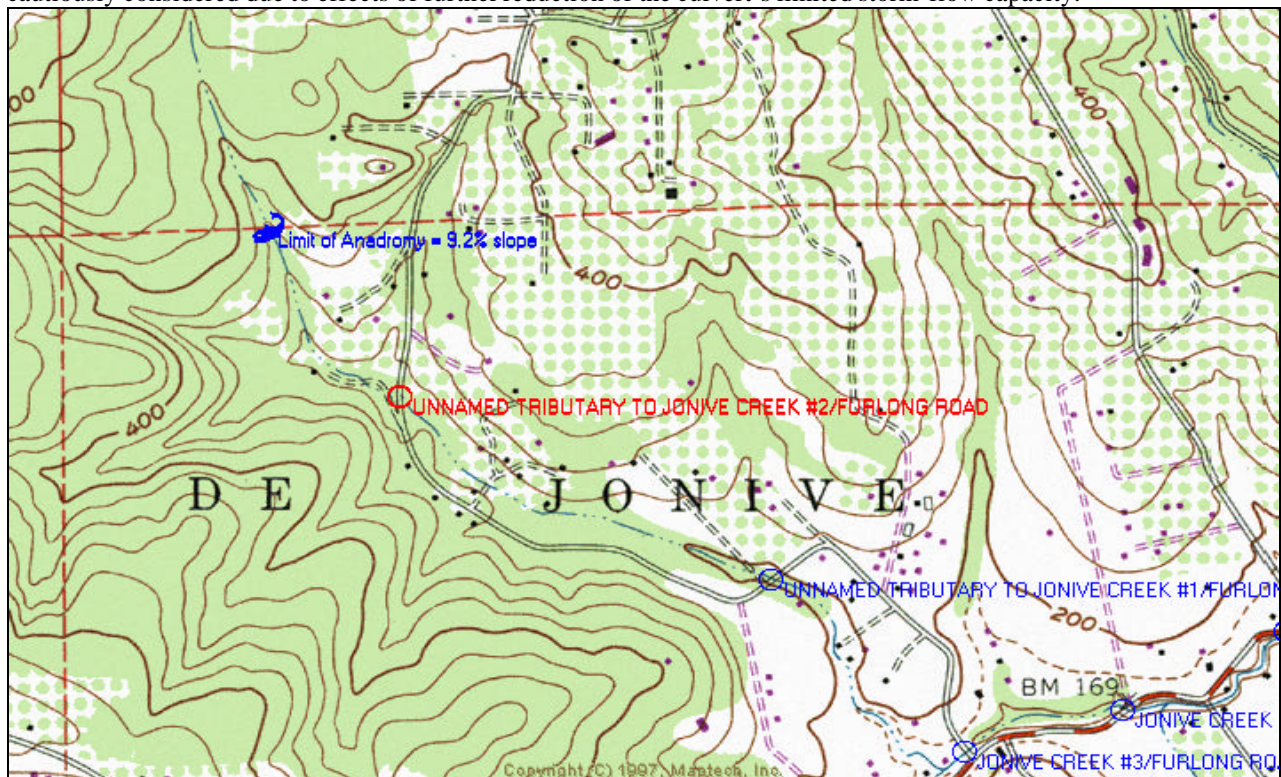
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 5.0' height x 7.0' width **Length:** 61.2' **Slope:** 0.07 % **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 7.7' **Fill Estimate:** 117 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 19-year recurrence interval. Furlong Road is overtopped on approximately a 193-year storm flow.

Barrier Status: GRAY: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 70% of the range of estimated migration flows and fails to meet passage criteria all age classes of juvenile salmonids. Actual adult passage may be higher than the FishXing estimate because the only violation of the criteria is lack-of-depth. For all juveniles the primary violation of the criteria is the drop at the outlet.

Additional Stream Crossings: Downstream = (~1,100') to private crossing – status unknown, and (~3,650') to Site ID #S-022, (~6,350') to Site ID #S-021, (~7,700') to Site ID #S-020, (~8,350') to bridge at Sexton Road and (~9,300') to Site ID #S-019. Then, two bridges on Jonive Creek, five bridges on Atascadero Creek, and seven bridges on Green Valley Creek. Upstream = none indicated on the USGS map within the fish-bearing stream reach.

Habitat: Quantity = approximately 2,050' of potential fish-bearing habitat upstream of Site ID# S-023. Quality = rated as “fair” for the ranking matrix by CDFG’s professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/14/01 and there was continuous flow in the channel. At 5:30PM the air temp = 24°C and the water temp = 15°C. The culvert survey crew described the habitat as “good” and noted several deep pools near the crossing and a moderately dense riparian canopy of mostly hardwoods and some conifers. Several young-of-year salmonids were observed upstream of Site ID #S-023..

Preferred Treatment: None recommended immediately because current box culvert provides adequate adult passage and in good condition. One or two downstream boulder weirs would cost-effectively improve passage conditions for juveniles if CDFG deemed this a vital concern. The feasibility of corner baffles in culvert should be cautiously considered due to effects of further reduction of the culvert’s limited storm flow capacity.



Site ID #S-023: Unnamed Tributary #2/Furlong Road; Jonive Creek; Atascadero Creek; Green Valley Creek; Russian River



Site ID #S-024: Jonive Creek #4/Bodega Highway; Atascadero Creek; Green Valley Creek; Russian River

Road Ownership: County

County Ranking: #73 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 6904; County Map Sheet #4J52. USGS Quad: Camp Meeker. T6N, R9W. Lat/Long: 38° 23' 19.60" 122° 53' 15.81" Milepost = 0.2 miles to Furlong Road.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 7.0' height x 8.0' width **Length:** 31.7'
Slope: -2.21 % **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 9.2'
Fill Estimate: 245 cubic yards. **Overall Condition:** Good.

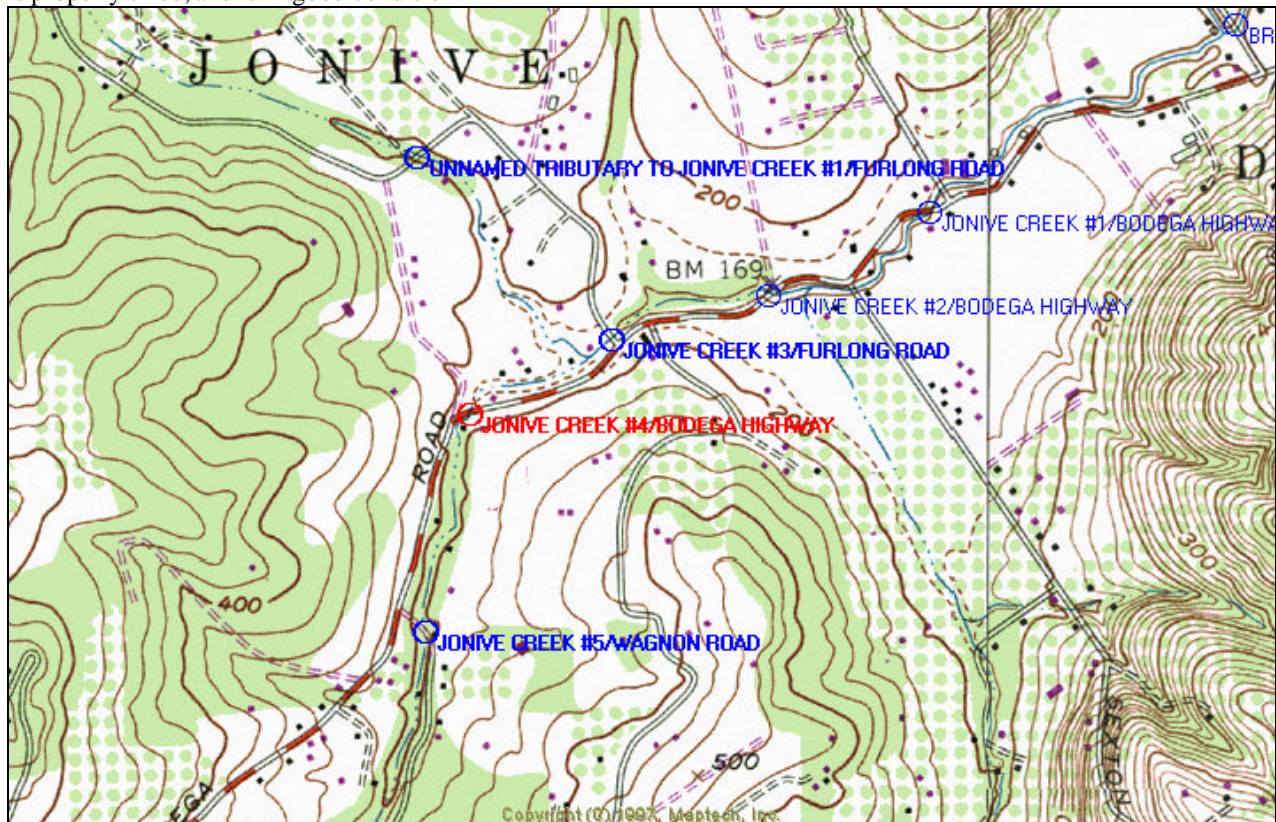
Sizing: Properly sized; HW/D = 1 on a storm flow with approximately a 182-year recurrence interval. Bodega Highway is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for all species of adult salmonids and all age classes of juveniles. Culvert is backwatered at low flow and is partially embedded.

Additional Stream Crossings: Downstream = (~ 1,350') to Site ID #S-021, (~ 2,700') to Site ID #S-020, (~ 3,350') to bridge at Sexton Road and (~ 4,400') to Site ID #S-019. Then, two bridges on Jonive Creek, five bridges on Atascadero Creek, and seven bridges on Green Valley Creek. Upstream = (~ 1,850') to Site ID #S-025.

Habitat: Quantity = approximately 7,450' of potential fish-bearing habitat upstream of Site ID# S-024. Quality = rated as "fair" for the ranking matrix by CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/15/01 and there was continuous flow in the channel. At 11:00AM the air temp = 14°C and the water temp = 12°C. The culvert survey crew described the habitat as "good" and noted several deep pools near the crossing and a moderately dense riparian canopy of mostly hardwoods and some conifers. However, the water was described as silty and the streambed was silty too. Between five and 10 young-of-year salmonids were observed upstream and downstream of Site ID #S-024.

Preferred Treatment: None recommended immediately because current box culvert provides unimpeded passage, is properly sized, and is in good condition.





Site ID #S-025: Jonive Creek #5/Wagnon Road; Atascadero Creek; Green Valley Creek; Russian River

Road Ownership County

County Ranking: #35 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 69046; County Map Sheet #4J52. USGS Quad: Camp Meeker. T6N, R9W. Lat/Long: 38° 23' 4.22" 122° 53' 19.74" Milepost = 0.1 miles to Bodega Highway.

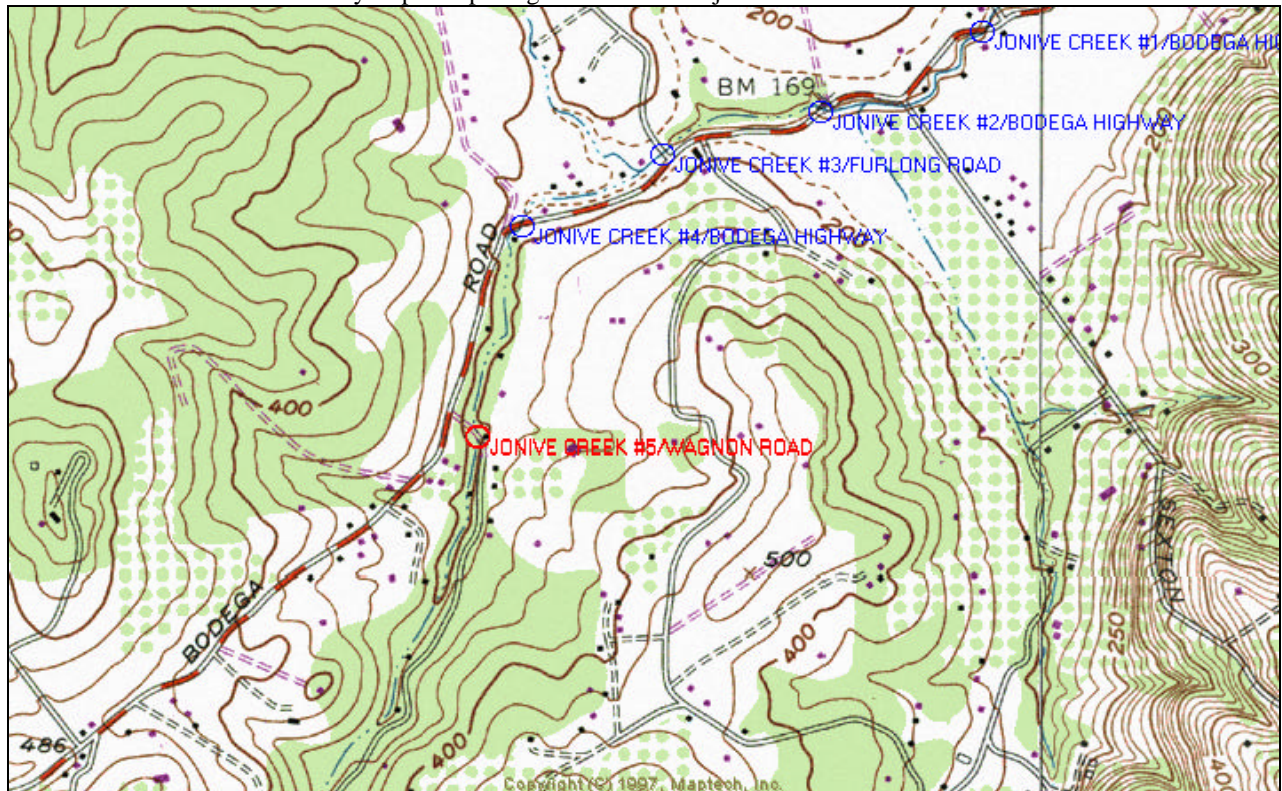
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.0' height x 8.0' width **Length:** 54.5'
Slope: 0.86 % **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 7.9'
Fill Estimate: 305 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 123-year recurrence interval. Wagnon Road is overtopped on more than a 250-year storm flow.

Barrier Status: GRAY: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 42% of the range of estimated migration flows and fails to meet passage criteria all age classes of juvenile salmonids. Actual adult passage may be higher than the FishXing estimate because the only violation of the criteria is lack-of-depth. For all juveniles the primary violation of the criteria is the excessive (2.8') drop at the outlet.

Additional Stream Crossings: Downstream = (~1,850') to Site ID #S-024, (~3,100') to Site ID #S-021, (~4,500') to Site ID #S-020, (~5,150') to bridge at Sexton Road and (~6,300') to Site ID #S-019. Then, two bridges on Jonive Creek, five bridges on Atascadero Creek, and seven bridges on Green Valley Creek. Upstream = none indicated on the USGS map within the fish-bearing stream reach.

Habitat: Quantity = approximately 5,750' of potential fish-bearing habitat upstream of Site ID# S-025. Quality = rated as "fair" for the ranking matrix by CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/15/01 and there was continuous flow in the channel. At 12:00PM the air temp = 19°C and the water temp = 13°C. The culvert survey crew described the habitat as "good" and noted a moderately dense riparian canopy of mostly hardwoods and some conifers. The streambed was described as gravel and cobble – good spawning substrate. No fish were observed.

Preferred Treatment: None recommended immediately because current box culvert provides adequate adult passage, is in good condition, and is properly sized. Two or three downstream boulder weirs and corner baffles within the culvert would cost-effectively improve passage conditions for juveniles if CDFG deemed this a vital concern.





Site ID #S-026: Purrington Creek#1/Graton Road; Green Valley Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #16 = High-Priority **Basin-wide Ranking:** Tied for #21 = High-Priority

Location: Road ID# 7901; County Map Sheet #4J51. USGS Quad: Camp Meeker. T7N, R10W, Section 25.
Lat/Long: 38° 24' 55.71" 122° 54' 48.46" Milepost= 1.6 miles to Acreage Road.

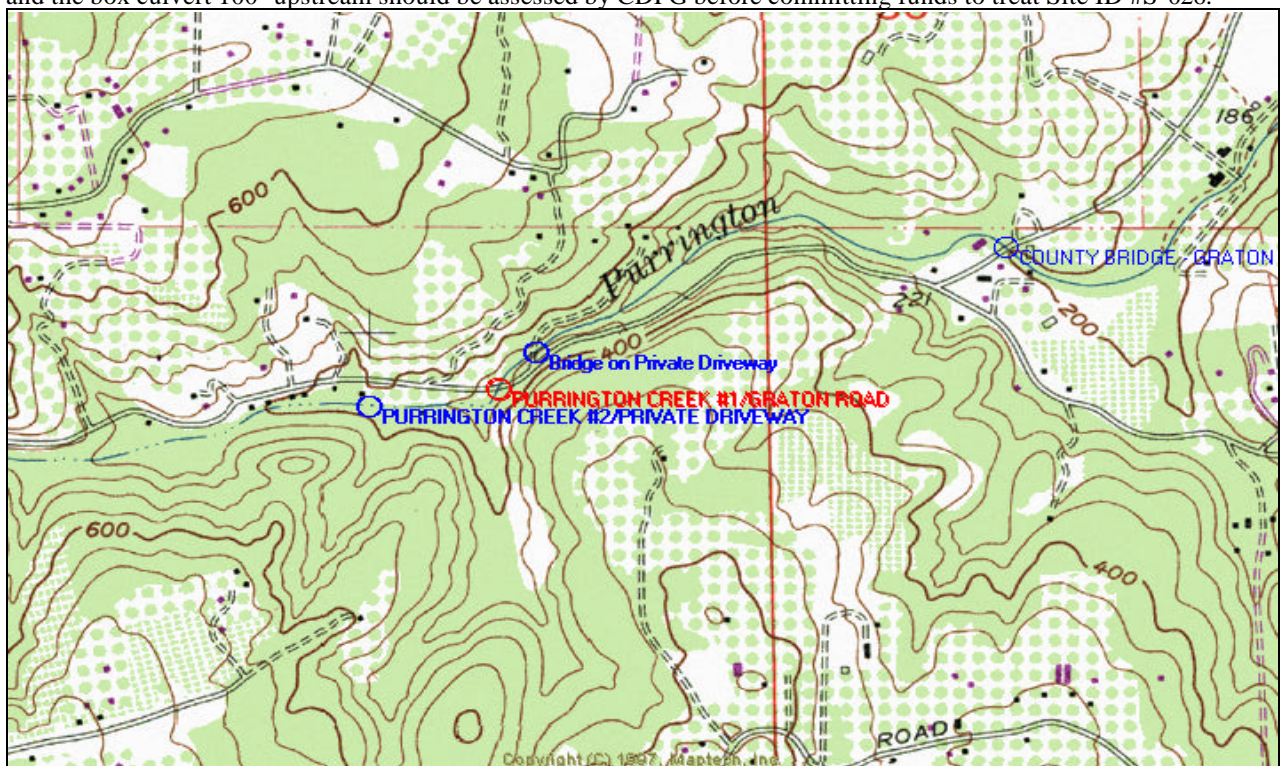
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 9.9' height x 8.7' width **Length:** 59.2'
Slope: 3.23% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 8.4'
Fill Estimate: 643 cubic yards. **Overall Condition:** Abraded. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Graton Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for all species of adult salmonids and all age classes of juveniles. For adults, there is a lack-of-depths at lower flows and excessive velocities over the upper 50% range of migration flows. Excessive velocity is the primary impediment for juveniles.

Additional Stream Crossings: Downstream = (~ 500') to bridge on private driveway, (~ 4,650') to bridge at Graton Road, (~ 6,900') to private crossing – status unknown, (~ 11,950') to five foot high splashboard dam, (~ 13,100') to bridge on Graton Road, and (14,450') to confluence with Green Valley Creek. CDFG's 1994 habitat survey also noted four wet fords and five dams within the fish-bearing stream reach. Upstream = (~ 100') to private box culvert (10' x 11 x 60' long) – measured by CDFG, but not surveyed by fish passage crew and (~ 1,000') to Site ID #S-027.

Habitat: Quantity = approximately 4,700' of potential fish-bearing habitat upstream of Site ID# S-026. Quality = rated as "fair" for the ranking matrix (quality score = 0.55) by CDFG's 1994 habitat typing survey of 19,000' of channel. Juvenile coho salmon were sampled (in small numbers) as recently as 1994 and are considered to be sporadically present (Coey, pers. comm.). CDFG crew noted lots of garbage dumps, eroding banks, erosion at wet fords, and cutting of riparian vegetation. The crossing was surveyed by Taylor and Assoc. on 8/07/01 and there was continuous flow in the channel. At 12:00PM the air temp = 19°C and the water temp = 13°C. The culvert survey crew described the habitat as "good" and noted a moderately dense riparian canopy of hardwoods and conifers. The streambed was described as gravel and cobble – good spawning substrate. Approximately 30-50 young-of-year salmonids were observed both upstream and downstream of Site ID #S-026.

Preferred Treatment: Two or three downstream boulder weirs and corner baffles within the culvert would cost-effectively improve passage conditions for both adults and juveniles. Passage over the five dams on private property and the box culvert 100' upstream should be assessed by CDFG before committing funds to treat Site ID #S-026.





Site ID #S-027: Purrington Creek #2/Private Driveway; Green Valley Ck; Russian River **Road Ownership:** Private

County Ranking: #63 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: County Map Sheet #4J51. USGS Quad: Camp Meeker. T7N, R10W. Lat/Long: 38° 24' 54.39" 122° 54' 59.84" Milepost = 0.1 Miles to Graton Road.

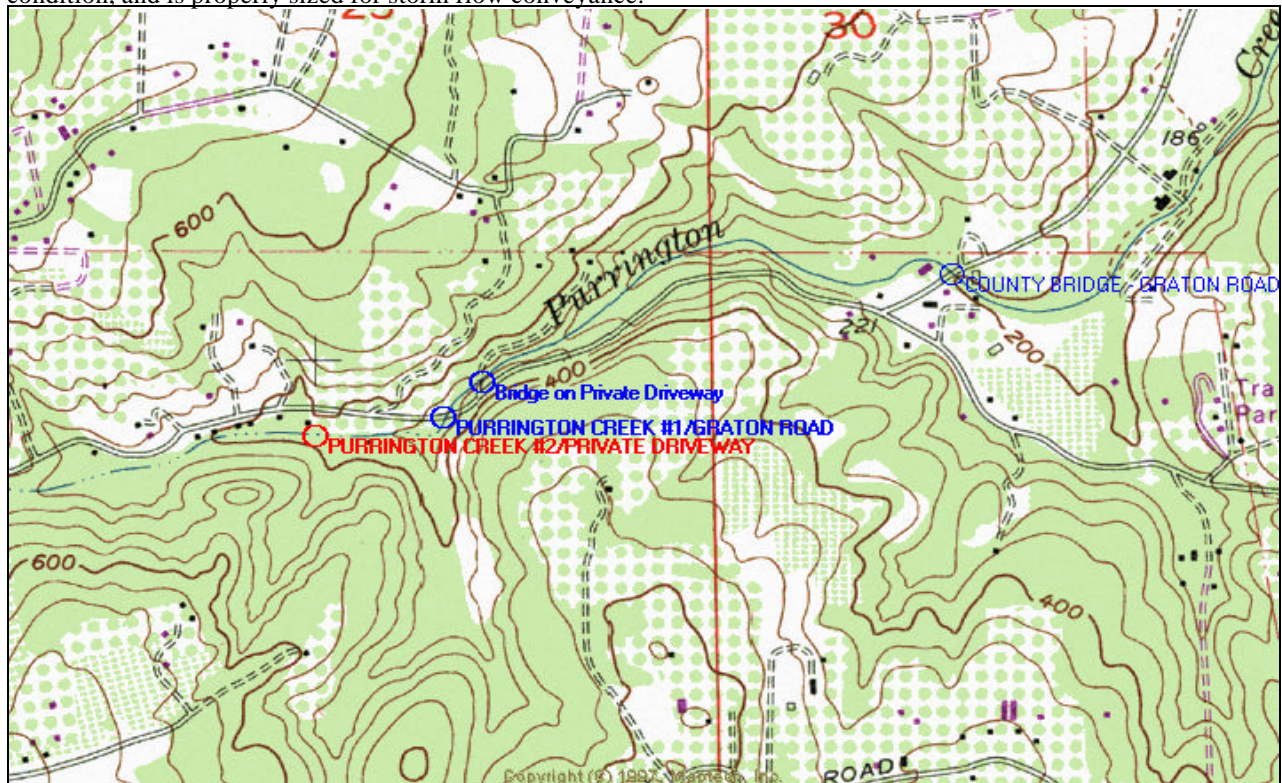
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.6' height x 10.65' width **Length:** 12.0' **Slope:** -5.50% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 14.4' **Fill Estimate:** 122 cubic yards. **Overall Condition:** Fair. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. This private driveway is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for all species of adult salmonids on 86% of the range of estimated migration flows, meets passage criteria for resident/2+ fish on 100% of estimated migratons and fails to meet passage criteria for 1+/young-of-year juvenile salmonids.

Additional Stream Crossings: Downstream = (~900') to private box culvert (10' x 11 x 60' long) – measured by CDFG, but not surveyed by fish passage crew, (~1,000') to Site ID #S-026, (~1,500') to bridge on private driveway, (~5,650') to bridge at Graton Road, (~7,900') to private crossing – status unknown, (~12,950') to five foot high splashboard dam, (~14,100') to bridge on Graton Road, and (15,450') to confluence with Green Valley Creek. CDFG's 1994 habitat survey also noted four wet fords and five dams within the fish-bearing stream reach. Upstream = none indicated on the USGS map or by CDFG's 1994 habitat survey.

Habitat: Quantity = approximately 3,700' of potential fish-bearing habitat upstream of Site ID# S-027. Quality = rated as "fair" for the ranking matrix (quality score = 0.55) by CDFG's 1994 habitat typing survey of 19,000' of channel. Juvenile coho salmon were sampled (in small numbers) as recently as 1994 and are considered to be sporadically present (Coey, pers. comm.). CDFG crew noted lots of garbage dumps, eroding banks, erosion at wet fords, and cutting of riparian vegetation. The crossing was surveyed by Taylor and Assoc. on 4/10/02 and there was continuous flow in the channel. At 10:00AM the air temp = 14.5°C and the water temp = 10.5°C. The culvert survey crew described the habitat as "good" and noted a dense riparian canopy of hardwoods and conifers. The streambed was described as mostly gravel and cobble – good spawning substrate. No fish were observed.

Preferred Treatment: None recommended because the current crossing provides ample fish passage, is in fair condition, and is properly sized for storm flow conveyance.





Site ID #S-028: Green Valley Creek/Green Valley Road; Russian River **Road Ownership** County

County Ranking: Tied for #20 = Moderate -Priority **Basin-wide Ranking:** Tied for #26 = Moderate -Priority

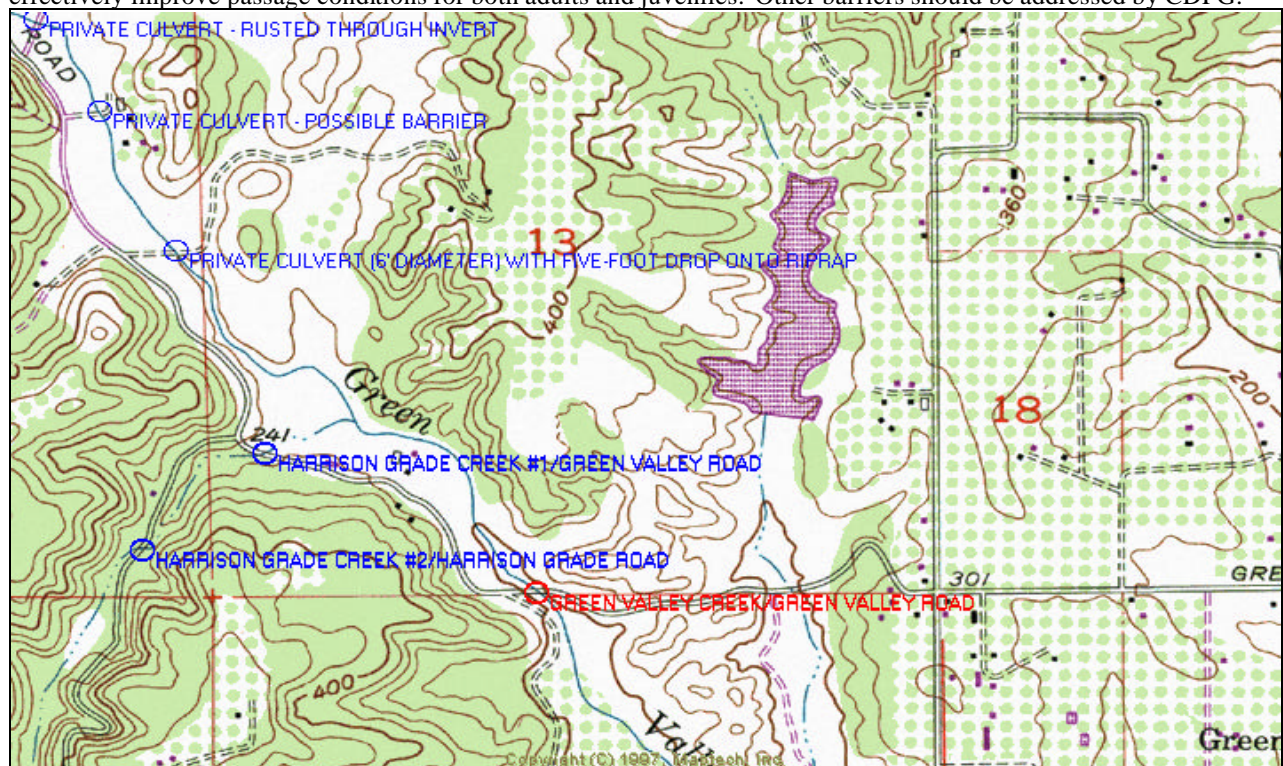
Location: Road ID# 79040; County Map Sheet #4J41. USGS Quad: Camp Meeker. T7N, R10W, Section 13.
Lat/Long: 38° 26' 40.10" 122° 55' 2.20" Milepost = 0.6 miles to Maddocks Road.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.15' height x 10.00' width **Length:** 68.0'
Slope: 0.54% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.9'
Fill Estimate: 876 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 48-year recurrence interval. Green Valley Road is overtopped on more than a 250-year storm flow.
Barrier Status: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 71% of the range of estimated migration flows and fails to meet passage criteria all age classes of juvenile salmonids. Actual adult passage may be higher than the FishXing estimate because the only violation of the criteria is lack-of-depth. For all juveniles the primary violation of the criteria is the excessive (2.7') drop at the outlet.

Additional Stream Crossings: Downstream = (~4,700') to private bridge on Bones Road, (~12,600') to confluence with Purrington Creek, (~16,100') to bridge on Green Valley Road, and (~17,900') to confluence with Atascadero Creek. Upstream = (~300') to a dam with three notched concrete weirs – visually assessed as a migration barrier, (~2,100-2,400') to two in-channel dams identified by CDFG, (~4,700') to private culvert with five-foot drop onto riprap, (~6,200') to private culvert – possible barrier too, and (~7,200') to private culvert with rusted-through invert.

Habitat: Quantity = approximately 11,500' of potential fish-bearing habitat upstream of Site ID# S-028. Quality = rated as “fair” for the ranking matrix (quality score = 0.55) by CDFG’s 1994 habitat typing survey of 51,000' of channel. Juvenile coho salmon were sampled (in small numbers) as recently as 1995 and are considered to be sporadically present (Coey, pers. comm.). A 1966 fisheries survey by Water Resources “found steelhead and coho commonly throughout 16 miles of Green Valley Creek”. CDFG crew noted impacts of unfenced grazing, bank erosion, and garbage in the channel. The crossing was surveyed by Taylor and Assoc. on 8/08/01 and there was continuous flow in the channel. At 10:00AM the air temp = 14.5°C and the water temp = 10.5°C. The culvert survey crew described the habitat as “good” and noted a dense riparian canopy of hardwoods and conifers. The streambed was described as mostly gravel and cobble – good spawning substrate. Approximately 10 to 15 young-of-year salmonids were observed both upstream and downstream of Site ID #S-028.

Preferred Treatment: Two or three downstream boulder weirs and corner baffles within the culvert would cost-effectively improve passage conditions for both adults and juveniles. Other barriers should be addressed by CDFG.





Site ID #S-029: Harrison Grade Creek #1/Green Valley Road; Green Valley Creek; Russian River
Road Ownership: County

County Ranking: #15 = High-Priority

Basin-wide Ranking: #20 = High-Priority

Location: Road ID# 79040; County Map Sheet #4J41. USGS Quad: Camp Meeker. T7N, R10W, Section 13.
Lat/Long: 38° 26' 50.63" 122° 55' 26.44" Milepost = 250' to Harrison Grade Road.

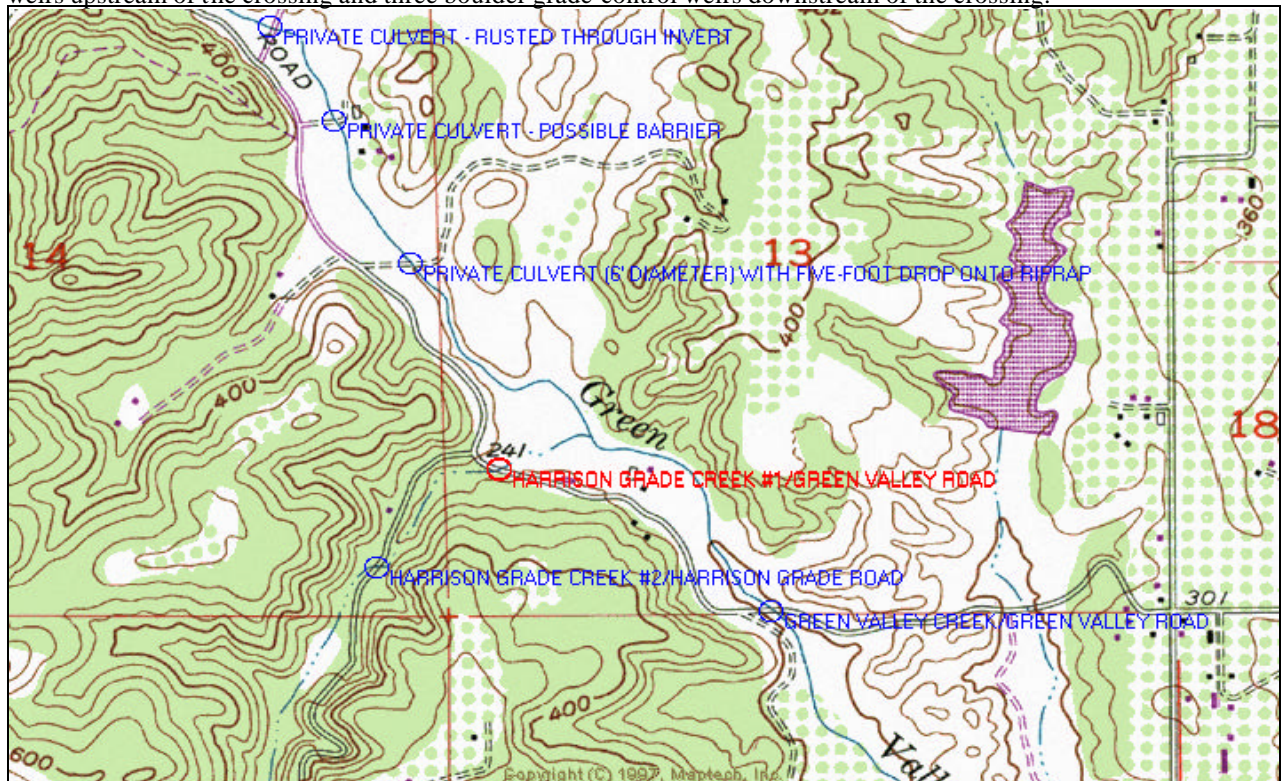
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 7.0' height x 5.0' width **Length:** 67.1'
Slope: 0.04% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 15.3'
Fill Estimate: 1,381 cubic yards. **Overall Condition:** Fair. **Sizing:** Slightly undersized; HW/D = 1 on a storm flow with approximately a 54-year recurrence interval. Green Valley Road is overtopped on a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for all species of adult salmonids and all age classes of juveniles due to the extremely perched outlet (~ 7 feet).

Additional Stream Crossings: Downstream = (~800') to confluence with Green Valley Creek and (~ 3,200') to Site ID #S-028. Upstream = (~ 1,400') to Site ID #S-030.

Habitat: Quantity = approximately 5,300' of potential fish-bearing habitat upstream of Site ID# S-029. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coe, pers. comm.). On 6/13/95, CDFG sampled the creek and only found salmonids downstream of Site ID #S-029 – including a single coho y-o-y. The crossing was surveyed by Taylor and Assoc. on 1/17/02 and there was continuous flow in the channel. At 9:30AM the air temp = 4°C and the water temp = 9°C. The culvert survey crew described the habitat as "good" and noted a dense riparian canopy of mostly hardwoods and a few conifers. The channel had "nice pools" and was low-gradient. The streambed was described as mostly gravel and cobble. No fish were observed. The culvert crew spoke with a local, Charlie Chenoweth (sp?), who has seen adult steelhead in the creek, but not many in recent years. Also said Harrison Grade Creek dries up every summer.

Preferred Treatment: A full replacement with a properly sized SSP circular culvert is the best long-term solution for this crossing. Because of the extremely perched nature of the current culvert, grade-control structures may be required to minimize headcutting. Consult with CDFG and NMFS hydraulic engineers for design assistance. Site may require a design similar to Morrison Gulch in Humboldt County that incorporated three boulder grade-control weirs upstream of the crossing and three boulder grade-control weirs downstream of the crossing.





Site ID #S-030: Harrison Grade Creek #2/Harrison Grade Road; Green Valley Creek; Russian River

Road Ownership: County

County Ranking: Tied for #34 = Moderate-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 7001; County Map Sheet #4J41. USGS Quad: Camp Meeker. T7N, R10W, Section 14.
Lat/Long: 38° 26' 43.29" 122° 55' 37.32" Milepost = 0.15 miles to Green Valley Road.

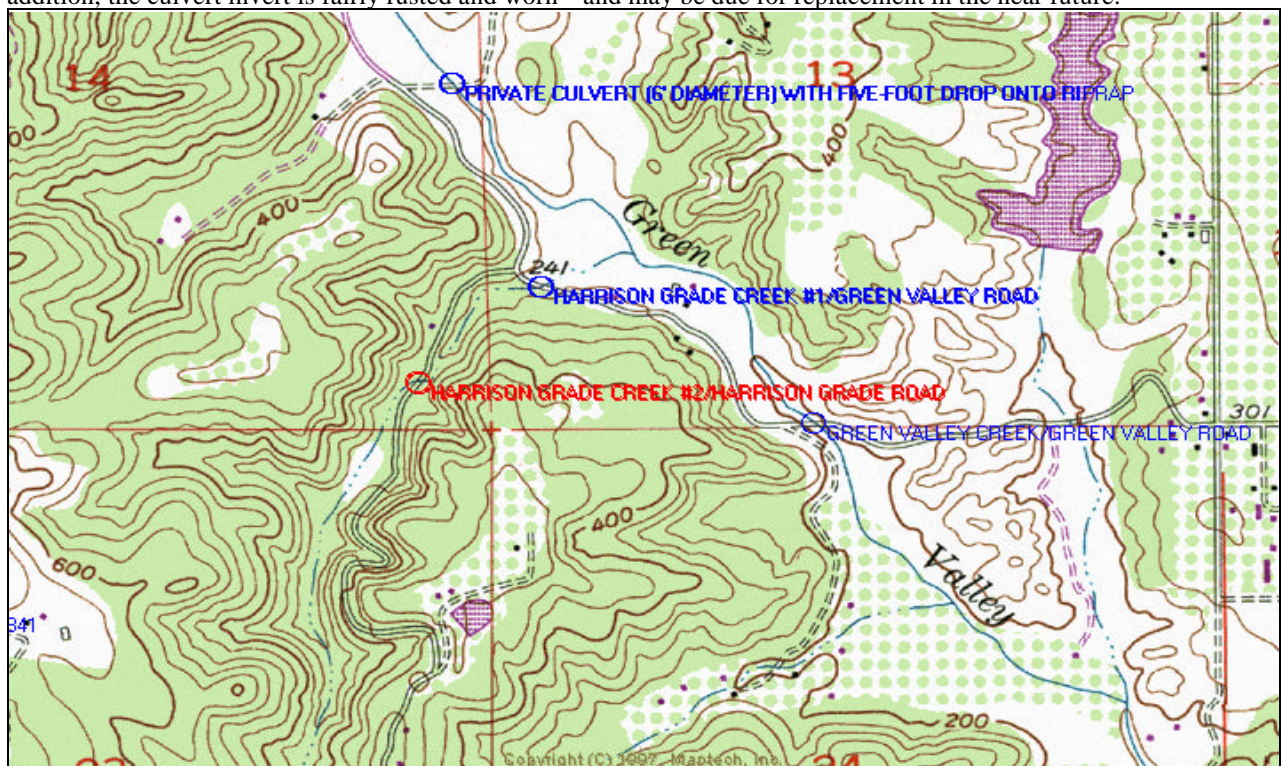
Culvert Type: Circular, SSP. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameter= 6.0' **Length:** 40.8'
Slope: 1.72% **Modifications:** None. **Rustline Height:** 1.2' **Average Active Channel Width:** 18.8'
Fill Estimate: 472 cubic yards. **Overall Condition:** Fair. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 13-year recurrence interval. Harrison Grade Road is overtopped on approximately a 93-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for all species of adult salmonids on 94% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juveniles because of the slightly perched outlet and also excessive velocities.

Additional Stream Crossings: Downstream = (~1,400') to Site ID #S-029, (~2,200') to confluence with Green Valley Creek and (~4,600') to Site ID #S-028. Upstream = none within the fish-bearing stream reach.

Habitat: Quantity = approximately 3,900' of potential fish-bearing habitat upstream of Site ID# S-030. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). On 6/13/95, CDFG sampled the creek and only found salmonids downstream of Site ID #S-029 – including a single coho y-o-y. The crossing was surveyed by Taylor and Assoc. on 1/17/02 and there was continuous flow in the channel. At 10:30AM the air temp = 5°C and the water temp = 9°C. The culvert survey crew described the habitat as "good" and noted a dense riparian canopy of mostly hardwoods and a few conifers. The channel had "nice pools" and was low-gradient. The streambed was described as mostly gravel and cobble. No fish were observed. The culvert crew spoke with a local, Charlie Chenoweth (sp?), who has seen adult steelhead in the creek, but not many in recent years. Also said Harrison Grade Creek dries up every summer.

Preferred Treatment: A full replacement with a properly sized open-bottom arch or a bridge is the best long-term solution for this crossing. A retrofit to backwater the culvert with weirs is not recommended because the current culvert is undersized and a further reduction in capacity may result in overtopping and/or failure of the road prism. In addition, the culvert invert is fairly rusted and worn – and may be due for replacement in the near future.





Site ID #S-031: Pool Creek; Chalk Hill Road; Windsor Ck; Mark West Ck; Russian River **Road Ownership:** County

County Ranking: #13 = High-Priority

Basin-wide Ranking: #18 = High-Priority

Location: Road ID # 8806; County Map Sheet #4J33. USGS Quad: Healdsburg. T8N, R8W, section 17. Lat/Long: 38° 32' 48.06" 122° 46' 16.35" Milepost = 10.50

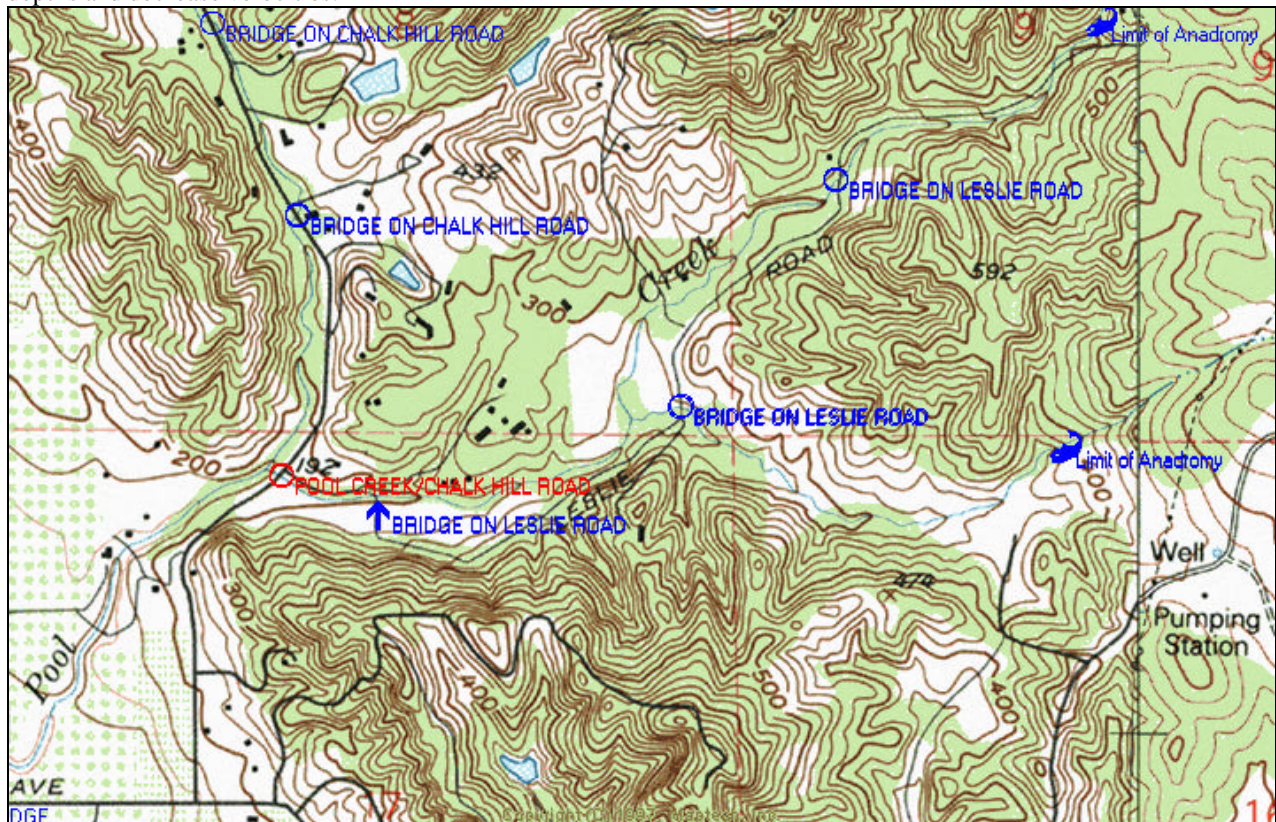
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.2' height x 8.0' width **Length:** 46.0' **Slope:** 0.87% **Modifications:** Four offset concrete baffles. **Rustline Height:** N/A **Average Active Channel Width:** 7.9' **Fill Estimate:** 991 cubic yards. **Overall Condition:** Fair- exposed rebar on floor. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 17-year recurrence interval. Chalk Hill Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juveniles due to the extremely perched outlet (4.1 feet).

Additional Stream Crossings: Downstream = (~4,200') to bridge on Pleasant Avenue, (~8,000') to bridge on Old Redwood Highway, (~11,100') to bridge on Highway 101/Hembree Avenue, (~12,800') to bridge on Conde Lane, (~13,800') to Railroad Xing – status unknown, and (~19,600') to bridge on Windsor Road. Upstream = (~900') to bridge on Leslie Road, (~3,500') to bridge on Leslie Road – crosses the LB tributary, and (~6,300') to bridge on Leslie Road.

Habitat: Quantity = approximately 11,600' of potential fish-bearing habitat upstream of Site ID# S-031. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). The lower 11,000' of Pool Creek was habitat typed in 1997, but access was denied to the upper ½ of the watershed. The crossing was surveyed by Taylor and Assoc. on 2/06/02 and there was continuous flow in the channel. At 10:00AM the air temp = 8°C and the water temp = 6.5°C. The culvert survey crew described the habitat as "fair to good" and noted a dense hardwood riparian canopy. The flow in the channel was described as, "gray and murky". No fish were observed.

Preferred Treatment: A series of four to five boulder weirs downstream of the crossing will raise the tail-water elevation and cost-effectively improve fish passage. The offset baffles already within the culvert should increase depths and decrease velocities.





Site ID #S-032: Windsor Creek #1; Natalie Road; Mark West Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #71 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID # 89102; County Map Sheet #4J32. USGS Quad: Healdsburg. T8N, R9W. Lat/Long: 38° 33' 20.38" 122° 48' 35.26" Milepost = 0.1 miles to Elsbree Circle.

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 7.85' height x 12.0' width
Length: 53.2' **Slopes:** LB = -2.22%; RB = -0.39% **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 19.6' **Fill Estimate:** 400 cubic yards. **Overall Condition:** Good.

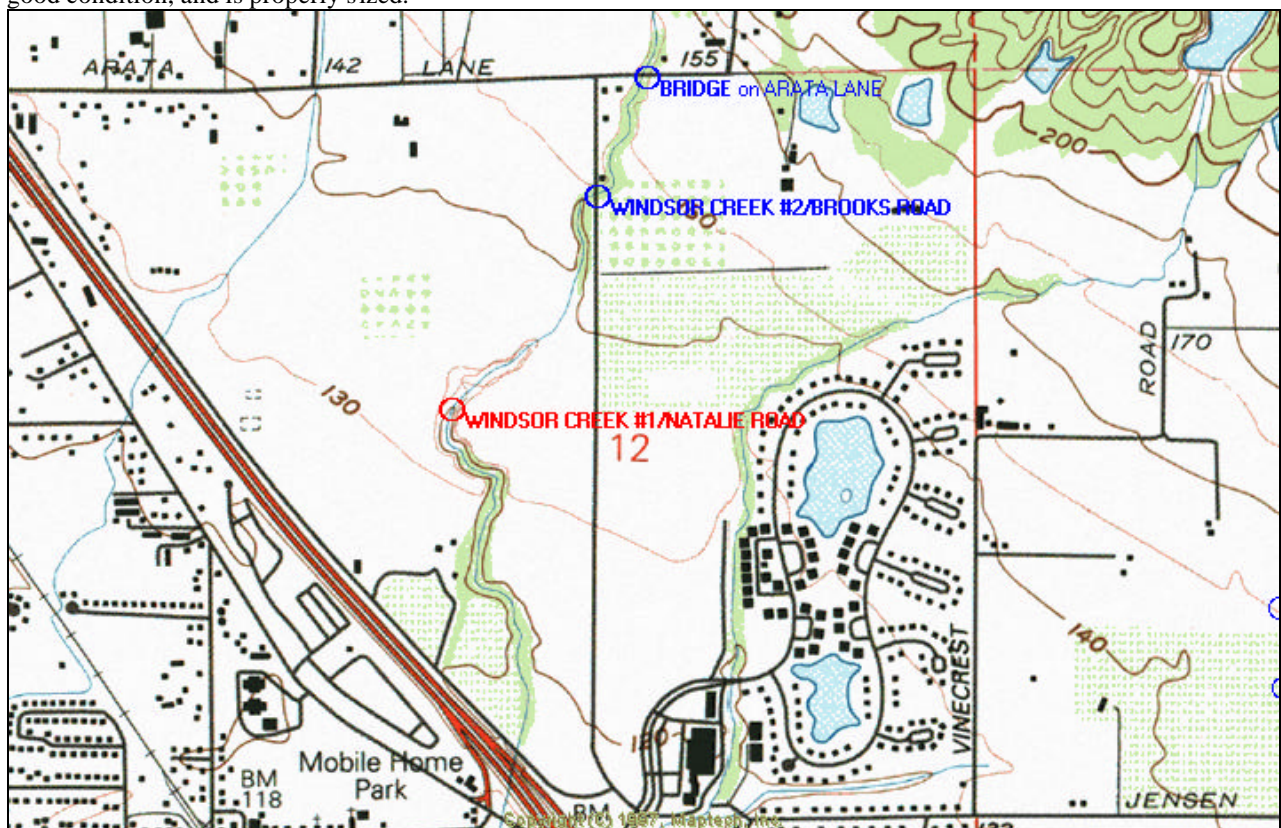
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Natalie Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined the RB bay of this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 98% of the range of estimated migration flows, meets passage criteria for resident/2+ fish on 95% of the range of estimated migration flows, and 90% of the migration flows for 1+/young-of-year juveniles.

Additional Stream Crossings: Downstream = (~3,400') to Highway 101 – status unknown, (~3,750') to bridge on Old Redwood Highway, (~3,900') to bridge on Conde Road, (~6,500') Railroad Xing – status unknown, (~10,000') to bridge on Windsor Road, (~23,500') to bridge on Mark West Station Road, and (30,500') to confluence with Mark West Creek. Upstream = (~2,100') to Site ID #S-033, (~3,200') to bridge on Arata Lane, (~6,800') to Site ID #34, and (~11,000') to a private crossing on the northern branch of Windsor Creek – status unknown.

Habitat: Quantity = approximately 34,550' of potential fish-bearing habitat upstream of Site ID# S-032. Quality = rated as “poor” for the ranking matrix as based on CDFG’s professional judgment (Coe, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 2/06/02 and there was continuous flow in the channel. At 5:00PM the air temp = 13°C and the water temp = 8°C. The culvert survey crew described the habitat as “poor” and noted a very sparse riparian canopy of brush. The channel was described as featureless and flowing through a residential area. Stream substrate was primarily silt and mud. No fish were observed.

Preferred Treatment: None recommended because the current crossing provides nearly unimpeded passage, is in good condition, and is properly sized.





Site ID #S-033: Windsor Creek #2; Brooks Road; Mark West Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #24 = Moderate -Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID # 89028; County Map Sheet #4J32. USGS Quad: Healdsburg. T8N, R9W, Section 1. Lat/Long: 38° 33' 35.37" 122° 48' 22.47" Milepost = 0.1 miles to Jessica Drive.

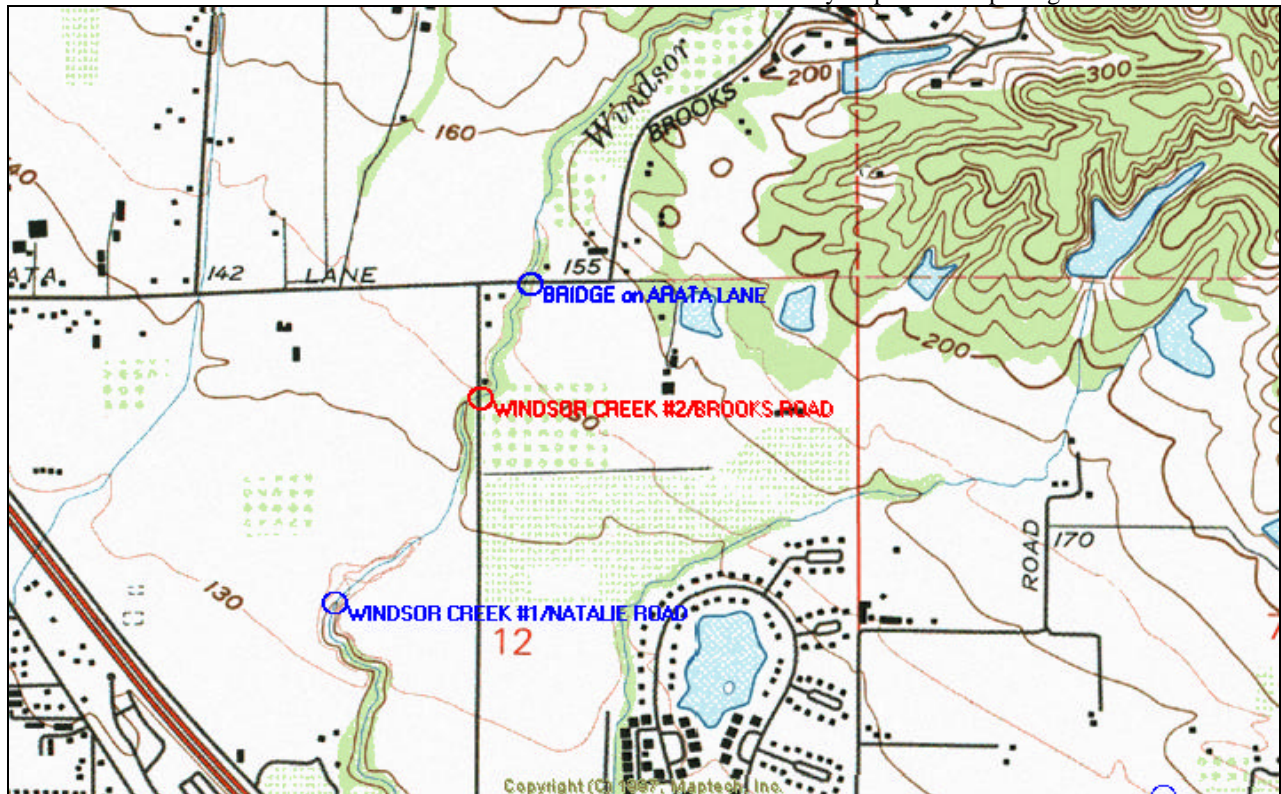
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.0' height x 12.0' width **Length:** 61.9' **Slopes:** 0.10% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 19.7' **Fill Estimate:** 1,213 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Brooks Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 54% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. The drop at the outlet, armoured with riprap, is the crossing's main feature that impedes fish passage. There are also lack-of-depth and excessive velocity concerns within the culvert too.

Additional Stream Crossings: Downstream = (~2,100') to Site ID #S-032, (~ 5,500') to Highway 101 – status unknown, (~ 5,850') to bridge on Old Redwood Highway, (~ 6,000') to bridge on Conde Road, (~8,600') Railroad Xing – status unknown, (~12,100') to bridge on Windsor Road, (~25,600') to bridge on Mark West Station Road, and (31,700') to confluence with Mark West Creek. Upstream = (~1,100') to bridge on Arata Lane, (~6,550') to Site ID #34, and (~ 10,700') to a private crossing on the northern branch of Windsor Creek – status unknown.

Habitat: Quantity = approximately 32,450' of potential fish-bearing habitat upstream of Site ID# S-033. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 2/06/02 and there was continuous flow in the channel. At 1:00PM the air temp = 12.5°C and the water temp = 8°C. The culvert survey crew described the habitat as "fair" and noted a sparse riparian canopy of hardwoods and brush. The channel was flowing through a residential area. Stream substrate was primarily gravel and cobble, but highly embedded with fines. No fish were observed. Culvert survey crew talked to locals who had never seen steelhead in the winter and said this section of creek is dry every summer.

Preferred Treatment: Because the current crossing is properly sized and in good condition, a retrofit is recommended. Construction of three to four boulder weirs downstream of the crossing to raise tail-water elevation and the installation of corner baffles within the culvert should cost-effectively improve fish passage.





Site ID #S-034: Windsor Creek #3; Brooks Road; Mark West Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #76 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID # 89028A; County Map Sheet #4J33. USGS Quad: Healdsburg. T8N, R9W, Section 1.
Lat/Long: 38° 34' 19.58" 122° 47' 49.94" Milepost = 12.03

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 12.0' height x 12.0' width **Length:** 42.0'
Slopes: 0.38% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 16.3'
Fill Estimate: 457 cubic yards. **Overall Condition:** Good.

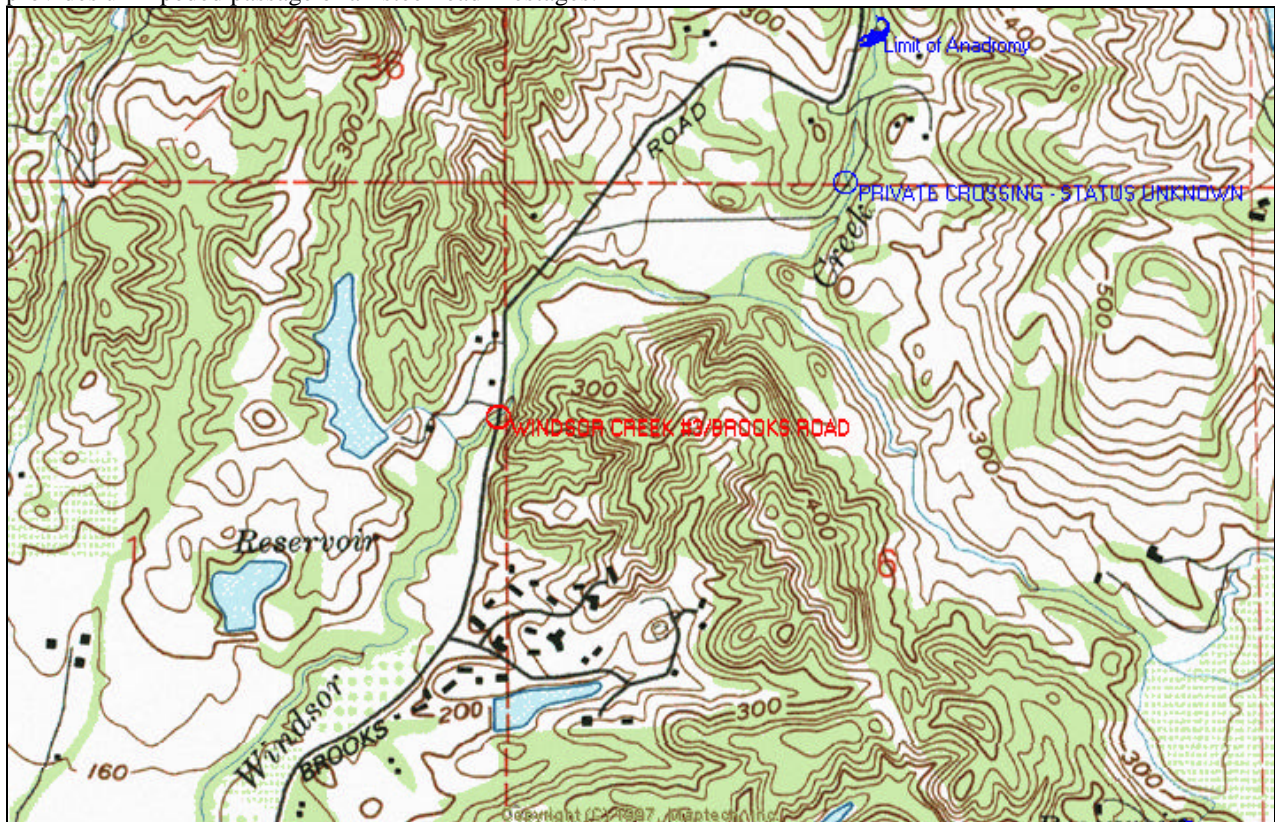
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Brooks Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for adult steelhead and all age classes of juveniles. The culvert is fully back-watered at low flow.

Additional Stream Crossings: Downstream = (~5,600') to bridge on Arata Lane, (~6,700') to Site ID #S-033, (~9,100') to Site ID #32, (~12,500') to Highway 101 – status unknown, (~12,900') to bridge on Old Redwood Highway, (~13,200') to bridge on Conde Road, (~15,850') Railroad Xing – status unknown, (~19,650') to bridge on Windsor Road, (~33,100') to bridge on Mark West Station Road, and (39,750') to confluence with Mark West Creek. Upstream = (~4,300') to a private crossing on the northern branch of Windsor Creek – status unknown.

Habitat: Quantity = approximately 26,350' of potential fish-bearing habitat upstream of Site ID# S-034. Quality = rated as “fair” for the ranking matrix as based on CDFG’s professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 2/06/02 and there was continuous flow in the channel. At 3:30PM the air temp = 10°C and the water temp = 6°C. The culvert survey crew described the habitat as “good” and noted a moderately dense riparian canopy of hardwoods. The crew noted several large/deep pools, located both upstream and downstream of the crossing. Stream substrate was primarily gravel and cobble and appeared to be good-quality for spawning. No fish were observed.

Preferred Treatment: No treatment required because the current crossing is properly sized, in good condition, and provides unimpeded passage of all steelhead lifestages.





Site ID #S-035: Pauline Creek #1/Marlow Road; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: County

County Ranking: Tied for #76 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E078; County Map Sheet #4J43. USGS Quad: Sebastapol. T7N, R8W, Section 16. Lat/Long: 38° 27' 25.36" 122° 45' 3.03" Milepost= 0.05 miles to Hershey Court.

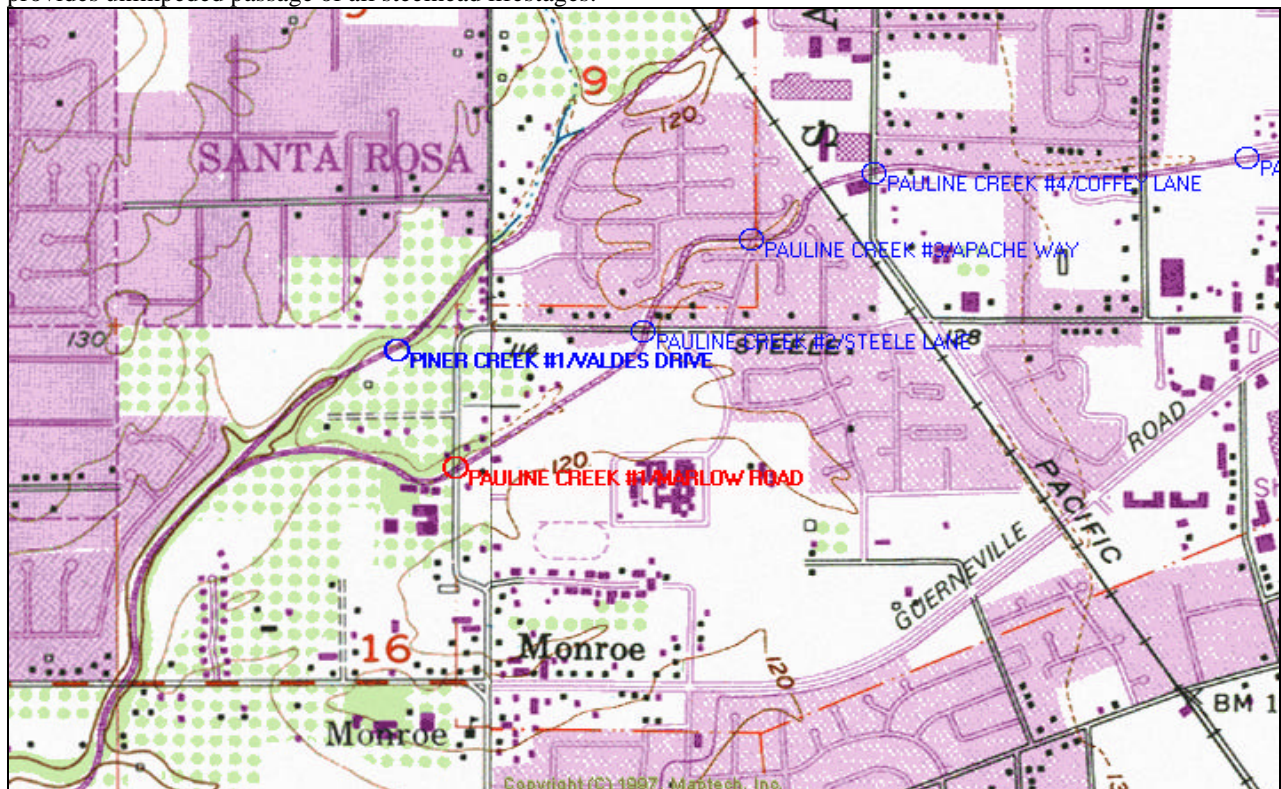
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.8' height x 10.0' width **Length:** 104.5'
Slope: 0.57% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 17.9'
Fill Estimate: 1,243 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Marlow Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for all species of adult salmonids and all age classes of juveniles.

Additional Stream Crossings: Downstream = (~3,800') to bridge on Guerneville Road, (~7,400') to bridge on Wright Avenue, (~10,100') to confluence with Santa Rosa Flood Control Channel, and then (~34,400') to confluence with Mark West Creek. Upstream = (~1,950') to Site ID #S-036, (~3,250') to Site ID #S-037, (~4,100') to Railroad crossing – status unknown, (~4,550') to Site ID #S-038, (~6,500') to Site ID #S-039, (~7,300') to Site ID #S-040, (~8,050') to Site ID #S-041, (~8,600') to Site ID #S-042, (~9,100') to Highway 101 – status unknown, (~11,350') to bridge on Mendocino Avenue, (~11,650') to Site ID #S-043, (~12,450') to bridge on Lomitas Avenue, (~14,150') to Site ID #S-044, (~18,200') to Site ID #S-045, and (~19,200') to Site ID #S-046.

Habitat: Quantity = approximately 21,050' of potential fish-bearing habitat upstream of Site ID# S-035. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 3/05/02 and there was continuous flow in the channel. At 3:30PM the air temp = 10°C and the water temp = 6°C. The culvert survey crew described the habitat as “poor” and noted a sparse riparian canopy of hardwoods. The crew noted a featureless channelized reach through residential/urban area. Stream substrate was primarily silt and mud. About 30 fish of unknown species (not salmonids) were observed upstream and downstream of Site ID #S-035.

Preferred Treatment: No treatment required because the current crossing is properly sized, in good condition, and provides unimpeded passage of all steelhead lifestages.





Site ID #S-036: Pauline Creek #2/Steele Lane; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: County

County Ranking: Tied for #76 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E092; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 16. Lat/Long: 38° 27' 35.40" 122° 44' 46.33" Milepost=0.1 miles to Apache Avenue.

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** Each Bay = 6.9' height x 10.0' width
Length: 56.3' **Slopes:** LB = -1.49%; RB = 0.18% **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 17.1' **Fill Estimate:** 539 cubic yards. **Overall Condition:** Good. **Sizing:**
Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Steele Lane is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 93% of the range of estimated migration flows, meets passage criteria for resident/2+ fish on 97% of the range of migration flows, and meets criteria for 1+/young-of-year juveniles on 100% of the range of migration flows.

Additional Stream Crossings: Downstream = (~1,950') to Site ID #S-035, (~5,750') to bridge on Guerneville Road, (~9,350') to bridge on Wright Avenue, (~12,050') to confluence with Santa Rosa Flood Control Channel, and then (~36,350') to confluence with Mark West Creek. Upstream = (~1,300') to Site ID #S-037, (~2,150') to Railroad crossing – status unknown, (~2,600') to Site ID #S-038, (~4,550') to Site ID #S-039, (~5,350') to Site ID #S-040, (~6,100') to Site ID #S-041, (~6,550') to Site ID #S-042, (~7,150') to Highway 101 – status unknown, (~9,400') to bridge on Mendocino Avenue, (~9,700') to Site ID #S-043, (~10,500') to bridge on Lomas Avenue, (~12,200') to Site ID #S-044, (~16,250') to Site ID #S-045, and (~17,250') to Site ID #S-046.

Habitat: Quantity = approximately 19,350' of potential fish-bearing habitat upstream of Site ID# S-036. Quality = rated as "fair" for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 3/06/02 and there was continuous flow in the channel. At 11:00AM the air temp = 15°C and the water temp = 15.5°C. The culvert survey crew described the habitat as "poor" and noted a sparse riparian canopy of hardwoods. The crew noted a featureless channelized reach both upstream and downstream of the crossing. Stream substrate was primarily mud and silt. No fish were observed.

Preferred Treatment: No treatment required because the current crossing is properly sized, in good condition, and provides nearly unimpeded passage of all steelhead lifestages.





Site ID #S-037: Pauline Creek #3/Apache Way; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: City of Santa Rosa

County Ranking: Tied for #76 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 9. Lat/Long: 38° 27' 42.13" 122° 44' 36.82" Milepost = 0.1 miles to Mohawk Street.

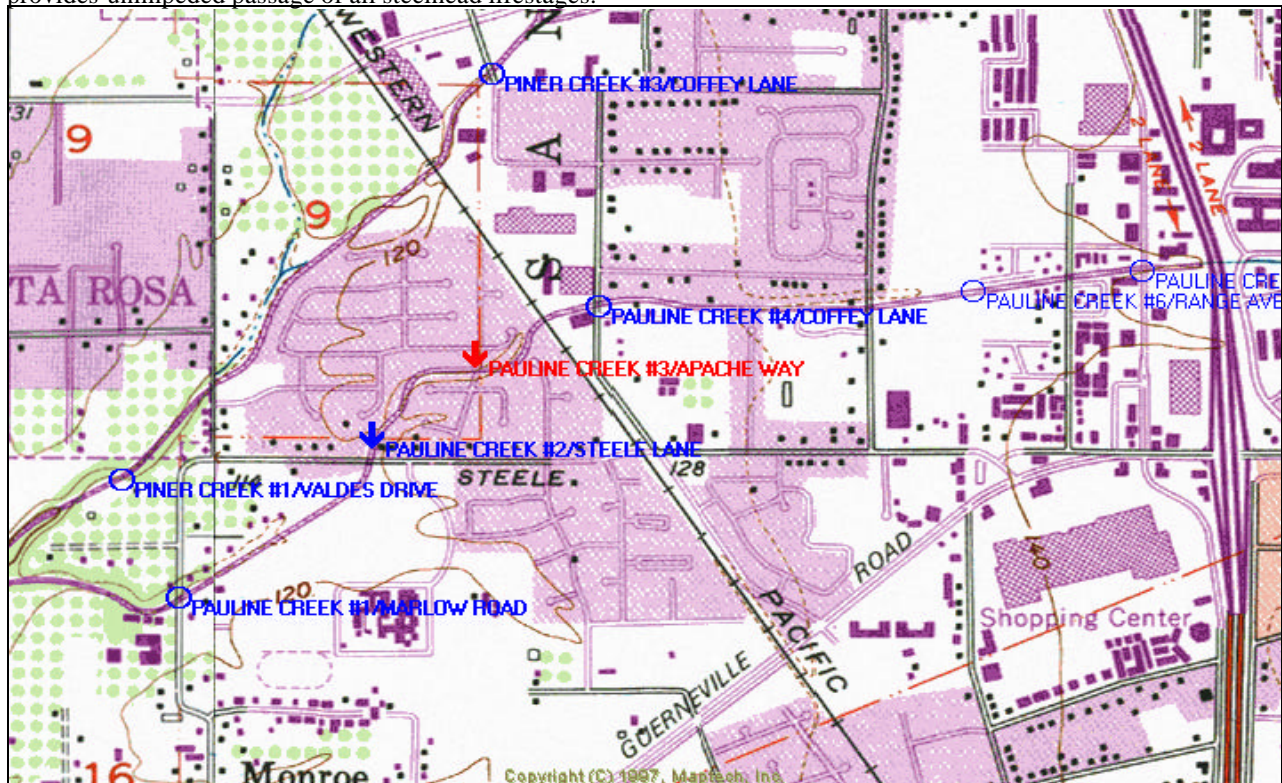
Culvert Type: Two Pipe Arches, SSP. **Corrugations:** 6"x 2" **Dimensions:** Each Bay = 7.5' rise x 11.7' span
Lengths: LB = 74.8'; RB = 68.8' **Slopes:** LB = -0.21%; RB = -0.36% **Modifications:** None. **Rustline Height:** 1.4'
Average Active Channel Width: 19.4' **Fill Estimate:** 556 cubic yards. **Overall Condition:** Good.
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Apache Way is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for all species of adult salmonids and all age classes of juveniles.

Additional Stream Crossings: Downstream = (~1,300') to Site ID #S-036, (~3,250') to Site ID #S-035, (~7,050') to bridge on Guerneville Road, (~10,650') to bridge on Wright Avenue, (~13,350') to confluence with Santa Rosa Flood Control Channel, and then (~37,650') to confluence with Mark West Creek. Upstream = (~850') to Railroad crossing – status unknown, (~1,300') to Site ID #S-038, (~3,250') to Site ID #S-039, (~4,050') to Site ID #S-040, (~4,800') to Site ID #S-041, (~5,250') to Site ID #S-042, (~5,850') to Highway 101 – status unknown, (~8,100') to bridge on Mendocino Avenue, (~8,400') to Site ID #S-043, (~9,200') to bridge on Lomitas Avenue, (~10,900') to Site ID #S-044, (~14,950') to Site ID #S-045, and (~15,950') to Site ID #S-046.

Habitat: Quantity = approximately 18,150' of potential fish-bearing habitat upstream of Site ID# S-037. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 3/06/02 and there was continuous flow in the channel. At 12:15PM the air temp = 18°C and the water temp = 16°C. The culvert survey crew described the habitat as "poor" and noted a sparse riparian canopy of hardwoods. The crew noted a featureless channelized reach through a residential area within Santa Rosa's city limits. Stream substrate was primarily mud and silt. No fish were observed.

Preferred Treatment: No treatment required because the current crossing is properly sized, in good condition, and provides unimpeded passage of all steelhead lifestages.





Site ID #S-038: Pauline Creek #4/Coffey Lane; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: County

County Ranking: Tied for #76 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E088; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 9. Lat/Long: 38° 27' 46.90" 122° 44' 26.12" Milepost = 0.05 miles to Terry Road.

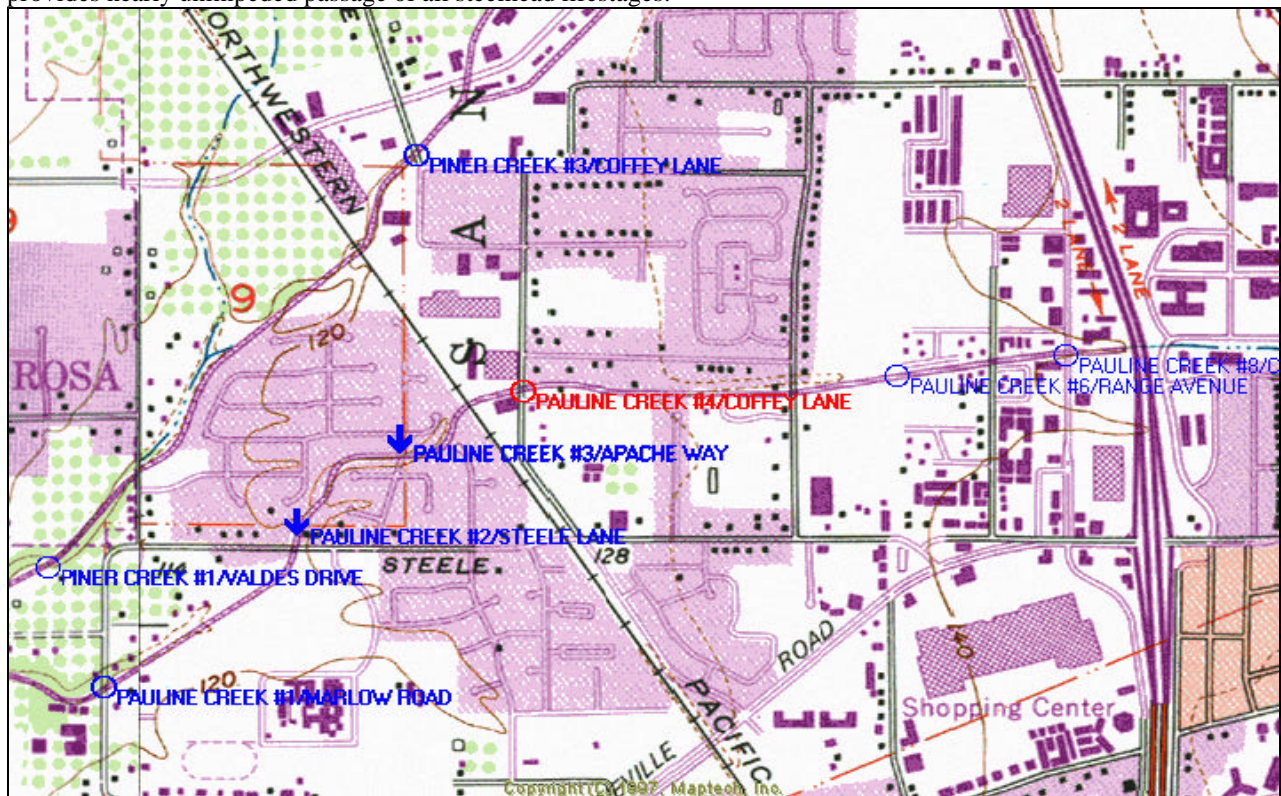
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 6.9' height x 20.0' width
Length: 61.0' **Slope:** 0.08% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 17.9'
Fill Estimate: 537 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Coffey Lane is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 91% of the range of estimated migration flows, meets passage criteria for resident/2+ fish on 83% of the range of migration flows, and meets criteria for 1+/young-of-year juveniles on 100% of the range of migration flows.

Additional Stream Crossings: Downstream = (~450') to Railroad crossing – status unknown, (~1,300') to Site ID #S-037, (~2,600') to Site ID #S-036, (~4,550') to Site ID #S-035, (~8,350') to bridge on Guerneville Road, (~11,950') to bridge on Wright Avenue, (~14,650') to confluence with Santa Rosa Flood Control Channel, and then (~38,950') to confluence with Mark West Creek. Upstream = (~1,950') to Site ID #S-039, (~2,750') to Site ID #S-040, (~3,500') to Site ID #S-041, (~4,050') to Site ID #S-042, (~4,550') to Highway 101 – status unknown, (~6,800') to bridge on Mendocino Avenue, (~7,100') to Site ID #S-043, (~7,900') to bridge on Lomitas Avenue, (~9,600') to Site ID #S-044, (~13,650') to Site ID #S-045, and (~14,650') to Site ID #S-046.

Habitat: Quantity = approximately 17,100' of potential fish-bearing habitat upstream of Site ID# S-038. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 3/06/02 and there was continuous flow in the channel. At 12:15PM the air temp = 18°C and the water temp = 16°C. The culvert survey crew described the habitat as “poor” and noted a sparse riparian canopy of hardwoods. The crew noted a featureless channelized reach through a residential area within Santa Rosa’s city limits. Stream substrate was primarily mud and silt. No fish were observed.

Preferred Treatment: No treatment required because the current crossing is properly sized, in good condition, and provides nearly unimpeded passage of all steelhead lifestages.





Site ID #S-039: Pauline Creek #5/Mardie's Lane; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: City of Santa Rosa

County Ranking: Tied for #76 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 10. Lat/Long: 38° 27' 46.84" 122° 44' 2.14" Milepost= 0.1 miles to Terry Road.

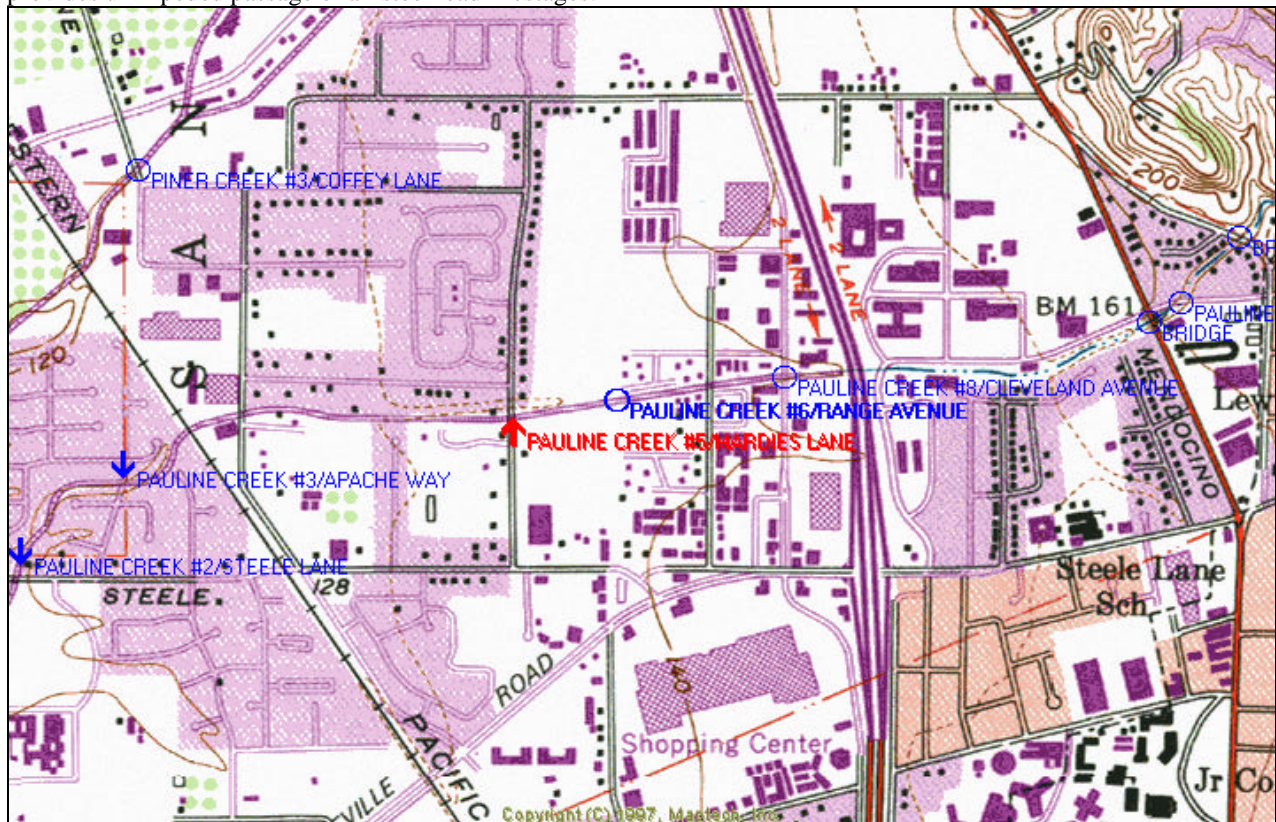
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 7.0' height x 16.0' width
Length: 56.8' **Slope:** 0.00% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 22.4'
Fill Estimate: 566 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 210-year recurrence interval. Mardie's Lane is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for adult steelhead and all age classes of juveniles.

Additional Stream Crossings: Downstream = (~1,950') to Site ID #S-038, (~2,400') to Railroad crossing – status unknown, (~3,250') to Site ID #S-037, (~4,550') to Site ID #S-036, (~6,500') to Site ID #S-035, (~10,300') to bridge on Guerneville Road, (~13,900') to bridge on Wright Avenue, (~16,600') to confluence with Santa Rosa Flood Control Channel, and then (~40,900') to confluence with Mark West Creek. Upstream = (~800') to Site ID #S-040, (~1,550') to Site ID #S-041, (~2,100') to Site ID #S-042, (~2,600') to Highway 101 – status unknown, (~4,850') to bridge on Mendocino Avenue, (~5,150') to Site ID #S-043, (~5,950') to bridge on Lomitas Avenue, (~7,650') to Site ID #S-044, (~11,700') to Site ID #S-045, and (~12,700') to Site ID #S-046.

Habitat: Quantity = approximately 15,200' of potential fish-bearing habitat upstream of Site ID# S-039. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 3/06/02 and there was continuous flow in the channel. At 3:15PM the air temp = 16°C and the water temp = 17°C. The culvert survey crew described the habitat as "poor" and noted a sparse riparian canopy of hardwoods. The crew noted a featureless channelized reach through a residential area within Santa Rosa's city limits. Stream substrate was primarily mud and silt. No fish were observed.

Preferred Treatment: No treatment required because the current crossing is properly sized, in good condition, and provides unimpeded passage of all steelhead lifestages.





Site ID #S-040: Pauline Creek #6/Range Avenue; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: County

County Ranking: Tied for #76 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E087; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 10. Lat/Long: 38° 27' 48.02" 122° 43' 52.79" Milepost= 0.2 miles to Steele Lane.

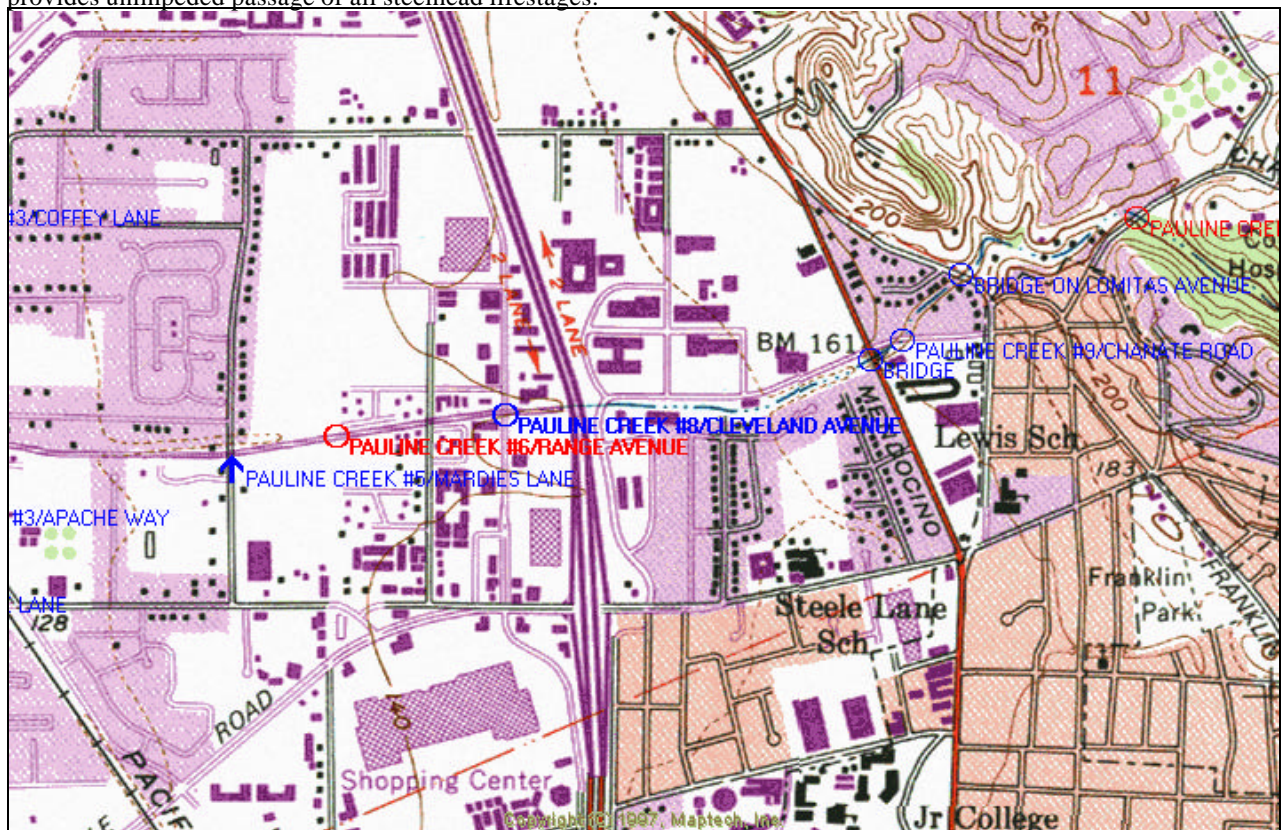
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 6.9' height x 16.0' width
Length: 71.0' **Slope:** 0.41% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 20.7'
Fill Estimate: 779 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 199-year recurrence interval. Range Avenue is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for adult steelhead and all age classes of juveniles.

Additional Stream Crossings: Downstream = (~800') to Site ID #S-039, (~2,750') to Site ID #S-038, (~3,200') to Railroad crossing – status unknown, (~4,050') to Site ID #S-037, (~5,350') to Site ID #S-036, (~7,300') to Site ID #S-035, (~11,100') to bridge on Guerneville Road, (~14,700') to bridge on Wright Avenue, (~17,400') to confluence with Santa Rosa Flood Control Channel, and then (~41,700') to confluence with Mark West Creek. Upstream = (~750') to Site ID #S-041, (~1,300') to Site ID #S-042, (~1,800') to Highway 101 – status unknown, (~4,050') to bridge on Mendocino Avenue, (~4,350') to Site ID #S-043, (~5,150') to bridge on Lomitas Avenue, (~6,850') to Site ID #S-044, (~10,900') to Site ID #S-045, and (~11,900') to Site ID #S-046.

Habitat: Quantity = approximately 14,550' of potential fish-bearing habitat upstream of Site ID# S-040. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 3/06/02 and there was continuous flow in the channel. At 4:00PM the air temp = 15°C and the water temp = 15.5°C. The culvert survey crew described the habitat as “poor” and noted a sparse riparian canopy of hardwoods. The crew noted a featureless channelized reach through a residential area within Santa Rosa’s city limits. Stream substrate was primarily mud and silt. No fish were observed.

Preferred Treatment: No treatment required because the current crossing is properly sized, in good condition, and provides unimpeded passage of all steelhead lifestages.





Site ID #S-041: Pauline Creek #7/McBride Lane; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: City of Santa Rosa

County Ranking: #74 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 10. Lat/Long: 38° 27' 48.95" 122° 43' 44.45" Milepost = 0.1 miles to Terry Lane.

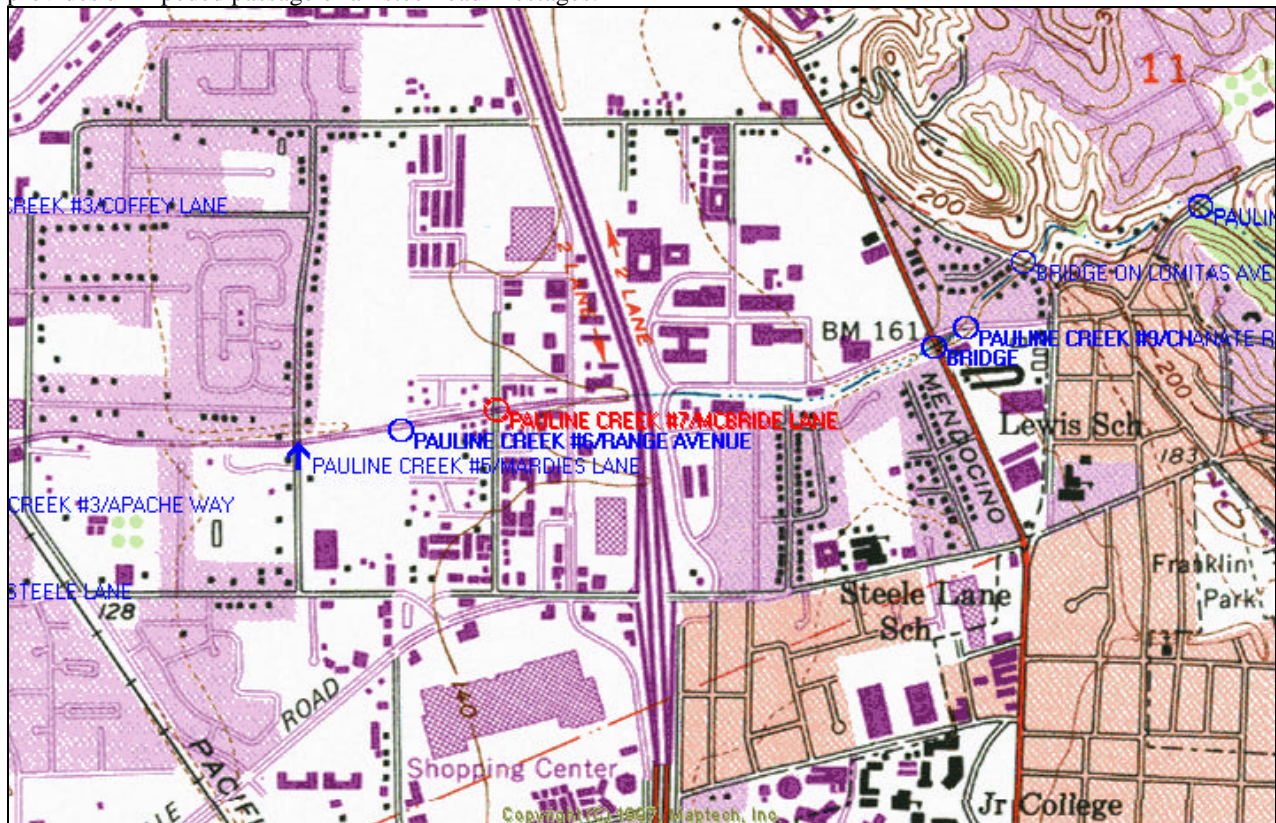
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 5.9' height x 16.0' width
Length: 54.3' **Slope:** 0.41% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 21.2'
Fill Estimate: 553 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 61-year recurrence interval. McBride Lane is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juveniles.

Additional Stream Crossings: Downstream = (~750') to Site ID #S-040, (~1,550') to Site ID #S-039, (~3,500') to Site ID #S-038, (~3,950') to Railroad crossing – status unknown, (~4,800') to Site ID #S-037, (~6,100') to Site ID #S-036, (~8,050') to Site ID #S-035, (~11,850') to bridge on Guerneville Road, (~15,450') to bridge on Wright Avenue, (~18,150') to confluence with Santa Rosa Flood Control Channel, and then (~42,450') to confluence with Mark West Creek. Upstream = (~550') to Site ID #S-042, (~1,050') to Highway 101 – status unknown, (~3,300') to bridge on Mendocino Avenue, (~3,600') to Site ID #S-043, (~4,400') to bridge on Lomitas Avenue, (~6,100') to Site ID #S-044, (~10,150') to Site ID #S-045, and (~11,150') to Site ID #S-046.

Habitat: Quantity = approximately 13,800' of potential fish-bearing habitat upstream of Site ID# S-041. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 3/06/02 and there was continuous flow in the channel. At 5:00PM the air temp = 16°C and the water temp = 17°C. The culvert survey crew described the habitat as "poor" and noted a sparse riparian canopy of hardwoods. The crew noted a featureless channelized reach through a residential area within Santa Rosa's city limits. Stream substrate was primarily mud and silt. No fish were observed.

Preferred Treatment: No treatment required because the current crossing is properly sized, in good condition, and provides unimpeded passage of all steelhead lifestages.





Site ID #S-042: Pauline Creek #8/Cleveland Avenue; Piner Creek; Santa Rosa Creek; Mark West Ck; Russian River
Road Ownership: County

County Ranking: Tied for #41 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E086; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 10. Lat/Long: 38° 27' 49.57" 122° 43' 37.84" Milepost = 0.05 miles to Terry Lane.

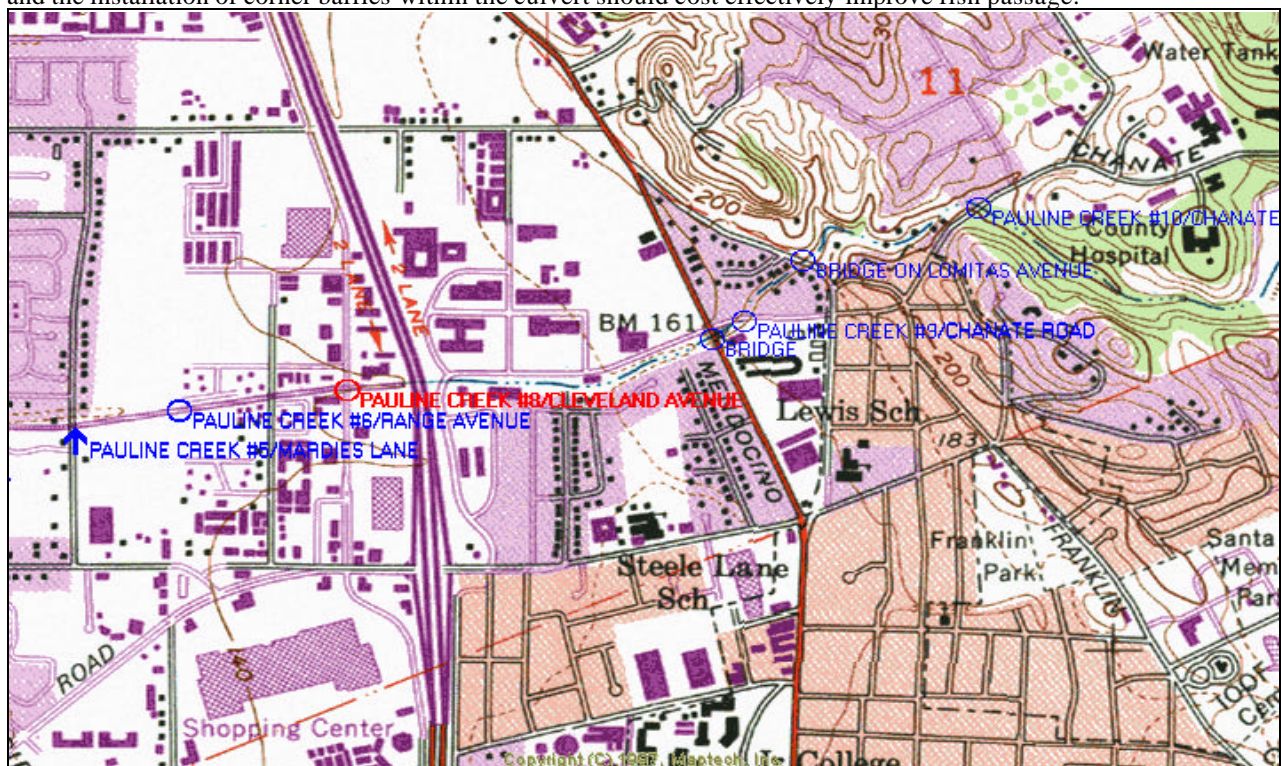
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 4.85' height x 22.0' width
Length: 64.6' **Slope:** 0.53% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 14.8'
Fill Estimate: 763 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 63-year recurrence interval. Cleveland Avenue is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 47% of the range of expected migration flows and all fails to meet passage criteria for all age classes of juvenile salmonids. For all juveniles, the perched outlet (1.8') is the crossing's primary feature that impedes passage.

Additional Stream Crossings: Downstream = (~550') to Site ID #S-041, (~1,300') to Site ID #S-040, (~2,100') to Site ID #S-039, (~4,050') to Site ID #S-038, (~4,500') to Railroad crossing – status unknown, (~5,350') to Site ID #S-037, (~6,650') to Site ID #S-036, (~8,600') to Site ID #S-035, (~12,400') to bridge on Guerneville Road, (~16,000') to bridge on Wright Avenue, (~18,700') to confluence with Santa Rosa Flood Control Channel, and then (~43,000') to confluence with Mark West Creek. Upstream = (~500') to Highway 101 – status unknown, (~2,750') to bridge on Mendocino Avenue, (~3,050') to Site ID #S-043, (~3,850') to bridge on Lomitas Avenue, (~5,550') to Site ID #S-044, (~9,600') to Site ID #S-045, and (~10,600') to Site ID #S-046.

Habitat: Quantity = approximately 13,250' of potential fish-bearing habitat upstream of Site ID# S-042. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed on 3/08/02 and there was continuous flow in the channel. At 8:30AM the air temp = 8°C and the water temp = 12°C. The culvert survey crew described the habitat as "poor" and noted a sparse riparian canopy of hardwoods. The crew noted a featureless channelized reach through a residential area within Santa Rosa's city limits. Stream substrate was primarily mud and silt. No fish were observed. Homeless encampment upstream by Highway 101 crossing.

Preferred Treatment: Because the current crossing is properly sized and in good condition, a retrofit is recommended. Construction of three to four boulder weirs downstream of the crossing to raise tail-water elevation and the installation of corner baffles within the culvert should cost-effectively improve fish passage.





Site ID #S-043: Pauline Creek #9/Chanate Road; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: County
County Ranking: Tied for #21 = Moderate-Priority **Basin-wide Ranking:** Tied for #28 = Moderate-Priority

Location: Road ID# E102; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 11. Lat/Long: 38° 27' 54.84" 122° 43' 02.60" Milepost = 0.05 miles to Mendocino Avenue.

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 4.0' height x 14.0' width
Length: 89.0' **Slope:** 1.06% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 14.0' **Fill Estimate:** 474 cubic yards. **Overall Condition:** Good. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. Chanate Road is overtopped on approximately a 66-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 37% of the range of expected migration flows and all fails to meet passage criteria for all age classes of juvenile salmonids. For all juveniles, the perched outlet (1.8') is the crossing's primary feature that impedes passage.

Additional Stream Crossings: Downstream = (~300') to bridge on Mendocino Avenue, (~2,550') to Highway 101 – status unknown, (~3,050') to Site ID #S-042, (~3,600') to Site ID #S-041, (~4,350') to Site ID #S-040, (~5,150') to Site ID #S-039, (~7,100') to Site ID #S-038, (~7,550') to Railroad crossing – status unknown, (~8,400') to Site ID #S-037, (~9,700') to Site ID #S-036, (~11,650') to Site ID #S-035, (~15,450') to bridge on Guerneville Road, (~19,050') to bridge on Wright Avenue, (~21,750') to confluence with Santa Rosa Flood Control Channel, and then (~46,050') to confluence with Mark West Creek. Upstream = (~800') to bridge on Lomitas Avenue, (~2,500') to Site ID #S-044, (~6,550') to Site ID #S-045, and (~7,550') to Site ID #S-046.

Habitat: Quantity = approximately 10,300' of potential fish-bearing habitat upstream of Site ID# S-043. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed on 3/08/02 and there was continuous flow in the channel. At 10:15AM the air temp = 13°C and the water temp = 12°C. The culvert survey crew described the habitat as "poor" and noted a dense riparian canopy of hardwoods, but still a featureless channelized reach through a residential area within Santa Rosa's city limits. Upstream of the crossing the in-stream habitat appeared to start to improve. No fish were observed.

Preferred Treatment: Because the current box culvert is extremely undersized, a retrofit may not be feasible. Three to four downstream boulder weirs would raise tail-water elevation and possibly back-water the culvert. The installation of corner baffles within the culvert is not recommended due to the already low storm-flow capacity. A full replacement is the best long-term solution for improving fish passage and storm flow conveyance, but this is probably cost-prohibitive due to the poor quality of the habitat in Pauline Creek.





Site ID #S-044: Pauline Creek #10/Chanate Road; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: County
County Ranking: Tied for #53 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E102; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 11. Lat/Long: 38° 28' 03.34" 122° 42' 41.82" Milepost = 0.05 miles to Terra Linda Drive.

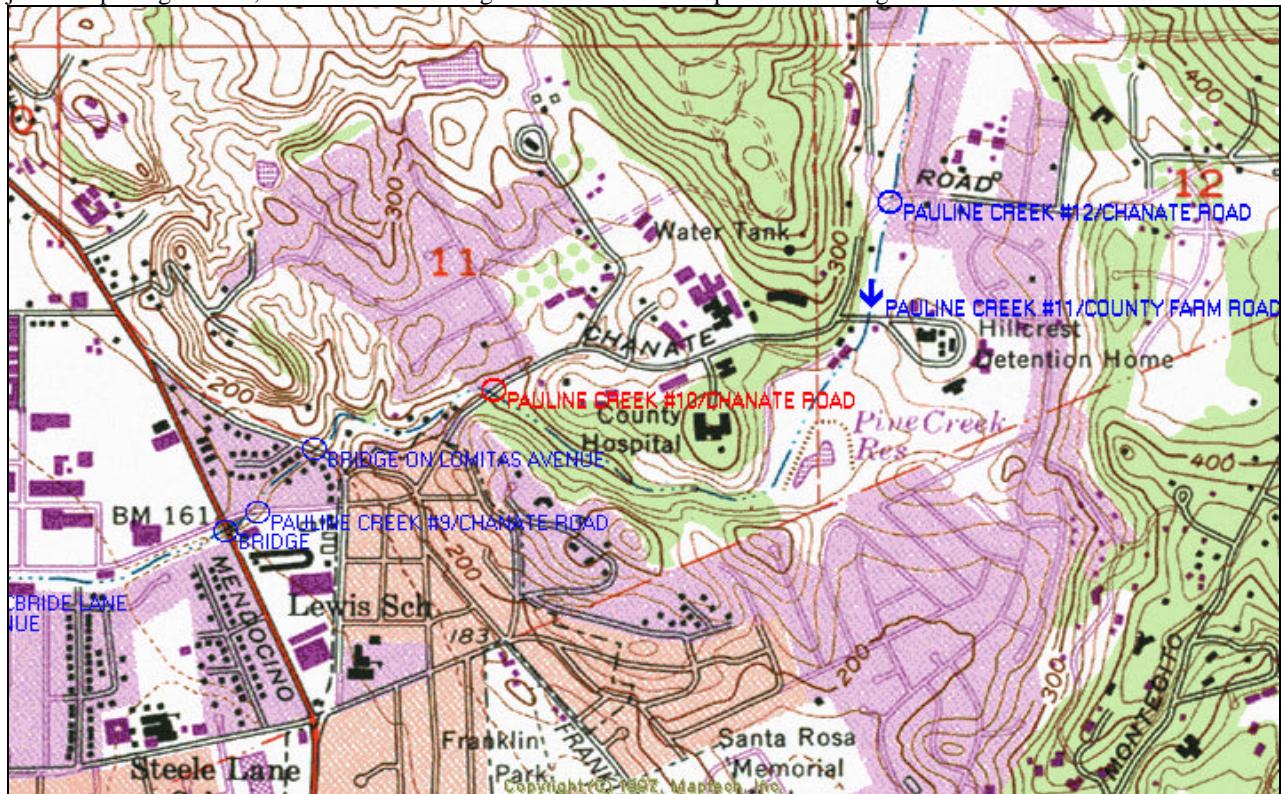
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 8.6' height x 8.9' width **Length:** 62.0'
Slope: 0.97% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 13.0'
Fill Estimate: 1,186 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 44-year recurrence interval. Chanate Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 54% of the range of expected migration flows and all fails to meet passage criteria for all age classes of juvenile salmonids. For adults, lack-of-depth is the only passage criteria violation – actual passage may be higher than predicted by FishXing. For older juveniles, there is only a lack-of-depth violation up to 8 c.f.s. - then excessive velocities occur. For 1+/young-of-year juveniles excessive velocities is the primary factor that impedes passage.

Additional Stream Crossings: Downstream = (~1,700') to bridge on Lomas Avenue, (~2,500') to Site ID #S-043, (~2,800') to bridge on Mendocino Avenue, (~5,050') to Highway 101 – status unknown, (~5,550') to Site ID #S-042, (~6,100') to Site ID #S-041, (~6,850') to Site ID #S-040, (~7,650') to Site ID #S-039, (~9,600') to Site ID #S-038, (~10,050') to Railroad crossing – status unknown, (~10,900') to Site ID #S-037, (~12,200') to Site ID #S-036, (~14,150') to Site ID #S-035, (~17,950') to bridge on Guerneville Road, (~21,150') to bridge on Wright Avenue, (~24,250') to confluence with Santa Rosa Flood Control Channel, and then (~48,550') to confluence with Mark West Creek. Upstream = (~4,050') to Site ID #S-045 and (~5,050') to Site ID #S-046.

Habitat: Quantity = approximately 8,100' of potential fish-bearing habitat upstream of Site ID# S-044. Quality = rated as “fair” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed on 3/08/02 and there was continuous flow in the channel. At 11:30AM the air temp = 16°C and the water temp = 13°C. The culvert survey crew described the habitat as “fair to good” and noted a moderately dense riparian canopy of hardwoods, and finally a more natural channel upstream of Santa Rosa’s city limits. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate adult passage and probably some juvenile passage. Also, downstream crossing is a more serious impediment to migration.





Site ID #S-045: Pauline Creek #11/County Farm Road; Piner Creek; Santa Rosa Ck; Mark West Ck; Russian River

Road Ownership: City of Santa Rosa

County Ranking: Tied for #78 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 12. Lat/Long: 38° 28' 08.80" 122° 42' 08.31" Milepost = 0.05 miles to Chanate Road.

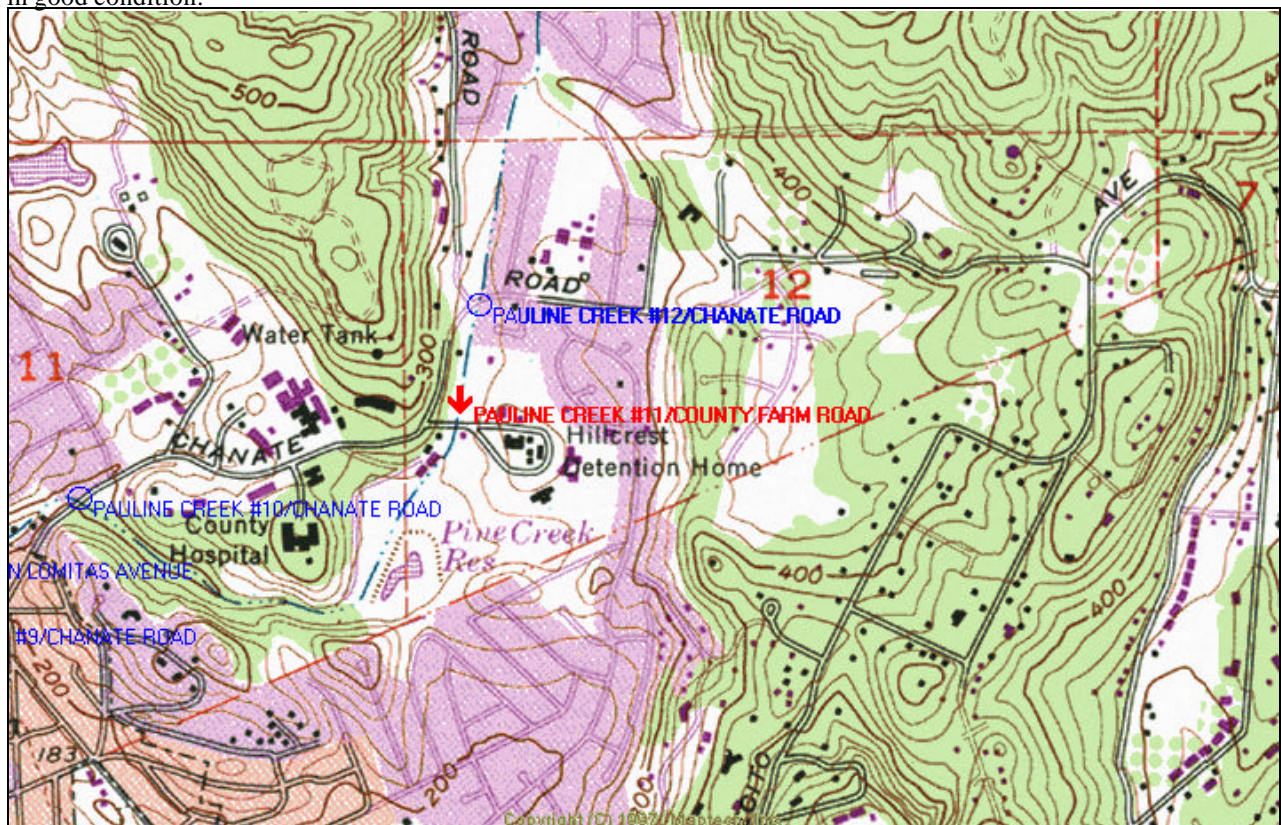
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.0' height x 9.0' width **Length:** 29.8'
Slope: 0.64% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 8.4'
Fill Estimate: 151 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. County Farm Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for adult steelhead and all age classes of juveniles.

Additional Stream Crossings: Downstream = (~4,050') to Site ID #S-044, (~5,750') to bridge on Lomitas Avenue, (~6,550') to Site ID #S-043, (~6,850') to bridge on Mendocino Avenue, (~9,100') to Highway 101 – status unknown, (~9,600') to Site ID #S-042, (~10,150') to Site ID #S-041, (~10,900') to Site ID #S-040, (~11,700') to Site ID #S-039, (~13,650') to Site ID #S-038, (~14,100') to Railroad crossing – status unknown, (~14,950') to Site ID #S-037, (~16,250') to Site ID #S-036, (~18,200') to Site ID #S-035, (~22,000') to bridge on Guerneville Road, (~25,200') to bridge on Wright Avenue, (~28,300') to confluence with Santa Rosa Flood Control Channel, and then (~52,600') to confluence with Mark West Creek. Upstream = (~1,000') to Site ID #S-046.

Habitat: Quantity = approximately 4,450' of potential fish-bearing habitat upstream of Site ID# S-045. Quality = rated as “fair” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed on 3/08/02 and there was continuous flow in the channel. At 1:40PM the air temp = 14°C and the water temp = 15°C. The survey crew described the habitat as “fair” and noted a moderately dense riparian canopy of hardwoods and brush. Overall there was a more natural channel than the reach through Santa Rosa city limit. No fish were observed.

Preferred Treatment: None recommended because crossing provides unimpeded passage, is properly sized, and is in good condition.





Site ID #S-046: Pauline Creek #12/Chanate Road; Piner Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: County

County Ranking: Tied for #69 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E102; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 12. Lat/Long: 38° 28' 17.42" 122° 42' 06.34" Milepost = 0.05 miles to Parker Hill Road.

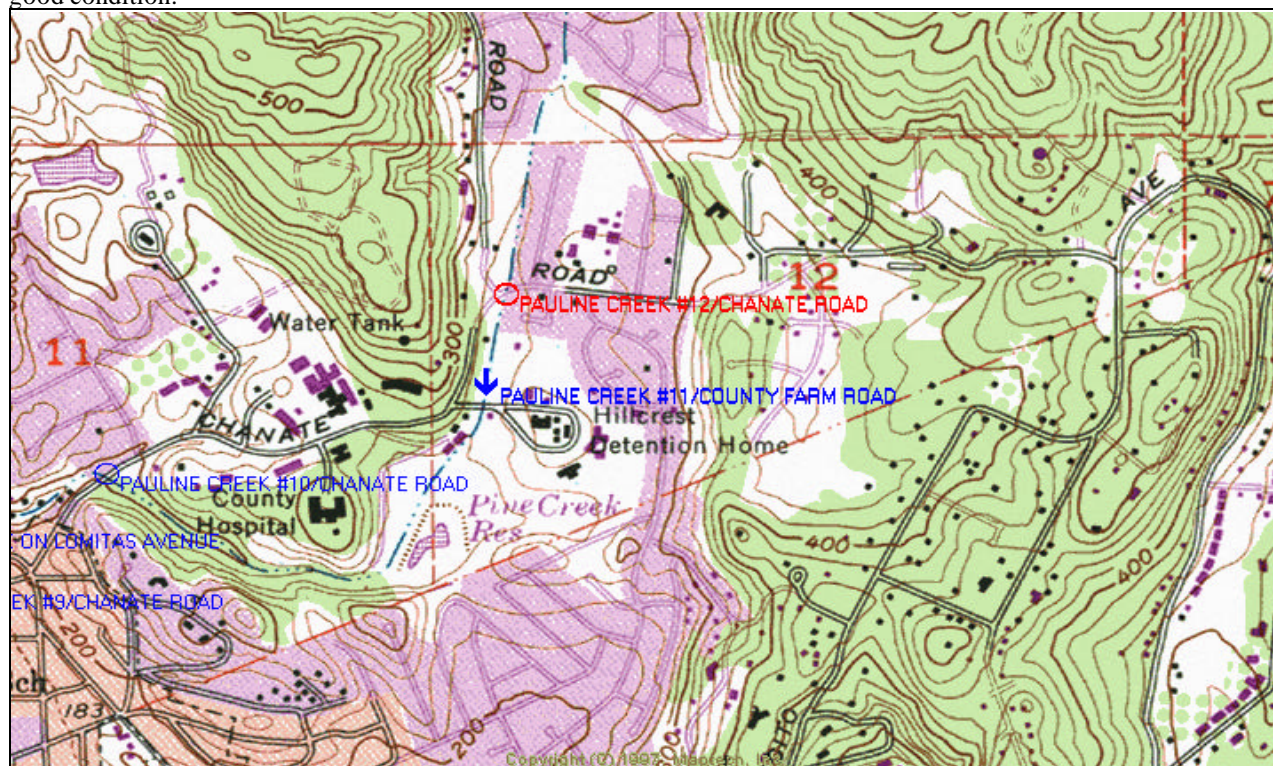
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 8.0' height x 11.9' width **Length:** 54.8'
Slope: -0.80% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.6'
Fill Estimate: 331 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Chanate Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 82% of the range of estimated migration flows, meets passage criteria for resident/2+ fish on 60% of the range of estimated migration flows, and 22% of the migration flows for 1+/young-of-year juvenile salmonids. Actual passage of juveniles may be higher than predicted by FishXing because lack-of-depth is the primary violation.

Additional Stream Crossings: Downstream = (~1,000') to Site ID #S-045, (~5,050') to Site ID #S-044, (~6,750') to bridge on Lomitas Avenue, (~7,550') to Site ID #S-043, (~7,850') to bridge on Mendocino Avenue, (~10,100') to Highway 101 – status unknown, (~10,600') to Site ID #S-042, (~11,150') to Site ID #S-041, (~11,900') to Site ID #S-040, (~12,700') to Site ID #S-039, (~14,650') to Site ID #S-038, (~15,100') to Railroad crossing – status unknown, (~15,950') to Site ID #S-037, (~17,250') to Site ID #S-036, (~19,200') to Site ID #S-035, (~23,000') to bridge on Guerneville Road, (~26,200') to bridge on Wright Avenue, (~29,300') to confluence with Santa Rosa Flood Control Channel, and then (~53,600') to confluence with Mark West Creek. Upstream = none within the fish-bearing stream reach.

Habitat: Quantity = approximately 3,550' of potential fish-bearing habitat upstream of Site ID# S-046. Quality = rated as "fair" for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed on 3/08/02 and there was continuous flow in the channel. At 2:30PM the air temp = 19°C and the water temp = 15°C. The survey crew described the habitat as "fair" and noted a moderately dense riparian canopy of hardwoods and brush. Overall there was a more natural channel than the reach through Santa Rosa city limit. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate passage, is properly sized, and is in good condition.





Site ID #S-047: Piner Creek #1/Valdez Drive; Santa Rosa Creek; Mark West Ck; Russian River
Road Ownership: City of Santa Rosa

County Ranking: Tied for #76 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J43. USGS Quad: Sebastapol. T7N, R8W, Section 16. Lat/Long: 38° 27' 34.12" 122° 45' 8.42" Milepost = 0.05 miles to Nightingale Drive.

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 9.05' height x 20.0' width
Length: 45.0' **Slope:** 0.80% **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 23.5' **Fill Estimate:** 614 cubic yards. **Overall Condition:** Good.

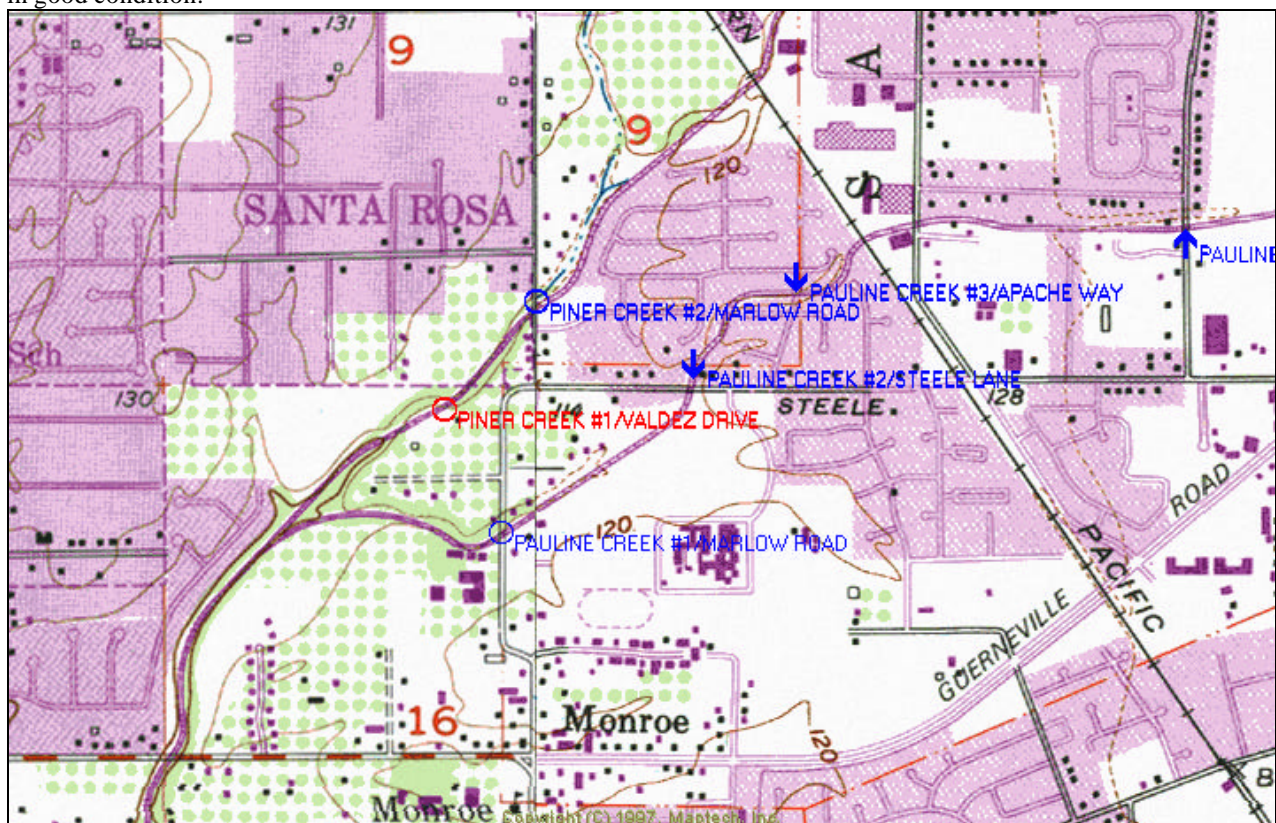
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Valdes Drive is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for all species of adult salmonids and all age classes of juveniles.

Additional Stream Crossings: Downstream = (~1,750') to confluence with Pauline Creek, (~4,000') to bridge on Guerneville Road, (~7,950') to bridge on Fulton Road, and (~10,750') to confluence with Santa Rosa Flood Control Channel. Upstream = (~1,150') to Site ID #S-048, (~3,750') to Railroad crossing – status unknown, (~4,800') to Site ID #S-049, (~9,800') to Site ID #S-050, (~11,000') to bridge on Airway Drive, (~11,800') to Highway 101 – status unknown, (~12,200') to bridge on Old Redwood Highway, and (~13,400') to dam/reservoir = limit of andromy.

Habitat: Quantity = approximately 28,100' of potential fish-bearing habitat upstream of Site ID# S-047. Length estimate includes several tributaries of questionable fish-bearing habitat. The main channel is 13,400' in length up to a dam/reservoir. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed on 3/05/02 and there was continuous flow in the channel. At 4:00PM the air temp = 16°C and the water temp = 15°C. The survey crew described the habitat as “poor” and noted a lack of a riparian zone and a channelized reach through a residential area of Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides unimpeded passage, is properly sized, and is in good condition.





Site ID #S-048: Piner Creek #2/Marlow Road; Santa Rosa Creek; Mark West Creek; Russian River

Road Ownership: County

County Ranking: Tied for #62 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E078; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 9. Lat/Long: 38° 27' 41.66" 122° 44' 59.99" Milepost = 0.05 miles to Marsh Road.

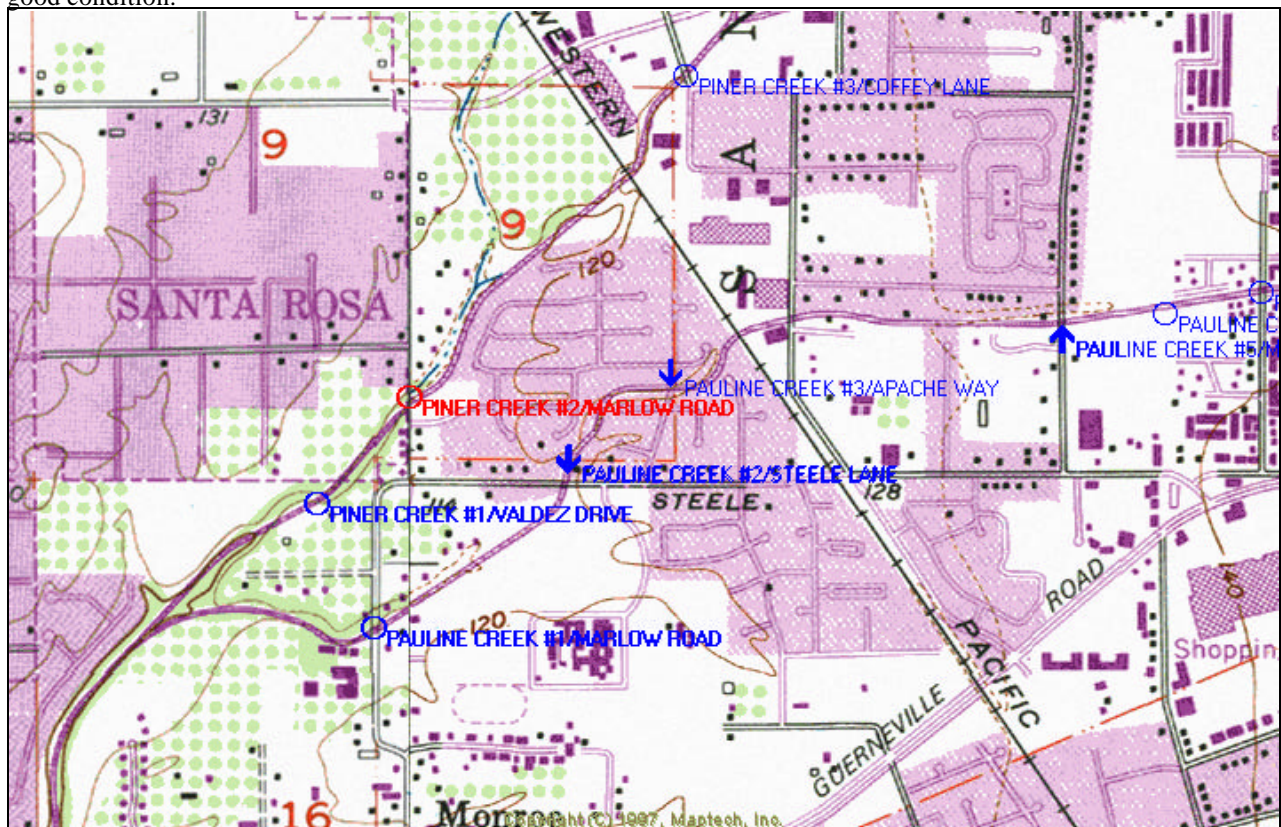
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 6.9' height x 21.0' width
Length: 97.0' **Slope:** 0.36% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 21.3'
Fill Estimate: 1,305 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Marlow Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 71% of the range of estimated migration flows, meets passage criteria for resident/2+ fish on 35% of the range of estimated migration flows, and 41% of the migration flows for 1+/young-of-year juvenile salmonids. Actual passage of juveniles may be higher than predicted by FishXing because lack-of-depth is the primary violation.

Additional Stream Crossings: Downstream = (~ 1,150') to Site ID #S-047, (~2,900') to confluence with Pauline Creek, (~ 5,150') to bridge on Guerneville Road, (~ 9,100') to bridge on Fulton Road, and (~11,900') to confluence with Santa Rosa Flood Control Channel. Upstream = (~ 2,600') to Railroad crossing – status unknown, (~ 3,650') to Site ID #S-049, (~ 8,650') to Site ID #S-050, (~ 9,850') to bridge on Airway Drive, (~ 10,650') to Highway 101 – status unknown, (~ 11,050') to bridge on Old Redwood Highway, and (~ 12,250') to dam/reservoir = limit of andromy.

Habitat: Quantity = approximately 26,950' of potential fish-bearing habitat upstream of Site ID# S-048. Length estimate includes several tributaries of questionable fish-bearing habitat. The main channel is 12,250' in length up to a dam/reservoir. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed on 3/05/02 and there was continuous flow in the channel. At 5:30PM the air temp = 15°C and the water temp = 15°C. The survey crew described the habitat as "poor" and noted a lack of a riparian zone and a channelized reach through a residential area of Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate passage, is properly sized, and is in good condition.





Site ID #S-049: Piner Creek #3/Coffey Lane; Santa Rosa Creek; Mark West Creek; Russian River

Road Ownership: County

County Ranking: #47 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E088; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 9. Lat/Long: 38° 28' 04.10" 122° 44' 35.38" Milepost = 0.05 miles to Blue Bell Drive.

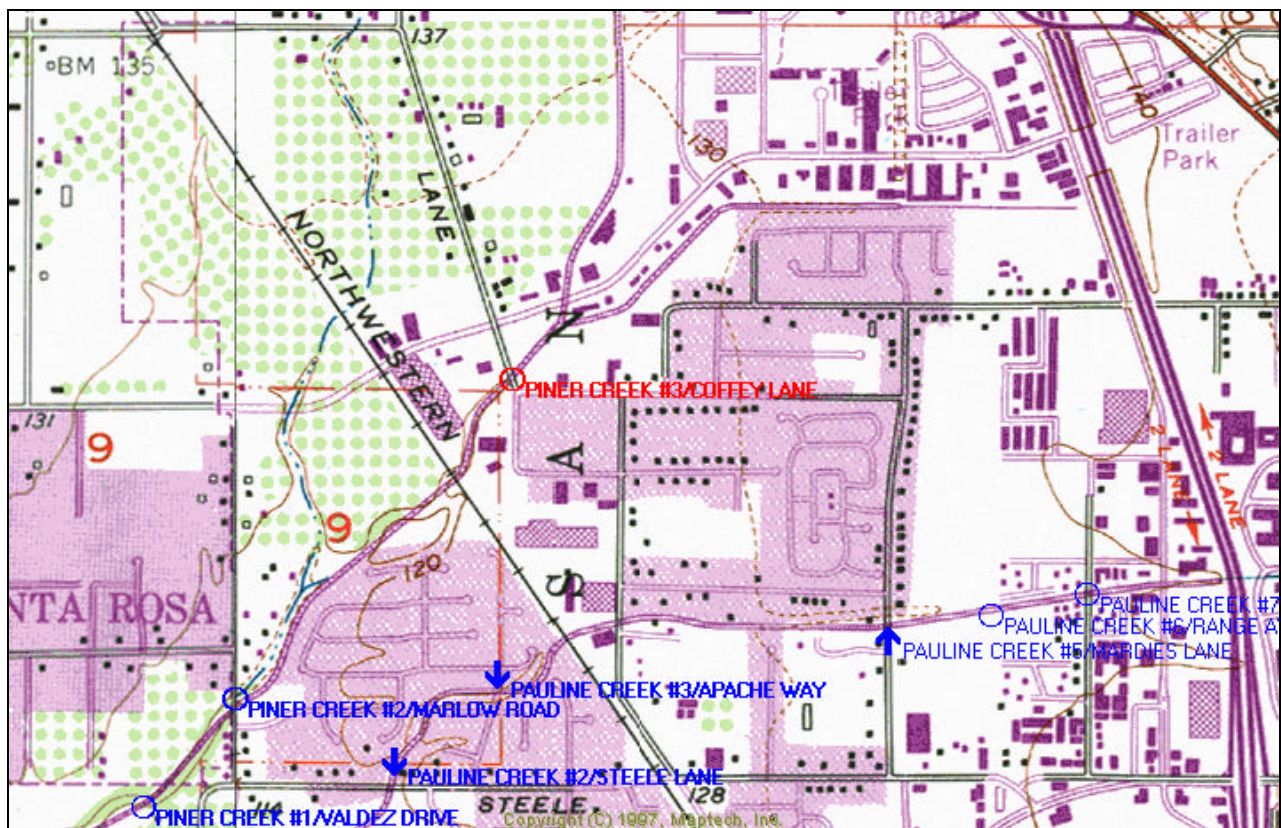
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 6.9' height x 20.0' width
Length: 61.0' **Slope:** 0.08% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 17.5'
Fill Estimate: 478 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Coffey Lane is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 55% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. Actual passage of all lifestages is probably much greater than predicted by FishXing because lack-of-depth is the only violation of criteria – even for 1+/young-of-year juvenile salmonids

Additional Stream Crossings: Downstream = (~1,100') to Railroad crossing – status unknown, (~3,650') to Site ID #S-048, (~4,800') to Site ID #S-047, (~6,550') to confluence with Pauline Creek, (~8,800') to bridge on Guerneville Road, (~12,750') to bridge on Fulton Road, and (~15,550') to confluence with Santa Rosa Flood Control Channel. Upstream = (~5,000') to Site ID #S-050, (~6,200') to bridge on Airway Drive, (~7,000') to Highway 101 – status unknown, (~7,400') to bridge on Old Redwood Highway, and (~8,600') to dam/reservoir = limit of andromy.

Habitat: Quantity = approximately 8,600' of potential fish-bearing habitat upstream of Site ID# S-049. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed on 3/06/02 and there was continuous flow in the channel. At 8:30AM the air temp = 16.5°C and the water temp = 15.5°C. The survey crew described the habitat as “poor” and noted a very sparse riparian zone and a channelized, featureless reach through a residential area of Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate passage (regardless of FishXing output), is properly sized, and is in good condition.





Site ID #S-050: Piner Creek #4/Hopper Avenue; Santa Rosa Creek; Mark West Creek; Russian River **Road**
Ownership: County

County Ranking: #55 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E082; County Map Sheet #4J43. USGS Quad: Santa Rosa. T7N, R8W, Section 3. Lat/Long: 38° 28' 47.24" 122° 44' 23.85" Milepost= 0.1 miles to Airway Drive.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.1' height x 12.0' width **Length:** 101.5'
Slope: 0.10% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 15.9'

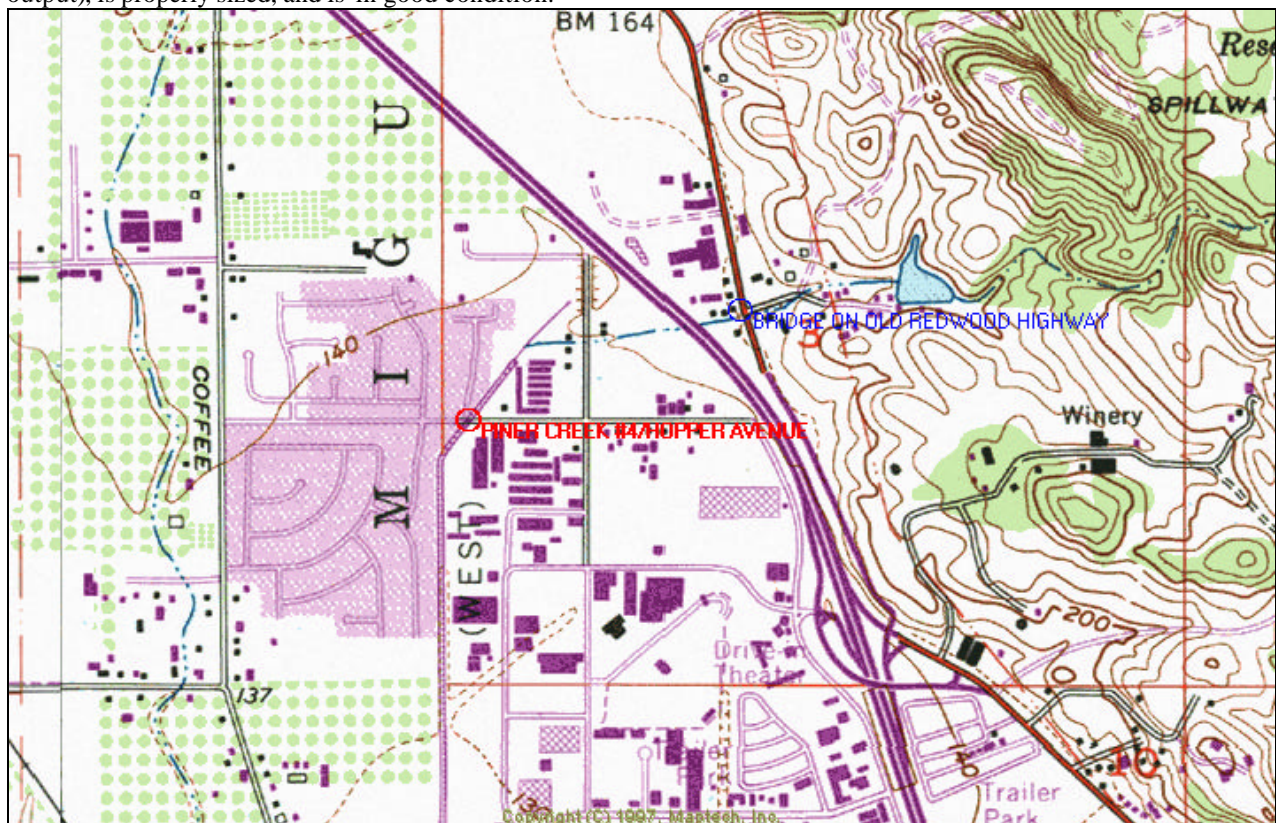
Fill Estimate: 751 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Hopper Avenue is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 64% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. Actual passage of all lifestages is probably much greater than predicted by FishXing because lack-of-depth is the only violation of criteria – even for 1+/young-of-year juvenile salmonids

Additional Stream Crossings: Downstream = (~5,000') to Site ID #S-049, (~ 6,100') to Railroad crossing – status unknown, (~ 8,650') to Site ID #S-048, (~9,800') to Site ID #S-047, (~ 11,550') to confluence with Pauline Creek, (~13,800') to bridge on Guerneville Road, (~17,750') to bridge on Fulton Road, and (~20,550') to confluence with Santa Rosa Flood Control Channel. Upstream = (~ 1,200') to bridge on Airway Drive, (~2,000') to Highway 101 – status unknown, (~3,400') to bridge on Old Redwood Highway, and (~3,600') to dam/reservoir = limit of andromy .

Habitat: Quantity = approximately 3,600' of potential fish-bearing habitat upstream of Site ID# S-050. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed on 3/06/02 and there was continuous flow in the channel. At 10:00AM the air temp = 16.5°C and the water temp = 15.5°C. The survey crew described the habitat as “poor” and noted a very sparse riparian zone and a channelized, featureless reach through a residential area of Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate passage (regardless of FishXing output), is properly sized, and is in good condition.





Site ID #S-051: Spring Creek #1/Summerfield Road; Matanzas Creek; Santa Rosa Ck; Mark West Ck; Russian River

Road Ownership: City of Santa Rosa

County Ranking: Tied for #48 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J44. USGS Quad: Santa Rosa. T7N, R7W, Section 20. Lat/Long: 38° 26' 37.54" 122° 39' 43.10" Milepost = 0.01 miles to Summerfield Road.

Culvert Type: Circular, CSP. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameter= 4.5' **Length:** 98.9'
Slope: 0.52% **Modifications:** None. **Rustline Height:** 0.7' **Average Active Channel Width:** 12.2'
Fill Estimate: 626 cubic yards. **Overall Condition:** Fair.

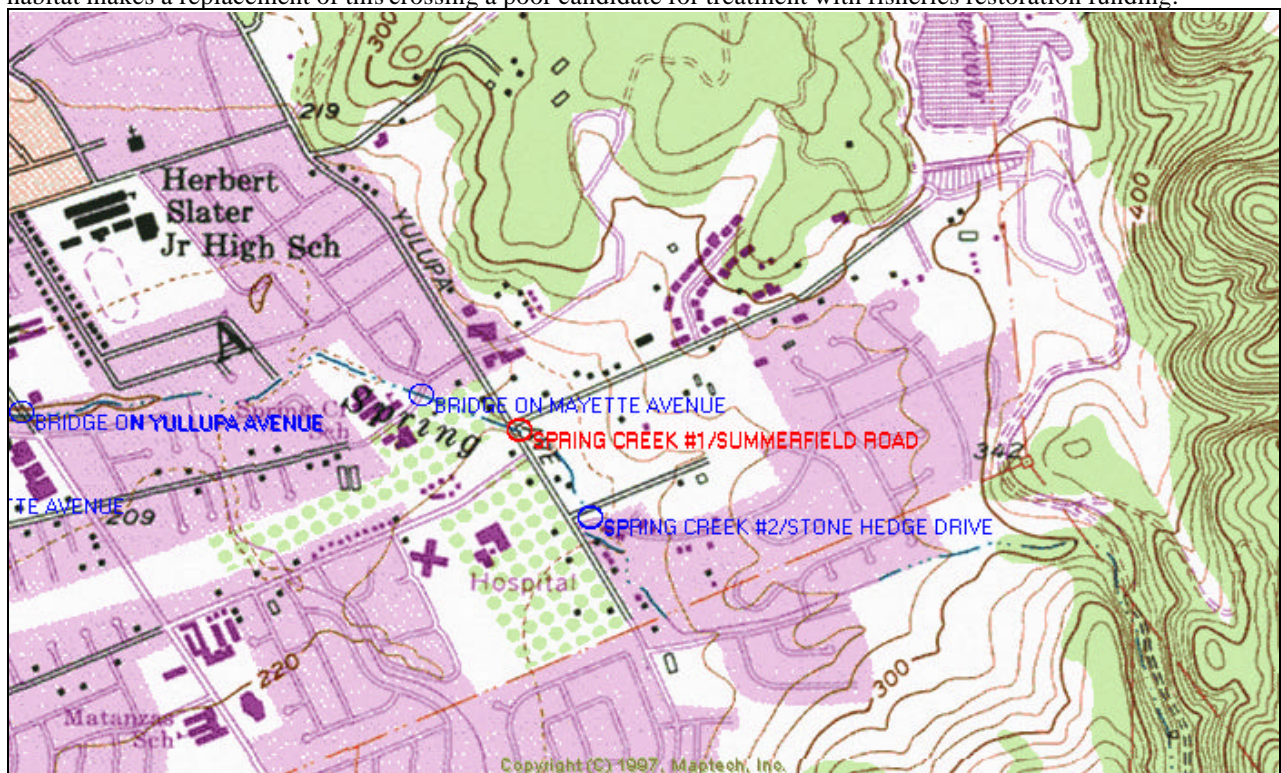
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a one-year recurrence interval. Summerfield Road is overtopped on approximately a two-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 100% of the range of estimated migration flows, meets passage criteria for resident/2+ salmonids on 15% of the range of estimated migration flows, and fails to meet passage criteria for 1+/young-of-year juveniles.

Additional Stream Crossings: Downstream = (~900') to bridge on Mayette Avenue, (~4,200') to bridge on Yullupa Avenue, (~6,300') to bridge on Franquette Avenue, (~7,850') to bridge on Hahman Avenue, (~8,450') to bridge on Farmers Lane, (~10,850') to bridge on Hoen Lane, (~12,250') to bridge in Doyle Park, (~13,200') to confluence with Matanzas Creek, and (~17,750') to confluence with Santa Rosa Creek. Upstream = (~1,150') to Site ID #S-052.

Habitat: Quantity = approximately 8,200' of potential fish-bearing habitat upstream of Site ID# S-051. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates field notes and assessment channel at lower crossings. The crossing was surveyed on 3/09/02 and there was continuous flow in the channel. At 11:45AM the air temp = 15°C and the water temp = 13°C. The survey crew described the habitat at this site as "fair" and noted moderately dense riparian zone along a channelized reach through a residential area east of downtown Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate adult passage. The culvert is extremely undersized and should be replaced if there are known flooding problems at this location. A lack of quality habitat makes a replacement of this crossing a poor candidate for treatment with fisheries restoration funding.





Site ID #S-052: Spring Creek #2/Stone Hedge Drive; Matanzas Creek; Santa Rosa Ck; Mark West Ck; Russian River

Road Ownership: City of Santa Rosa

County Ranking: Tied for #49 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J44. USGS Quad: Santa Rosa. T7N, R7W, Section 20. Lat/Long: 38° 26' 29.79" 122° 39' 37.36" Milepost= At Summerfield Road.

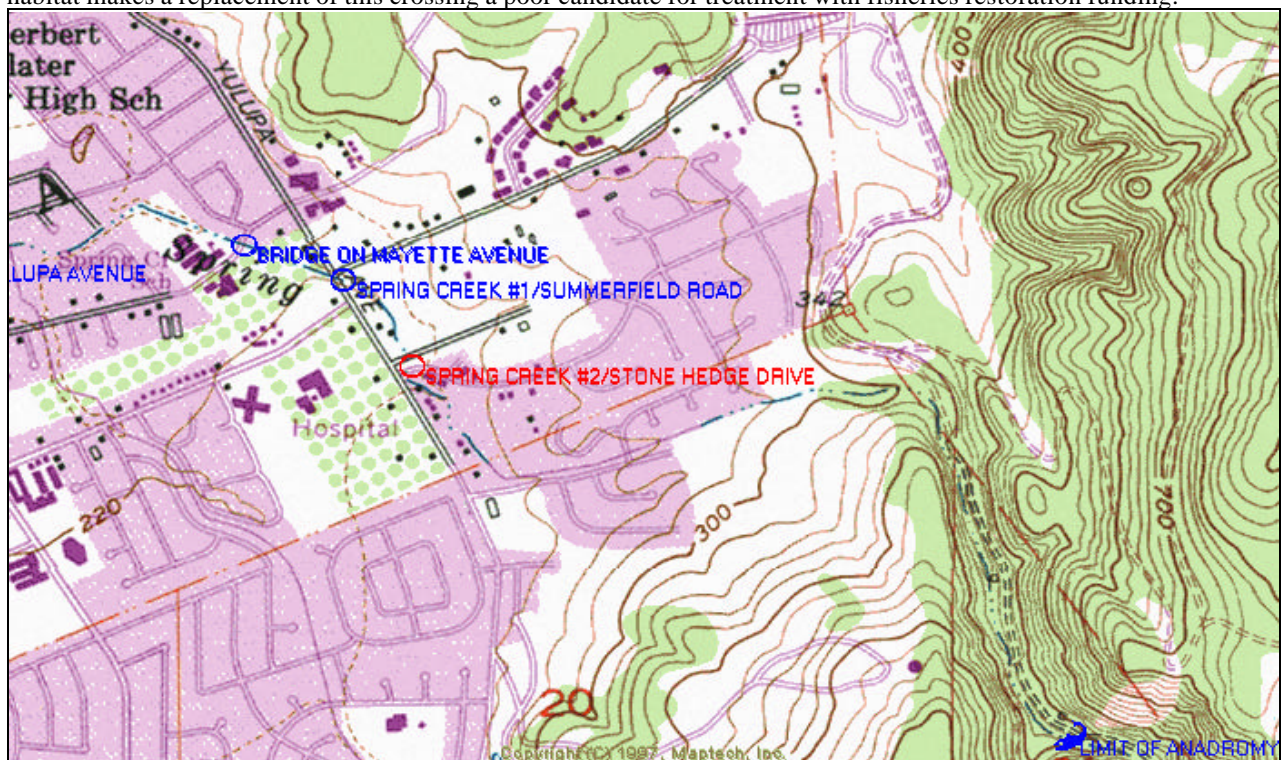
Culvert Type: Oval, Concrete. **Corrugations:** None. **Dimensions:** 2.8' rise x 4.4' span **Length:** 113.4' **Slope:** 0.72% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 8.3' **Fill Estimate:** 268 cubic yards. **Overall Condition:** Fair. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a one-year recurrence interval. Stone Hedge Drive is overtopped on approximately a one-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 99% of the range of estimated migration flows, meets passage criteria for resident/2+ salmonids on 16% of the range of estimated migration flows, and fails to meet passage criteria for 1+/young-of-year juveniles.

Additional Stream Crossings: Downstream = (~1,150') to Site ID #S-051, (~2,050') to bridge on Mayette Avenue, (~5,350') to bridge on Yullupa Avenue, (~7,450') to bridge on Franquette Avenue, (~9,000') to bridge on Hahman Avenue, (~9,600') to bridge on Farmers Lane, (~12,000') to bridge on Hoen Lane, (~13,400') to bridge in Doyle Park, (~14,350') to confluence with Matanzas Creek, and (~18,900') to confluence with Santa Rosa Creek. Upstream = none within the fish-bearing stream reach.

Habitat: Quantity = approximately 7,050' of potential fish-bearing habitat upstream of Site ID# S-052. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates field notes and assessment channel at lower crossings. The crossing was surveyed on 3/09/02 and there was continuous flow in the channel. At 11:00AM the air temp = 18°C and the water temp = 16°C. The survey crew described the habitat at this site as "poor to fair" and noted moderately dense riparian zone along a relatively featureless channelized reach through a residential area east of downtown Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate adult passage. The culvert is extremely undersized and should be replaced if there are known flooding problems at this location. A lack of quality habitat makes a replacement of this crossing a poor candidate for treatment with fisheries restoration funding.





Site ID #S-053: Matanzas Creek/Bethards Drive; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: County

County Ranking: #57 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E346; County Map Sheet #4J44. USGS Quad: Santa Rosa. T7N, R7W, Section 29. Lat/Long: 38° 25' 44.04" 122° 39' 42.59" Milepost = 0.1 Miles to Tachevan Drive.

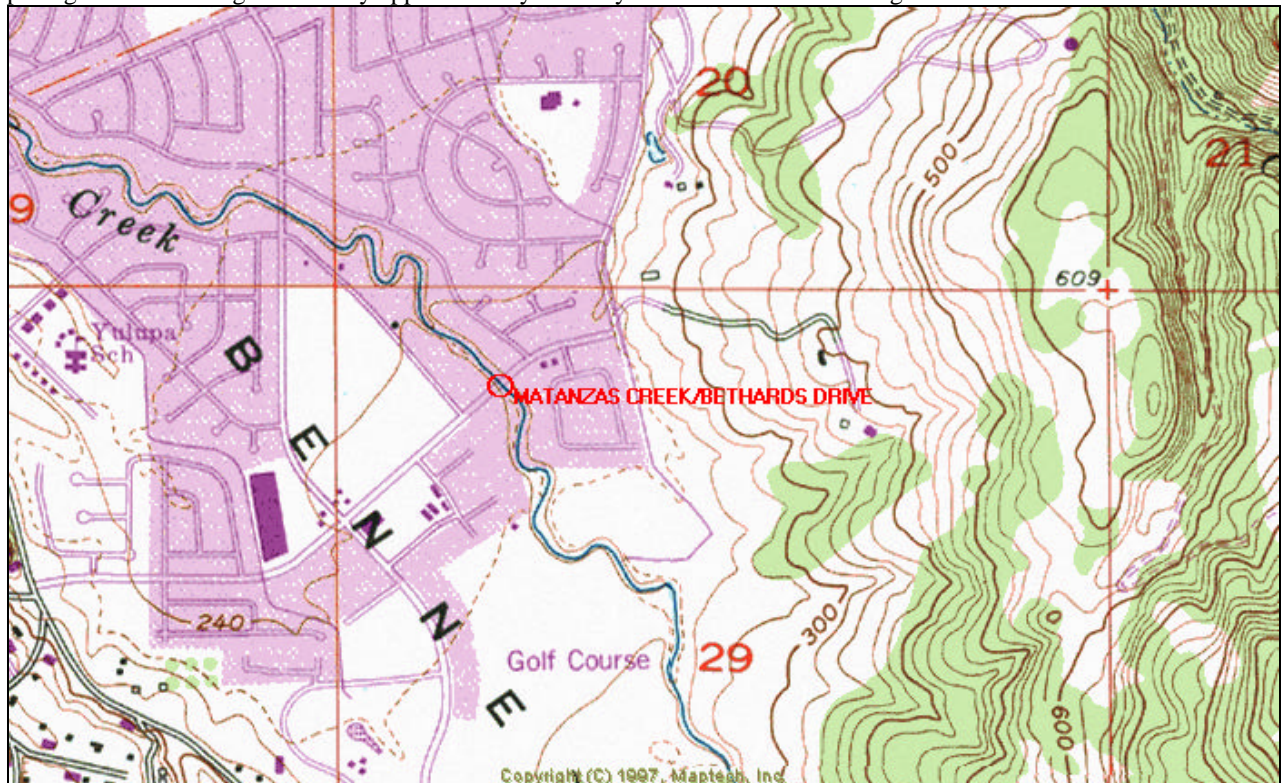
Culvert Type: Pipe Arch, SSP. **Corrugations:** 6" x 2" **Dimensions:** 16.8' rise x 19.1' span **Length:** 150.0'
Slope: 0.53% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 27.2'
Fill Estimate: 4,605 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 51-year recurrence interval. Bethards Drive is overtopped on approximately a 174-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 89% of the range of estimated migration flows, meets passage criteria for resident/2+ salmonids on 22% of the range of estimated migration flows, and meets criteria 3% of the migration flows for 1+/young-of-year juveniles.

Additional Stream Crossings: Downstream = (~3,100') to bridge on Yullupa Avenue, (~10,950') to bridge on Hoen Lane, (~12,750') to bridge on Farmers Lane, (~17,650') to confluence with Spring Creek, (~18,450') to bridge on East Street, (~20,300') to box culvert with fish ladder at E Street, and (~22,300') to confluence with Santa Rosa Creek. Upstream = (~7,850') to bridge on Bennett Valley Road.

Habitat: Quantity = approximately 14,700' of potential fish-bearing habitat upstream of Site ID# S-053. Quality = rated as "poor" for the ranking matrix (quality score = 0.37) as based on CDFG's 1997 habitat typing survey of 22,600' of channel. Spawning habitat is limited, and what exists is highly embedded. Much of the creek has been channelized and levied and lacks riparian vegetation. Most of the fish observed by CDFG's crew were exotic, warm-water species, such as green sunfish and bluegills. The crossing was surveyed by Taylor and Assoc. on 3/08/02 and there was continuous flow in the channel. At 5:00PM the air temp = 14°C and the water temp = 14.5°C. The survey crew described the habitat at this site as "poor to fair" and noted moderately dense riparian zone along a relatively featureless channelized reach through a residential area east of downtown Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate adult passage and some juvenile passage. The crossing can convey approximately the 50-year storm-flow and is in good condition.





Site ID #S-054: Ducker Creek #1/Benicia Drive; Rincon Creek; Santa Rosa Creek; Mark West Creek; Russian River
Road Ownership: City of Santa Rosa

County Ranking: #77 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J44. USGS Quad: Santa Rosa. T7N, R7W, Section 7. Lat/Long: 38° 28' 09.62" 122° 40' 16.91" Milepost = 0.05 Miles to Rinconada Drive.

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** Each Bay = 6.0' height x 8.0' width. **Length:** 52.3' **Slopes:** LB = -1.91%; RB = -2.87 **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 14.4' **Fill Estimate:** 197 cubic yards. **Overall Condition:** Good.

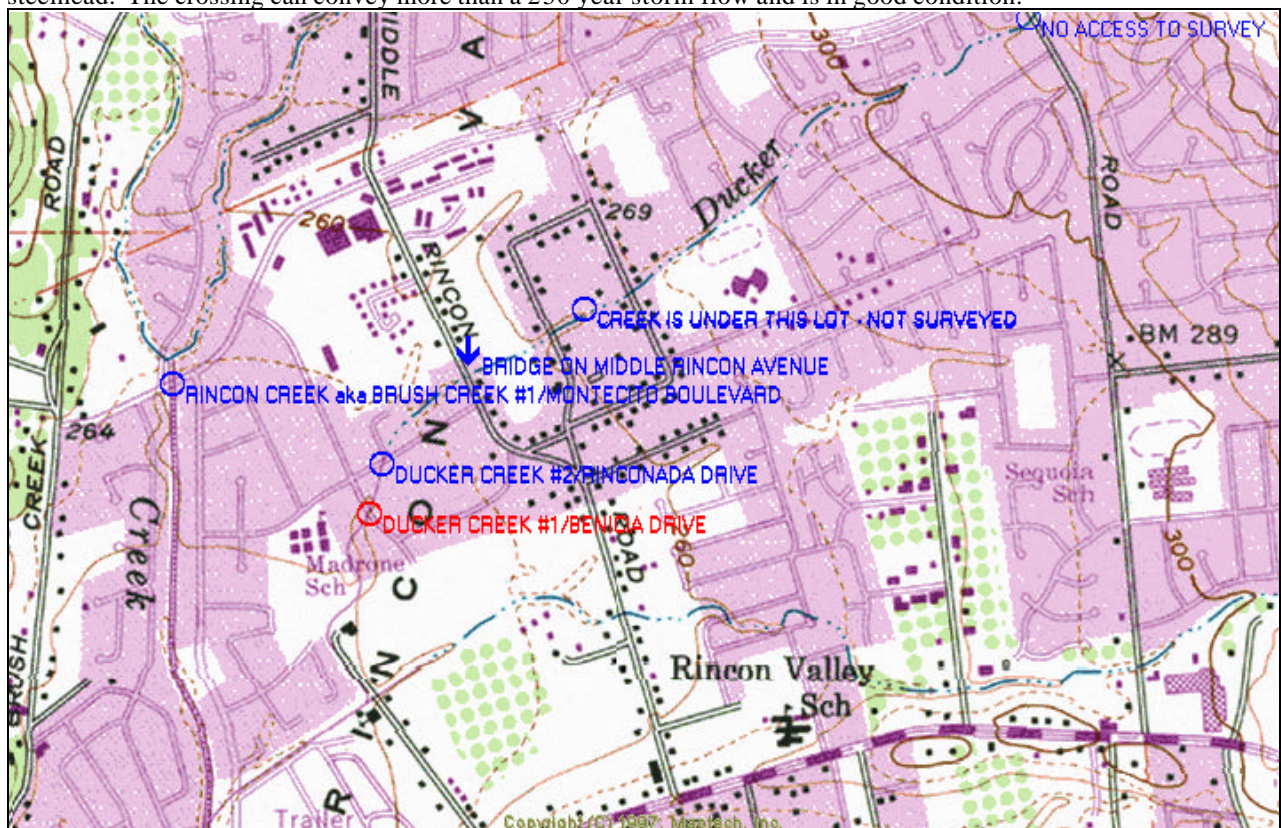
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Benicia Drive is overtopped on more than a 250-year storm flow.

Barrier Status: LB= **GREEN**: the Green-Gray-Red filter determined this crossing meets passage criteria for adult steelhead and all age classes of juveniles. RB= **GREEN**: the Green-Gray-Red filter determined this crossing meets passage criteria for adult steelhead and all age classes of juveniles.

Additional Stream Crossings: Downstream = (~5,050') to confluence with Santa Rosa Creek – there are seven bridges between Site ID #S-054 and Santa Rosa Creek. Upstream = (~400') to Site ID #S-055, (~1,400') to bridge on Middle Rincon Avenue, (~2,150') to section of creek under a city lot – not surveyed, (~6,400') to crossing on Calistoga Road – not surveyed because of no access to fenced private property on downstream side of crossing.

Habitat: Quantity = approximately 7,600' of potential fish-bearing habitat upstream of Site ID# S-054. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates’ field notes. The crossing was surveyed by Taylor and Assoc. on 3/09/02 and there was continuous flow in the channel. At 8:00AM the air temp = 9.5°C and the water temp = 14.5°C. The survey crew described the habitat at this site as “poor” and noted a sparse riparian zone along a relatively featureless channelized reach through a residential area of Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides unimpeded passage for all life-stages of steelhead. The crossing can convey more than a 250-year storm-flow and is in good condition.





Site ID #S-055: Ducker Creek #2/Rinconada Drive; Rincon Creek; Santa Rosa Creek; Mark West Ck; Russian River
Road Ownership: County

County Ranking: Tied for #69 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# E333; County Map Sheet #4J44. USGS Quad: Santa Rosa. T7N, R7W, Section 7. Lat/Long: 38° 28' 13.09" 122° 40' 15.88" Milepost = 0.05 Miles to Benicia Drive.

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** Each Bay = 5.9' height x 8.0' width
Length: 75.2' **Slopes:** LB = 0.43%; RB = -0.25 **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 10.1' **Fill Estimate:** 243 cubic yards. **Overall Condition:** Good.

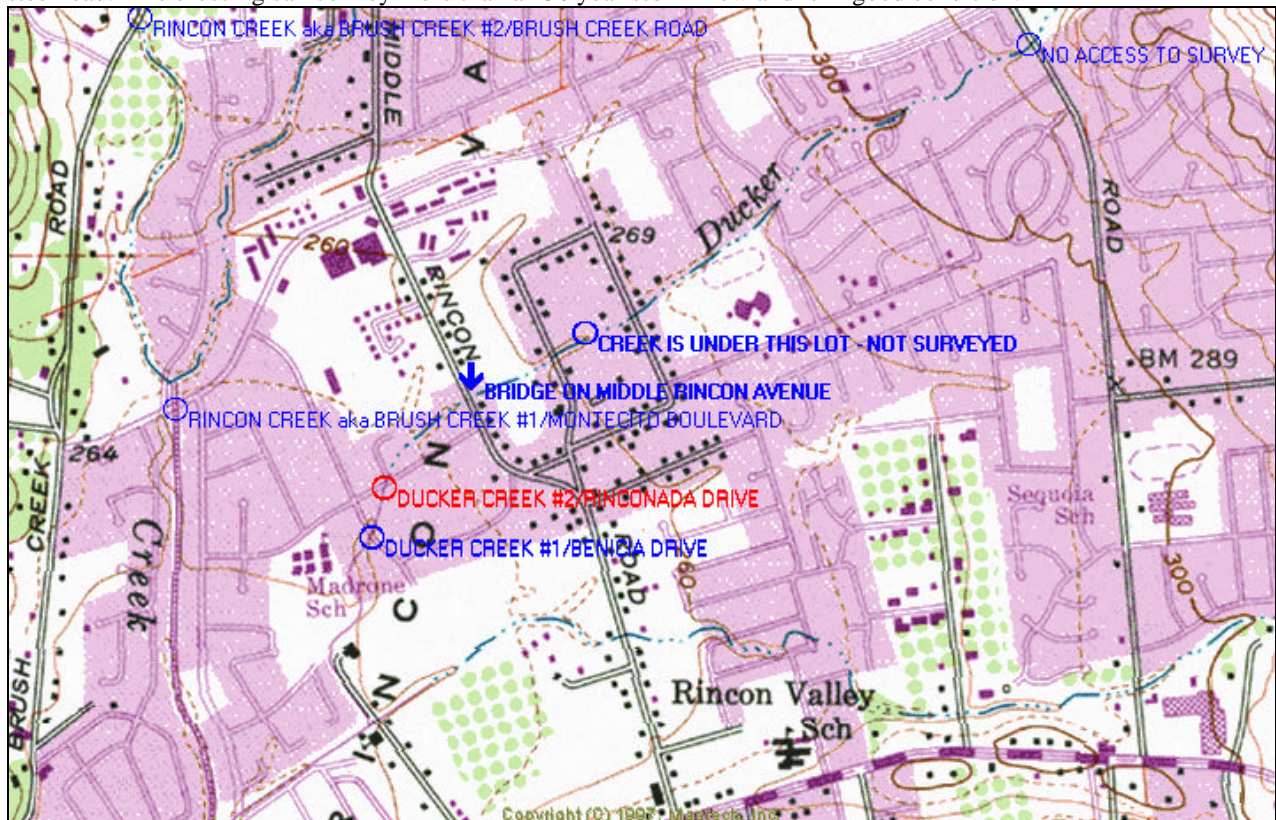
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Rinconada Drive is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on (LB = 77% and RB = 68%) of the range of estimated migration flows, meets passage criteria for resident/2+ salmonids on (LB = 49% and RB = 18%) of the range of estimated migration flows, and meets criteria on (LB = 80% and RB = 59%) of the migration flows for 1+/young-of-year juveniles.

Additional Stream Crossings: Downstream = (~400') to Site ID #S-054 and (~5,450') to confluence with Santa Rosa Creek – there are seven bridges between Site ID #S-054 and Santa Rosa Creek. Upstream = (~1,000') to bridge on Middle Rincon Avenue, (~1,750') to section of creek under a city lot – not surveyed, (~6,000') to crossing on Calistoga Road – not surveyed because of no access to fenced private property on downstream side of crossing.

Habitat: Quantity = approximately 7,200' of potential fish-bearing habitat upstream of Site ID# S-055. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates’ field notes. The crossing was surveyed by Taylor and Assoc. on 3/09/02 and there was continuous flow in the channel. At 9:20AM the air temp = 12°C and the water temp = 14°C. The survey crew described the habitat at this site as “poor” and noted a sparse riparian zone along a relatively featureless channelized reach through a residential area of Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate passage for all life -stages of steelhead. The crossing can convey more than a 250-year storm-flow and is in good condition.





Site ID #S-056: Rincon Creek aka Brush Creek #1/Montecito Boulevard; Santa Rosa Ck; Mark West Ck; Russian River **Road Ownership:** County

County Ranking: Tied for #62 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# E325; County Map Sheet #4J44. USGS Quad: Santa Rosa. T7N, R7W. Lat/Long: 38° 28' 18.75" 122° 40' 34.50" Milepost = 0.05 miles to Bridgewood Drive.

Culvert Type: Two Bay Bridge with concrete floor. **Corrugations:** None. **Dimensions:** LB= 9.1' height x 9.9' width; RB = 9.3' height x 9.9' width **Lengths:** 78.2' **Slopes:** LB = 0.28%; RB = 1.05% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 25.3' **Fill Estimate:** 1,569 cubic yards.

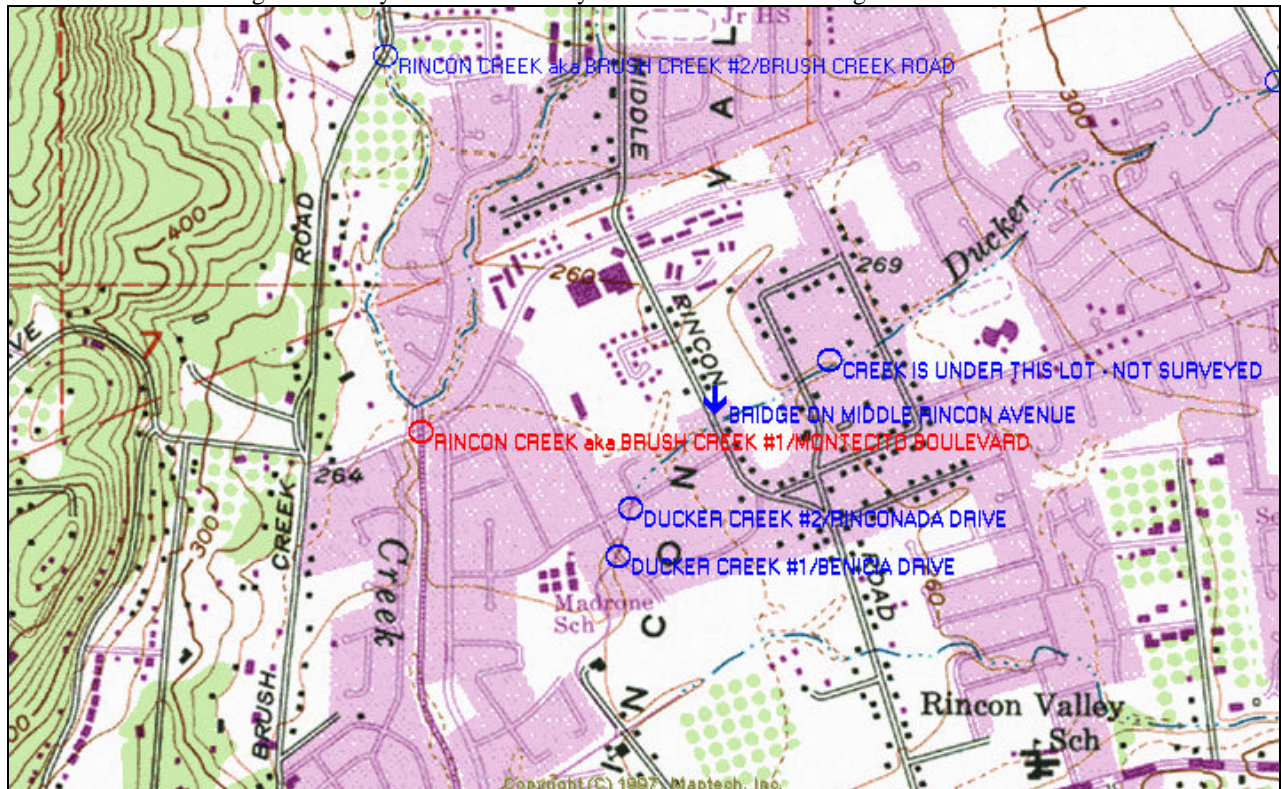
Overall Condition: Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Montecito Boulevard is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on (LB = 86% and RB = 81%) of the range of estimated migration flows, meets passage criteria for resident/2+ salmonids on (LB = 60% and RB = 11%) of the range of estimated migration flows, and both bays fail to criteria on of the migration flows for 1+/young-of-year juveniles.

Additional Stream Crossings: Downstream = (~7,700') to Highway 12 – status unknown and (~9,200') to confluence with Santa Rosa Creek. Upstream = (~3,350') to Site ID #S-057, (~3,450') to bridge on Bridgewood Drive, (~5,950') to Site ID #S-058, (~10,850') to Site ID #S-59, (~13,750') to Site ID #S-061, and (~16,050') to private crossing – status unknown.

Habitat: Quantity = approximately 36,800' of potential fish-bearing habitat upstream of Site ID# S-056 – includes ~18,000' in the unnamed LB tributary. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates' field notes. The crossing was surveyed by Taylor and Assoc. on 2/05/02 and there was continuous flow in the channel. At 4:30PM the air temp = 12.5°C and the water temp = 7.5°C. The survey crew described the habitat at this site as “poor” and noted a sparse riparian zone along a relatively featureless channelized reach through a residential area of Santa Rosa. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate passage for most life-stages of steelhead. The crossing can convey more than a 250-year storm-flow and is in good condition.



Site ID #S-056: Rincon Creek aka Brush Creek #1/Montecito Boulevard; Santa Rosa Creek; Mark West Creek; Russian River



Site ID #S-057: Rincon Creek aka Brush Creek #2/Brush Creek Road; Santa Rosa Ck; Mark West Ck; Russian River

Road Ownership: County

County Ranking: Tied for #54 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# E330; County Map Sheet #4J44. USGS Quad: Santa Rosa. T7N, R7W, section 6. Lat/Long: 38° 28' 46.18" 122° 40' 37.57" Milepost = 11.84

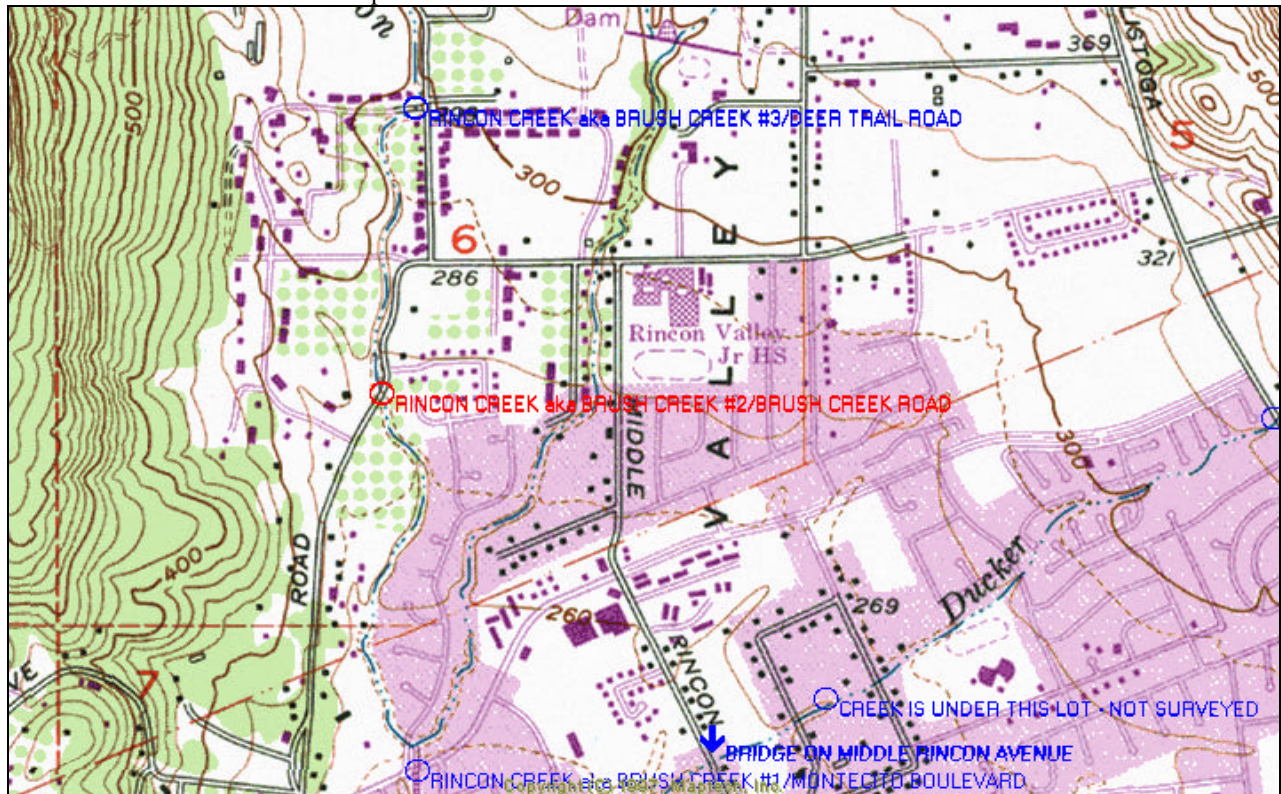
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.0' height x 12.0' width **Length:** 75.0' **Slope:** -0.04% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 21.5' **Fill Estimate:** 710 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Brush Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 86% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. The perched outlet (2.7') is the crossing's main feature that impedes juvenile passage. Riprap placed at base of outlet may create a confusing attractant flow for adults too.

Additional Stream Crossings: Downstream = (~3,350') to Site ID #S-056, (~11,050') to Highway 12 – status unknown and (~12,550') to confluence with Santa Rosa Creek. Upstream = (~100') to bridge on Bridgewood Drive, (~2,600') to Site ID #S-058, (~7,500') to Site ID #S-59, (~10,400') to Site ID #S-061, and (~12,700') to private crossing – status unknown.

Habitat: Quantity = approximately 18,300' of potential fish-bearing habitat upstream of Site ID# S-057. Quality = rated as "fair" for the ranking matrix as based on Taylor and Associates' field notes. The crossing was surveyed by Taylor and Assoc. on 2/05/02 and there was continuous flow in the channel. At 2:30PM the air temp = 11°C and the water temp = 8°C. The survey crew described the habitat at this site as "fair to good" and noted a moderately dense riparian zone of hardwoods and substrate of cobbles and gravels that appeared to be suitable for spawning. This section of creek runs through a residential area of Santa Rosa – busy street. No fish were observed.

Preferred Treatment: Because the culvert is properly sized and in good condition, a retrofit is recommended to cost-effectively improve passage. Three to four downstream boulder weirs will raise tail-water elevation and corner baffles within the culvert will increase depths and decrease velocities.





Site ID #S-058: Rincon Creek aka Brush Creek #3/Deer Trail Road; Santa Rosa Ck; Mark West Ck; Russian River

Road Ownership: Private

County Ranking: Tied for #41 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J44. USGS Quad: Santa Rosa. T7N, R7W, section 6. Lat/Long: 38° 29' 06.78" 122° 40' 34.89" Milepost = At Wallace Road.

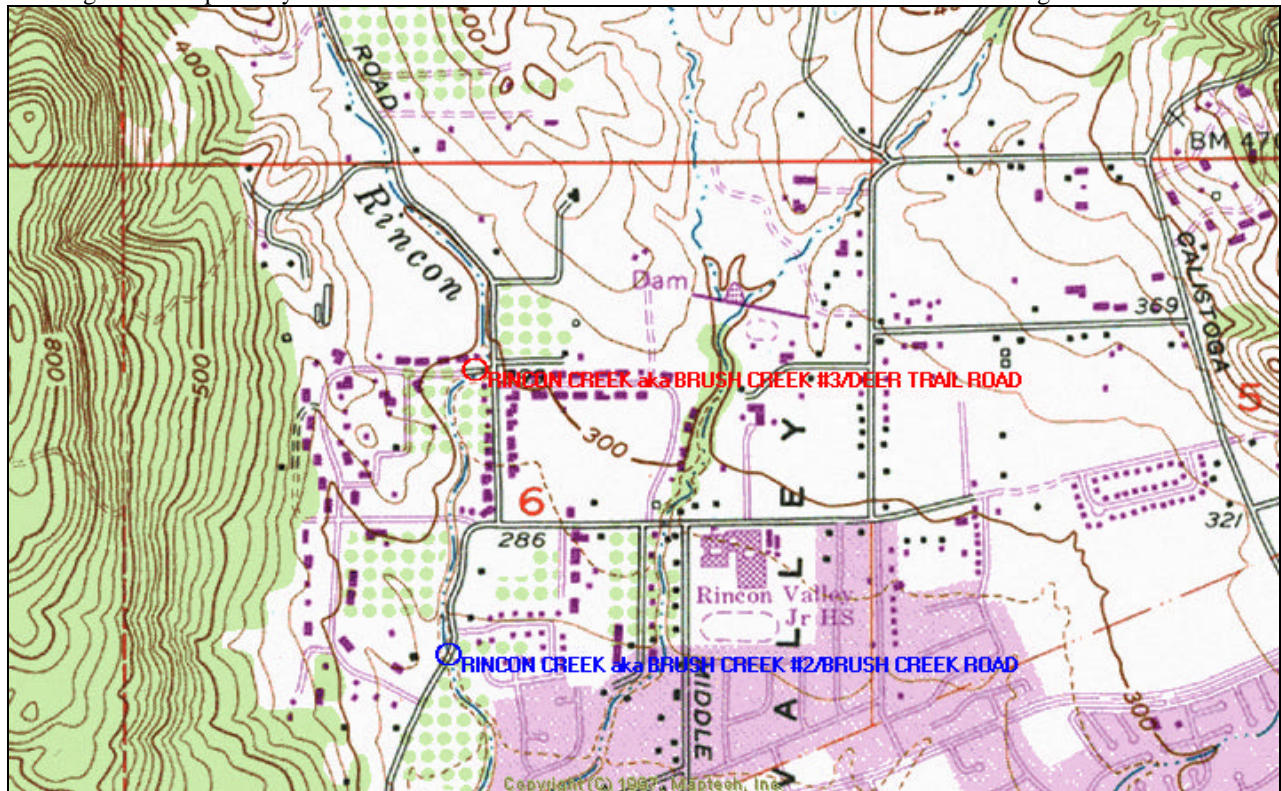
Culvert Type: Bridge with concrete floor – is the concrete slab remains of the previous crossing? **Corrugations:** None. **Dimensions:** 8.3' height x 15.9' width **Length:** 20.3' **Slope:** -3.10% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 16.6' **Fill Estimate:** 569 cubic yards. **Overall Condition:** Fair. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Deer Trail Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 75% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. For juveniles there is both a lack-of-depth and excessive velocities over the concrete slab that is in the channel – it appears this might be the remains of an old box culvert.

Additional Stream Crossings: Downstream = (~2,500') to bridge on Bridgewood Drive, (~ 2,600') to Site ID #S-057, (~ 5,950') to Site ID #S-056, (~ 13,650') to Highway 12 – status unknown and (~15,150') to confluence with Santa Rosa Creek. Upstream = (~4,900') to Site ID #S-059, (~ 7,800') to Site ID #S-061, and (~ 10,100') to private crossing – status unknown.

Habitat: Quantity = approximately 16,050' of potential fish-bearing habitat upstream of Site ID# S-058. Quality = rated as “fair” for the ranking matrix as based on Taylor and Associates’ field notes. The crossing was surveyed by Taylor and Assoc. on 2/05/02 and there was continuous flow in the channel. At 9:20AM the air temp = 4.5°C and the water temp = 5°C. The survey crew described the habitat at this site as “fair to good” and noted a sparse riparian zone of hardwoods and substrate of cobbles and gravels that appeared to be suitable for spawning. This section of creek runs through a private residential area outside of Santa Rosa. No fish were observed.

Preferred Treatment: Remove the concrete slab in the channel – if this does not affect the structural integrity of the crossing. At least partially remove so there is a section of natural streambed underneath the bridge-like structure.





Site ID #S-059: Rincon Creek aka Brush Creek #4/Amber Lane; Santa Rosa Creek; Mark West Creek; Russian River

Road Ownership: Private

County Ranking: #25 = Low to Moderate-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J44. USGS Quad: Santa Rosa. T7N, R7W, section 31. Lat/Long: 38° 29' 44.48" 122° 40' 55.32" Milepost = At Wallace Road.

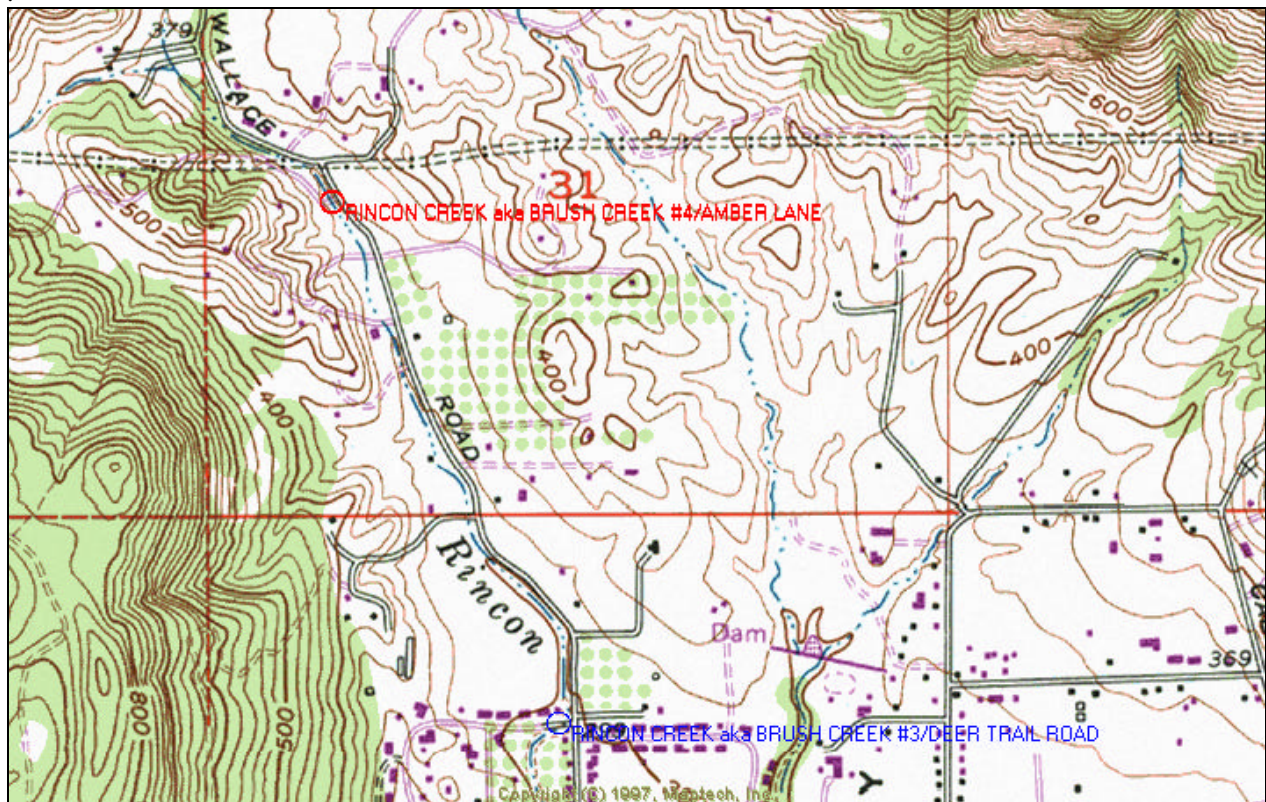
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 6.8' height x 10.8' width
Length: 20.5' **Slopes:** LB = 0.54%, RB = 1.80% **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 18.0' **Fill Estimate:** 232 cubic yards. **Overall Condition:** Fair.
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Amber Lane is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 22% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. For adults and older juveniles actual passage is probably higher than predicted by FishXing because the primary violation of the passage criteria is lack-of-depth.

Additional Stream Crossings: Downstream = (~4,900') to Site ID #S-058, (~7,400') to bridge on Bridgewood Drive, (~7,500') to Site ID #S-057, (~10,850') to Site ID #S-056, (~18,550') to Highway 12 – status unknown and (~20,050') to confluence with Santa Rosa Creek. Upstream = (~2,900') to Site ID #S-061 and (~5,200') to private crossing – status unknown.

Habitat: Quantity = approximately 11,700' of potential fish-bearing habitat upstream of Site ID# S-059. Quality = rated as "fair" for the ranking matrix as based on Taylor and Associates' field notes. The crossing was surveyed by Taylor and Assoc. on 2/05/02 and there was continuous flow in the channel. At 1:00PM the air temp = 16°C and the water temp = 8°C. The survey crew described the habitat at this site as "fair" and noted a sparse riparian zone of hardwoods and substrate of cobbles and gravels that appeared to be suitable for spawning. No fish were observed.

Preferred Treatment: Partially remove the concrete floor in the channel – if this does not affect the structural integrity of the crossing. Treat downstream partial/temporal barriers before addressing this crossing.





Site ID #S-060: Unnamed Tributary/Wallace Road; Rincon Ck aka Brush Ck; Santa Rosa Ck; Mark West Ck; Russian River **Road Ownership:** County

County Ranking: Tied for #32 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID # 77067; County Map Sheet #4J44. USGS Quad: Santa Rosa. T8N, R7W, section 31. Lat/Long: 38° 29' 59.15" 122° 41' 06.84" Milepost= 11.28

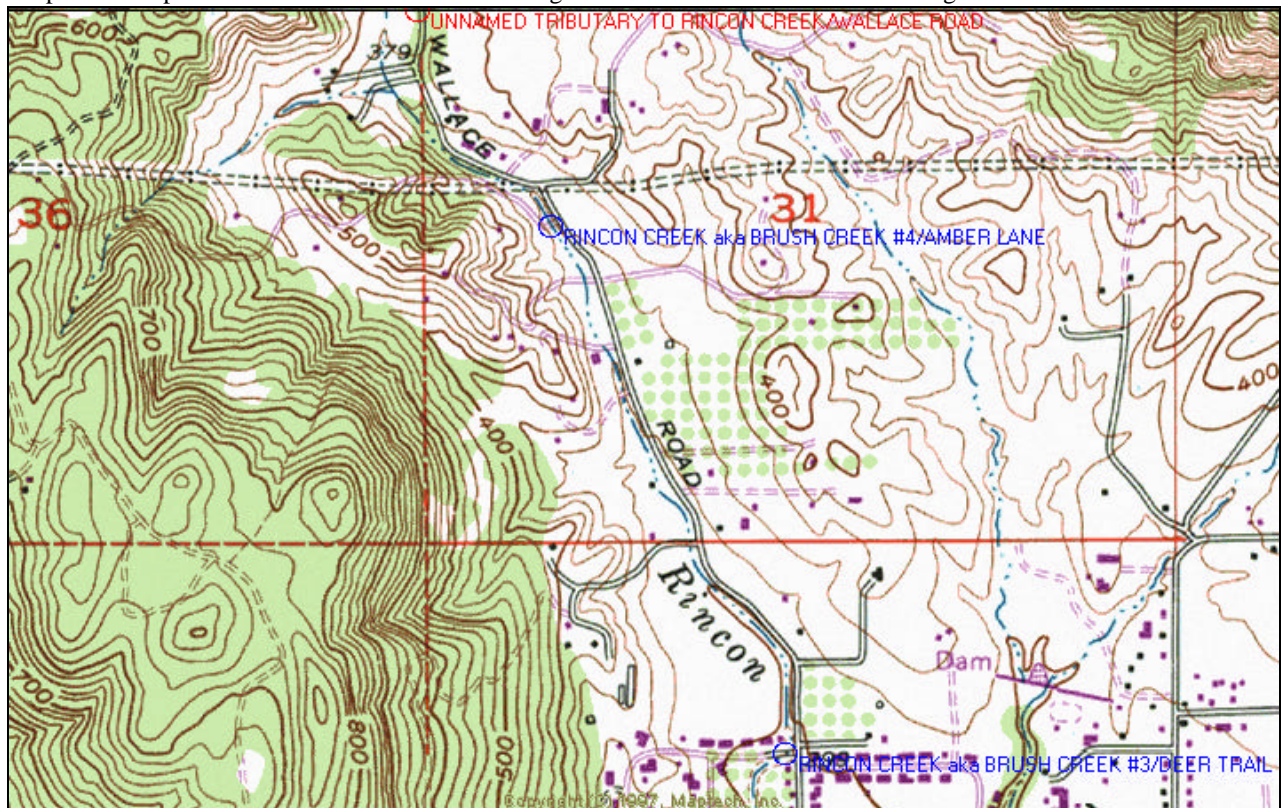
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 5.0' height x 10.0' width **Length:** 55.0' **Slope:** 3.36% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 16.6' **Fill Estimate:** 368 cubic yards. **Overall Condition:** Fair- exposed rebar on floor. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 162-year recurrence interval. Wallace Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juveniles due to both the perched outlet (~3 ft) and the steep slope over a smooth concrete floor.

Additional Stream Crossings: Downstream = (~2,600') to Site ID #S-059, (~7,500') to Site ID #S-058 (~10,000') to bridge on Bridgewood Drive, (~10,100') to Site ID #S-057, (~13,450') to Site ID #S-056, (~18,550') to Highway 12 – status unknown and (~20,350') to confluence with Santa Rosa Creek. Upstream = none indicated on the USGS map.

Habitat: Quantity = approximately 3,050' of potential fish-bearing habitat upstream of Site ID# S-060. Quality = rated as “fair” for the ranking matrix as based on Taylor and Associates’ field notes. The crossing was surveyed by Taylor and Assoc. on 2/05/02 and there was continuous flow in the channel. At 11:20AM the air temp = 11°C and the water temp = 7°C. The survey crew described the habitat at this site as “fair” and noted a moderately dense riparian zone of hardwoods. No fish were observed.

Preferred Treatment: Because the crossing is properly sized, a retrofit is recommended. Four to five boulder weirs downstream of the culvert will raise tail-water elevation and corner baffles will increase depths and decrease velocities. However, the County will need permission of downstream property owners for placement of weirs. Treat the partial/temporal barriers at downstream crossings on Rincon Creek before addressing this site.



Site ID #S-060: Unnamed Tributary/Wallace Road; Rincon Creek aka Brush Creek; Santa Rosa Creek; Mark West Creek; Russian River



Site ID #S-061: Rincon Creek aka Brush Creek #5; Riebli Road; Santa Rosa Creek; Mark West Creek; Russian River

Road Ownership: County

County Ranking: Tied for #45 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID # 88001; County Map Sheet #4J34. USGS Quad: Santa Rosa. T8N, R8W, section 36. Lat/Long: 38° 30' 03.71" 122° 41' 11.06" Milepost = 12.40

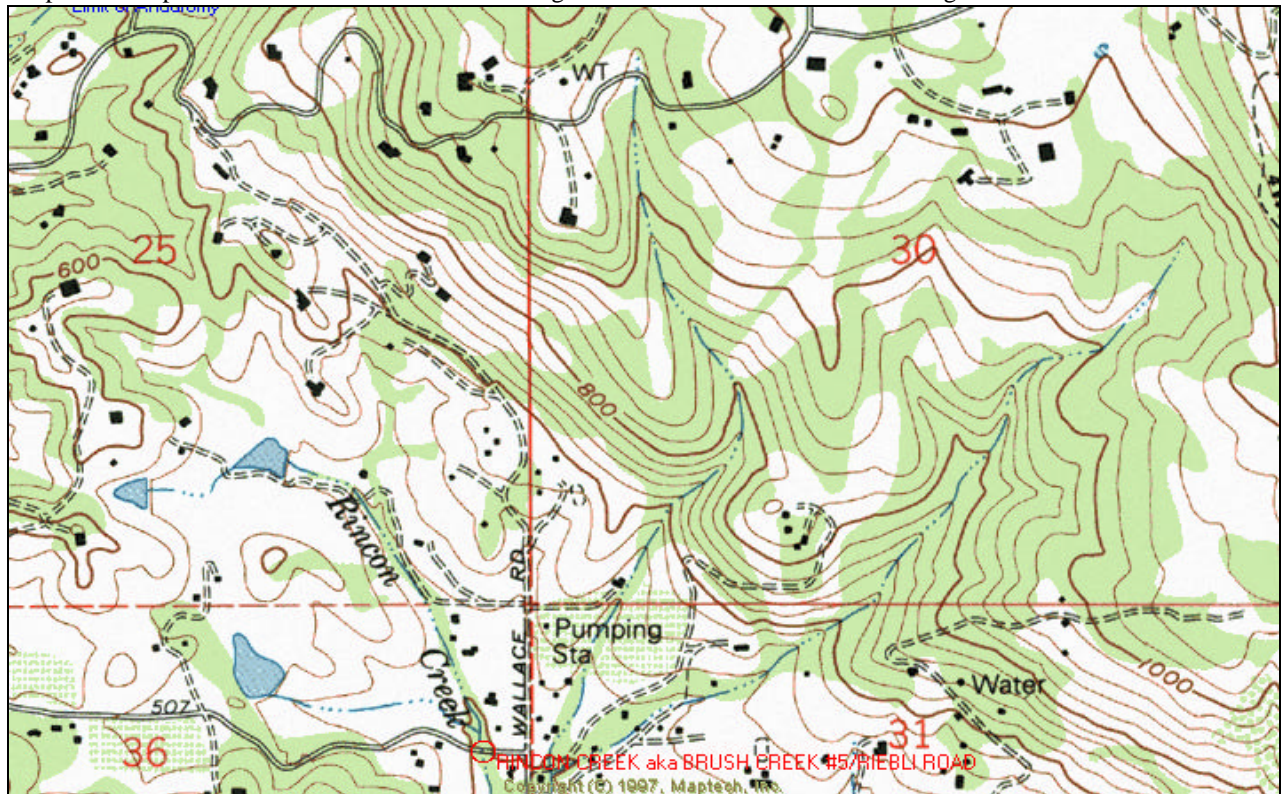
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 8.0' height x 8.0' width **Length:** 21.3'
Slope: 0.05% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.1'
Fill Estimate: 191 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Riebli Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 32% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. For juveniles, there are numerous factors impeding migration – perched outlet, lack-of-depth, and excessive velocities.

Additional Stream Crossings: Downstream = (~2,900') to Site ID #S-059, (~7,800') to Site ID #S-058, (~10,300') to bridge on Bridgewood Drive, (~10,400') to Site ID #S-057, (~13,750') to Site ID #S-056, (~21,450') to Highway 12 – status unknown and (~22,950') to confluence with Santa Rosa Creek. Upstream = (~2,300') to private crossing – status unknown.

Habitat: Quantity = approximately 4,200' of potential fish-bearing habitat upstream of Site ID# S-061. Quality = rated as “fair” for the ranking matrix as based on Taylor and Associates’ field notes. The crossing was surveyed by Taylor and Assoc. on 2/05/02 and there was continuous flow in the channel. At 10:30AM the air temp = 8.5°C and the water temp = 5°C. The survey crew described the habitat at this site as “fair to good” and noted a moderately dense riparian zone of hardwoods and cobble substrate that was embedded with fines. No fish were observed.

Preferred Treatment: Because the crossing is properly sized, a retrofit is recommended. One to two boulder weirs downstream of the culvert will raise tail-water elevation and corner baffles will increase depths and decrease velocities. However, the County will need permission of downstream property owners for placement of weirs. Treat the partial/temporal barriers at downstream crossings on Rincon Creek before addressing this site.





Site ID #S-062: Blucher Creek #1/Bloomfield Road; Laguna De Santa Rosa; Mark West Creek; Russian River

Road Ownership: County

County Ranking: #18 = Moderate-Priority **Basin-wide Ranking:** Tied for #24 = Moderate-Priority

Location: Road ID# 5901; County Map Sheet #4J52. USGS Quad: Two Rock. T6N, R9W. Lat/Long: 38° 20' 57.90" 122° 49' 6.42" Milepost = 13.83.

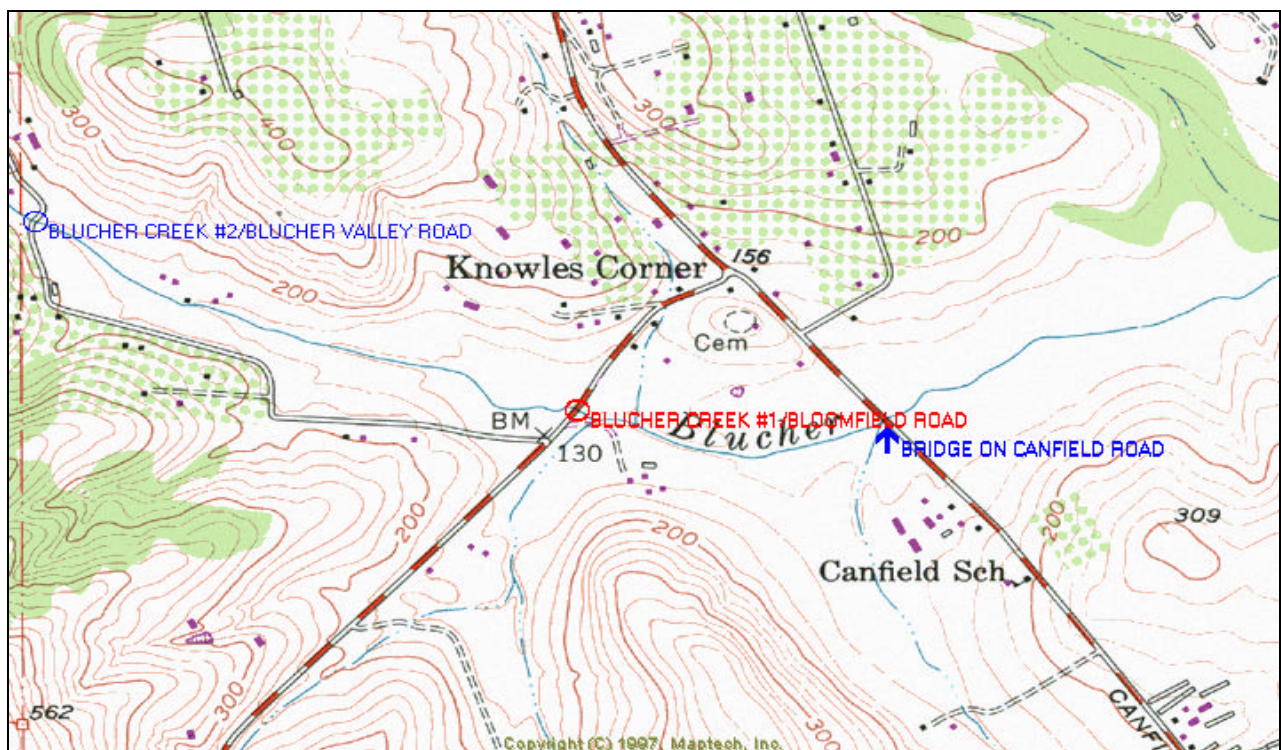
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 6.1' height x 16.0' width
Length: 42.0' **Slope:** 0.19% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 13.9'
Fill Estimate: 232 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Bloomfield Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juvenile salmonids due primarily to the drop at the outlet that spills over a 14-foot length of riprap (at about a 20% slope). Within the two-bay box culvert, passage is impeded by lack-of-depth and possibly excessive velocity at higher migration flows.

Additional Stream Crossings: Downstream = (~2,650') to bridge on Canfield Road, (~14,350') to bridge on Lone Pine Road, (~15,750') to Railroad crossing – status unknown, (~16,850') to bridge on Gravenstein Highway, (~17,400') to bridge on Old Gravenstein Highway, and (~20,400') to confluence with Laguna de Santa Rosa. Upstream = (~4,800') Site ID #S-063.

Habitat: Quantity = approximately 6,300' of potential fish-bearing habitat upstream of Site ID# S-062. Quality = rated as “fair” for the ranking matrix (quality score = 0.4) as based on CDFG’s professional judgment (Coe, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 4/10/02 and there was continuous flow in the channel. At 2:00PM the air temp = 19°C and the water temp = 14°C. The survey crew described the habitat at this site as “poor to fair” and noted a dense riparian zone of hardwoods and brush, and a featureless channel with a silt/mud bottom and minimal pool habitat. No fish were observed.

Preferred Treatment: Because the crossing is properly sized, a retrofit is recommended. Three to four boulder weirs downstream of the culvert will raise tail-water elevation and corner baffles will increase depths and decrease velocities. Recommend an evaluation of fish passage at the Railroad crossing prior to treating Site ID #S-062.





Site ID #S-063: Blucher Creek #2/Blucher Valley Road; Laguna De Santa Rosa; Mark West Creek; Russian River

Road Ownership: County

County Ranking: #42 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 69007; County Map Sheet #4J52. USGS Quad: Two Rock. T6N, R9W. Lat/Long: 38° 21' 12.54" 122° 49' 54.09" Milepost = 0.1 Miles to Camp Road.

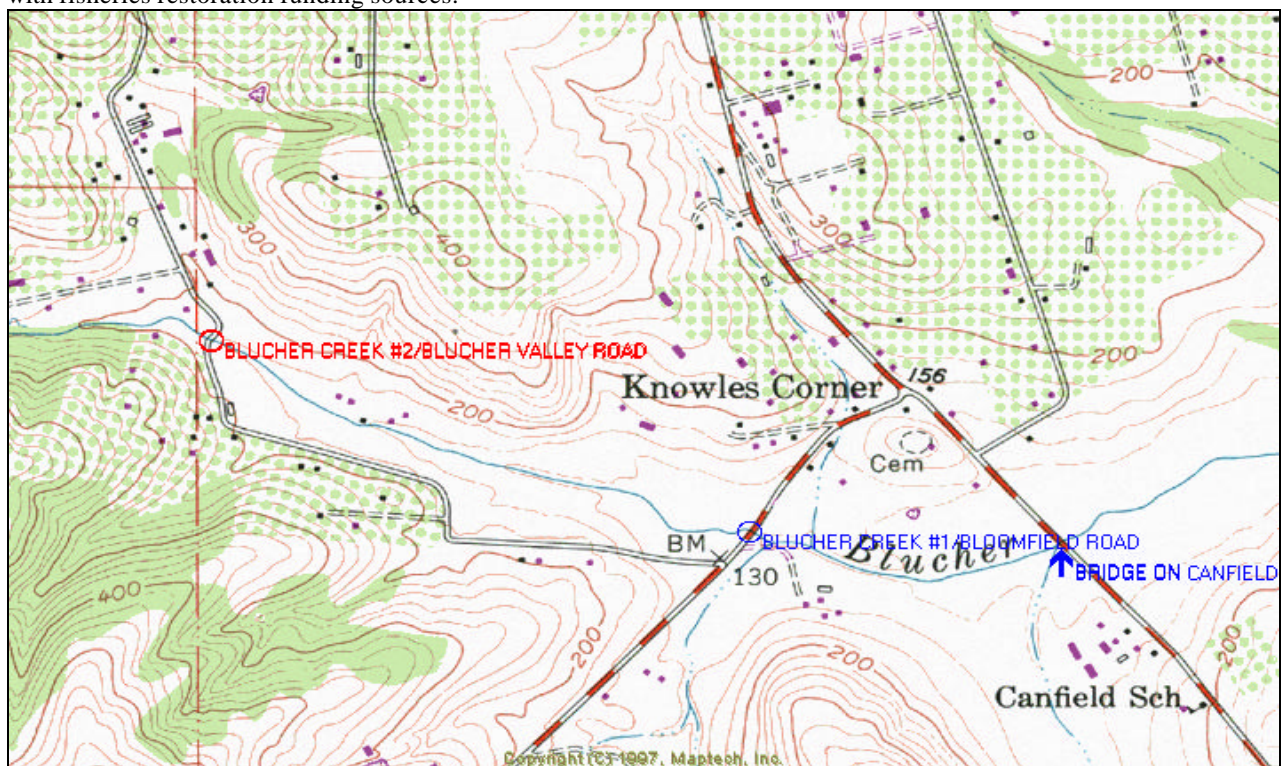
Culvert Type: Circular, SSP. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameter = 4.0' **Length:** 40.5' **Slope:** 4.84% **Modifications:** None. **Rustline Height:** 1.0' **Average Active Channel Width:** 6.7' **Fill Estimate:** 205 cubic yards. **Overall Condition:** Poor- invert is rusted through. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval. Blucher Valley Road is overtopped on approximately a 23-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for all adult steelhead on 86% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. The nearly 5% slope creates excessive velocities for all age classes of juveniles.

Additional Stream Crossings: Downstream = (~4,800') Site ID #S-062, (~7,450') to bridge on Canfield Road, (~19,150') to bridge on Lone Pine Road, (~20,550') to Railroad crossing – status unknown, (~21,650') to bridge on Gravenstein Highway, (~22,200') to bridge on Old Gravenstein Highway, and (~25,200') to confluence with Laguna de Santa Rosa. Upstream = none indicated on the USGS map within the fish-bearing stream reach.

Habitat: Quantity = approximately 1,700' of potential fish-bearing habitat upstream of Site ID# S-063. Quality = rated as "fair" for the ranking matrix (quality score = 0.4) as based on CDFG's professional judgment (Coe, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 4/10/02 and there was continuous flow in the channel. At 3:00PM the air temp = 20°C and the water temp = 13°C. The survey crew described the habitat at this site as "fair" and noted a dense riparian zone of hardwoods and brush. In-stream habitat quality was better than the previous site on Blucher Creek. Downstream channel had extensive agricultural fields on both sides. No fish were observed.

Preferred Treatment: Although the current crossing allows adequate passage of adult steelhead, the culvert is extremely undersized, is in poor condition, and due for replacement. A properly sized embedded circular SSP culvert is recommended at this crossing. The limited upstream habitat gain makes this project a poor candidate for treating with fisheries restoration funding sources.





Site ID #S-064: Hinebaugh Creek/Commerce Boulevard; Laguna De Santa Rosa; Mark West Creek; Russian River
Road Ownership: City of Rohnert Park

County Ranking: Tied for #54 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J53. USGS Quad: Cotati. T6N, R8W. Lat/Long: 38° 21' 2.87" 122° 42' 29.58"
Milepost = 0.1 Miles to Rohnert Park Expressway.

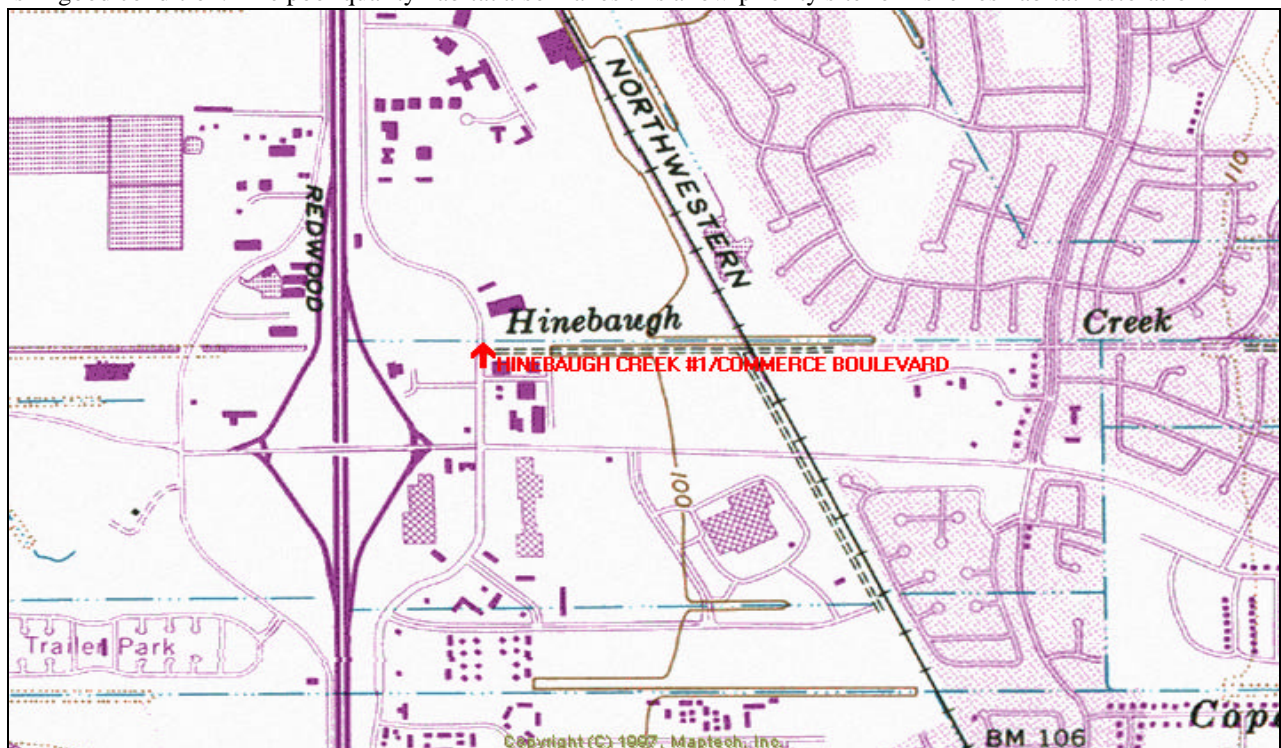
Culvert Type: Four Bay Box, Concrete. **Corrugations:** None. **Dimensions:** LB=11.8' height x 11.0' width; MLB=11.4' height x 11.0' width; MRB and RB =11.2' height x 11.0' width. **Lengths:** 44.9' **Slopes:** LB=-0.85%; MLB=-0.07%; MRB=-0.36%; RB=-2.52%. **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 29.4' **Fill Estimate:** 759 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Commerce Boulevard is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined three of the bays meet the 8-16-16 ft/sec passage criteria for adult steelhead (LB = 89%, MLB = 74% , MRB = 74%) of the range of estimated migration flows and fails to meet passage criteria for all age classes of juveniles. The RB=**RED:** FishXing determined this bay fails to meet passage criteria for adult steelhead and all age classes of juveniles. Actual juvenile passage is probably higher than predicted by FishXing because the primary violation of the passage criteria is lack-of-depth. At lower discharges, all the water flows through the middle two bays.

Additional Stream Crossings: Downstream = (~1,000') to Highway 101 – status unknown, (~ 2,000') to bridge on South Santa Rosa Avenue, (~3,100') to bridge on Labath Avenue, (~8,000') to bridge on Rohnert Park Expressway, and (~8,600') to confluence with Laguna de Santa Rosa. Upstream = (~ 1,800') to Railroad crossing – status unknown, (~ 5,300') to Crane Creek in-flow, and (~6,950') to crossing at Snyder Lane -not surveyed (no access).

Habitat: Quantity = approximately 54,250' of potential fish-bearing habitat upstream of Site ID# S-064. Quality = rated as “poor” for the ranking matrix as based on CDFG’s professional judgment (Coe, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 4/12/02 and there was continuous flow in the channel. At 11:00AM the air temp = 24°C and the water temp = 19°C. The survey crew described the habitat at this site as “poor” and noted a sparse riparian zone of hardwoods and brush. Creek is completely channelized, featureless and swampy with a mud/silt bottom. No salmonids were observed, but crew noted fish (species unknown), crayfish, ducks, and a turtle.

Preferred Treatment: None recommended because crossing provides adequate adult passage, is properly sized, and is in good condition. The poor quality habitat also makes this a low-priority site for fisheries habitat restoration.





Site ID #S-065: Crane Creek #1/Snyder Lane; Hinebaugh Ck; Laguna De Santa Rosa; Mark West Ck; Russian River
Road Ownership: County

County Ranking: Tied for #51 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 68025; County Map Sheet #4J54. USGS Quad: Cotati. T6N, R8W. Lat/Long: 38° 21' 18.51" 122° 41' 4.53" Milepost = 11.32

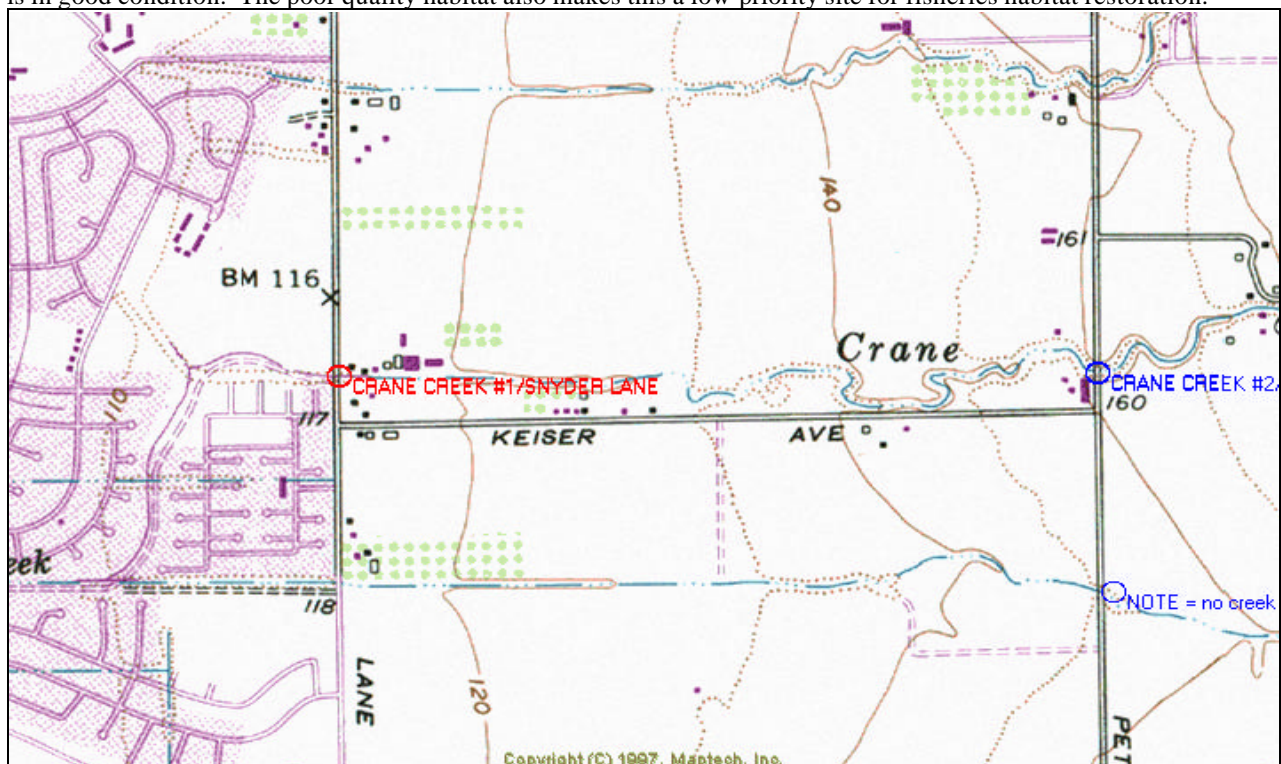
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** Each Bay = 8.05' height x 12.0' width
Length: 71.2' **Slopes:** LB = 0.15%; RB = 0.42% **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 12.3' **Fill Estimate:** 554 cubic yards. **Overall Condition:** Good.
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Snyder Lane is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined the RB bay of this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead 72% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juveniles. The LB bay is embedded several feet deep with cobble, gravel, and fines; and only receives flow on elevated discharges. Riprap at inlet assist in directing lower flows into the RB bay.

Additional Stream Crossings: Downstream = (~3,100') to confluence with Hinebaugh Creek, (~6,500') to Railroad crossing – status unknown, (~8,300') to Site ID #S-064, (~9,300') to Highway 101 – status unknown, (~10,400') to bridge on South Santa Rosa Avenue, (~11,500') to bridge on Labath Avenue, (~16,600') to bridge on Rohnert Park Expressway, and (~17,200') to confluence with Laguna de Santa Rosa. Upstream = (~6,650') to Site ID #66, (~8,550') to private crossing - status unknown, (13,400') to private crossing – status unknown, and (~17,450') to Site ID #S-067.

Habitat: Quantity = approximately 22,300' of potential fish-bearing habitat upstream of Site ID# S-065. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coe, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 4/11/02 and there was continuous flow in the channel. At 5:00PM the air temp = 23°C and the water temp = 15°C. The survey crew described the habitat at this site as "poor" and noted a sparse riparian zone of hardwoods and brush. Creek is completely channelized, featureless and swampy with a mud/silt bottom. No fish were observed.

Preferred Treatment: None recommended because crossing provides adequate adult passage, is properly sized, and is in good condition. The poor quality habitat also makes this a low-priority site for fisheries habitat restoration.





Site ID #S-066: Crane Creek #2/Petaluma Hill Road; Hinebaugh Ck; Laguna De Santa Rosa; Mark West Ck; Russian River
Road Ownership: County

County Ranking: Tied for #71 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID#5710B; County Map Sheet #4J54. USGS Quad: Cotati. T6N, R7W. Lat/Long: 38° 21' 19.01" 122° 39' 57.06" Milepost = 14.28

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 11.0' height x 16.0' width **Length:** 70.3'
Slope: -1.29% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 17.3'
Fill Estimate: 667 cubic yards. **Overall Condition:** Good.

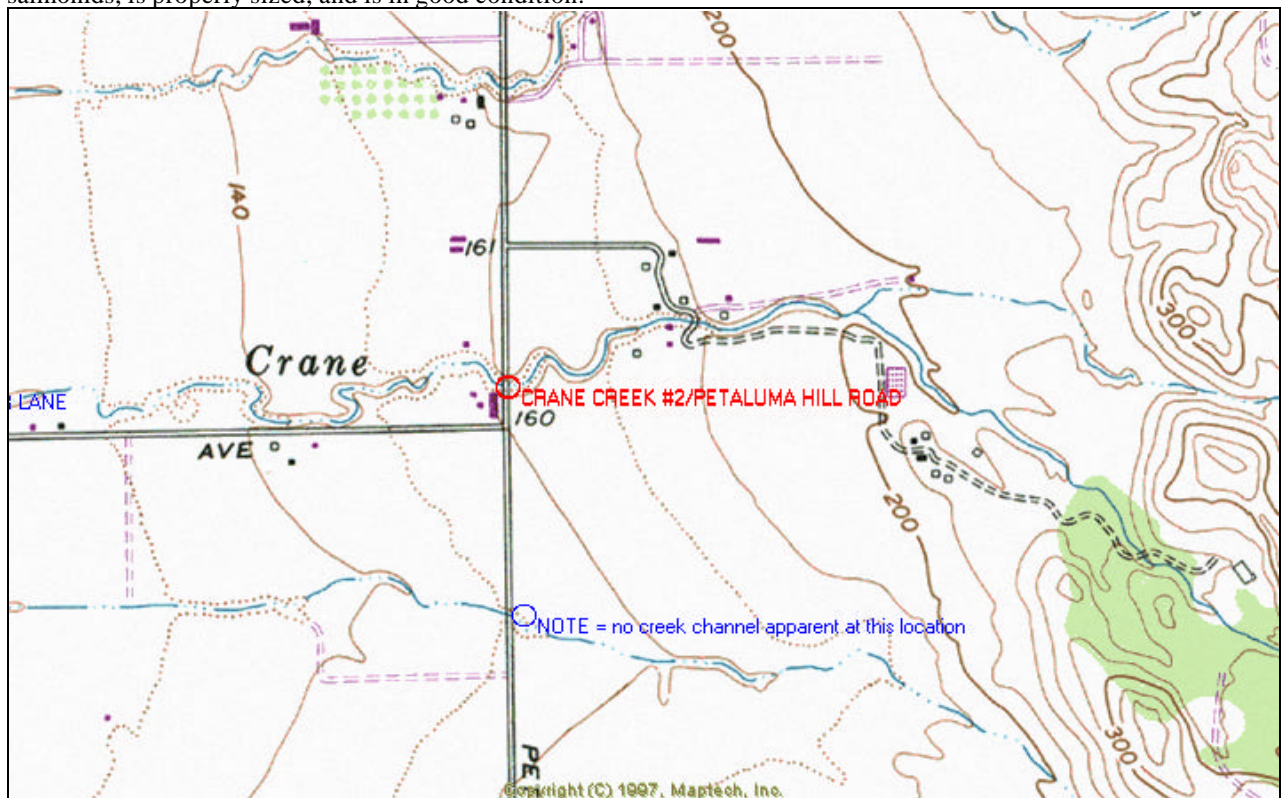
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Petaluma Hill Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for adult steelhead and all age classes of juvenile salmonids.

Additional Stream Crossings: Downstream = (~6,650') to Site ID #65, (~9,750') to confluence with Hinebaugh Creek, (~13,150') to Railroad crossing – status unknown, (~14,950') to Site ID #S-064, (~15,950') to Highway 101 – status unknown, (~17,050') to bridge on South Santa Rosa Avenue, (~18,150') to bridge on Labath Avenue, (~23,250') to bridge on Rohnert Park Expressway, and (~23,850') to confluence with Laguna de Santa Rosa. Upstream = (~1,900') to private crossing - status unknown, (6,750') to private crossing – status unknown, and (~10,800') to Site ID #S-067.

Habitat: Quantity = approximately 15,600' of potential fish-bearing habitat upstream of Site ID# S-066. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 4/11/02 and there was continuous flow in the channel. At 5:00PM the air temp = 23°C and the water temp = 15°C. The survey crew described the habitat at this site as "poor" and noted a sparse riparian zone of hardwoods and brush. Crew noted a relative lack of in-stream habitat features or complexity. Creek is bordered on both sides by dairy grazing pastures. No fish were observed.

Preferred Treatment: None recommended because crossing provides unimpeded passage for all life stages of salmonids, is properly sized, and is in good condition.



Site ID #S-066: Crane Creek #2/Petaluma Hill Road; Hinebaugh Creek; Laguna De Santa Rosa; Mark West Creek;
Russian River



Site ID#S-067: Crane Creek #3/Pressley Road; Hinebaugh Ck; Laguna De Santa Rosa; Mark West Ck; Russian River

Road Ownership: County

County Ranking: Tied for #21 = Moderate-Priority **Basin-wide Ranking:** Tied for #28 = Moderate-Priority

Location: Road ID# 67001A; County Map Sheet #4J54. USGS Quad: Cotati. T6N, R7W, Section 21. Lat/Long: 38° 20' 50.96" 122° 38' 25.44" Milepost = 12.47

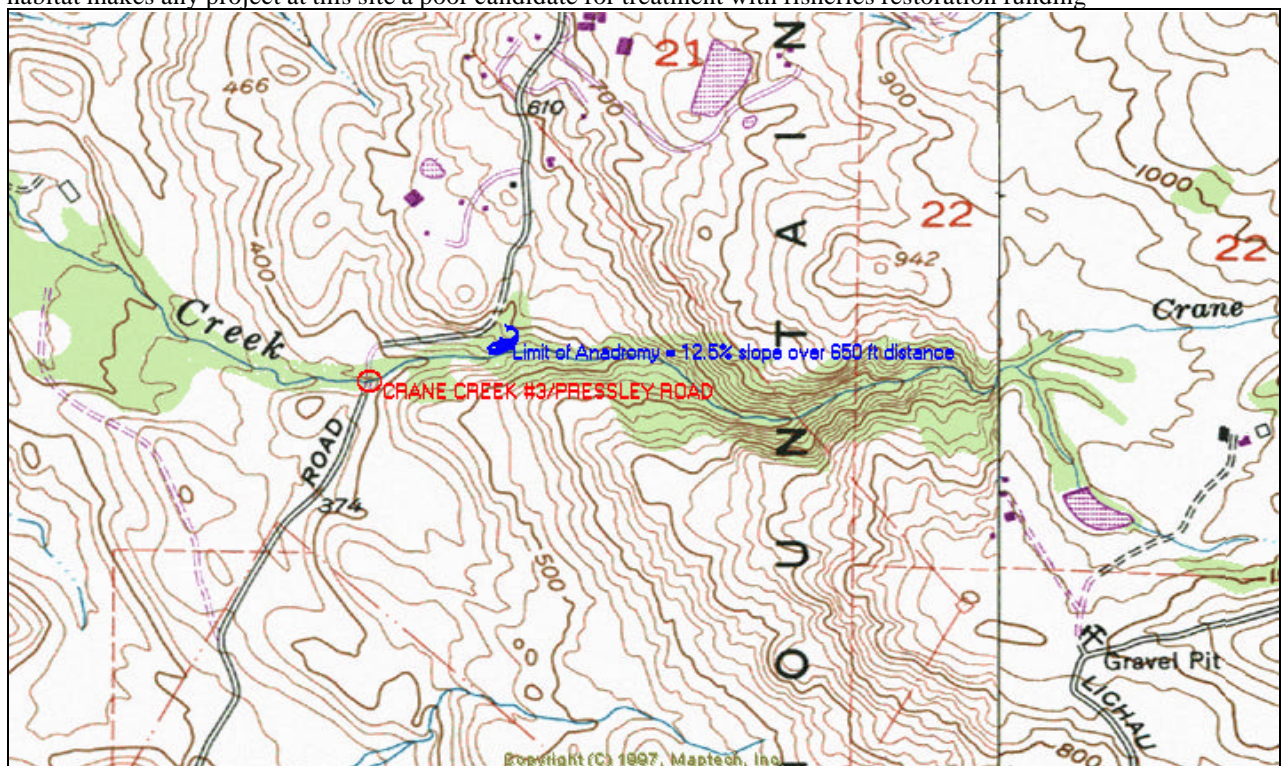
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 11.0' height x 16.0' width
Length: 70.3' **Slope:** -1.29% **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 14.7' **Fill Estimate:** 180 cubic yards. **Overall Condition:** Fair.
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately an eight-year recurrence interval.
Pressley Road is overtopped on approximately a 60-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juvenile salmonids due to the extremely perched outlet (~ 5 ft).

Additional Stream Crossings: Downstream = (~4,000') to private crossing - status unknown, (8,700') to private crossing - status unknown, (~10,800') to Site ID #S-066, (~17,450') to Site ID #65, (~20,550') to confluence with Hinebaugh Creek, (~ 23,950') to Railroad crossing - status unknown, (~ 25,750') to Site ID #S-064, (~ 26,750') to Highway 101 - status unknown, (~27,850') to bridge on South Santa Rosa Avenue, (~28,950') to bridge on Labath Avenue, (~ 34,050') to bridge on Rohnert Park Expressway, and (~34,650') to confluence with Laguna de Santa Rosa. Upstream = none indicated on the USGS map within the limited fish-bearing reach upstream of Site ID #S-067.

Habitat: Quantity = approximately 1,150' of potential fish-bearing habitat upstream of Site ID# S-067. Quality = rated as "fair" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 4/11/02 and there was continuous flow in the channel. At 2:00PM the air temp = 29°C and the water temp = 14.5°C. The survey crew described the habitat at this site as "fair" and noted a moderately dense riparian zone of hardwoods and brush. Crew noted a hardened ford crossing approximately 40 feet upstream that is a barrier too. Creek is bordered on both sides by dairy grazing pastures. No fish were observed.

Preferred Treatment: Because the current crossing is undersized (<10-year flow) and is extremely perched, a full replacement is the best long-term solution to restore fish passage. However, the limited reach of available upstream habitat makes any project at this site a poor candidate for treatment with fisheries restoration funding



Site ID #S-067: Crane Creek #3/Pressley Road; Hinebaugh Creek; Laguna De Santa Rosa; Mark West Creek; Russian River



Site ID #S-068: Copeland Creek/Snyder Lane; Laguna De Santa Rosa; Mark West Creek; Russian River
Road Ownership: County

County Ranking: #30 = Moderate-Priority Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 68025; County Map Sheet #4J54. USGS Quad: Cotati. T6N, R8W. Lat/Long: 38° 21' 2.87" 122° 41' 3.60" Milepost = 0.1 Miles to Rohnert Park Expressway.

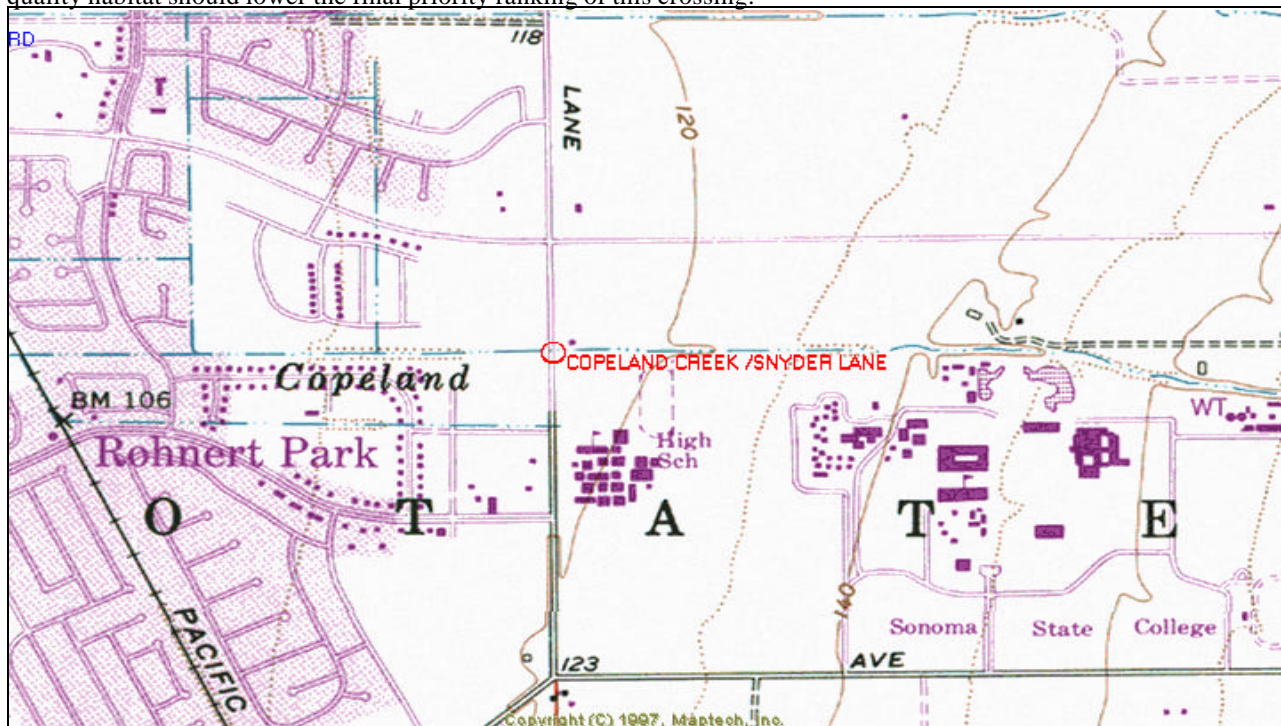
Culvert Type: Three Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 8.0' height x 15.4' width
Length: 48.0' **Slopes:** LB= -1.48%; MB= 0.73%; RB= 1.13% **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 31.4' **Fill Estimate:** 397 cubic yards. **Overall Condition:** Good.
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Snyder Lane is overtopped on more than a 250-year storm flow.

Barrier Status: LB=**RED**: the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juveniles. This bay is ½ full of sediment. MB and RB =**GRAY**: FishXing determined these bays meet the 8-16-16 ft/sec passage criteria for adult steelhead on 19%(MB) and 7%(LB) of the range of estimated migration flows and fail to meet passage criteria for all age classes of juvenile salmonids. Lack-of-depth is the primary criteria violation for adults and older juveniles – actual passage is probably higher than predicted by FishXing.

Additional Stream Crossings: Downstream = (~2,700') to bridge on Country Club Drive, (~3,700') to Railroad crossing – concrete box culvert, (7,500') to bridge on Commerce Blvd, (~ 7,950') to Highway 101/Santa Rosa Avenue – status unknown, (~10,950') to confluence with Laguna de Santa Rosa. Upstream = (~ 5,550') to bridge on Petaluma Hill Road, (~13,250') to bridge on Roberts Road, and (19,650') to bridge on Lichau Road.

Habitat: Quantity = approximately 22,200' of potential fish-bearing habitat upstream of Site ID# S-068. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 4/10/02 and there was continuous flow in the channel. At 5:30PM the air temp = 20°C and the water temp = 20°C. The survey crew described the habitat at this site as "poor" and noted a sparse riparian zone of hardwoods and brush along a channelized reach with minimal in-stream habitat features such as pools, cover, or spawning substrate. This reach is through city limits of Rohnert Park. No fish were observed.

Preferred Treatment: None immediately recommended because the crossing provides some passage for adults and older juveniles. Corner baffles and a single downstream boulder weir would improve passage. However, the poor-quality habitat should lower the final priority ranking of this crossing.





Site ID #S-069: Linda Creek #1/Mark West Springs Road; Mark West Ck; Russian River **Road Ownership:** County

County Ranking: #9 = High-Priority

Basin-wide Ranking: Tied for #12 = High-Priority

Location: Road ID# 8801A; County Map Sheet #4J33. USGS Quad: Mark West Springs. T8N, R8W, Section 27.
Lat/Long: 38° 30' 23.70" 122° 43' 23.80" Milepost= 0.2 miles to Riebli Road.

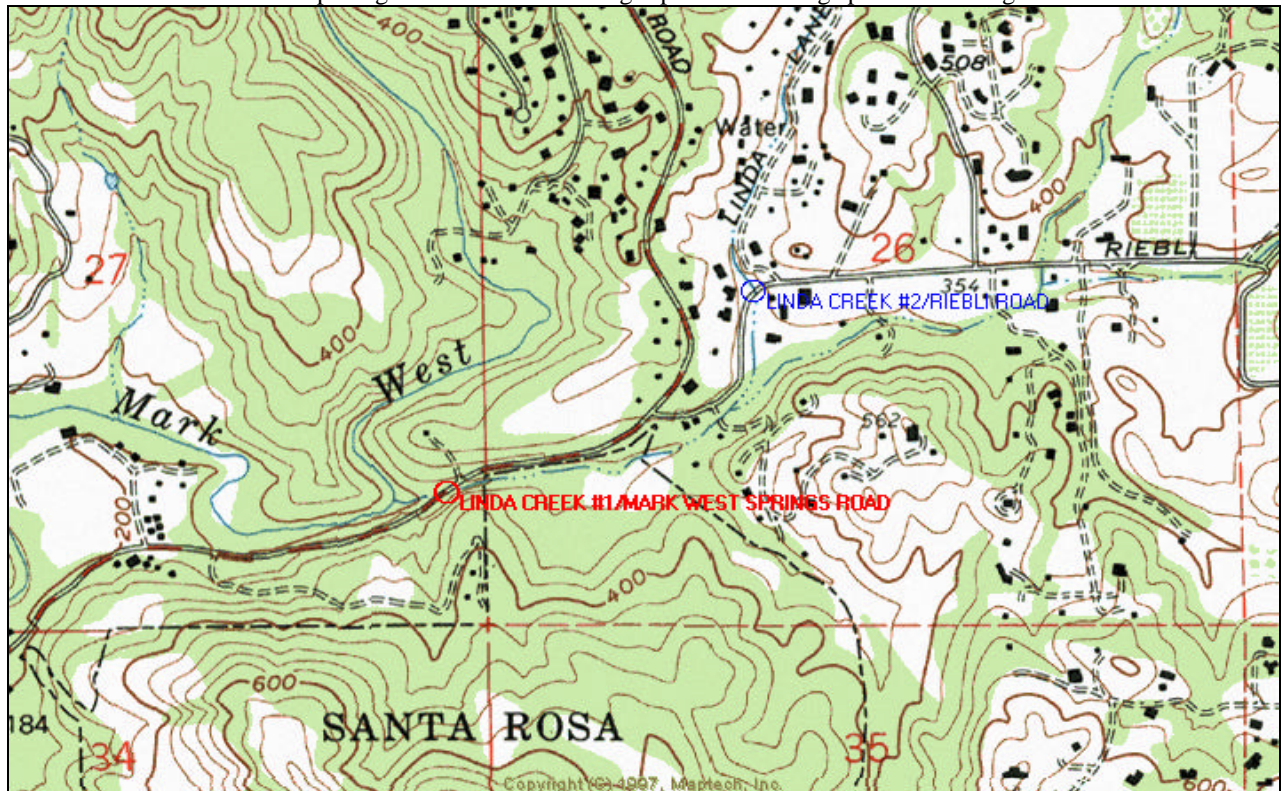
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.0' height x 10.0' width **Length:** 129.4'
Slope: 3.16% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 13.8'
Fill Estimate: 3,430 cubic yards. **Overall Condition:** Abraded. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 212-year recurrence interval. Mark West Springs Road is overtopped on more than a 250-year storm flow.

Barrier Status: RED: the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juveniles due to the extremely perched outlet.

Additional Stream Crossings: Downstream = (~450') to confluence with Mark West Creek. Upstream = (~2,250') to private crossing – status unknown, (~2,400') to fork in creek, North Fork = (~3,500') to Site ID #S-070, (~3,600') to culvert on private driveway – appeared to be a barrier, (~6,300') to private driveway crossing off of Linda Road – status unknown, and (~7,100') to private crossing – status unknown. East Fork = (~3,950') to private crossing – status unknown, (~5,000') to private crossing – status unknown, (~5,650') to private crossing – status unknown, (~6,000') to private crossing - status unknown, and (~7,000') to private culvert on Riebli Road past end of County-maintained road – not surveyed.

Habitat: Quantity = approximately 13,050' of potential fish-bearing habitat upstream of Site ID# S-069. Quality = rated as “fair” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 8/15/01 and there was continuous flow in the channel. At 4:40PM the air temp = 19°C and the water temp = 17°C. The survey crew described the habitat at this site as “fair to good” and noted a dense riparian zone of hardwoods and several pools with cover, and spawning substrate on the pool-tails. Many (>100) fish were observed both upstream and downstream of the crossing – some were salmonids, most were species unknown.

Preferred Treatment: Because the crossing is properly sized, a retrofit is recommended. Four to five boulder weirs downstream of the culvert will raise tail-water elevation and corner baffles will increase depths and decrease velocities. Recommend fish passage evaluations at the eight private crossings prior to treating Site ID #S-069.





Site ID #S-070: Linda Creek #2/Riebli Road; Mark West Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #31 = Moderate-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 88001; County Map Sheet #4J33. USGS Quad: Mark West Springs. T8N, R8W, Section 26. Lat/Long: 38° 30' 38.43" 122° 42' 56.68" Milepost = 0.2 miles to Mark West Springs Road.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 5.9' height x 12.0' width **Length:** 62.5' **Slope:** 1.07% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 21.3' **Fill Estimate:** 775 cubic yards. **Overall Condition:** Abraded.

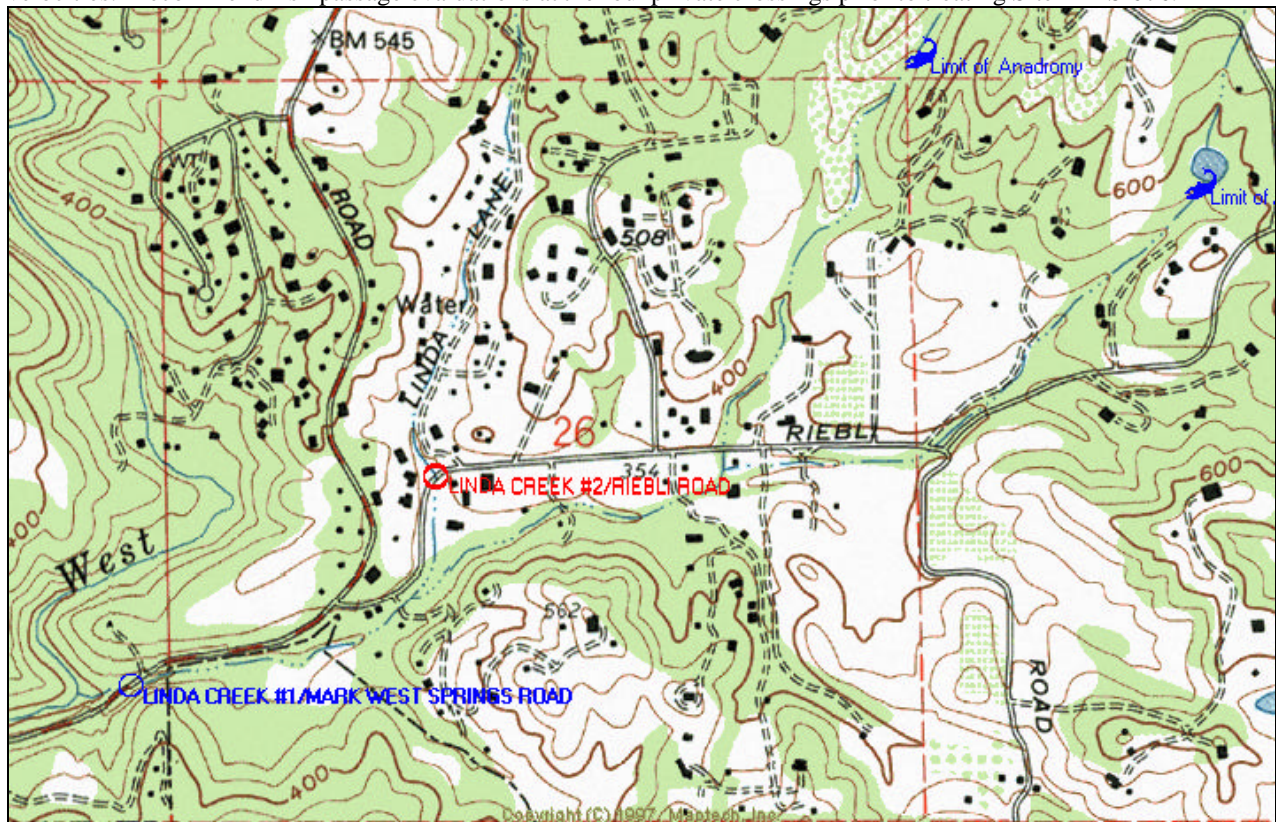
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Riebli Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** FishXing determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juvenile salmonids. For adults, the only violation of the passage criteria is lack-of-depth – so some passage of adults probably occurs. The slightly perched outlet impedes most juvenile passage, along with excessive velocities.

Additional Stream Crossings: Downstream = (~1,000') to fork in creek, (~1,150') to private crossing – status unknown, (~3,500') to Site ID #S-069, and (~3,950') to confluence with Mark West Creek. Upstream = (~100') to culvert on private driveway – appeared to be a barrier, (~2,250') to private crossing – status unknown, (2,850') to private driveway crossing off of Linda Road – status unknown, and (~3,600') to private crossing – status unknown.

Habitat: Quantity = approximately 3,700' of potential fish-bearing habitat upstream of Site ID# S-070. Quality = rated as “fair” for the ranking matrix as based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 8/15/01 and there was continuous flow in the channel. At 2:15PM the air temp = 14.5°C and the water temp = 9.5°C. The survey crew described the habitat at this site as “fair to good” and noted a moderately dense riparian zone of hardwoods and several pools with cover, and spawning substrate on the pool-tails. No fish were observed.

Preferred Treatment: Because the crossing is properly sized, a retrofit is recommended. Three to four boulder weirs downstream of the culvert will raise tail-water elevation and corner baffles will increase depths and decrease velocities. Recommend fish passage evaluations at the four private crossings prior to treating Site ID #S-070.





Site ID #S-071: Porter Creek #1 (tributary to Mark West Creek)/Porter Creek Road; Mark West Ck; Russian River
Road Ownership: County

County Ranking: Tied for #28 = Moderate-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 8801B; County Map Sheet #4J34. USGS Quad: Mark West Springs. T8N, R7W, Section 7.
Lat/Long: 38° 32' 58.13" 122° 40' 5.31" Milepost= 18.72 miles

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 8.2' height x 25.1' width.
Length: 134.5' **Slope:** 0.23% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.4'
Fill Estimate: 635 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 109-year recurrence interval. Porter Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 75% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids.

Additional Stream Crossings: Downstream = (~3,350') to private bridge, (~9,900') to private bridge, (~10,550') to bridge on Porter Creek Road, (~11,700') to private wooden bridge, (~14,650') to private bridge, and (~17,200') to confluence with Mark West Creek. Upstream = (~1,100') to concrete check dam – barrier status unknown, (~4,800') to private bridge, (8,600') to Site ID #S-072, (~13,900') to abandoned concrete dam – barrier status unknown, (~16,750') to private bridge, and (~18,100') to private bridge on Fechter Road.

Habitat: Quantity = approximately 23,250' of potential fish-bearing habitat upstream of Site ID# S-071. Quality = rated as “fair” for the ranking matrix (quality score = 0.57) as based on CDFG’s 1996 habitat typing survey of approximately 24,000' of channel. The CDFG crew observed more warm-water exotic fish species than salmonids. The crossing was surveyed by Taylor and Assoc. on 8/16/01 and there was continuous flow in the channel. At 11:00AM the air temp = 20°C and the water temp = 14.5°C. The survey crew described the habitat at this site as “fair to good” and noted a moderately dense riparian zone of hardwoods. Between 20-30 fish of unknown species (3”-5” long) were observed downstream of Site ID #S-071.

Preferred Treatment: Because the crossing is properly sized, a retrofit is recommended. Three to four boulder weirs downstream of the culvert will raise tail-water elevation and corner baffles will increase depths and decrease velocities. Consider placing a beam across one bay’s inlet to concentrate lower migration flows into a single bay.





Site ID #S-072: Porter Creek #2 (tributary to Mark West Creek) /Calistoga Road; Mark West Creek; Russian River
Road Ownership: County

County Ranking: #37 = Moderate-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 7703; County Map Sheet #4J34. USGS Quad: Mark West Springs. T8N, R7W, Section 8.
Lat/Long: 38° 33' 4.91" 122° 38' 59.67" Milepost= 17.12 miles

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** Each Bay= 10.8' height x 12.0' width
Lengths: LB= 120.0'; RB= 116.6' **Slopes:** LB=0.29%; RB= 0.42% **Modifications:** A fish Ladder in the left bay, alongside the left bank. **Rustline Height:** N/A **Average Active Channel Width:** 13.8' **Fill Estimate:** 2,689 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Calistoga Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing is unable to accurately model hydraulics and assess passage through fish ladders. Assume that temporal/partial passage of adult steelhead occurs through this crossing, but juveniles are unable to negotiate the ladder.

Additional Stream Crossings: Downstream = (~3,700') to private bridge, (~7,500') to concrete check dam – barrier status unknown, (8,600') to Site ID #S-071, (~ 11,950') to private bridge, (~18,500') to private bridge, (~19,150') to bridge on Porter Creek Road, (~20,300') to private wooden bridge, (~ 23,250') to private bridge, and (~ 25,800') to confluence with Mark West Creek. Upstream = (~ 5,300') to abandoned concrete dam – barrier status unknown, (~8,150') to private bridge, and (~ 9,500') to private bridge on Fechter Road.

Habitat: Quantity = approximately 15,350' of potential fish-bearing habitat upstream of Site ID# S-072. Quality = rated as "fair" for the ranking matrix (quality score = 0.57) as based on CDFG's 1996 habitat typing survey of approximately 24,000' of channel. The CDFG crew observed more warm-water exotic fish species than salmonids. The crossing was surveyed by Taylor and Assoc. on 8/16/01 and there were isolated areas of surface water in the channel. At 3:00PM the air temp = 25°C and the water temp = 15°C. The survey crew described the habitat at this site as "fair to good" and noted a moderately dense riparian zone of hardwoods. Several fish of unknown species (3"-5" long) were observed in the pool just upstream of Site ID #S-072.

Preferred Treatment: Possibly conduct a retrofit of the LB bay so that fish ladder is the entire width of the bay and also install sloped, v-notched concrete weirs within culvert. Recommend inspection of the crossing during migration-level storm flows to better assess effectiveness of the current fish ladder.





Site ID #S-073: Mark West Creek/Roehmer Road; Russian River

Road Ownership: Private

County Ranking: Tied for #38 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: County Map Sheet #4J34. USGS Quad: Mark West Springs. T8N, R7W, Section 20. Lat/Long: 38° 31' 17.06" 122° 39' 28.86" Milepost = At Alpine Road.

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** LB = 11.1' height x 21.4' width; RB = 9.3' height x 25.5' width **Length:** 14.6' **Slopes:** LB = -0.41%; RB = -6.16% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 56.2' **Fill Estimate:** 572 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Roehmer Road is overtopped on more than a 250-year storm flow.

Barrier Status: LB=**GRAY**: FishXing determined this bay of the crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 89% of the range of estimated migration flows, meets passage criteria for resident/2+ fish on 15% of the range of estimated migration flows, and fails to meet passage criteria for 1+/young-of-year juveniles. RB= **GRAY**: FishXing determined this bay of the crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 94% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juveniles. Juvenile passage may be higher than predicted by FishXing because the primary criteria violation over lower migration flows was a lack-of-depth.

Additional Stream Crossings: Downstream = at least ten bridges are located downstream of Site ID #S-073. Upstream = (~2,900') to bridge on Calistoga Road, (~5,350') to private bridge, and (~9,550') to private bridge, (~10,050') to private bridge, (~12,450') to bridge on St. Helena Road, (~21,600') to bridge on Lone Pine Road, (~23,200') to bridge on Tarwater Road, and (~24,800') to 10-foot high natural waterfall.

Habitat: Quantity = approximately 53,600' of potential fish-bearing habitat upstream of Site ID# S-073. Quality = rated as "good" for the ranking matrix (quality score = 0.65) as based on CDFG's 1996 habitat typing survey of approximately 82,000' of channel, from the mouth up to a natural waterfall known to be the limit of anadromy. The crossing was surveyed by Taylor and Assoc. on 1/08/02 and there was continuous surface flow. At 1:45PM the air temp = 14°C and the water temp = 7°C. The survey crew described the habitat at this site as "very good" and noted a sparse riparian zone of hardwoods. No fish were observed, but the water was turbid from recent rain storms.

Preferred Treatment: None recommended because the crossing provides adequate adult passage and probably allows some juvenile passage too.





Site ID #S-074: Weeks Creek/Calistoga Road; Mark West Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #51 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 7703; County Map Sheet #4J34. USGS Quad: Mark West Springs. T8N, R7W, Section 29.
Lat/Long: 38° 30' 21.72" 122° 38' 56.72" Milepost = 13.4 miles

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** Each Bay = 8.0' height x 8.15' width.
Lengths: LB = 47.2'; RB = 37.9' **Slopes:** LB = 0.04%; RB = -5.25% **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 14.1' **Fill Estimate:** 118 cubic yards. **Overall Condition:** Good.
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Calistoga Road is overtopped on more than a 250-year storm flow.

Barrier Status: LB=**GRAY**: FishXing determined this bay of the crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 95% of the range of estimated migration flows, meets passage criteria for resident/2+ fish on 84% of the range of estimated migration flows, and fails to meet passage criteria for 1+/young-of-year juveniles.
RB=**RED**: because of the highly aggraded condition of this bay, it was assumed there is no flow through this bay at migration-level flows.

Additional Stream Crossings: Downstream = (~300') to bridge on private property – status unknown – access was denied, (~1,400') to confluence with Mark West Creek, (~2,750') to private bridge, (~6,350') to bridge on Calistoga Road, and (~9,300') to Site ID #S-073. Upstream = none indicated by CDFG on their habitat typing survey of 6,300' of channel.

Habitat: Quantity = approximately 9,500' of potential fish-bearing habitat upstream of Site ID# S-074. Quality = rated as "poor" for the ranking matrix (quality score = 0.39) as based on CDFG's 1996 habitat typing survey of approximately 6,300' of channel that was terminated due to lack-of-access. The CDFG survey crew observed a section of creek channel upstream of Calistoga Road that had been bulldozed. The crossing was surveyed by Taylor and Assoc. on 8/21/01 and the channel was dry. The survey crew described the habitat at this site as "poor to fair" and noted a sparse riparian zone of hardwoods.

Preferred Treatment: The County should remove the hardware cloth placed across the inlet of the culvert – this fencing would impede fish passage and also cause plugging of debris during winter storms.





Site ID #S-075: Alpine Creek/St. Helena Road; Mark West Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #49 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 8701; County Map Sheet #4J34. USGS Quad: Mark West Springs. T8N, R7W, Section 29. Lat/Long: 38° 30' 21" 122° 38' 43" Milepost = 0.1 miles to Calistoga Road.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 4.7' height x 8.1' width **Length:** 26.3' **Slope:** 0.57% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 12.0' **Fill Estimate:** 135 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 10-year recurrence interval. St. Helena Road is overtopped on approximately a 41-year storm flow.

Barrier Status: **GRAY:** FishXing determined this bay of the crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 54% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. The perched outlet (1.8') is the main impediment to all age classes of juveniles.

Additional Stream Crossings: Downstream = (~850') to confluence with Mark West Creek, (~3,150') to private bridge, (~5,650') to bridge on Calistoga Road, and (~8,600') to Site ID #S-073. Upstream = none indicated on the USGS map within the limited fish-bearing reach upstream of Site ID #S-075.

Habitat: Quantity = approximately 1,250' of potential fish-bearing habitat upstream of Site ID# S-075 – limit of anadromy was the dam/reservoir indicated on the USGS map. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates' field notes. The crossing was surveyed by Taylor and Assoc. on 1/16/02 and there was continuous flow in the channel. At 4:20PM the air temp = 12°C and the water temp = 8°C. The survey crew described the habitat at this site as "poor to fair" and noted a sparse riparian zone of hardwoods and a wide, flat highly-aggraded channel with minimal features – other than the large pool scoured below the culvert's outlet. No fish were observed. Crew talked to a local who has observed adult steelhead in Alpine Creek – also said they had seen coho salmon in Weeks Creek this winter (NOTE: reliability of this observation is unknown).

Preferred Treatment: Due to the poor sizing of the current box culvert, a retrofit may not be a feasible option because of the increased risk of flooding if storm flow capacity is further reduced by downstream boulder weirs and/or baffles within the culvert. A full replacement is the best long-term solution to provide unimpeded passage and improve flow conveyance; however the limited upstream habitat makes this site a poor candidate for treatment with fisheries restoration funding.







Site ID #S-077: Unnamed Tributary #1 to Mark West Creek/St. Helena Road; Mark West Creek; Russian River

Road Ownership: County

County Ranking: Tied for #29 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 8701; County Map Sheet #4J34. USGS Quad: Calistoga. T8N, R7W, Section 26. Lat/Long: 38° 31' 12.89" 122° 35' 48.59" Milepost = 13.01 miles

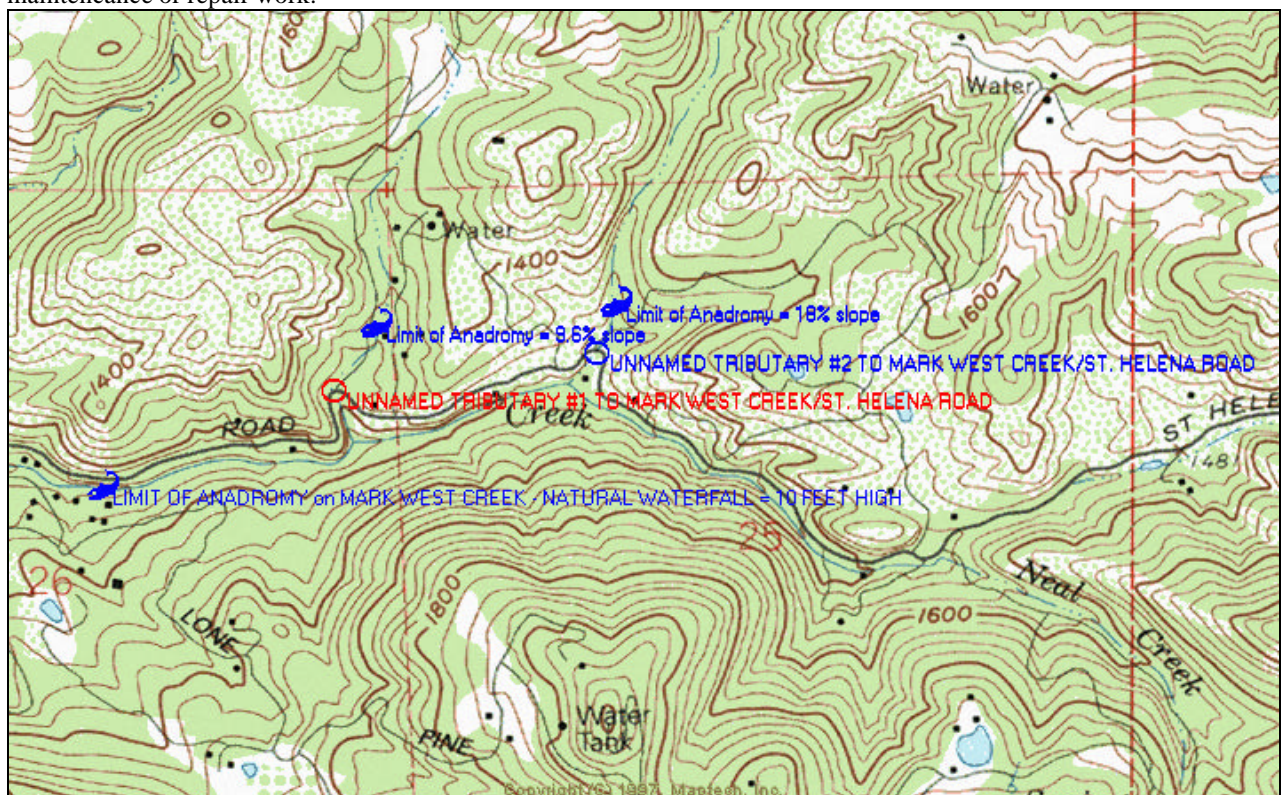
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 7.2' height x 4.0' width **Length:** 60.3' **Slope:** 1.74% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 13.7' **Fill Estimate:** 928 cubic yards. **Overall Condition:** Poor- exposed rebar on floor, and broken outlet apron. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. St. Helena Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juvenile salmonids due to the >4 foot perched outlet and steeply-slope concrete apron.

Additional Stream Crossings: Downstream = (~500') to confluence with Mark West Creek, and (~2,550') to 10-foot high waterfall on Mark West Creek – limit of anadromy. Upstream = none indicated on the USGS map within the limited fish-bearing stream reach.

Habitat: Quantity = approximately 550' of potential resident fish-bearing habitat upstream of Site ID# S-077 – limit of anadromy = 8.6% slope indicated on the USGS map. Quality = rated as "poor" for the ranking matrix as based on Talyor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 1/08/02 and there was continuous flow in the channel. At 10:30AM the air temp = 5°C and the water temp = 7.5°C. The survey crew described the habitat at this site as "poor" due to steepness of the channel and noted a riparian zone of hardwoods and a large drop at the culvert outlet. The culvert survey crew talked to a local who has observed resident trout in Mark West Creek downstream of this unnamed tributary. No fish were observed by the culvert survey crew.

Preferred Treatment: Although this crossing is located upstream of Mark West Creek's anadromous reach and the unnamd tributary has a very limited fish-bearing reach – the crossing is in poor condition and may require some maintenance or repair work.







Site ID #S-079: Press Creek/Sweetwater Springs Road; Porter Creek; Russian River **Road Ownership:** County

County Ranking: #12 = High-Priority

Basin-wide Ranking: #17 = High-Priority

Location: Road ID# 8902A; County Map Sheet #4J31. USGS Quad: Guerneville. T8N, R10W, Section 13.
Lat/Long: 38° 32' 23.84" 122° 54' 43.13" Milepost = 2.6 miles to Westside Road.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 8.0' height x 8.0' width **Length:** 36.3'
Slope: 1.96% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 7.9'
Fill Estimate: 545 cubic yard. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Sweetwater Springs Rd is overtopped on more than a 250-year storm flow. **Barrier Status:** **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 32% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. The perched outlet (~2.5') prevents all juvenile migration.

Additional Stream Crossings: Downstream = (~150') to confluence with Porter Creek, (~5,600') to three-foot high cement weir, (~5,700') to crossing described by CDFG as "filled-in creek bed", (~12,550') to private bridge, (~14,750') to private bridge, (~16,050') to culvert observed by CDFG – status unknown, and (17,500') to Porter Creek confluence with Russian River. Upstream = none identified in the lower 5,400' by CDFG and none indicated on the USGS map within the remaining fish-bearing stream reach.

Habitat: Quantity = approximately 9,800' of potential fish-bearing habitat upstream of Site ID# S-079. Quality = rated as "good" for the ranking matrix (quality score = 0.69) as based on CDFG's habitat typing survey of approximately 5,400' of channel during the summer of 1997. The upper 2,000' of the CDFG survey noted significant impacts of unfenced grazing along the channel. The crossing was surveyed by Taylor and Assoc. on 8/14/01 and there were isolated areas of surface water upstream and downstream of the crossing. At 12-noon the air temp = 18°C and the water temp = 14°C. The survey crew described the habitat as "good" and observed four young-of-year salmonids in the vicinity of the crossing.

Preferred Treatment: Debris jam at inlet should be cleared ASAP before damage occurs to the crossing. Because the crossing is properly sized, a retrofit is recommended. Three to four boulder weirs downstream of the culvert will raise tail-water elevation and corner baffles will increase depths and decrease velocities. Assess and, if needed, treat any downstream migration impediments prior to treating Site ID #S-079.





Site ID #S-080: Porter Creek #1/Sweetwater Springs Road; Russian River **Road Ownership:** County
County Ranking: #1 = High-Priority **Basin-wide Ranking: #1 = High-Priority**

Location: Road ID# 8902A; County Map Sheet #4J31. USGS Quad: Guerneville. T8N, R10W, Section 14.
Lat/Long: 38° 32' 38.91" 122° 56' 3.99" Milepost = 4.3 miles to Westside Road. **Culvert Type:** Two Pipes, Circular, SSP. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameters = 6.0' **Lengths:** 40.4' **Slopes:** LB = 7.79%; RB = 3.32% **Modifications:** None. **Rustline Heights:** LB = 2.2'; RB = 1.5' **Average Active Channel Width:** 10.1' **Fill Estimate:** 292 cubic yards. **Overall Condition:** Extremely poor = both pipes are rusted through. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. Sweetwater Springs Road is overtopped on approximately a 14-year storm flow.

Barrier Status: LB pipe=**RED**: the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juveniles due to the culvert's nearly 8% slope. RB pipe = **GRAY**: FishXing determined this pipe meets the 8-16-16 ft/sec passage criteria for adult steelhead on 33% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. This culvert's slightly perched outlet and nearly 3.5% slope are the features that impede juvenile migration.

Additional Stream Crossings: Downstream = (~1,850', 3,300', 7,200') to three bridges on Sweetwater Springs Road, (~13,500') to three-foot high cement weir, (~13,600') to crossing described by CDFG as "filled-in creek bed", (~20,050') to private bridge, (~22,250') to private bridge, (~23,550') to culvert observed by CDFG – status unknown, and (~25,050') to Porter Creek confluence with Russian River. Upstream = (~2,250') to bridge on Sweetwater Springs Road, (~3,850') to flashboard dam noted on CDFG habitat typing survey, and (~6,900') to Site ID #S-081.

Habitat: Quantity = approximately 11,800' of potential fish-bearing habitat upstream of Site ID# S-080. Quality = rated as "good" for the ranking matrix (quality score = 0.63) as based on CDFG's habitat typing survey of approximately 28,000' of channel in 1997. The survey ended at a landslide across channel – current limit of anadromy. Landowner of property upstream of upper Porter Creek crossing (Site ID #S-081) has observed adult steelhead spawning in recent winters. The crossing was surveyed by Taylor and Assoc. on 8/14/01 and there were isolated areas of surface water upstream and downstream of the crossing. At 1:30PM the air temp = 28°C and the water temp = 13.5°C. The survey crew described the habitat as "great" and noted a dense riparian canopy of conifers and hardwoods. No fish were observed in the vicinity of the crossing.

Preferred Treatment: Due to the current crossing's poor condition, a replacement with a properly sized open-bottom arch set on concrete footings or a bridge is recommended. CDFG should assess and, if needed, treat any downstream migration impediments prior to treating Site ID #S-080.





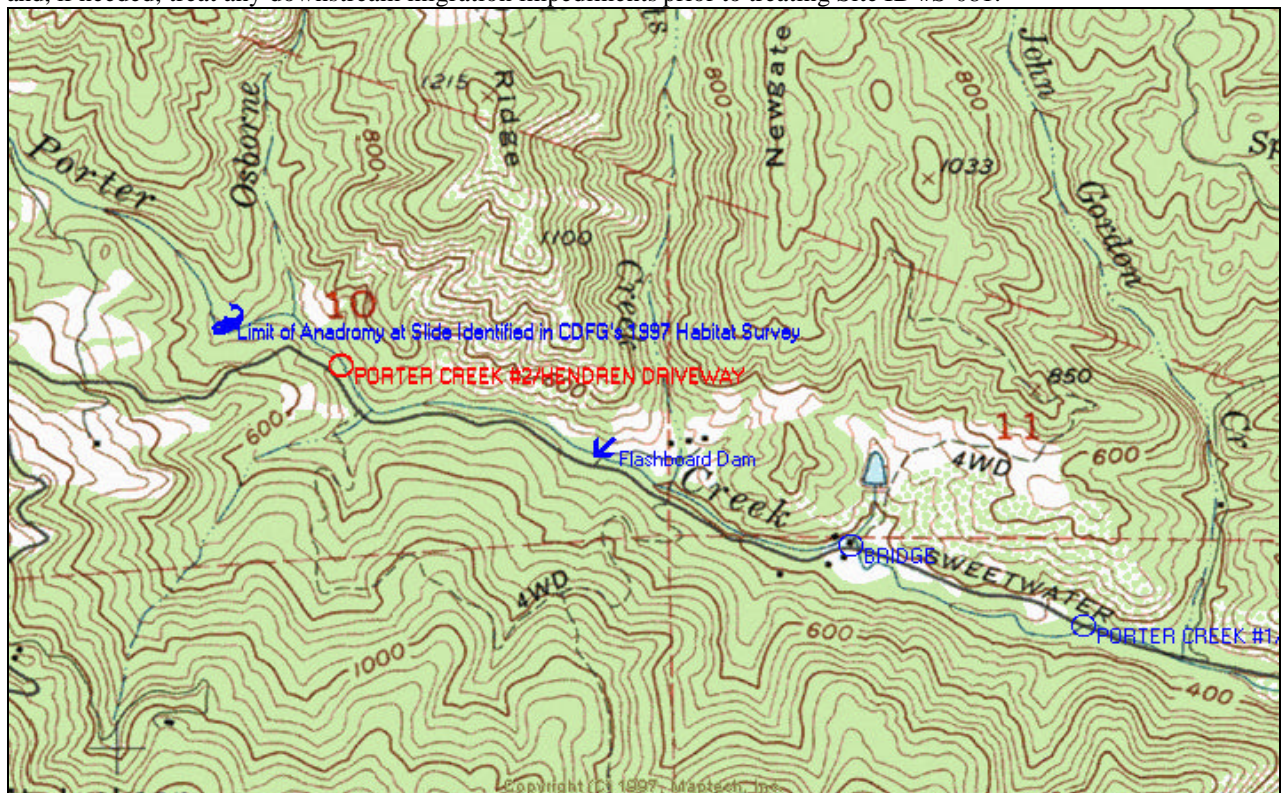
Site ID #S-081: Porter Creek #2/Hendren Driveway; Russian River **Road Ownership** Private
County Ranking: #37 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J31. USGS Quad: Guerneville. T8N, R10W, Section 10. Lat/Long: 38° 32' 57.97" 122° 57' 9.89" Milepost = 0.1 miles to Sweetwater Springs Road. **Culvert Type:** Two Oval Pipes, Concrete. **Corrugations:** None. **Dimensions:** Each Bay = 2.9' height x 4.4' rise **Lengths:** LB = 16.6; RB = 16.4' **Slopes:** LB = 8.13%; RB = 5.91% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.8' **Fill Estimate:** 63 cubic yards. **Overall Condition:** Poor- break/separation in middle of each pipe. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a one-year recurrence interval. Sweetwater Springs Road is overtopped on approximately a three-year storm flow. **Barrier Status:** GRAY: FishXing determined that both pipes meet the 8-16-16 ft/sec passage criteria for adult steelhead on LB=17% and RB=74%) of the range of estimated migration flows and fail to meet passage criteria for all age classes of juvenile salmonids. Both culverts' slightly perched outlets and steep slopes are the features that impede juvenile migration.

Additional Stream Crossings: Downstream = (~3,250') to flashboard dam noted on CDFG habitat typing survey, (~4,600') to bridge on Sweetwater Springs Road, (~6,900') to Site ID #S-081, (~8,750', 10,200', 14,100') to three bridges on Sweetwater Springs Road, (~20,400') to three-foot high cement weir, (~20,500') to crossing described by CDFG as "filled-in creek bed", (~26,950') to private bridge, (~29,150') to private bridge, (~30,450') to culvert observed by CDFG – status unknown, and (~31,950') to Porter Creek confluence with Russian River. Upstream = none indicated on the USGS map within the limited fish-bearing habitat upstream of Site ID #S-081.

Habitat: Quantity = approximately 1,050' of potential fish-bearing habitat upstream of Site ID# S-081. Quality = rated as "fair" for the ranking matrix (quality score = 0.58) as based on CDFG's habitat typing survey of approximately 28,000' of channel in 1997. The survey ended at a landslide across channel – current limit of anadromy. Landowner with property upstream of this crossing has observed adult steelhead spawning in recent winters. The crossing was surveyed by Taylor and Assoc. on 8/14/01 and there were isolated areas of surface water upstream and downstream of the crossing. At 1:30PM the air temp = 28°C and the water temp = 13.5°C. The survey crew described the habitat as "great" and noted a dense riparian canopy of conifers and hardwoods. No fish were observed in the vicinity of the crossing.

Preferred Treatment: Due to the current crossing's poor condition, a replacement with a properly sized flat-car bridge is recommended. Although there is limited habitat upstream, the poor sizing and condition make a failure of this crossing highly likely – release of sediment would impact downstream spawning gravels. CDFG should assess and, if needed, treat any downstream migration impediments prior to treating Site ID #S-081.





Site ID #S-082: Turtle Creek/West Side Road; Russian River **Road Ownership:** County

County Ranking: Tied for #16 = High-Priority

Basin-wide Ranking: Tied for #21 = High-Priority

Location: Road ID# 8001; County Map Sheet #4J32. USGS Quad: Healdsburg. T8N, R9W. Lat/Long: 38° 32' 24.34" 122° 52' 12.63" Milepost = 0.4 miles to Sweetwater Springs Road.

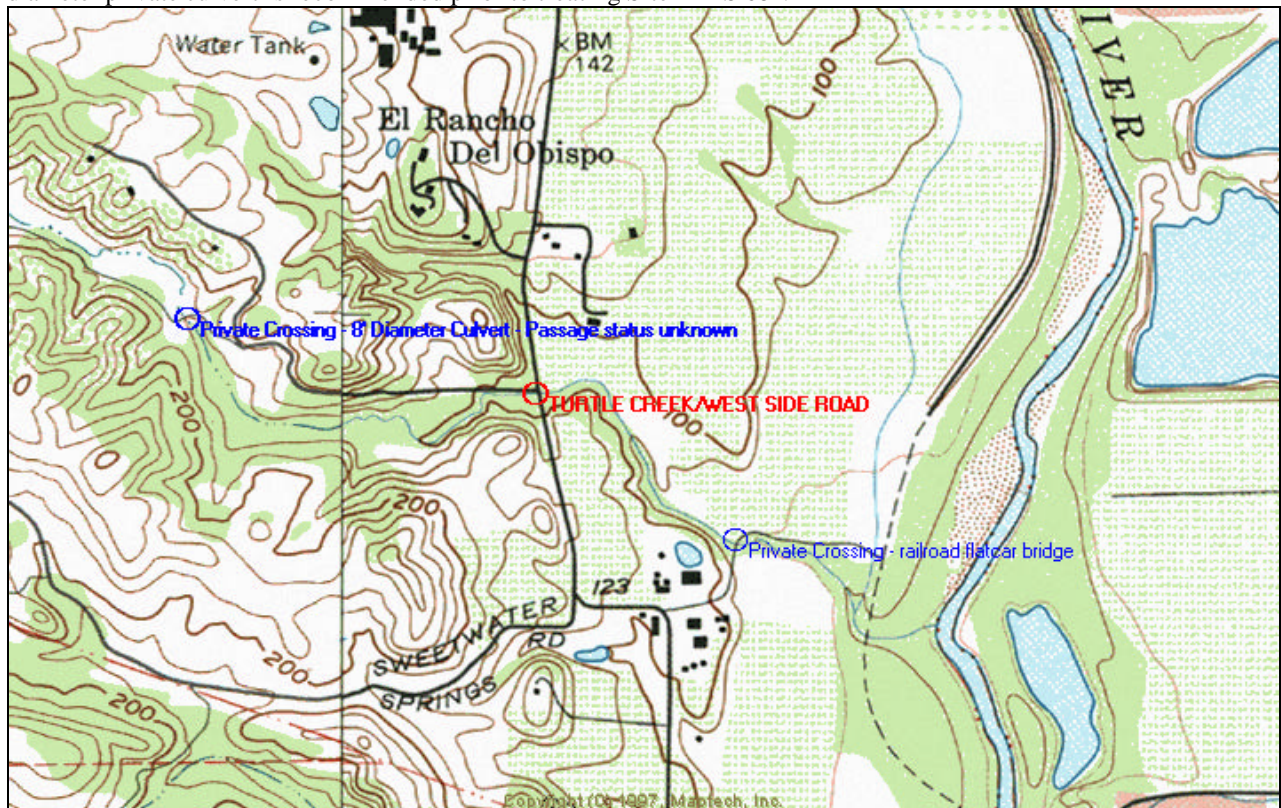
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 8.0' height x 10.0' width **Length:** 27.3' **Slope:** 3.63% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.0' **Fill Estimate:** 357 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. West Side Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 31% of the range of estimated migration flows and fail to meet passage criteria for all age classes of juvenile salmonids. Actual adult passage may be higher than predicted by FishXing because the only passage criteria violation is lack-of-depth. The moderately-steep slope over a smooth concrete invert creates a velocity barrier to juvenile salmonids.

Additional Stream Crossings: Downstream = (~ 2,550') to private flatcar bridge and (~ 4,600) to confluence with the Russian River. Upstream = (~ 3,800') to private culvert – barrier status unknown, but CDFG habitat typing recommended a replacement with a flatcar bridge.

Habitat: Quantity = approximately 10,200' of potential fish-bearing habitat upstream of Site ID# S-082. Quality = rated as “fair” for the ranking matrix (quality score = 0.41) as based on CDFG’s habitat typing survey in 1995 of approximately 13,200' of channel. Three young-of-year coho salmon were sampled in 1995 by CDFG. However, three upstream ponds continue to seed the creek with exotic sunfish and largemouth bass. The crossing was surveyed by Taylor and Assoc. on 8/22/01 and the channel was dry. The survey crew described the habitat as “fair” and noted a moderately-dense riparian canopy of hardwoods.

Preferred Treatment: Because the current crossing is properly sized and in good condition, a retrofit is recommended. Two downstream boulder weirs will raise tailwater elevation (possibly back-water the culvert) and corner baffles within the box culvert will increase depths and decrease velocities. An assessment of the eight-foot diameter private culvert is recommended prior to treating Site ID #S-082.



Site ID #S-082: Turtle Creek/West Side Road: Russian River



Site ID #S-083: Wallace Creek/Mill Creek Road; Mill Creek; Dry Creek; Russian River **Road Ownership:** County
County Ranking: #19 = High-Priority **Basin-wide Ranking: #25 = High-Priority**

Location: Road ID# 99010; County Map Sheet #4J21. USGS Quad: Guerneville. T9N, R10W. Lat/Long: 38° 35' 54.78" 122° 54' 39.03" Milepost = 18.01 miles

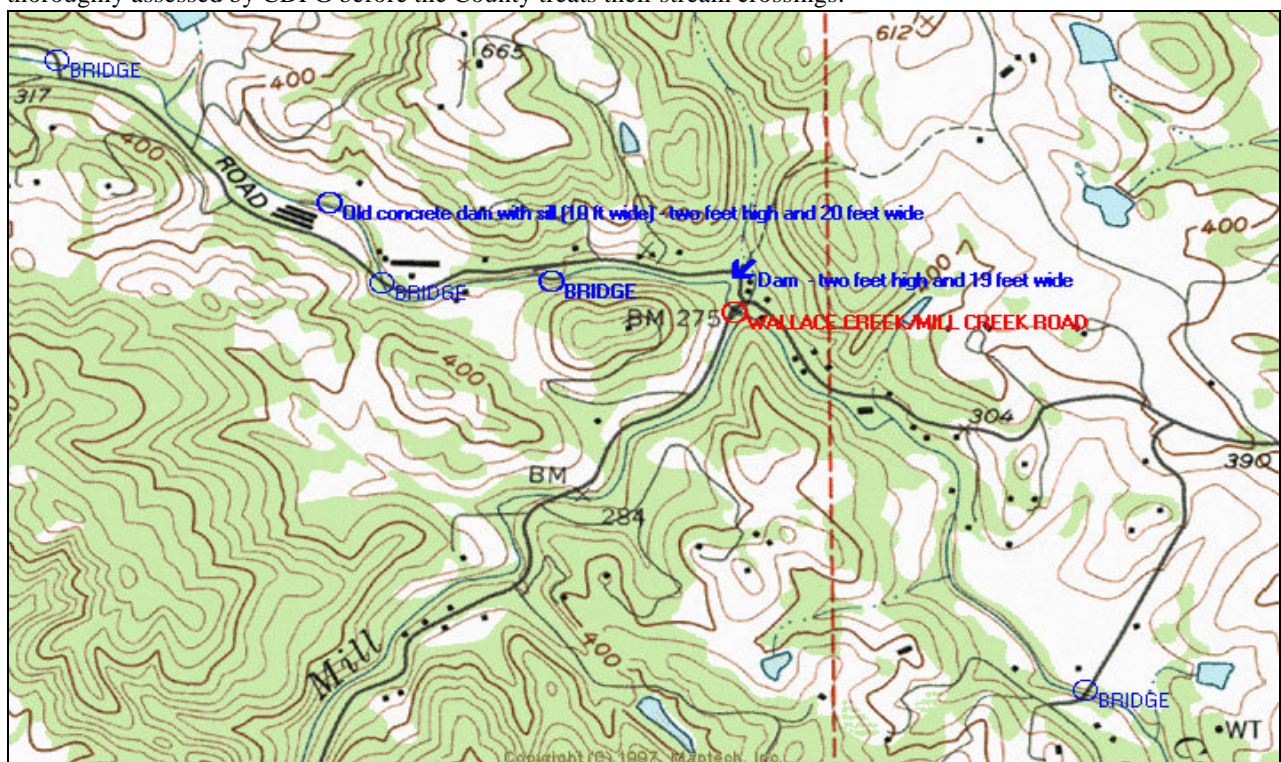
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 9.9' height x 18.10' width
Length: 32.6' **Slope:** 0.64% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.4'
Fill Estimate: 376 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 61-year recurrence interval. Mill Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: GRAY: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 22% of the range of estimated migration flows and fail to meet passage criteria for all age classes of juvenile salmonids. Actual adult passage may be higher than predicted by FishXing because the only passage criteria violation is lack-of-depth. The moderately-steep slope over a concrete invert creates a velocity barrier to juveniles.

Additional Stream Crossings: Downstream = (~50') to confluence with Mill Creek, (~5,050') to bridge, (~10,050') to bridge, (~13,750') to confluence of Mill Creek and Felta Creek, (~15,300') to bridge on West Side Road, and (~21,150') to confluence with the Russian River. CDFG also noted four dams on Mill Creek – downstream of Wallace Creek. Upstream = (~400') to dam - 2-feet high and 10'-wide concrete sill, (~1,650') to private bridge, (~3,100') to bridge on Wallace Creek Road, (~4,050') to old dam with 2-foot drop, (~6,650') to bridge on Wallace Creek Road, and (~6,700') to private bridge.

Habitat: Quantity = approximately 26,050' of potential fish-bearing habitat upstream of Site ID# S-083. Quality = rated as "fair" for the ranking matrix (quality score = 0.46) as based on CDFG's habitat typing survey in 1995 of approximately 7,500' of channel. Upstream ponds continue to seed the creek with exotic green sunfish. The crossing was surveyed by Taylor and Assoc. on 8/22/01 and there was continuous flow – except for the culvert. At 12:45PM the air temp = 22°C and water temp = 14°C. The survey crew described the habitat as "good" and noted a moderately-dense riparian canopy of hardwoods and conifers, low-gradient channel and numerous pools.

Preferred Treatment: Because the current crossing is properly sized and in good condition, a retrofit is recommended. Two downstream boulder weirs will raise tailwater elevation (possibly back-water the culvert) and corner baffles within the box culvert will increase depths and decrease velocities. Consider a beam at the inlet to concentrate lower migration flows into a single bay of the crossing. Fish passage at diversion dams should be thoroughly assessed by CDFG before the County treats their stream crossings.





Site ID #S-084: Mill Creek/Mill Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #64 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 99010; County Map Sheet #4J21. USGS Quad: Guerneville. T9N, R10W, Section 28.
Lat/Long: 38° 36' 17.95" 122° 58' 43.72" Milepost = 5.2 miles to Wallace Creek Road.

Culvert Type: Open Bottom Arch, SSP. **Corrugations:** 9.5" x 2.5" **Dimensions:** 7.5' rise x 13.0' span
Length: 61.3' **Slope:** -1.06% **Modifications:** None. **Rustline Height:** 2.5' **Average Active Channel Width:** 15.6'
Fill Estimate: 228 cubic yards. **Overall Condition:** Fair, sides of arch are abraded.

Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval. Mill Creek Road is overtopped on approximately a two-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for all species of adult salmonids and all age classes of juveniles.

Additional Stream Crossings: Downstream = the CDFG habitat typing survey identified 22 bridges and six dams – including two with five to seven foot drops. Upstream = (~ 450') to private bridge, (~ 2,950') to bridge near Daniels School, (~ 4,800') to confluence with Boyd Creek, (~ 6,650') to bridge on Wallace Creek Road, and (~ 6,900') to private bridge.

Habitat: Quantity = approximately 16,200' of potential fish-bearing habitat upstream of Site ID# S-084. Quality = rated as "fair" for the ranking matrix (quality score = 0.49) as based on CDFG's habitat typing survey in 1995 of approximately 81,000' of channel. Compared to historic surveys conducted in 1957 and 1973, Mill Creek's current habitat conditions have significantly degraded. The crossing was surveyed by Taylor and Assoc. on 8/22/01 and there was continuous flow. At 2:30PM the air temp = 21.5°C and water temp = 16°C. The survey crew described the habitat as "good" and noted a moderately-dense riparian canopy of hardwoods and conifers and numerous pools. Numerous young-of-year salmonids were observed both upstream and downstream of Site ID #S-084.

Preferred Treatment: None recommended because the current crossing provides unimpeded passage, however the culvert is extremely undersized. Periodically inspect for condition and maintenance. When needed, replace with a properly sized open-bottom arch set on concrete footings.





Site ID #S-085: Boyd Creek/Mill Creek Road; Mill Creek; Dry Creek; Russian River **Road Ownership:** County

County Ranking: #33 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 99010; County Map Sheet #4J21. USGS Quad: Guerneville. T9N, R10W, Section 29.
Lat/Long: 38° 35' 50.83" 122° 59' 12.54" Milepost= 6.1 miles to Wallace Creek Road.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 5.5' height x 7.0' width **Length:** 45.0'
Slope: 0.22% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 8.7'
Fill Estimate: 296 cubic yards. **Overall Condition:** Good.

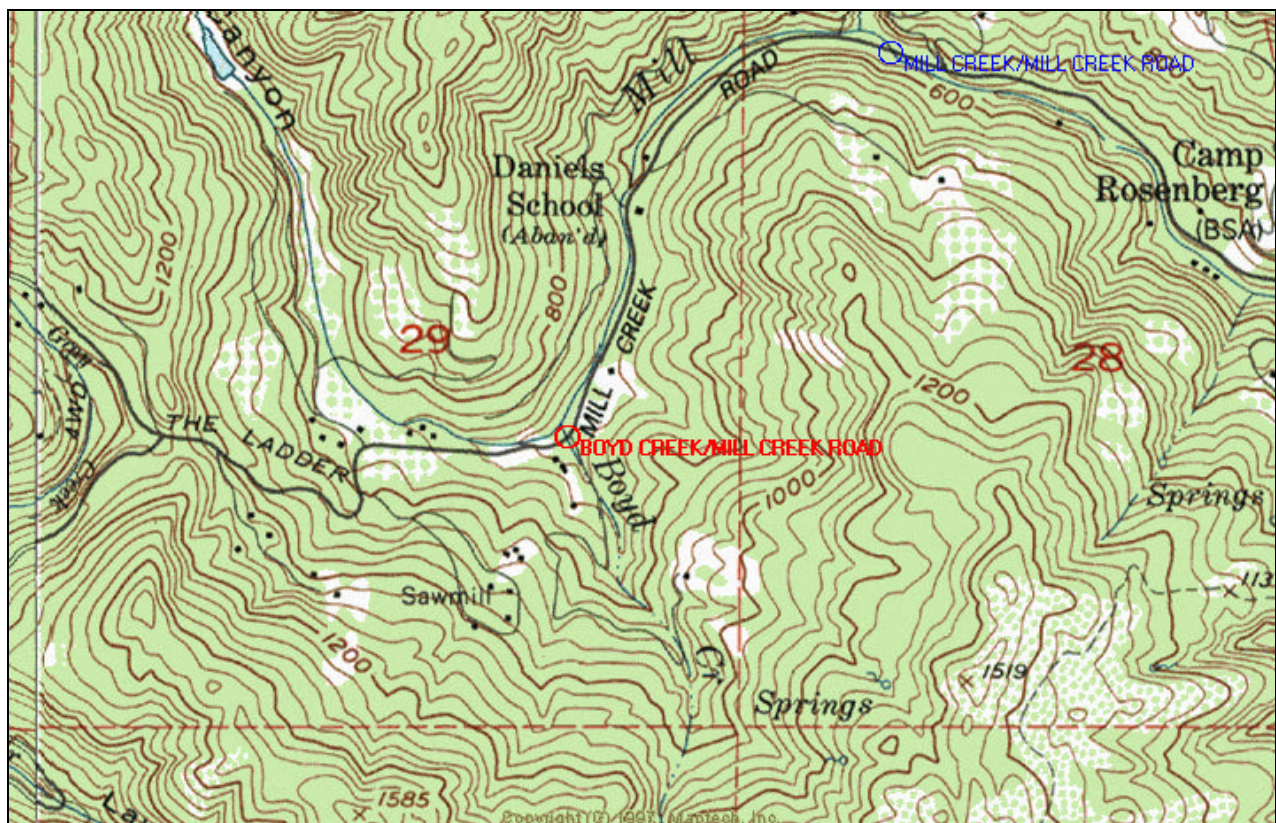
Sizing: Properly sized; HW/D = 1 on a storm flow with approximately a 124-year recurrence interval. Mill Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juveniles due to the extremely perched outlet = 9.6 foot drop.

Additional Stream Crossings: Downstream = the CDFG habitat typing survey identified 25 bridges and six dams on Mill Creek – including two dams with five to seven foot drops. Upstream = although none indicated on the USGS map within the limited fish-bearing stream reach, the Taylor and Associate survey crew noted a private culvert approximately 150' upstream that looked like a barrier.

Habitat: Quantity = approximately 1,100' of potential fish-bearing habitat upstream of Site ID# S-085. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates crew’s field notes describing the extremely steep channel slope. The crossing was surveyed by Taylor and Assoc. on 8/21/01 and there were isolated areas of surface water. At 4:00PM the air temp = 20°C and water temp = 14°C. The survey crew described the habitat as “poor” and noted a moderately-dense riparian canopy of hardwoods and conifers. No fish were observed, but crew talked to a local who used to observe steelhead in upper Mill Creek and lower reach of Boyd Creek, but none in past ten years, or more.

Preferred Treatment: Although a complete migration barrier, the limited upstream habitat (and a second barrier just upstream) and the extremely perched outlet would make this a very expensive project with minimal biological benefit.





Site ID #S-086: Kelley Creek/West Dry Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: #52 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 99017; County Map Sheet #4J21. USGS Quad: Geyserville. T9N, R9W, Section 18. Lat/Long: 38° 38' 3.52" 122° 54' 18.41" Milepost= 2.6 miles to Westside Road.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.15' height x 10.1' width **Length:** 43.0'

Slope: 0.23% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.5'

Fill Estimate: 290 cubic yards. **Overall Condition:** Good.

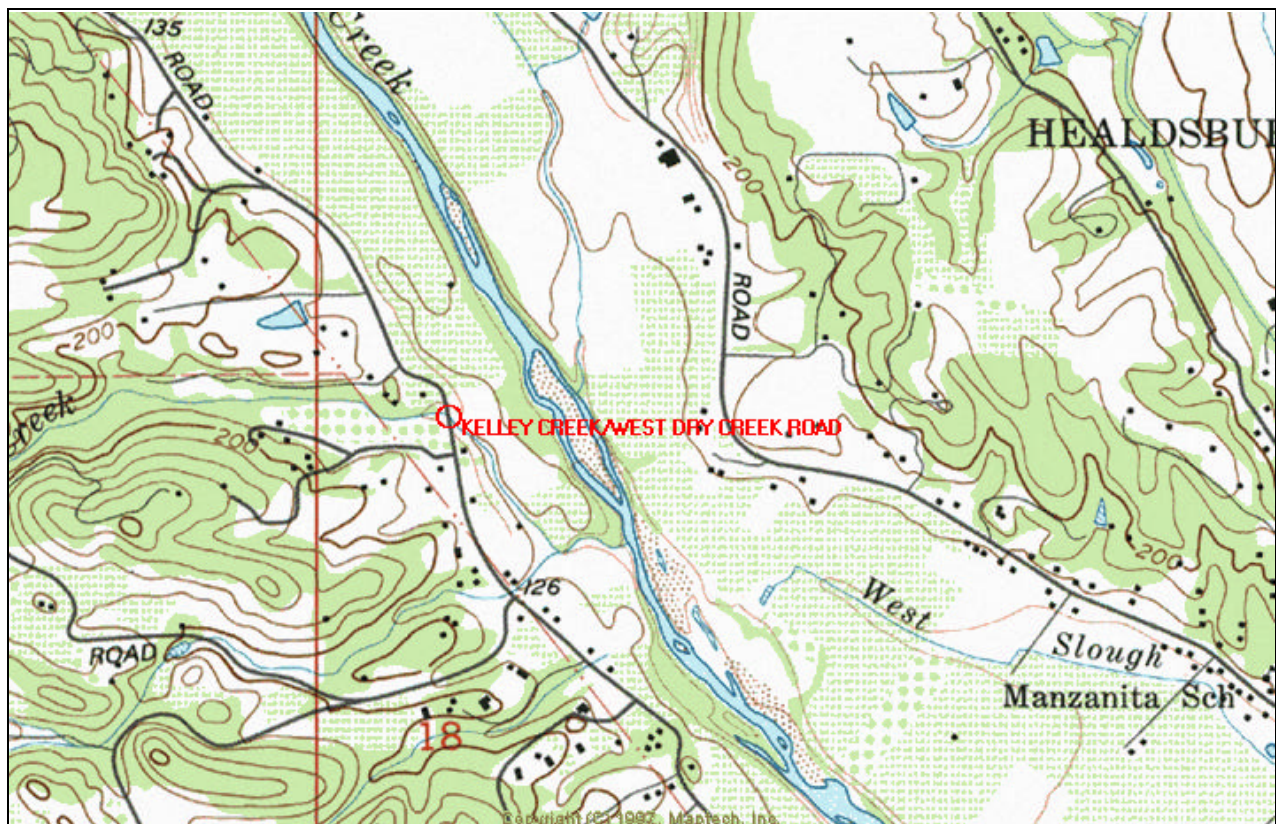
Sizing: Properly sized; HW/D = 1 on a storm flow with approximately a 103-year recurrence interval. West Dry Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 68% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. Juvenile passage probably occurs because the only passage criteria violation for all age classes is lack-of-depth.

Additional Stream Crossings: Downstream = none indicated on USGS map – (~1,900') to confluence with Russian River. Upstream = (~5,900') to private crossing – status unknown.

Habitat: Quantity = approximately 8,650' of potential fish-bearing habitat upstream of Site ID# S-086. Quality = rated as “poor” for the ranking matrix as based on CDFG’s professional judgment (Coe, pers. comm.). The crossing was surveyed by Taylor and Assoc. on 8/22/01 and the channel was dry. The survey crew described the habitat as “poor” and noted a sparse riparian canopy of hardwoods and brush along a channelized reach.

Preferred Treatment: Construction of a single downstream boulder weir to back-water the culvert outlet and installation of corner baffles within the box culvert would cost-effectively improve passage conditions.





Site ID #S-087: Lytton Springs Creek/Dry Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #53 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 9901; County Map Sheet #4J21. USGS Quad: Geyserville. T9N, R10W. Lat/Long: 38° 38'56.66" 122°54' 34.15" Milepost = 12.85 miles

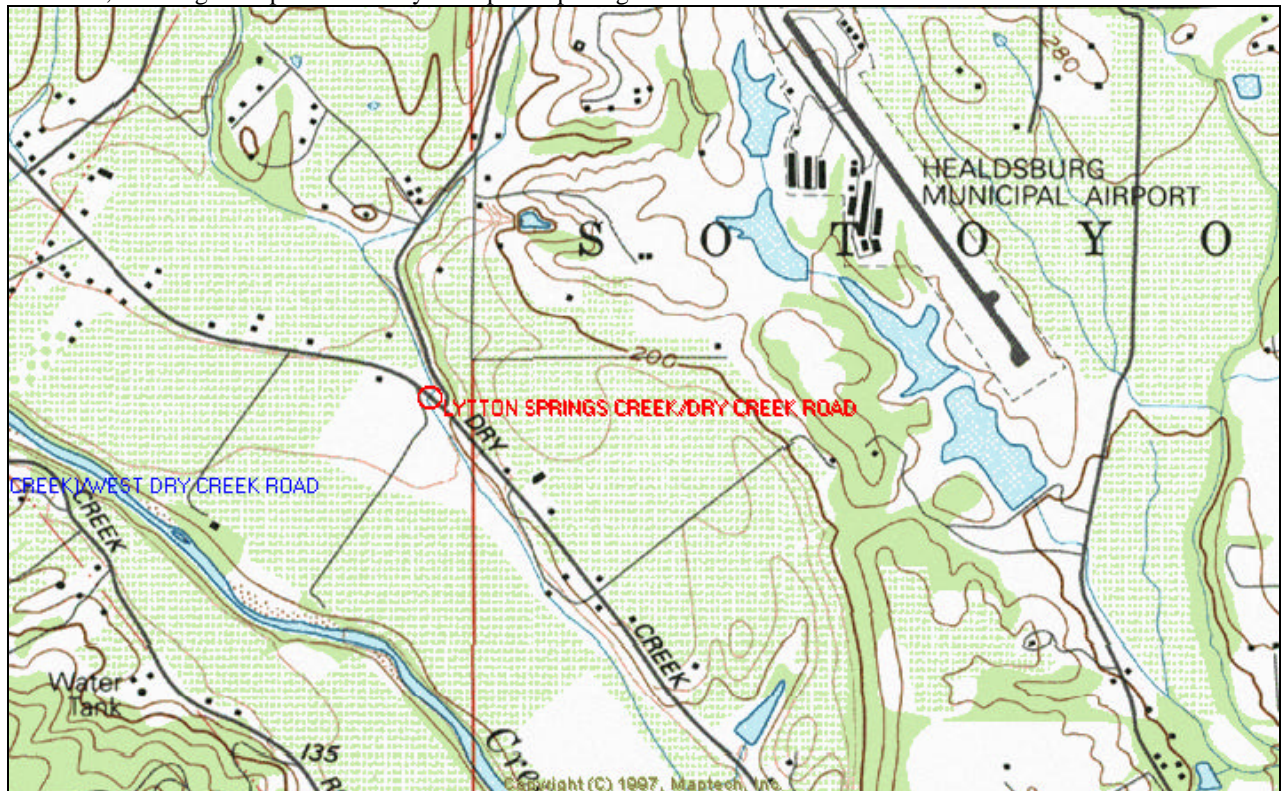
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** Each Bay= 5.0' height x 10.0' width **Length:** 81.8' **Slopes:** LB = -0.23%; RB = 0.12% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 12.3' **Fill Estimate:** 862 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Dry Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: LB=**GRAY**: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 91% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. The bay's slightly perched outlet impedes juvenile migration. RB=**RED**: this bay is highly embedded and it was assumed that all migration-level flows passed through the LB bay.

Additional Stream Crossings: Downstream = none indicated on USGS map – (~ 6,500') to confluence with Dry Creek. Upstream = (~ 1,500') to split in channel. Northern fork = (4,400') to private crossing – status unknown, (~6,300') to private crossing – status unknown, and (~7,850') to dam/reservoir. Eastern fork = (~2,000') to crossing on Lytton Springs Road – status unknown, (~ 3,950') to second crossing on Lytton Springs Road – status unknown, (~5,000') to private crossing – status unknown, and (~6,250') to dam/reservoir.

Habitat: Quantity = approximately 8,650' of potential fish-bearing habitat upstream of Site ID# S-087. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). CDFG conducted a habitat typing survey of approximately 9,200' of channel in 2001, but the data were not available for this report. The crossing was surveyed by Taylor and Assoc. on 8/23/01 and the channel was dry. The survey crew described the habitat as "poor" and noted a sparse riparian canopy of brush and a few alders along a channelized reach in an area of intensive vineyard cultivation.

Preferred Treatment: Construction of two or three downstream boulder weirs to back-water the culvert outlet and installation of corner baffles within the LB bay of the box culvert would cost-effectively improve passage conditions. However, crossing does provide nearly unimpeded passage for adult steelhead.





Site ID #S-088: Crane Creek Tributary to Dry Creek/West Dry Creek Road; Dry Creek; Russian River
Road Ownership: County

County Ranking: #65 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 99017; County Map Sheet #4J21. USGS Quad: Geyserville. T9N, R10W, Section 11.
Lat/Long: 38° 38' 50.88" 122° 55' 42.63" Milepost = 14.33 miles

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 9.0' height x 18.0' width **Length:** 30.0'
Slope: - 0.27% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 14.6'

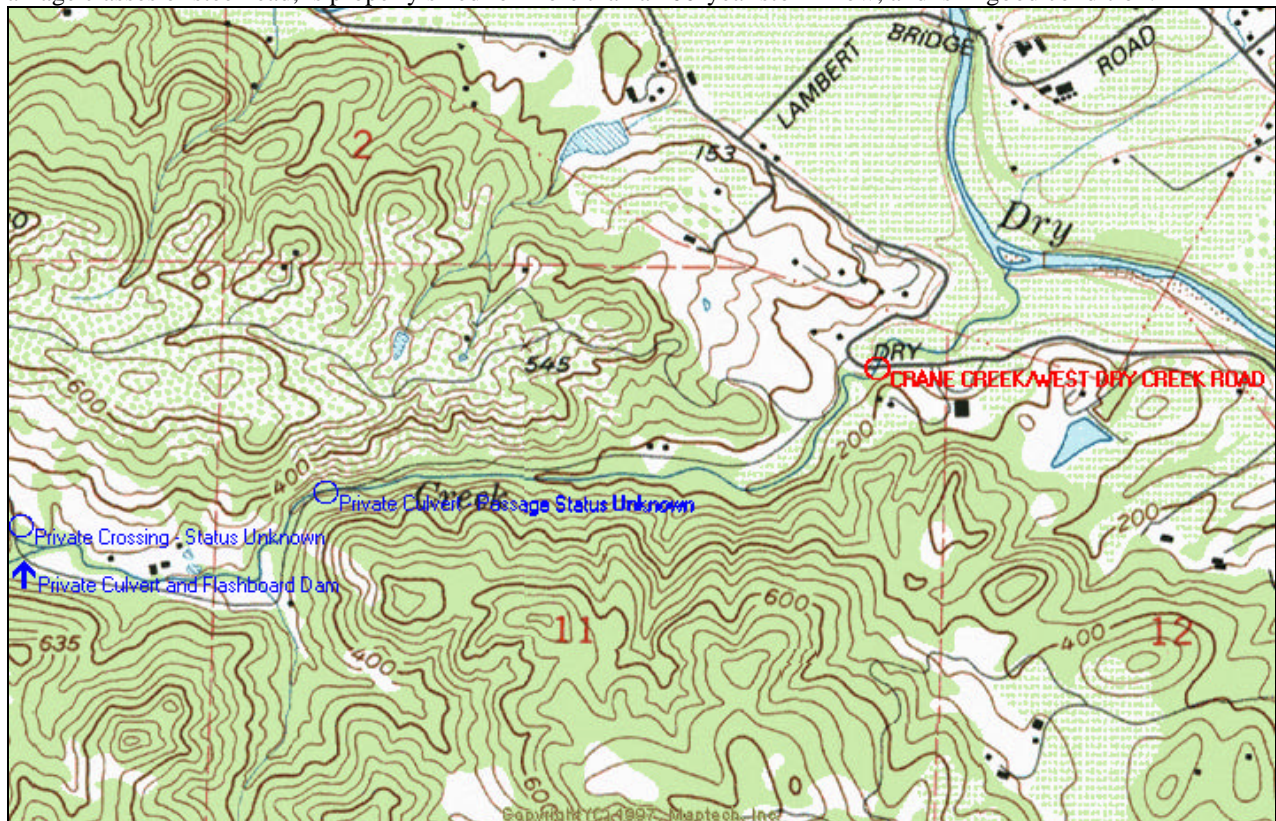
Fill Estimate: 198 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. West Dry Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: GRAY: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 88% of the range of estimated migration flows, 78% of the range of migration flows for resident trout/2+ juveniles, 79% of the range of migration flows for 1+/young-of-year juvenile salmonids.

Additional Stream Crossings: Downstream = none indicated on USGS map or CDFG survey - (~1,800') to confluence with Dry Creek. Upstream = (~ 4,800') to private culvert – status unknown, (~7,650') to Dorman Creek confluence with Crane Creek, and (~ 7,750') to private culvert and a flashboard dam with plunge pool. NOTE: CDFG's habitat survey report's "Problem Sites and Comments" section was vague to the status of the private crossings and flashboard dam.

Habitat: Quantity = approximately 14,950' of potential fish-bearing habitat upstream of Site ID# S-088. This includes habitat in Dorman Creek too. Quality = rated as "fair" for the ranking matrix (quality score = 0.58) as based on CDFG's habitat typing survey of approximately 13,900' of channel in 1999. A seven-foot high vertical waterfall located 12,800' up Crane Creek was considered the limit of anadromy. The crossing was surveyed by Taylor and Assoc. on 10/10/01 and the channel was dry. The survey crew described the habitat as "fair to good" and noted a dense riparian canopy of hardwoods, numerous pools, and a cobble/gravel streambed. Reach was surrounded by areas of intensive vineyard cultivation.

Preferred Treatment: None recommended because the current box culvert provides nearly unimpeded passage for all age classes of steelhead, is properly sized for more than a 100-year storm flow, and is in good condition.





Site ID #S-089: Grape Creek #1/West Dry Creek Road; Dry Creek; Russian River **Road Ownership:** County
County Ranking: #14 = High-Priority **Basin-wide Ranking: #19 = High-Priority**

Location: Road ID# 99017; County Map Sheet #4J21. USGS Quad: Geyserville. T9N, R10W, Section 2. Lat/Long: 38° 39' 23.47" 122° 56' 13.48" Milepost = 15.36 miles

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 9.5' height x 22.15' width **Length:** 35.0'
Slope: 1.54% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.9'
Fill Estimate: 372 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. West Dry Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: GRAY: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 28% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. Actual adult passage may be higher than predicted by FishXing because there is strictly a lack-of-depth criteria violation (up to 80 c.f.s. and $Q_{hp} = 101$ c.f.s.). The culvert's perched outlet (2.2 feet) impedes juvenile migration.

Additional Stream Crossings: Downstream = (~ 750') to flashboard dam and (~1,950') to confluence with Dry Creek. Upstream = (~300') to flashboard dam, (~2,000') to bridge on Wine Creek Road, (~3,250') to confluence of Wine/Grape Creeks, (~ 5,300') to Site ID #S-093, (~ 7,050') to flashboard dam, and (~ 7,600') to dam/reservoir indicated on USGS map.

Habitat: Quantity = approximately 15,950' of potential fish-bearing habitat upstream of Site ID# S-089. Quality = rated as "fair" for the ranking matrix (quality score = 0.59) as based on CDFG's habitat typing survey of approximately 12,000' of Grape Creek channel in 1998. Historical surveys indicate that habitat quality has degraded since the 1970's. The crossing was surveyed by Taylor and Assoc. on 8/23/01 and there were isolated areas of surface water adjacent to the crossing. At 10:00AM the air temp = 21°C and water temp = 15.5°C. The survey crew described the habitat as "fair to good" and noted a dense riparian canopy of hardwoods and numerous pools. A single fish of unknown species was observed in the isolated pool above the culvert inlet.

Preferred Treatment: Construction of three to four downstream boulder weirs to raise tail-water elevation (and possibly back-water the culvert outlet) and installation of sloped concrete weirs within the box culvert would cost-effectively improve passage conditions for adult steelhead and all age classes of juveniles.





Site ID #S-090: Wine Creek #1/Wine Creek Road; Grape Creek; Dry Ck; Russian River **Road Ownership:** County

County Ranking: #59 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 90003; County Map Sheet #4J21. USGS Quad: Geyserville. T9N, R10W, Section 3. Lat/Long: 38° 39' 25.27" 122° 56' 47.90" Milepost= 0.8 miles to West Dry Creek Road.

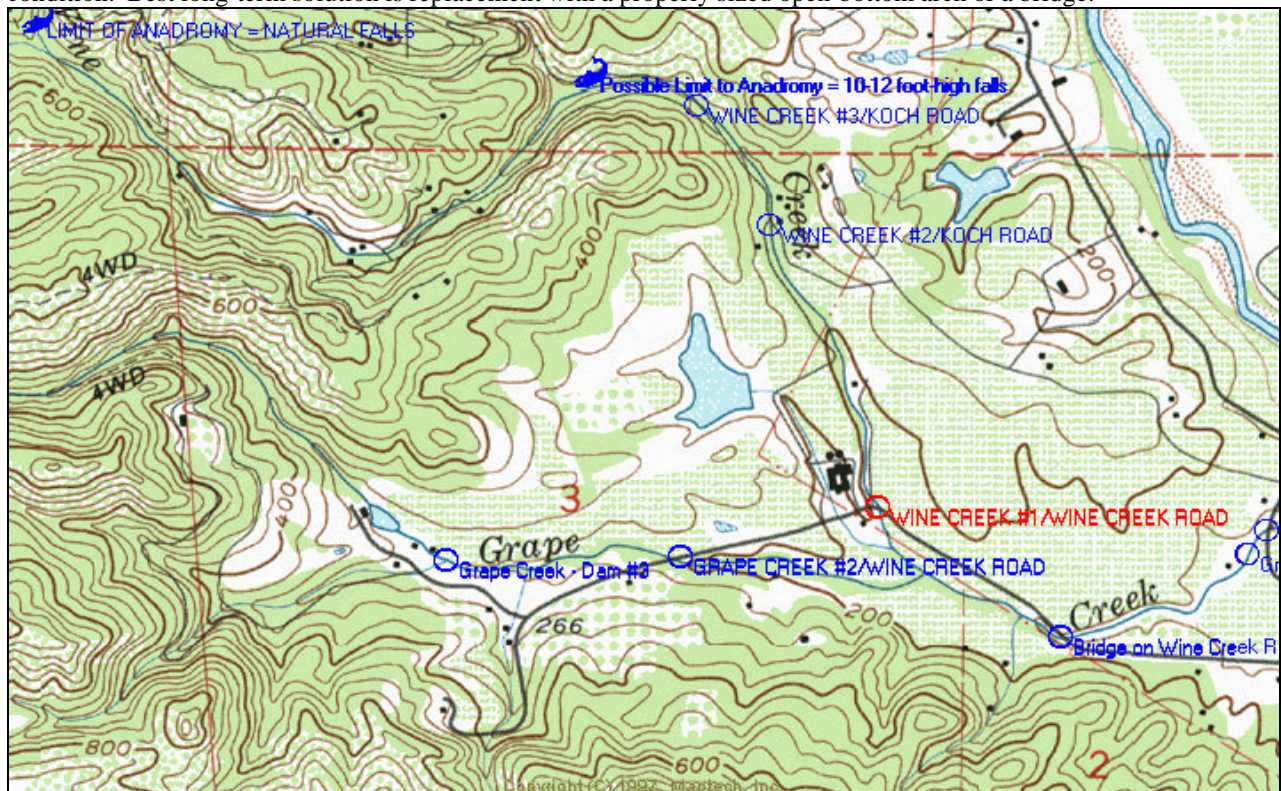
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 5.5' height x 6.05' width **Length:** 35.7' **Slope:** -0.08% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 6.4' **Fill Estimate:** 165 cubic yards. **Overall Condition:** Good. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a four-year recurrence interval. Wine Creek Road is overtopped on approximately a 29-year storm flow.

Barrier Status: GRAY: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 95% of the range of estimated migration flows, 90% of the range of migration flows for resident trout/2+ juveniles, 27% of the range of migration flows for 1+/young-of-year juvenile salmonids.

Additional Stream Crossings: Downstream = (~ 350') to confluence with Grape Creek, (~ 2,100') to bridge on Wine Creek Road, (~ 3,900') to flashboard dam, (~ 4,200') to Site ID #S-089, (~ 4,900') to flashboard dam, and (~ 5,900') to the Grape Creek confluence with Dry Creek. Upstream = (~ 2,600') to Site ID #S-091, (~ 3,700') to Site ID #S-092, and (~ 4,700') to first set of falls – the Taylor and Associates field crew examined these falls during a winter migration-level flow and considered this as the upper limit of anadromy (10-12 foot drop cascading down bedrock).

Habitat: Quantity = approximately 4,700' of potential fish-bearing habitat upstream of Site ID# S-090. Quality = rated as “fair” for the ranking matrix (quality score = 0.53) as based on CDFG’s habitat typing survey of approximately 12,100' of Wine Creek channel in 1998. Historical surveys indicate that habitat quality has degraded since the 1970's. The crossing was surveyed by Taylor and Assoc. on 8/23/01 and the channel was dry. The survey crew described the habitat as “fair” and noted a sparse riparian canopy of hardwoods along a riprapped, channelized reach surrounded by vineyards.

Preferred Treatment: None recommended because the culvert is providing ample passage. However, the box culvert is extremely undersized and has the potential to scour the downstream channel and create a perched outlet. Recommend periodic inspection for maintenance and condition – including inspection of the outlet and tail-water condition. Best long-term solution is replacement with a properly sized open-bottom arch or a bridge.





Site ID #S-091: Wine Creek #2/Koch Road; Grape Creek; Dry Creek; Russian River **Road Ownership:** Private
County Ranking: #40 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

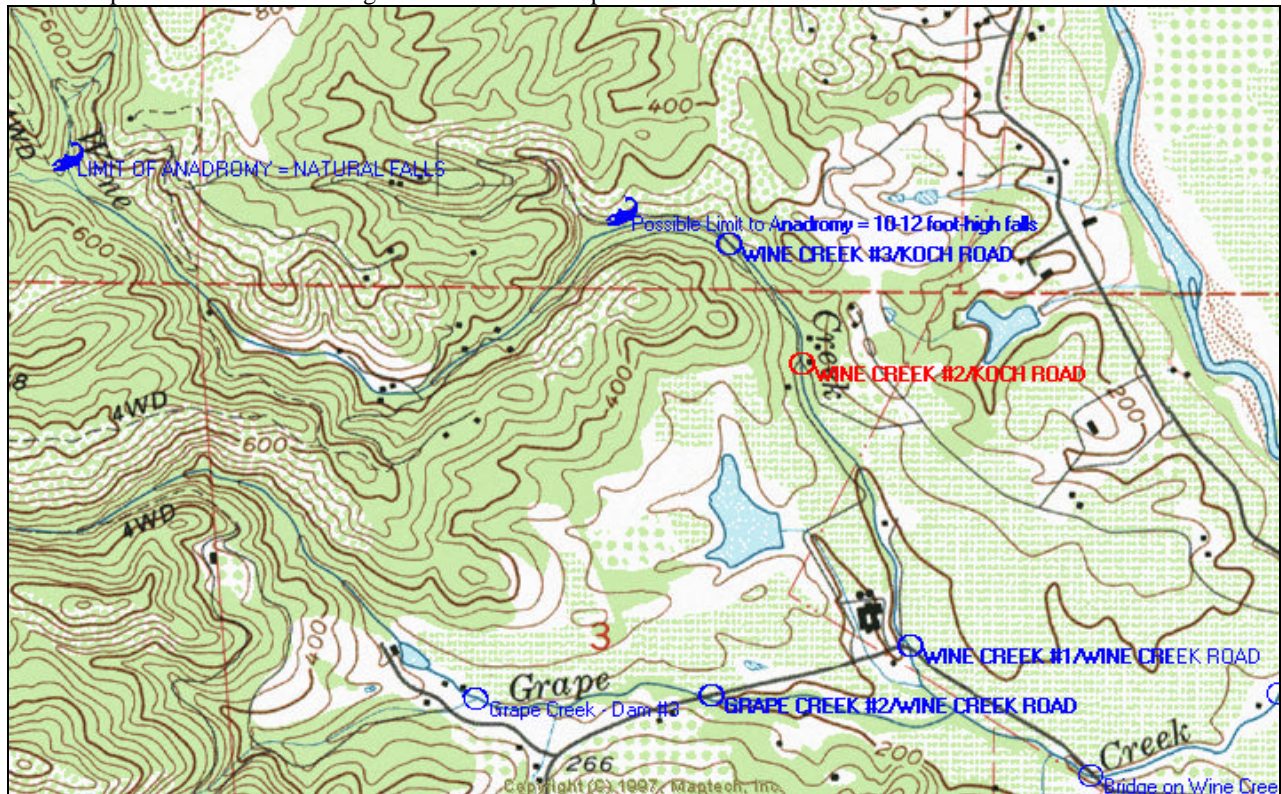
Location: County Map Sheet #4J21. USGS Quad: Geyserville. T9N, R10W, Section 3. Lat/Long: 38° 39' 45.84" 122° 56' 57.50" Milepost = 0.9 miles to West Dry Creek Road.

Culvert Type: Circular, CSP. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameter=8.0' **Length:** 20.2'
Slope: 2.43% **Modifications:** None. **Rustline Height:** 1.2' **Average Active Channel Width:** 9.9'
Fill Estimate: 178 cubic yards. **Overall Condition:** Fair – invert is abraded. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 34-year recurrence interval. Koch Road is overtopped on approximately a 190-year storm flow. **Barrier Status:** **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 93% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. There are excessive velocities caused by the culvert's 2.43% slope which impede juvenile migration.

Additional Stream Crossings: Downstream = (~2,600') to Site ID #S-090, (~2,950') to confluence with Grape Creek, (~4,700') to bridge on Wine Creek Road, (~6,500') to flashboard dam, (~6,800') to Site ID #S-089, (~7,500') to flashboard dam, and (~8,500') to the Grape Creek confluence with Dry Creek. Upstream = (~1,100') to Site ID #S-092, and (~2,100') to first set of falls – the Taylor and Associates field crew examined these falls during a winter migration-level flow and considered this as the upper limit of anadromy (10-12 foot drop cascading down bedrock).

Habitat: Quantity = approximately 2,400' of potential fish-bearing habitat upstream of Site ID# S-091. Quality = rated as "good" for the ranking matrix (quality score = 0.68) as based on CDFG's habitat typing survey of approximately 12,100' of Wine Creek channel in 1998. Historical surveys indicate that habitat quality has degraded since the 1970's. The crossing was surveyed by Taylor and Assoc. on 1/15/02 and there was continuous flow in the channel. At 2:15 PM the air temp = 17°C and water temp = 10°C. The survey crew described the habitat as "good" and noted a moderately dense riparian canopy of hardwoods and areas with spawning-sized gravels. Survey crew also noted a CDFG flagging just upstream of culvert that read "Coho 8/15/01".

Preferred Treatment: None immediately recommended because culvert allows ample adult passage and older juveniles are probably able to swim through culvert too by using the low-velocity edges along the culvert walls (FishXing modeled passage using an average velocity). Periodically inspect for condition of pipe and tail-water characteristics. If outlet becomes perched, consider downstream boulder weirs to back-water the crossing. When needed replace with a flatcar bridge set on abutments spaced at least at the bankfull channel width.





Site ID #S-092: Wine Creek #3/Koch Road; Grape Creek; Dry Creek; Russian River **Road Ownership:** Private

County Ranking: Tied for #23 = Moderate -Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J21. USGS Quad: Geyserville. T9N, R10W, Section 34. Lat/Long: 38° 39'54.59" 122° 57'03.97" Milepost = 1.1 miles to West Dry Creek Road.

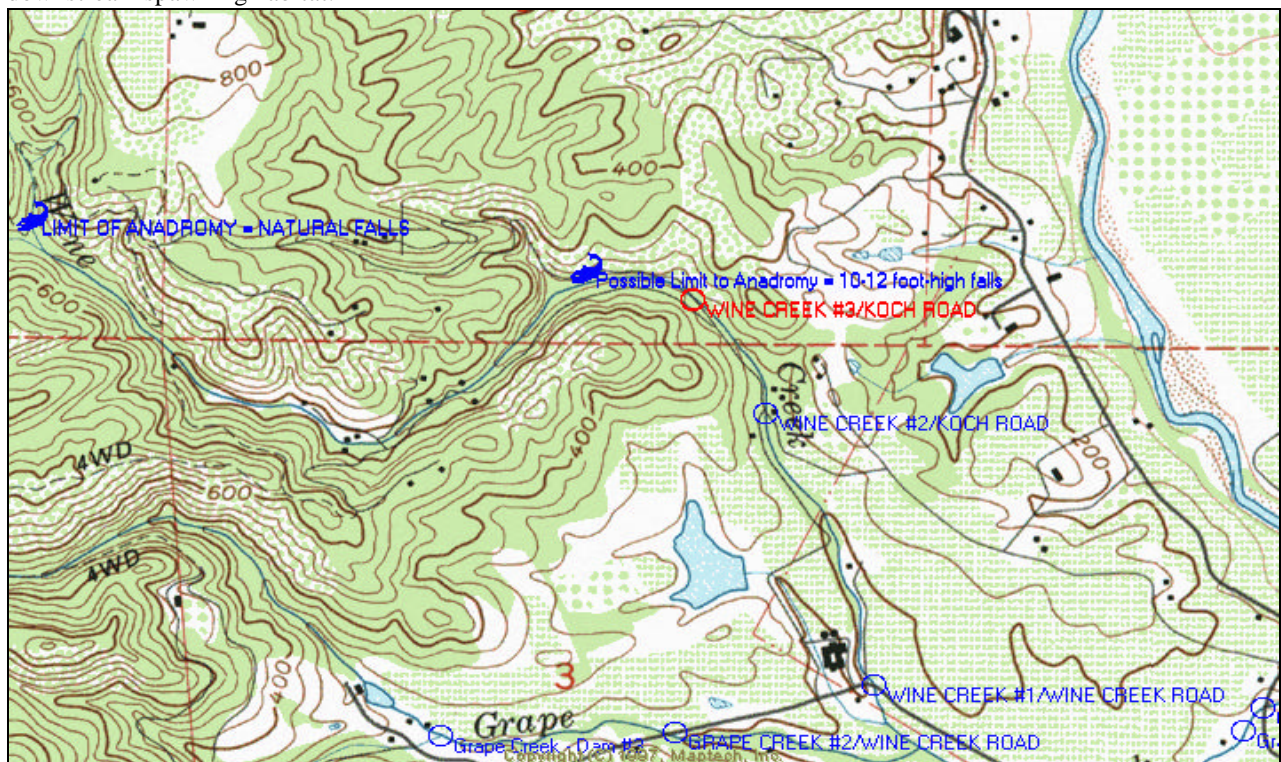
Culvert Type: Circular, CSP. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameter = 4.0' **Length:** 19.8' **Slope:** 4.24% **Modifications:** None. **Rustline Height:** 1.3' **Average Active Channel Width:** 9.4' **Fill Estimate:** 117 cubic yards. **Overall Condition:** Extremely poor – rusted through invert and crushed/torn inlet. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a one-year recurrence interval. Koch Road is overtopped on approximately a three-year storm flow.

Barrier Status: GRAY: FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 94% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. Excessive velocities caused by the culvert's 4.24% slope impede juvenile migration.

Additional Stream Crossings: Downstream = (~1,100') to Site ID #S-091, (~3,700') to Site ID #S-090, (~4,050') to confluence with Grape Creek, (~5,800') to bridge on Wine Creek Road, (~7,600') to flashboard dam, (~7,900') to Site ID #S-089, (~8,600') to flashboard dam, and (~9,600') to the Grape Creek confluence with Dry Creek. Upstream = (~1,000') to first set of falls – the Taylor and Associates field crew examined these falls during a winter migration-level flow and considered this as the upper limit of anadromy (10-12 foot drop cascading down bedrock).

Habitat: Quantity = approximately 1,000' of potential resident fish-bearing habitat upstream of Site ID# S-092. Quality = rated as "fair" for the ranking matrix (quality score = 0.52) as based on CDFG's habitat typing survey of approximately 12,100' of Wine Creek channel in 1998. Historical surveys indicate that habitat quality has degraded since the 1970's. The crossing was surveyed by Taylor and Assoc. on 1/15/02 and there was continuous flow in the channel. At 3:45PM the air temp = 17°C and water temp = 10°C. The survey crew described the habitat as "good" and noted a dense riparian canopy of hardwoods and some redwoods. Talked to landowner who said there were juvenile coho found in this reach last summer. Also said the road overtops on a fairly regular basis.

Preferred Treatment: Due to the extremely poor condition and sizing of the current culvert, replace either a properly sized embedded SSP culvert or a flatcar bridge set on abutments spaced at least at the bankfull channel width. Although there is limited upstream habitat, a replacement is recommended before the crossing fails and impacts downstream spawning habitat.





Site ID #S-093: Grape Creek #2/Wine Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #29 = Moderate -Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 90003; County Map Sheet #4J21. USGS Quad: Geyserville. T9N, R10W, Section 3. Lat/Long: 38° 39' 21.54" 122° 57' 6.10" Milepost= 1.1 miles to West Dry Creek Road.

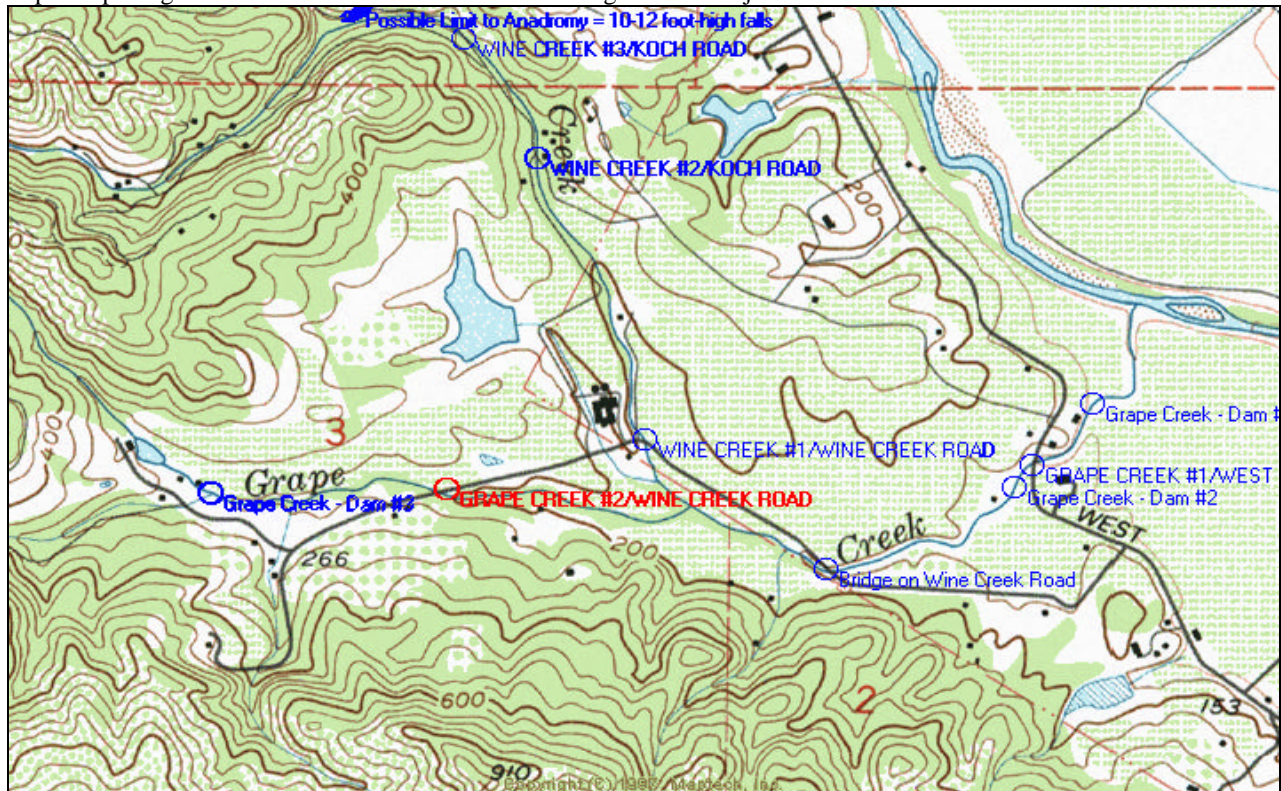
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 7.0' height x 8.0' width **Length:** 43.4' **Slope:** 2.17% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 8.7' **Fill Estimate:** 453 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 150-year recurrence interval. Wine Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 30% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. The 2% slope over a smooth concrete floor creates excessive velocities that impede juvenile migration.

Additional Stream Crossings: Downstream = (~2,100') to confluence of Wine/Grape Creeks, (~3,400') to bridge on Wine Creek Road, (~5,200') to flashboard dam, (~5,300') to Site ID #S-093, (~6,050') to flashboard dam and (~7,250') to confluence with Dry Creek. Upstream = (~1,750') to flashboard dam, and (~2,300') to dam/reservoir indicated on USGS map.

Habitat: Quantity = approximately 6,200' of potential fish-bearing habitat upstream of Site ID# S-093. Quality = rated as "fair" for the ranking matrix (quality score = 0.59) as based on CDFG's habitat typing survey of approximately 12,000' of Grape Creek channel in 1998. Historical surveys indicate that habitat quality has degraded since the 1970's. The crossing was surveyed by Taylor and Assoc. on 8/23/01 and there was continuous flow in the channel. At 2:30PM the air temp = 25°C and water temp = 16°C. The survey crew described the habitat as "good" and noted a dense riparian canopy of hardwoods and numerous pools. Several young-of-year salmonids were observed in a pool upstream of the culvert inlet. The survey crew talked to local who has observed adult steelhead in this of creek during the winter.

Preferred Treatment: Construction of one or two downstream boulder weirs to raise tail-water elevation (and possibly back-water the culvert outlet) and installation of corner baffles within the box culvert would cost-effectively improve passage conditions for adult steelhead and all age classes of juveniles.



Site ID #S-093: Grape Creek #2/Wine Creek Road; Dry Creek; Russian River



Site ID #S-094: Unnamed Tributary #1/West Dry Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #51 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 99017; County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W. Lat/Long: 38° 40'21.75" 122° 56' 40.92" Milepost = 16.65 miles

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 4.1' height x 4.0' width **Length:** 45.0'

Slope: 0.62% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 6.8'

Fill Estimate: 159 cubic yards. **Overall Condition:** Good.

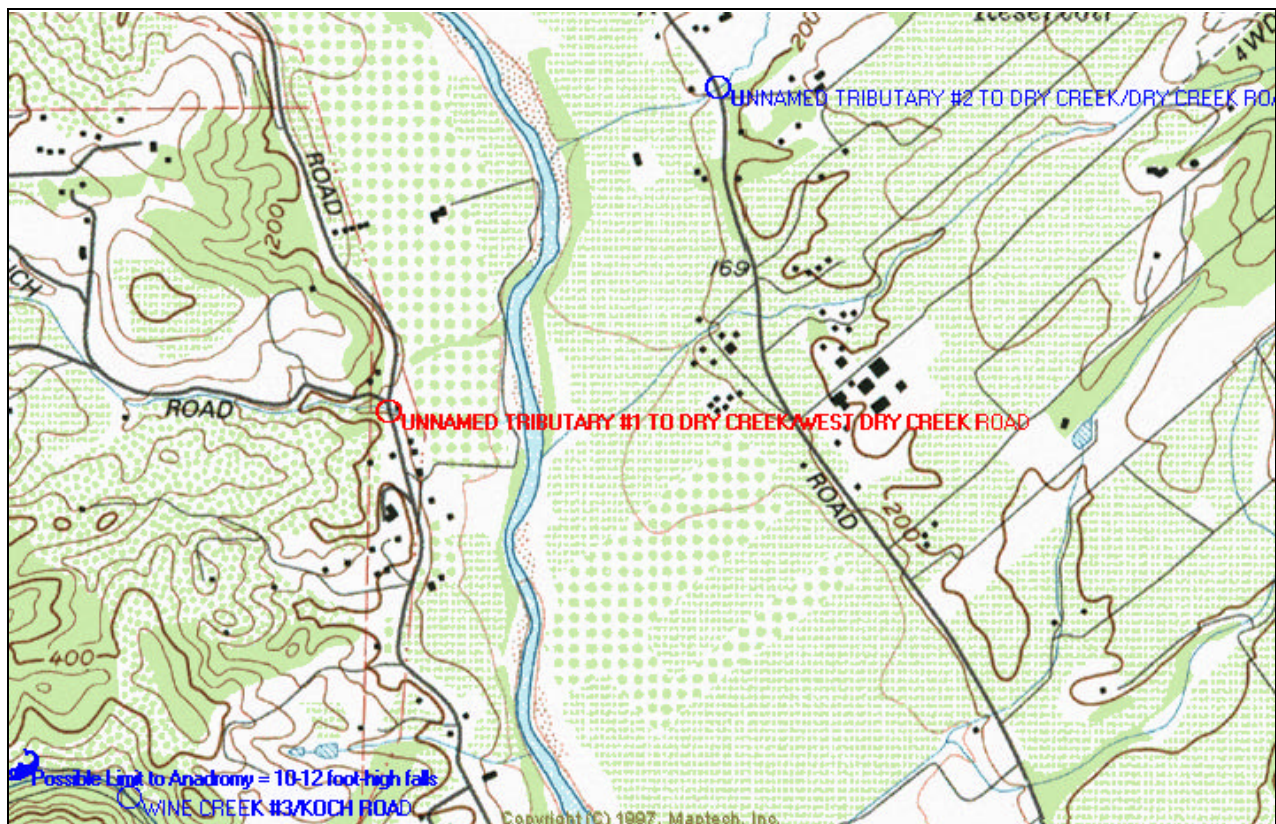
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 12-year recurrence interval. West Dry Creek Road is overtopped on approximately a 222-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 50% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids.

Additional Stream Crossings: Downstream = none indicated on the USGS map, (~1,100') to confluence with the Russian River. Upstream = none indicated on the USGS map within the limited fish-bearing stream reach.

Habitat: Quantity = approximately 100' of potential fish-bearing habitat upstream of Site ID# S-094. Quality = rated as "poor" for the ranking matrix based on CDFG's professional judgment (Coey, pers. comm.) due to the steep channel slope. The crossing was surveyed by Taylor and Assoc. on 10/10/01 and the channel was dry. The survey crew described the habitat as "poor" and questioned if this was even a fish-bearing stream channel. A large drop over a 6-7 foot diameter boulder was noted approximately 100 feet upstream of the crossing.

Preferred Treatment: None recommended because this creek has minimal, if any, fisheries potential. The current box culvert is in good condition. Recommend dropping the site in the final ranking due to lack of fish habitat.





Site ID #S-095: Unnamed Tributary #2/Dry Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: #26 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 9901; County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W. Lat/Long: 38° 40' 44.16" 122° 56' 11.55" Milepost = 1.9 miles to Lambert Bridge Road.

Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 3.0' height x 10.5' width
Length: 37.8' **Slope:** 0.48% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 9.8' **Fill Estimate:** 181 cubic yards. **Overall Condition:** Good.

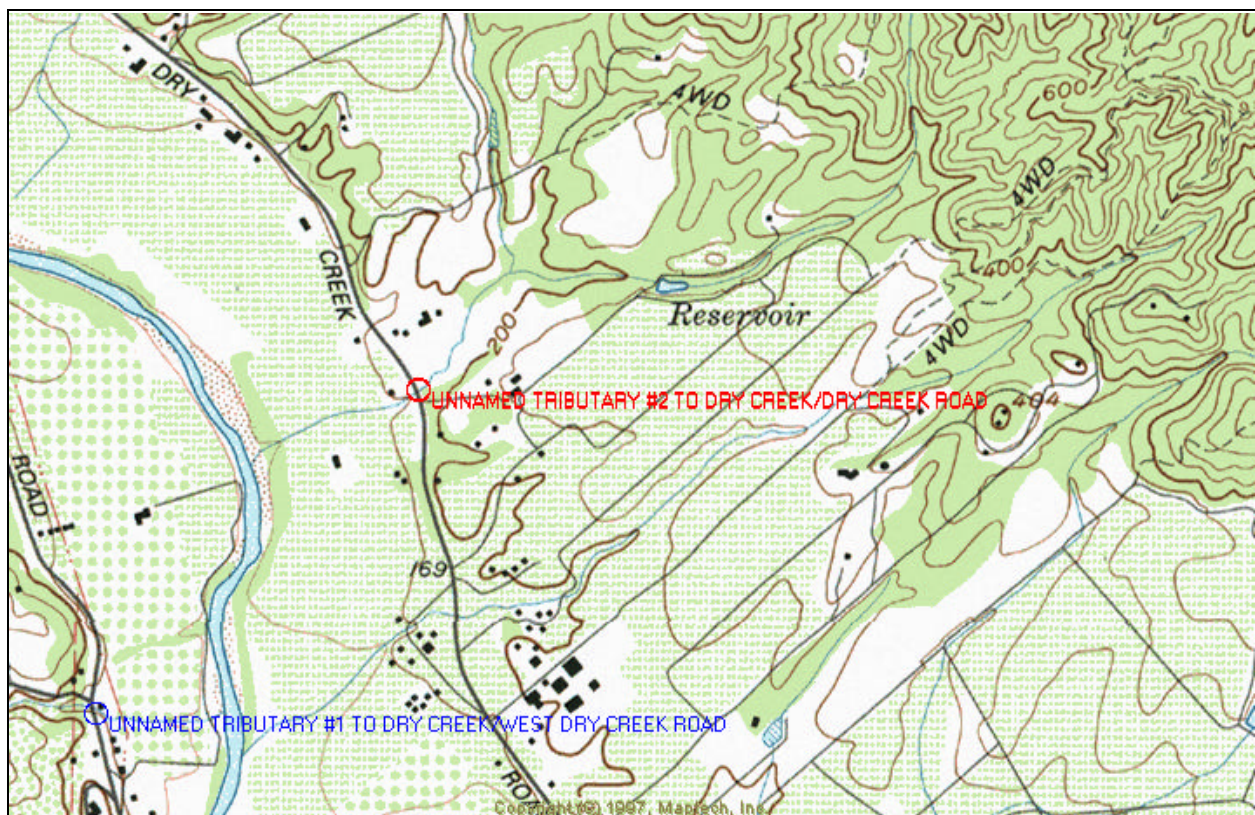
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a nine-year recurrence interval. Dry Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 9% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. For adults, the only passage criteria violation was lack-of-depth, thus actual passage may be higher than predicted by FishXing. For all age classes of juveniles, the perched outlet impedes passage.

Additional Stream Crossings: Downstream = none indicated on the USGS map, (~ 1,550') to confluence with the Russian River. Upstream = none indicated on the USGS map within the fish-bearing stream reach – up to the two dam/reservoirs.

Habitat: Quantity = approximately 3,400' of potential fish-bearing habitat upstream of Site ID# S-095. Quality = rated as “poor” for the ranking matrix based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 10/10/01 and the channel was dry. The survey crew described the habitat as “poor” and noted a channelized reach lacking habitat features through an area of vineyards. The riparian zone was sparse.

Preferred Treatment: Because the current box culvert is sized for less than a 10-year storm flow, downstream weirs to raise the tail-water elevation are not recommended due to the potential for increased likelihood of flooding or damage. The best long-term option is replacement with a bridge, but this is not a cost-effective project based on the quality and quantity of upstream habitat. Recommend dropping site in final ranking to low-priority.



Site ID #S-095: Unnamed Tributary #2/Dry Creek Road; Dry Creek; Russian River



Site ID #S-096: Unnamed Tributary #3/Dry Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: #36 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 9901; County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W. Lat/Long: 38° 41' 13.15" 122° 56' 41.24" Milepost = 1.8 miles to Canyon Road.

Culvert Type: Upstream = Open Bottom Arch, Concrete and Pipe; Downstream = Box, Concrete.

Corrugations: None. **Dimensions:** 7.2' height x 10.1' width **Length:** 81.0' **Slope:** -0.56%

Modifications: Two consecutive culverts of different shapes make up this crossing. The upstream culvert is a concrete open bottom pipe arch, and the downstream culvert is a concrete box. **Rustline Height:** N/A

Average Active Channel Width: 7.6' **Fill Estimate:** 294 cubic yards. **Overall Condition:** Good.

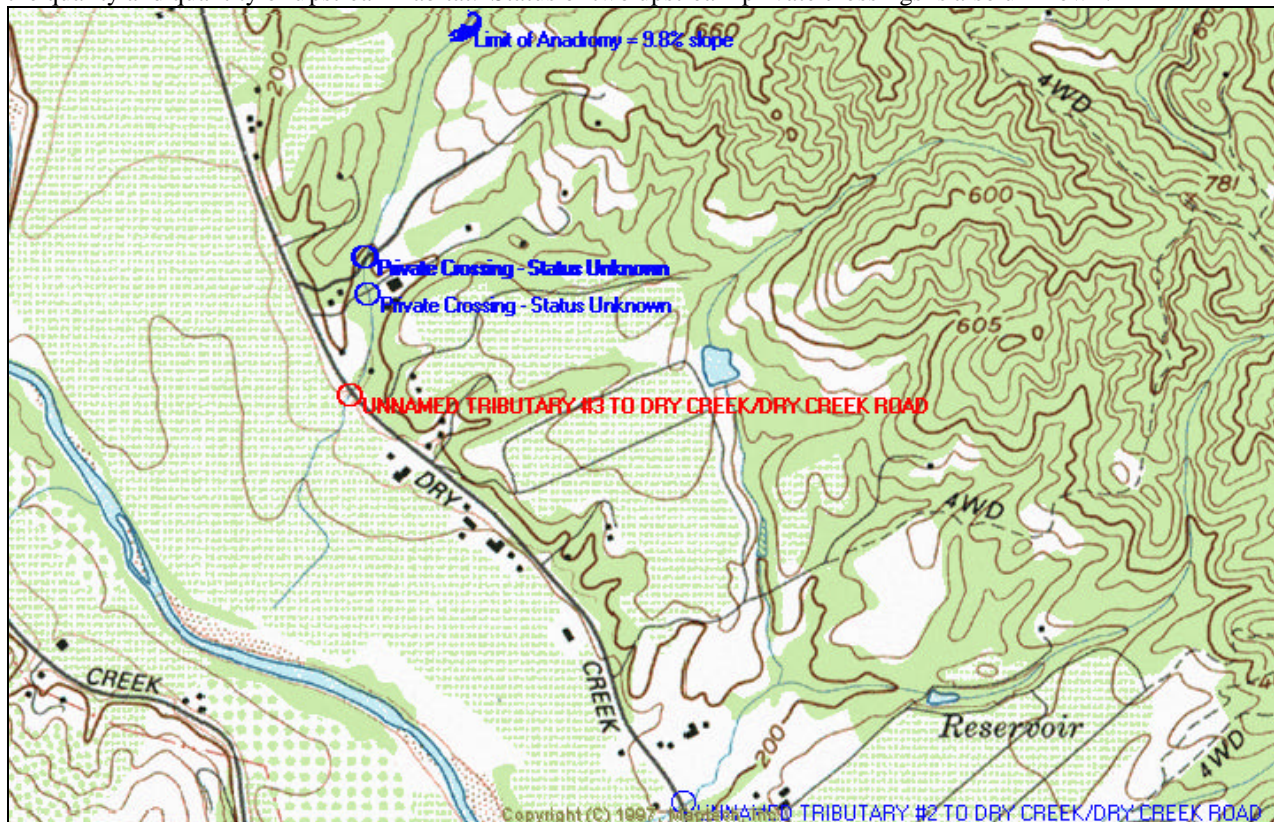
Sizing: Properly sized; HW/D = 1 on a storm flow with approximately a 177-year recurrence interval. Dry Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** FishXing determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for adult steelhead and passage criteria for all age classes of juveniles due to the extremely perched outlet and steeply-sloped outlet apron.

Additional Stream Crossings: Downstream = none indicated on the USGS map, (~2,600') to confluence with the Russian River. However, no access was permitted to private property (vineyards) to confirm the absence of additional crossings and/or flashboard dams. Upstream = (~850') to private crossing – status unknown and (~1,100') to a second private crossing – status unknown.

Habitat: Quantity = approximately 3,250' of potential fish-bearing habitat upstream of Site ID# S-096. Quality = rated as "poor" for the ranking matrix based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 10/10/01 and the channel was dry. The survey crew described the habitat as "poor" and noted a channelized reach lacking habitat features through an area of vineyards. The riparian zone was sparse.

Preferred Treatment: Because the current crossing is properly sized, four to five downstream boulders weirs would raise the tail-water elevation. However, because of the poor-quality habitat this is not a cost-effective project based on the quality and quantity of upstream habitat. Status of two upstream private crossings is also unknown.



Site ID #S-096: Unnamed Tributary #3/Dry Creek Road; Dry Creek; Russian River



Site ID #S-097: Canyon Creek/Dry Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #21 = Moderate-Priority **Basin-wide Ranking:** Tied for #28 = Moderate-Priority

Location: Road ID# 9901; County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W. Lat/Long: 38° 42' 3.52" 122° 57' 3.43" Milepost = 17.31 miles

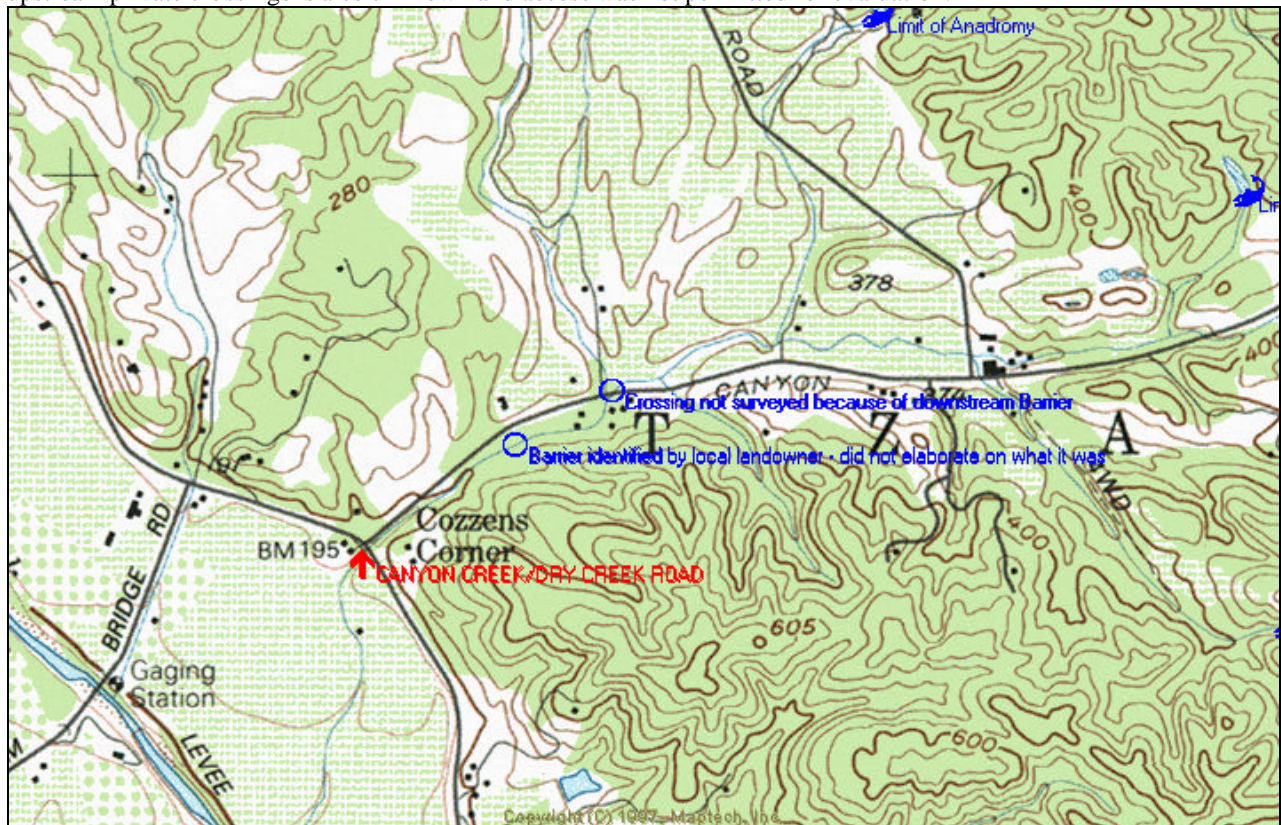
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 8.1' height x 20.6' width
Length: 59.1' **Slope:** 0.61% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.3'
Fill Estimate: 413 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Dry Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** FishXing determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for adult steelhead and passage criteria for all age classes of juveniles due to the extremely perched outlet.

Additional Stream Crossings: Downstream = none indicated on the USGS map, (~3,000') to confluence with the Russian River. However, no access was permitted to private property (vineyards) to confirm the absence of additional crossings and/or flashboard dams. Upstream = (~ 1,500') to a barrier identified by local - status unknown and (~2,100') to section of creek that goes under the Pedrocchi Winery – passage status unknown, and (~2,300') to County crossing on Canyon Road – not surveyed because of lack of access to fenced/posted private property. Canyon Creek then divides into six smaller tributaries which have four crossings on Walling Road and two on Canyon Road – none of these were surveyed.

Habitat: Quantity = approximately 28,000' of potential fish-bearing habitat upstream of Site ID# S-097. Quality = rated as “poor” for the ranking matrix based on Taylor and Associates field notes. The crossing was surveyed by Taylor and Assoc. on 8/23/01 and the channel was dry. The survey crew described the habitat as “poor” and noted a channelized reach lacking habitat features through an area of vineyards. The riparian zone was sparse. Survey crew talked to a local who informed them of several upstream barriers before Canyon Road. Also he has observed only a couple of steelhead in creek during winters of very high storm flows.

Preferred Treatment: Because the current crossing is properly sized, five to six downstream boulders weirs would raise the tail-water elevation. Not sure if there would be access to private property to construct the weirs. Status of upstream private crossings is also unknown and access was not permitted for evaluation.





Site ID #S-098: Dutcher Creek #1/Dry Creek Road; Dry Creek; Russian River **Road Ownership:** County
County Ranking: Tied for #28 = Moderate -Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 9901; County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W. Lat/Long: 38° 42' 44.72" 122° 58' 31.80" Milepost = 19.0 miles

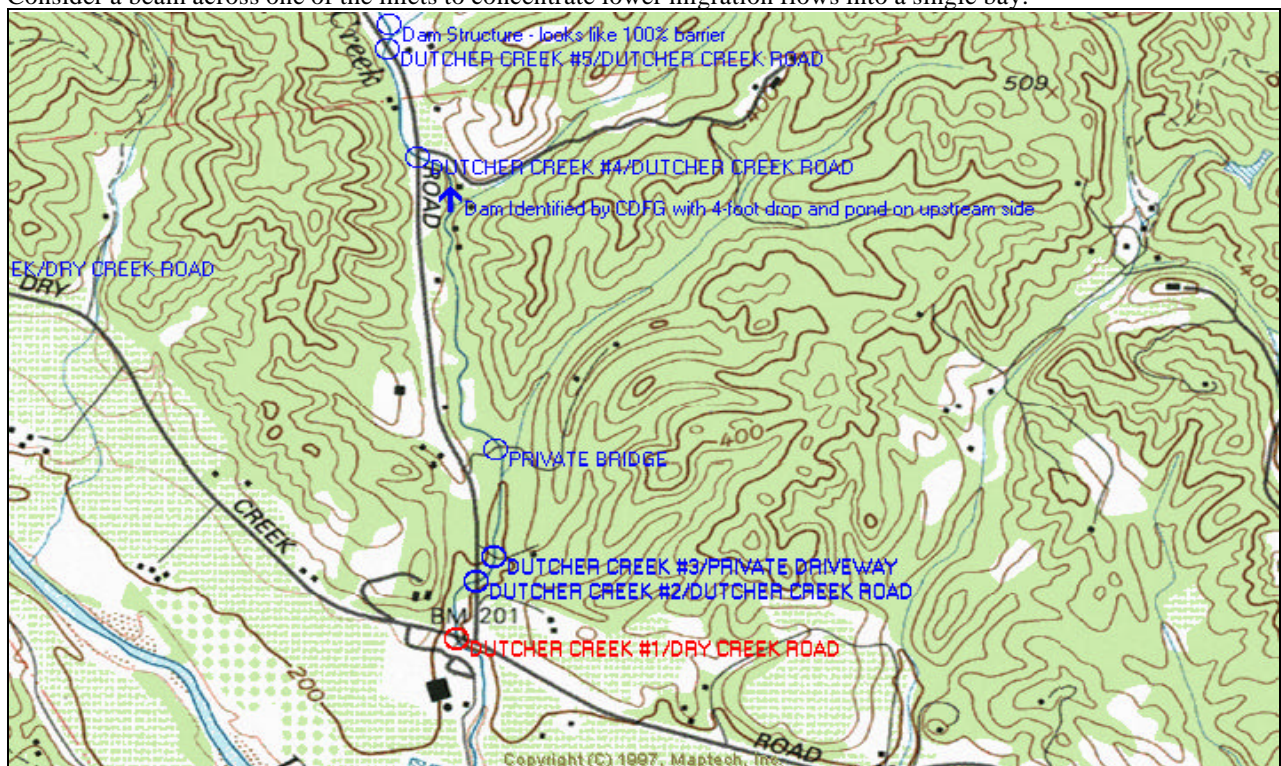
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 9.2' height x 24.8' width
Length: 55.8' **Slope:** 0.99% **Modifications:** None. **Rustline Height:** N/A
Average Active Channel Width: 16.7' **Fill Estimate:** 350 cubic yards. **Overall Condition:** Good.
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Dry Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 61% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. For adults, there is a lack-of-depth at lower flows and excessive velocities at upper migration flows. For juveniles, the perched outlet and excessive velocities impede passage.

Additional Stream Crossings: Downstream = none indicated on the USGS map, (~2,450') to confluence with the Russian River. However, no access was permitted to private property to assess habitat or confirm the absence of additional crossings and/or flashboard dams. Upstream = (~550') to Site ID #S-099, (~800') to Site ID #S-100, (~1,700') to private bridge, (~4,350') to dam with 4ft drop, (~4,800') to Site ID #S-101, (~5,900') to Site ID #S-102, (~6,200') to dam – probable migration barrier, (~7,550') to Site ID #S-103, (~8,350') to private crossing – status unknown (no access allowed), (~9,400') to private bridge, (~9,700') to flashboard dam with 4.5 foot drop, (~11,500') to private bridge, (~12,350') to private bridge, (~14,150') to private crossing – status unknown, and (~15,800') to private crossing – status unknown.

Habitat: Quantity = approximately 32,700' of potential fish-bearing habitat upstream of Site ID# S-098. Quality = rated as “fair” for the ranking matrix (quality score = 0.52) as based on CDFG’s 1998 habitat typing survey of approximately 13,700' of channel. The crossing was surveyed by Taylor and Assoc. on 9/26/01 and the channel was dry. The survey crew described the habitat as “fair” and noted a channel reach lacking habitat features through an area of vineyards. The riparian zone was sparse hardwoods and brush.

Preferred Treatment: Because the current crossing is properly sized, two to three downstream boulders weirs would raise the tail-water elevation. Corner baffles within the culvert would increase depths and decrease velocities. Consider a beam across one of the inlets to concentrate lower migration flows into a single bay.





Site ID #S-099: Dutcher Creek #2/Dutcher Creek Road; Dry Creek; Russian River **Road Ownership:** County
County Ranking: #10 = High-Priority **Basin-wide Ranking: #13 = High-Priority**

Location: Road ID# 0002; County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W. Lat/Long: 38° 42' 49.04" 122° 58' 30.08" Milepost = 10.09 miles

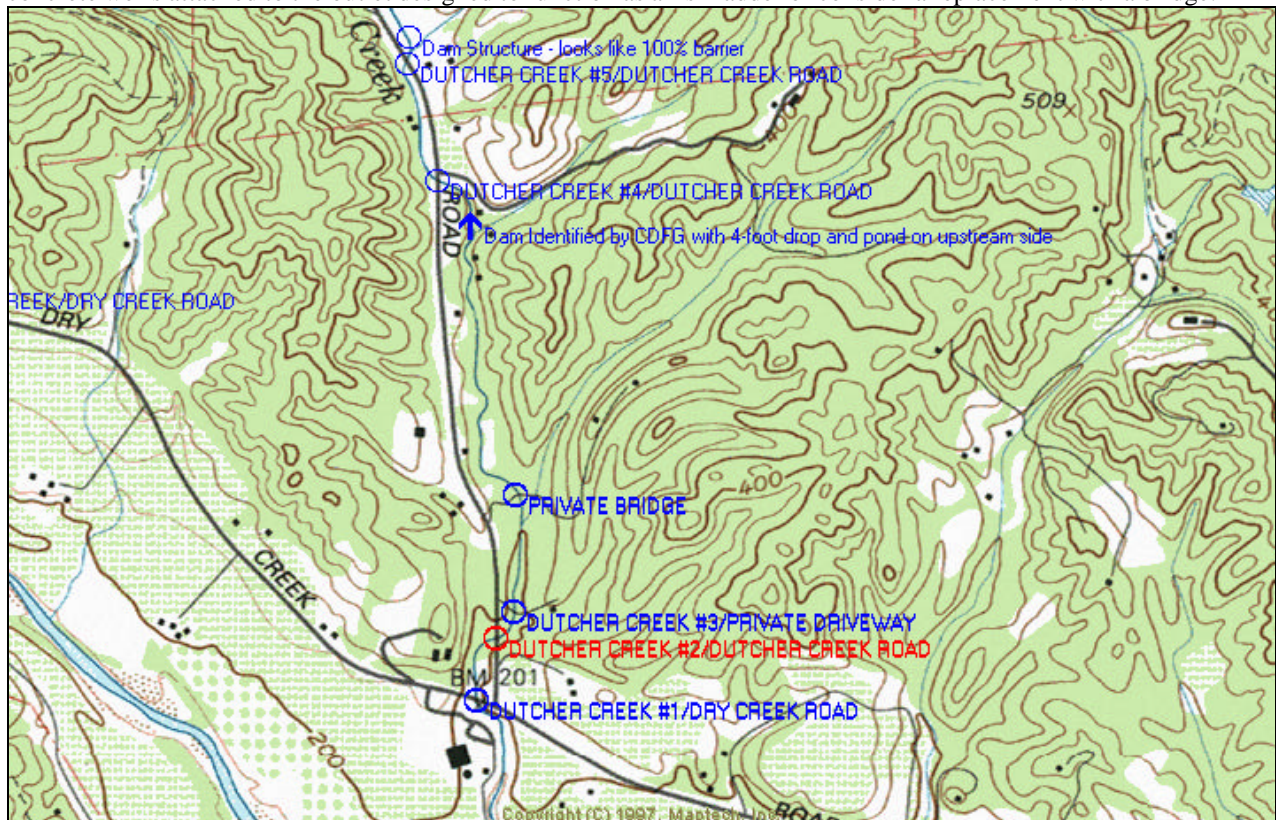
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 6.0' height x 24.7' width
Length: 29.5' **Slope:** -0.14% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 14.5'
Fill Estimate: 203 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Dutcher Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: RED: FishXing determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for adult steelhead and passage criteria for all age classes of juveniles due to the perched outlet (3.5 feet). If some adults are able to enter the culvert there is a lack-of-depth throughout the culvert.

Additional Stream Crossings: Downstream = (~550') to Site ID #S-098 and (~3,000') to confluence with the Russian River. Upstream = (~250') to Site ID #S-100, (~1,150') to private bridge, (~3,800') to dam with 4 ft drop, (~4,250') to Site ID #S-101, (~5,350') to Site ID #S-102, (~5,650') to dam – probable migration barrier, (~7,000') to Site ID #S-103, (~7,800') to private crossing – status unknown (no access allowed), (~8,850') to private bridge, (~9,150') to flashboard dam with 4.5 foot drop, (~10,950') to private bridge, (~11,800') to private bridge, (~13,600') to private crossing – status unknown, and (~15,250') to private crossing – status unknown.

Habitat: Quantity = approximately 32,150' of potential fish-bearing habitat upstream of Site ID# S-099. Quality = rated as “fair” for the ranking matrix (quality score = 0.49) as based on CDFG’s 1998 habitat typing survey of approximately 13,700' of channel. The crossing was surveyed by Taylor and Assoc. on 9/26/01 and the channel was dry. The survey crew described the habitat as “fair” and noted a channel reach lacking habitat features and the riparian zone consisted of sparse hardwoods and brush.

Preferred Treatment: Because the current crossing is properly sized, four to five downstream boulders weirs would raise the tail-water elevation. Corner baffles within the culvert would increase depths and decrease velocities. Consider a beam across one of the inlets to concentrate lower migration flows into a single bay. County will need access to private property for placement of boulder weirs. If not feasible, consider the construction of a series of concrete weirs attached to the outlet designed to function as a fish ladder or consider a replacement with a bridge.





Site ID #S-100: Dutcher Creek #3/Private Driveway; Dry Creek; Russian River **Road Ownership:** Private
County Ranking: #11 = High-Priority **Basin-wide Ranking:** Tied for #16 = High-Priority

Location: County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W. Lat/Long: 38° 42' 50.88" 122° 58' 28.49" Milepost = At Dutcher Creek Road.

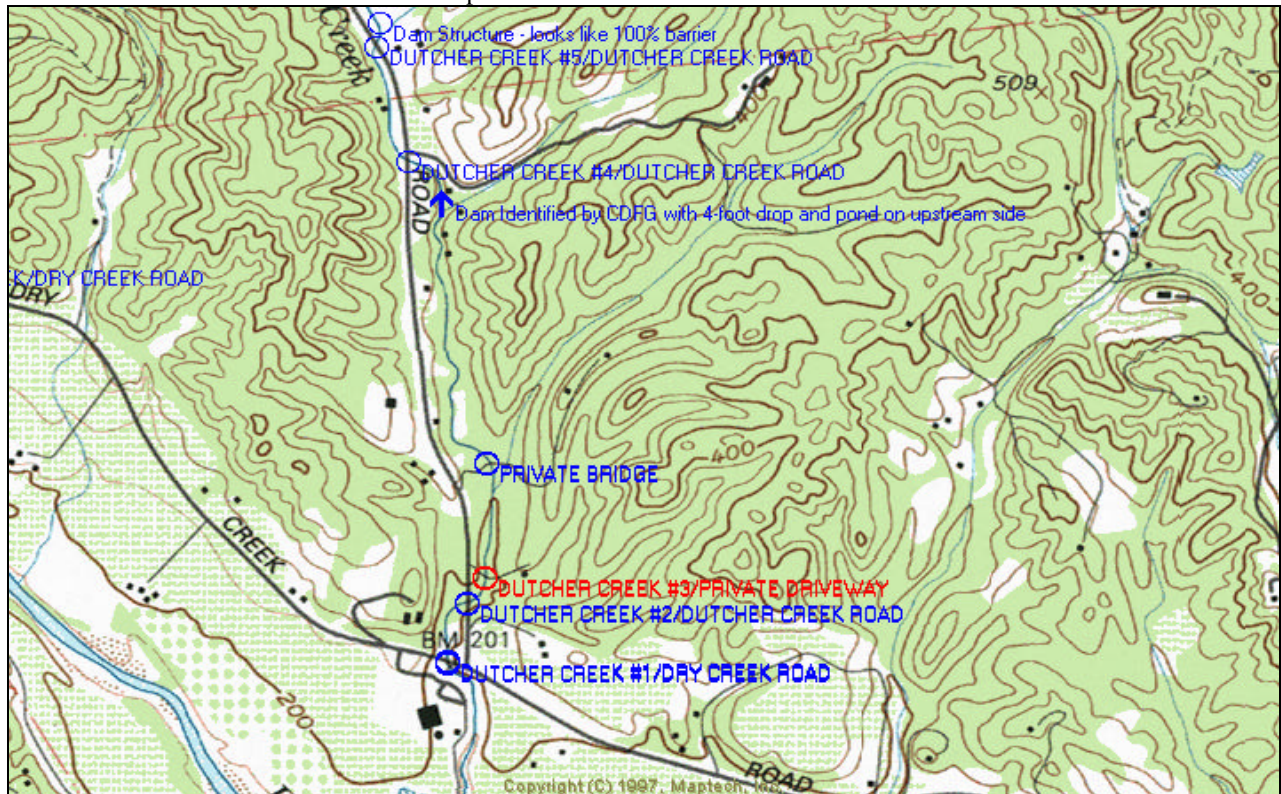
Culvert Type: Three Circular Pipes; LB = SSP; MB = SSP; RB = CSP. **Corrugations:** 2-2/3" x 1/2"
Dimensions: diameters = 4.0' **Lengths:** 20.0' **Slopes:** LB = 2.50%; MB = 2.35%; RB = 2.30%
Modifications: None. **Rustline Heights:** LB = 1.7'; MB = 1.4'; RB = 0.8' **Average Active Channel Width:** 14.5'
Fill Estimate: 187 cubic yards. **Overall Condition:** Fair, abraded inverts. **Sizing:** Extremely undersized; HW/D = 1
on a storm flow with approximately a two-year recurrence interval. This private driveway is overtopped on
approximately a six-year storm flow.

Barrier Status: **GRAY:** FishXing determined the culverts at this crossing meet the 8-16-16 ft/sec passage criteria for adult steelhead on (LB=91%; MB=91%; RB=84%) of the range of estimated migration flows and fail to meet passage criteria for all age classes of juvenile salmonids. For all age classes of juveniles, excessive velocities impede passage.

Additional Stream Crossings: Downstream = (~250') to Site ID #S-099, (~800') to Site ID #S-098 and (~3,250') to confluence with the Russian River. Upstream = (~900') to private bridge, (~3,550') to dam with 4ft drop, (~4,000') to Site ID #S-101, (~5,100') to Site ID #S-102, (~5,400') to dam – probable migration barrier, (~6,750') to Site ID #S-103, (~7,550') to private crossing – status unknown (no access allowed), (~8,600') to private bridge, (~8,900') to flashboard dam with 4.5 foot drop, (~10,700') to private bridge, (~11,550') to private bridge, (~13,350') to private crossing – status unknown, and (~15,000') to private crossing – status unknown.

Habitat: Quantity = approximately 31,900' of potential fish-bearing habitat upstream of Site ID# S-100. Quality = rated as "fair" for the ranking matrix (quality score = 0.68) as based on CDFG's 1998 habitat typing survey of approximately 13,700' of channel. The crossing was surveyed by Taylor and Assoc. on 1/16/02 and there was continuous flow in the channel. At 9:00AM the air temp = 3.5°C and water temp = 8°C. The survey crew described the habitat as "good" and noted a channel reach with a cobble/gravel bed, several pools/riffle features near the crossing and the riparian zone consisted of sparse hardwoods. No fish were observed.

Preferred Treatment: Because the current crossing is extremely undersized, the placement of downstream boulders weirs to raise the tail-water elevation is not recommended. Recommend replacement with a flatcar bridge. Also recommend treatment of downstream sites prior to treatment of Site ID #S-100.



Site ID #S-100: Dutcher Creek #3/Private Driveway; Dry Creek; Russian River



Site ID #S-101: Dutcher Creek #4/Dutcher Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: #3 = High-Priority **Basin-wide Ranking:** #3 = High-Priority

Location: Road ID# 0002; County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W. Lat/Long: 38° 43' 21.14" 122° 58' 35.28" Milepost = 10.60 miles

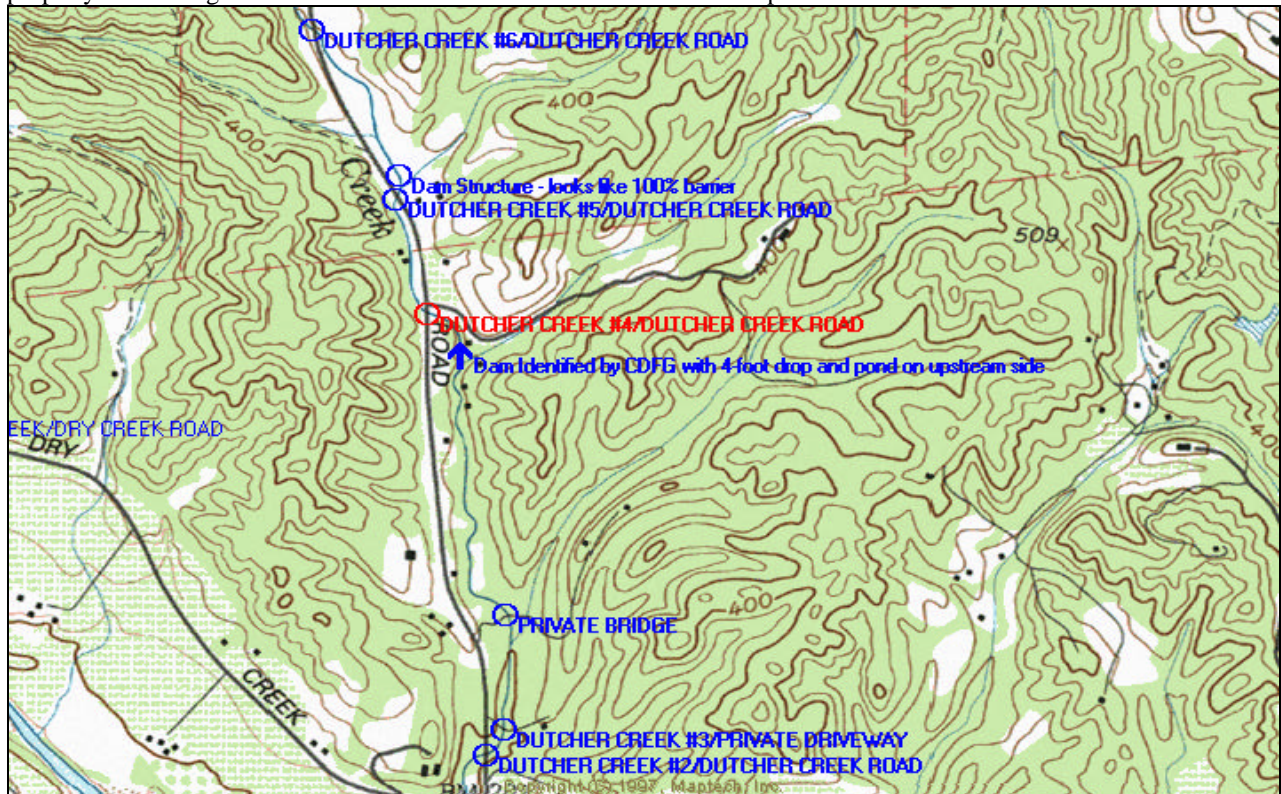
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.0' height x 9.5' width **Length:** 62.5' **Slope:** 0.70% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.7' **Fill Estimate:** 912 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 12-year recurrence interval. Dutcher Ck Rd is overtopped on approximately a 191-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for all species of adult salmonids and all age classes of juveniles due to the extremely perched outlet (> 5 feet).

Additional Stream Crossings: Downstream = (~450') to dam with 4ft drop, (~3,100') to private bridge, (~4,000') to Site ID #S-100, (~4,250') to Site ID #S-099, (~4,800') to Site ID #S-098 and (~7,250') to confluence with the Russian River. Upstream = (~1,100') to Site ID #S-102, (~1,400') to dam – probable migration barrier, (~2,750') to Site ID #S-103, (~3,550') to private crossing – status unknown (no access allowed), (~4,600') to private bridge, (~4900') to flashboard dam with 4.5 foot drop, (~6,700') to private bridge, (~7,550') to private bridge, (~9,350 to private crossing – status unknown, and (~11,000') to private crossing – status unknown.

Habitat: Quantity = approximately 19,500' of potential fish-bearing habitat upstream of Site ID# S-101. Quality = rated as “fair” for the ranking matrix (quality score = 0.62) as based on CDFG’s 1998 habitat typing survey of approximately 13,700' of channel. The crossing was surveyed by Taylor and Assoc. on 9/26/01 and there were isolated areas of surface water in the channel. At 11:45AM the air temp = 15°C and water temp = 14°C. The survey crew described the habitat as “good” and noted a channel reach with a cobble/gravel bed, several pools/riffle features near the crossing and a moderately-dense riparian canopy of hardwoods. Two young-of-year salmonids were observed in an isolated pool upstream of the crossing.

Preferred Treatment: Because the current crossing is undersized, the placement of downstream boulders weirs to raise the tail-water elevation and corner baffles to increase depths and decrease velocities should be cautiously considered. Best long-term solution to restore passage and increase storm flow capacity is a replacement with a properly sized bridge. Also recommend treatment of downstream sites prior to treatment of Site ID #S-101.



Site ID #S-101: Dutcher Creek #4/Dutcher Creek Road; Dry Creek; Russian River



Site ID #S-102: Dutcher Creek #5/Dutcher Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #31 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 0002; County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W, Section 9. Lat/Long: 38° 43' 29.43" 122° 58' 38.05" Milepost= 10.91 miles

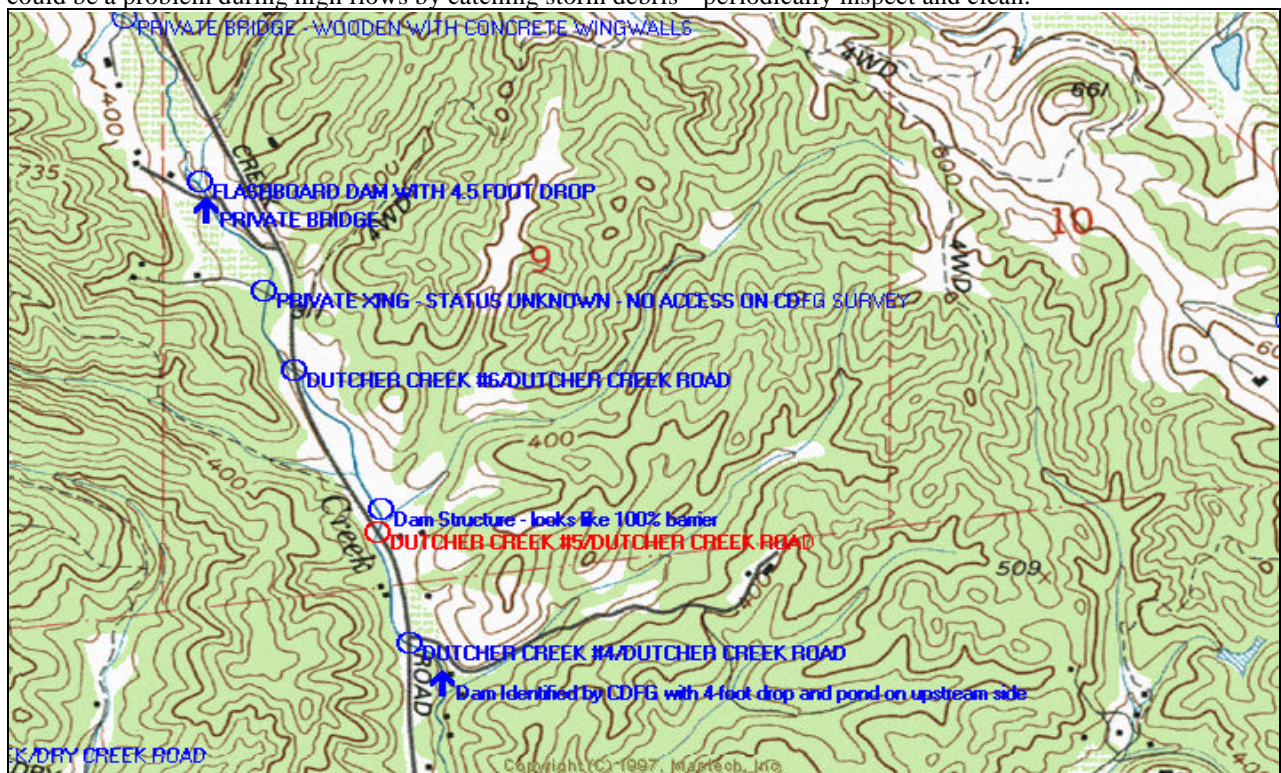
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.1' height x 11.6' width **Length:** 50.7' **Slope:** 0.69% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.8' **Fill Estimate:** 534 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 32-year recurrence interval. Dutcher Creek Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 78% of the range of estimated migration flows, meets passage criteria for resident trout/2+ juveniles on 57% of the range of estimated migration flows, and fails to meet passage criteria for 1+/young-of-year juveniles.

Additional Stream Crossings: Downstream = (~1,100') to Site ID #S-101, (~1,550') to dam with 4ft drop, (~4,200') to private bridge, (~5,100') to Site ID #S-100, (~5,350') to Site ID #S-099, (~5,900') to Site ID #S-098 and (~8,350') to confluence with the Russian River. Upstream = (~300') to dam – probable migration barrier, (~1,650') to Site ID #S-103, (~2,450') to private crossing – status unknown (no access allowed), (~3,500') to private bridge, (~3,800') to flashboard dam with 4.5 foot drop, (~5,600') to private bridge, (~6,450') to private bridge, (~8,250') to private crossing – status unknown, and (~9,900') to private crossing – status unknown.

Habitat: Quantity = approximately 18,600' of potential fish-bearing habitat upstream of Site ID# S-102. Quality = rated as “good” for the ranking matrix (quality score = 0.69) as based on CDFG’s 1998 habitat typing survey of approximately 13,700' of channel. The crossing was surveyed by Taylor and Assoc. on 9/26/01 and there were isolated areas of surface water in the channel. At 3:35PM the air temp = 20°C and water temp = 16°C. The survey crew described the habitat as “fair to good” and noted a channel reach with a cobble/gravel bed, several pools/riffle features near the crossing and a dense riparian canopy of hardwoods, brush, and poison oak. The standing water in isolated pools was described as “mucky and funky-looking”. No fish were observed.

Preferred Treatment: None recommended until the downstream sites and the dam immediately upstream of this crossing are treated. Actual passage of both adult steelhead and older juveniles is probably higher than predicted by FishXing software because lack-of-depth was the primary violation of the passage criteria. Cattle guard across inlet could be a problem during high flows by catching storm debris – periodically inspect and clean.



Site ID #S-102: Dutcher Creek #5/Dutcher Creek Road; Dry Creek; Russian River



Site ID #S-103: Dutcher Creek #6/Dutcher Creek Road; Dry Creek; Russian River **Road Ownership:** County

County Ranking: #7 = High-Priority **Basin-wide Ranking:** #7 = High-Priority

Location: Road ID# 0002; County Map Sheet #4J11. USGS Quad: Geyserville. T10N, R10W, Section 9. Lat/Long: 38° 43' 41.72" 122° 58' 45.46" Milepost = 11.16 miles

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 5.9' height x 12.1' width **Length:** 64.6' **Slope:** 1.32% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 12.7' **Fill Estimate:** 233 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 196-year recurrence interval. Dutcher Ck Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 12% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. Perched outlet (2.5 feet) impedes juvenile migration.

Additional Stream Crossings: Downstream = (~1,350') to dam – probable migration barrier, (~1,650') to Site ID #S-102, (~2,750') to Site ID #S-101, (~3,200') to dam with 4ft drop, (~5,850') to private bridge, (~6,750') to Site ID #S-100, (~7,000') to Site ID #S-099, (~7,550') to Site ID #S-098 and (~10,000') to confluence with the Russian River. Upstream = (~800') to private crossing – status unknown (no access allowed), (~1,850') to private bridge, (~2,150') to flashboard dam with 4.5 foot drop, (~3,950') to private bridge, (~4,800') to private bridge, (~6,600') to private crossing – status unknown, and (~8,250') to private crossing – status unknown.

Habitat: Quantity = approximately 10,350' of potential fish-bearing habitat upstream of Site ID# S-103. Quality = rated as “good” for the ranking matrix (quality score = 0.75) as based on CDFG’s 1998 habitat typing survey of approximately 13,700' of channel. The crossing was surveyed by Taylor and Assoc. on 9/26/01 and there were isolated areas of surface water in the channel. At 3:35PM the air temp = 20°C and water temp = 16°C. The survey crew described the habitat as “fair to good” and noted a channel reach with a cobble/gravel bed, several pools/riffle features near the crossing and a dense riparian canopy of hardwoods, brush, and poison oak. The standing water in isolated pools was described as “mucky and funky-looking”. No fish were observed.

Preferred Treatment: Because the current crossing is properly sized, three to four downstream boulders weirs would raise the tail-water elevation. Corner baffles within the culvert would increase depths and decrease velocities. Recommend treating downstream migration barriers prior to addressing this crossing. Cattle guard across inlet could be a problem during high flows by catching storm debris – periodically inspect and clean.







Site ID #S-105: Brooks Creek/Spurgeon Road; Russian River **Road Ownership:** County

County Ranking: Tied for #46 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 98001; County Map Sheet #4J. USGS Quad: Healdsburg. T9N, R9W, Section 32. Lat/Long: 38° 35'10.20" 122° 45' 44.17" Milepost = 10.05 miles

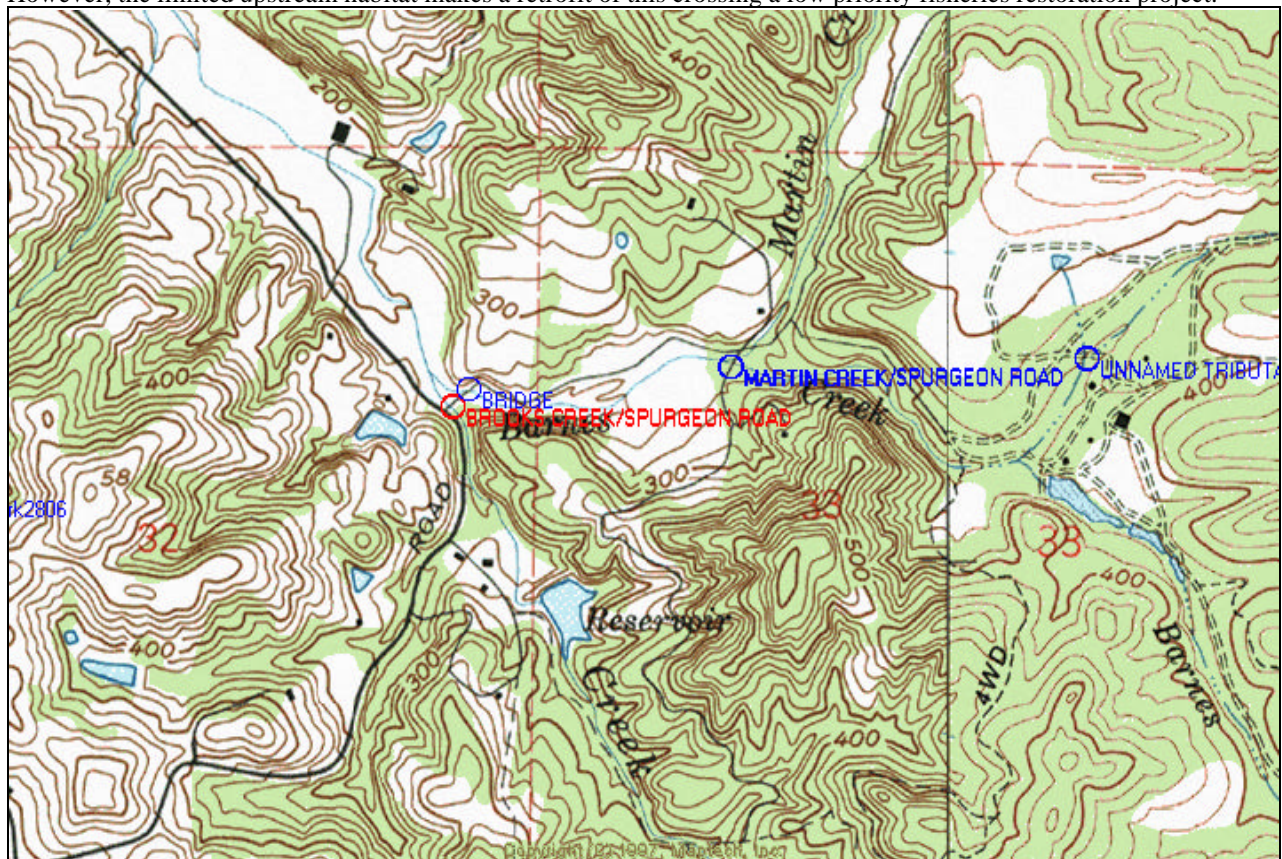
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 6.0' H x 12.7' W **Length:** 22.2'
Slope: -0.23% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.5'
Fill Estimate: 126 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Spurgeon Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 36% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. Perched outlet (2.5 feet) impedes juvenile migration.

Additional Stream Crossings: Downstream = (~350') to confluence with Martin Creek, (~2,550') to private crossing – status unknown, (~8,200') to bridge on Chalk Hill Road, and (~12,000') to confluence with Russian River. Upstream = none within the limited fish-bearing stream reach.

Habitat: Quantity = approximately 1,600' of potential fish-bearing habitat upstream of Site ID# S-105. Limit of anadromy was up to dam/reservoir as indicated on the USGS map and CDFG survey. Quality = rated as "fair" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). CDFG surveyed approximately 13,250' of Brooks Creek in 2001 - up to the first major dam/reservoir. The survey data were unavailable to generate a habitat quality score for the ranking matrix. CDFG captured no salmonids during their electro-fishing sampling in 2001. The crossing was surveyed by Taylor and Assoc. on 8/24/01 and the channel was dry. The survey crew described the habitat as "fair to good" and noted a channel reach with a cobble/gravel bed, several pools /riffle features near the crossing and a sparse riparian canopy of hardwoods.

Preferred Treatment: Three to four downstream boulder weirs would be required to raise tail-water elevation to improve passage into the culvert. Corner baffles would increase depths and reduce velocities within the culvert. However, the limited upstream habitat makes a retrofit of this crossing a low-priority fisheries restoration project.



Site ID #S-105: Brooks Creek/Spurgeon Road; Russian River



Site ID #S-106: Martin Creek/Spurgeon Road; Barnes Creek; Brooks Ck; Russian River **Road Ownership:** Private
County Ranking: Tied for #53 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked
Location: County Map Sheet #4J. USGS Quad: Healdsburg. T9N, R9W, Section 32. Lat/Long: 38° 35' 11.13" 122° 45' 45.52" Milepost= 0.5 miles to Chalk Hill Road.

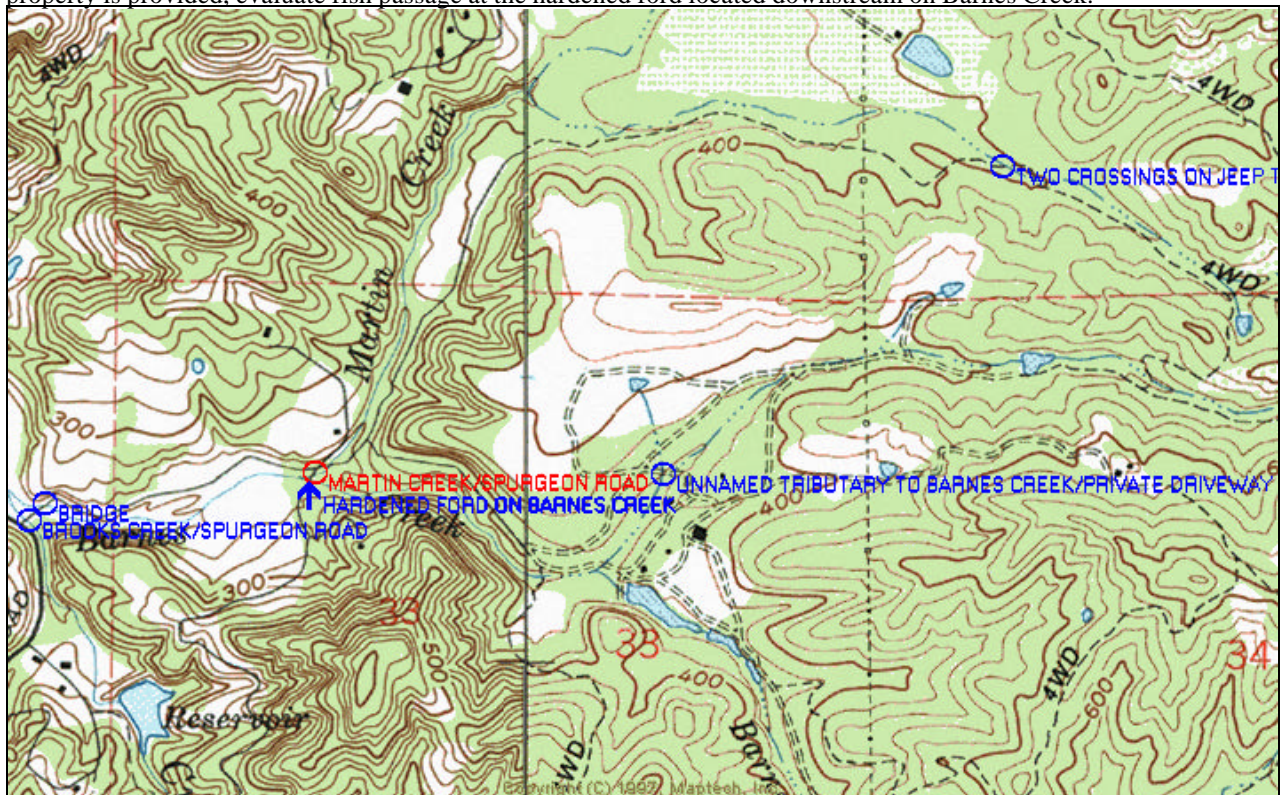
Culvert Type: Box, Concrete with Pipe Arch top. **Corrugations:** None. **Dimensions:** 8.8' height x 9.5' width
Length: 25.0' **Slope:** -0.60% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.4' **Fill Estimate:** 349 cubic yards. **Overall Condition:** Poor, floor is broken, and flow goes under it.
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 60-year recurrence interval. Spurgeon Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 87% of the range of estimated migration flows, meets passage criteria for resident trout/2+ juveniles on 47% of the range of estimated migration flows, and fails to meet passage criteria for 1+/young-of-year juveniles.

Additional Stream Crossings: Downstream = (~50') to confluence with Barnes Creek, (~150') hardened ford on Barnes Creek – probable barrier, (~2,300') to Barnes Creek bridge on Chalk Hill Road, (~2,700') to confluence of Barnes and Brooks Creeks, (~4,750') to private crossing on Brooks Creek – status unknown, (~10,550') to bridge on Chalk Hill Road, and (~14,400') to confluence with Russian River. Upstream = (~3,700') to confluence with LB tributary that accounts for approximately 6,100' of the habitat quantity estimate, (~6,400') to private crossing – status unknown and (~8,000') to dam/reservoir. LB trib = the USGS map suggests a jeep trail crosses this unnamed tributary twice, approximately 4,100' and 4,300' upstream from its confluence with Martin Creek.

Habitat: Quantity = approximately 14,100' of potential fish-bearing habitat upstream of Site ID# S-106. Limit of anadromy was up to dam/reservoir with 30-foot drop noted on CDFG survey. Quality = rated as “fair” for the ranking matrix as based on CDFG’s professional judgment (Coey, pers. comm.). CDFG surveyed approximately 7,950' of Martin Creek in 2001. The survey data were unavailable to generate a habitat quality score for the ranking matrix. CDFG captured four salmonids during their electro-fishing sampling in 2001. The crossing was surveyed by Taylor and Assoc. on 4/11/02 and there was continuous surface flow in the channel. At 9:30AM air temp = 15°C and water temp = 14°C. The survey crew described the habitat as “very good” and noted a channel reach with a cobble/gravel bed, several pools formed by boulders near the crossing and a dense riparian canopy of hardwoods.

Preferred Treatment: Repair the broken and failing culvert floor. Examine feasibility of removing culvert floor to allow a natural streambed to form through crossing – might require reinforcing the footings. If access to private property is provided, evaluate fish passage at the hardened ford located downstream on Barnes Creek.





Site ID #S-107: Unnamed Tributary/Private Drive; Barnes Ck; Brooks Ck; Russian River **Road Ownership:** Private
County Ranking: Tied for #17 = Moderate-Priority **Basin-wide Ranking:** Tied for #23 = Moderate-Priority

Location: County Map Sheet #4J. USGS Quad: Mark West Springs. T9N, R8W, Section 33. Lat/Long: 38° 35' 7.04" 122° 44' 52.77" Milepost = 0.5 miles to Spurgeon Road.

Culvert Type: Three Circular Pipes, Aluminum. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** All Pipes= 3.0'

Lengths: 20.0' **Slopes:** Left Pipe= 2.05%; Middle Pipe= 1.95%; Right Pipe= 1.15% **Modifications:** None.

Rustline Heights: N/A **Average Active Channel Width:** 11.7' **Fill Estimate:** 145 cubic yards.

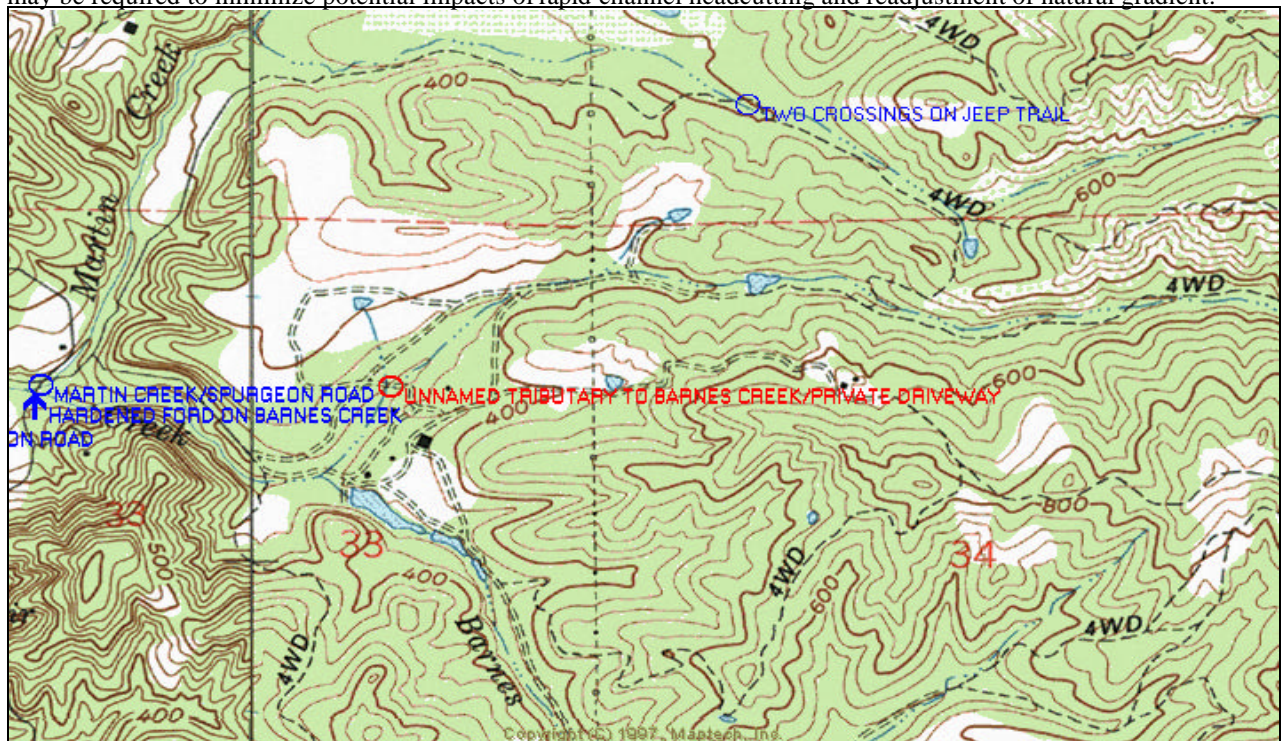
Overall Condition: Fair, outlet is scouring and undermining the crossing. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. This Private Road is overtopped on approximately a 24-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for adult steelhead and all age classes of juvenile salmonids due to the extremely perched outlet (3.5 feet). The undersized crossing is also disrupting the geomorphic processes of bedload transport and maintenance of a natural gradient.

Additional Stream Crossings: Downstream = (~800') to private crossing – status unknown, (~850') to confluence with Barnes Creek, (~3,500') to confluence of Barnes and Martin Creeks, (~3,650') hardened ford on Barnes Creek – probable barrier, (~5,700') to Barnes Creek bridge on Chalk Hill Road, (~6,100') to confluence of Barnes and Brooks Creeks, (~8,200') to private crossing on Brooks Creek – status unknown, (~18,100') to bridge on Chalk Hill Road, and (~14,400') to confluence with Russian River. Upstream = (~1,400') to private crossing – status unknown, (~2,200') to private crossing, and (~3,100') to dam/reservoir.

Habitat: Quantity = approximately 3,100' of potential fish-bearing habitat upstream of Site ID# S-107. Limit of anadromy was up to dam/reservoir indicated on the USGS map. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates survey crew's field notes. CDFG's habitat typing survey of Barnes Creek in 2001 did not include this unnamed tributary. The crossing was surveyed by Taylor and Assoc. on 4/11/02 and there was barely continuous surface flow in the channel. At 11:00AM air temp = 19°C and water temp = 15°C. The survey crew described the habitat as "poor to fair" and noted an aggraded upstream channel reach with a cobble/gravel bed and a sparse riparian canopy of hardwoods upstream of the crossing and a denser riparian zone downstream. No fish were observed.

Preferred Treatment: Replacement with a properly sized open-bottom arch set on concrete footings or a bridge is the only feasible option to restore fish passage and improve hydraulic capacity of the crossing. Grade control weirs may be required to minimize potential impacts of rapid channel headcutting and readjustment of natural gradient.





Site ID #S-108: Little Briggs Creek/Santa Angelina Ranch; Briggs Creek; Maacama Creek; Russian River
Road Ownership: Private

County Ranking: #58 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J. USGS Quad: Mt. St. Helena. T10N, R8W, Section 27. Lat/Long: 38° 40' 45.62" 122° 43' 29.15" Milepost = 2.7 miles to Highway 128.

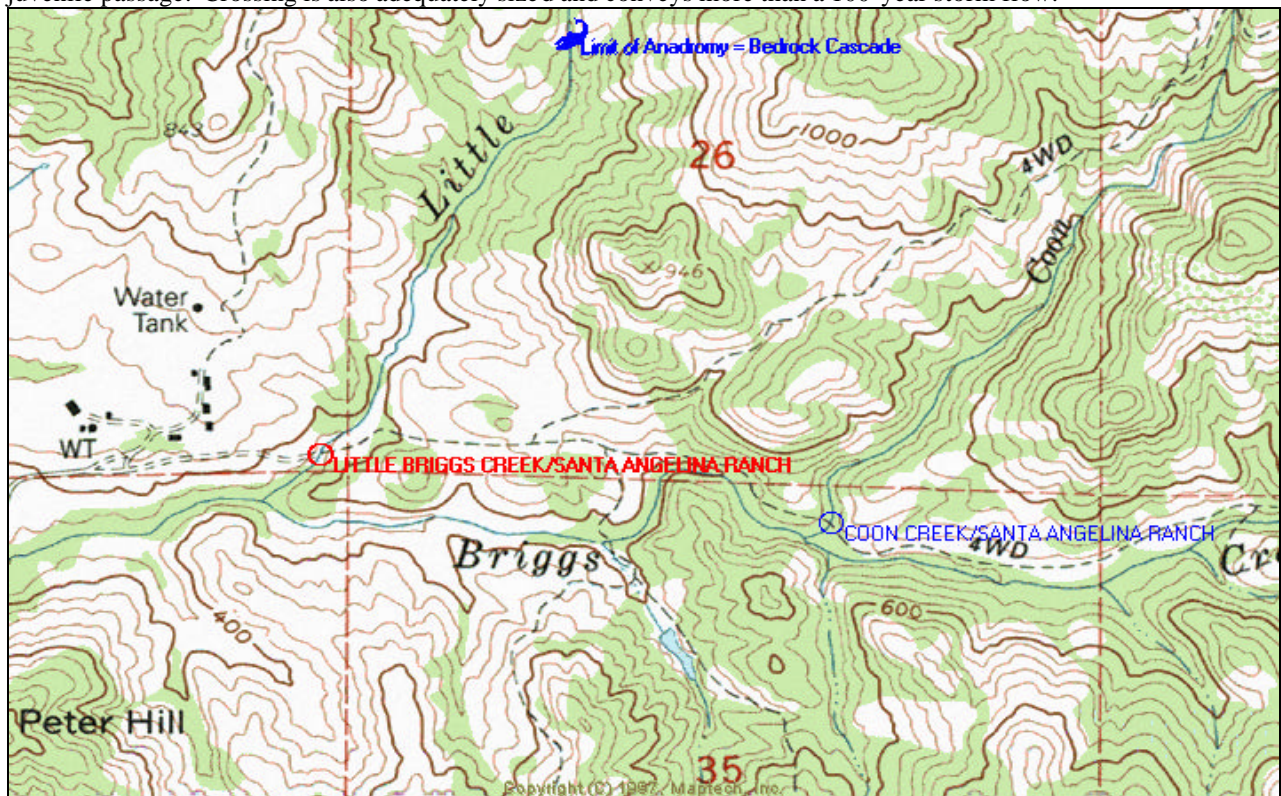
Culvert Type: Five Circular SSP Pipes. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameters = 5.5'
Lengths: 60.7' **Slopes:** LB pipe=0.61%; MLB pipe=0.94%; Mid-pipe=2.21%; MRB pipe=1.75%; RB pipe=0.99%
Modifications: None. **Rustline Heights:** LB pipe=0.6'; MLB pipe=1.7'; Mid-pipe=1.4'; MRB pipe=1.5'; RB pipe=0.8' **Average Active Channel Width:** 23.5' **Fill Estimate:** 708 cubic yards. **Overall Condition:** Fair – inverts are abraded. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 126-year recurrence interval. This private road on Santa Angelina Ranch is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined three culverts at this crossing meet the 8-16-16 ft/sec passage criteria for adult steelhead on (LB = 78%; MRB = 8%; RB = 77%) of the range of migration flows and two culverts meet passage criteria for resident trout/2+ juveniles on (LB = 22%; RB = 44%) of the range of migration flows, and all five culverts fail to meet passage criteria for 1+/young-of-year juvenile salmonids.

Additional Stream Crossings: Downstream = (~700') to confluence with Briggs Creek, (~3,700') to private crossing – status unknown, and (~6,150') to confluence of Briggs and Maacama Creeks. Upstream = none indicated on the USGS map or by CDFG's habitat survey within the fish-bearing stream reach.

Habitat: Quantity = approximately 3,600' of potential fish-bearing habitat upstream of Site ID# S-108. Limit of anadromy was up to a bedrock cascade indicated on the CDFG habitat typing survey. Quality = rated as "fair" for the ranking matrix (quality score = 0.52) as based on CDFG's 1996 habitat typing survey of approximately 5,300' of channel. The lower reach had little to no riparian vegetation and high water temperatures. Pool habitat lacked depth and cover. The crossing was surveyed by Taylor and Assoc. on 1/28/02 and there was continuous surface flow in the channel. At 3:45PM air temp = 5°C and water temp = 8°C. The survey crew described the habitat as "fair" and noted a sparse riparian canopy of hardwoods and a cobble/gravel streambed. No fish were observed.

Preferred Treatment: None recommended because current crossing allows adequate adult passage and some juvenile passage. Crossing is also adequately sized and conveys more than a 100-year storm flow.





Site ID #S-109: Coon Creek/Santa Angelina Ranch; Briggs Ck; Maacama Ck; Russian River **Road Ownership:** Private **County Ranking:** #60 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J. USGS Quad: Mt. St. Helena. T10N, R8W, Section 35. Lat/Long: 38° 40' 40.59" 122° 42' 43.63" Milepost = 2.7 miles to Highway 128.

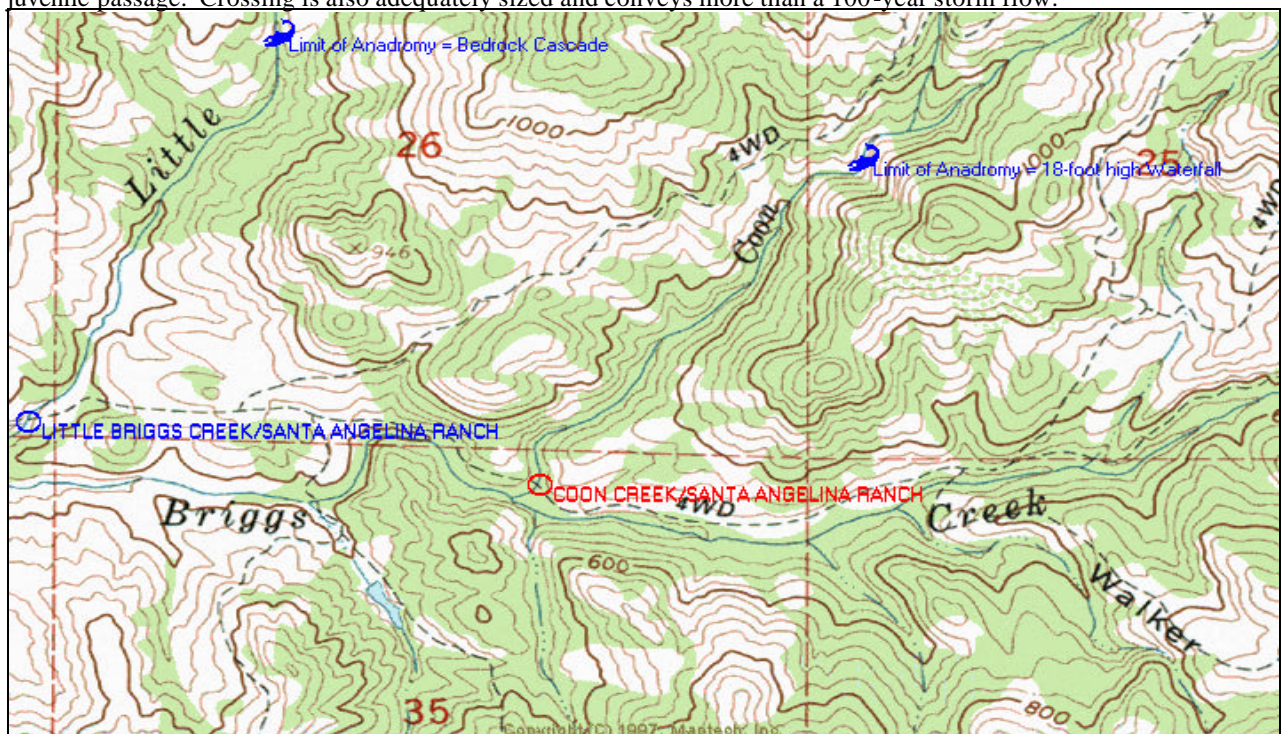
Culvert Type: Four Circular SSP Pipes. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameters = 6.0' **Lengths:** 61.0' **Slopes:** LB Pipe=2.18%; Mid-left Pipe=2.34%; Mid-right Pipe=1.33%; RB pipe=2.39% **Modifications:** None. **Rustline Heights:** LB Pipe=0.8'; Mid-left Pipe=0.9'; Mid-right Pipe=0.8'; RB Pipe=1.1' **Average Active Channel Width:** 26.3' **Fill Estimate:** 1,682 cubic yards. **Overall Condition:** LB Pipe = Fair; Mid-left Pipe = Fair; Mid-right Pipe = Poor; RB Pipe = Poor. **Sizing:** Properly sized; HW/D = 1 on a storm flow with approximately a 111-year recurrence interval. This private road on Santa Angelina Ranch is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined that all four culverts at this crossing meet the 8-16-16 ft/sec passage criteria for adult steelhead on (LB Pipe = 72%; Mid-left Pipe = 80%; Mid-right Pipe = 80%; RB Pipe = 71%) of the range of estimated migration flows, two culverts meet passage criteria for resident trout/2+ juveniles on (LB pipe = 14% and Mid-left pipe = 45%) of the range of migration flows, and all four culverts fail to meet passage criteria for 1+/young-of-year juvenile salmonids.

Additional Stream Crossings: Downstream = (~ 400') to confluence with Briggs Creek, (~5,200') to confluence of Little Briggs and Briggs Creeks, (~ 8,400') to private crossing – status unknown, and (~10,850') to confluence of Briggs and Maacama Creeks. Upstream = none indicated on the USGS map or by CDFG's habitat survey within the fish-bearing stream reach.

Habitat: Quantity = approximately 3,600' of potential fish-bearing habitat upstream of Site ID# S-109. Limit of anadromy was up to an 18-foot high waterfall indicated on the CDFG habitat typing survey. Quality = rated as "fair" for the ranking matrix (quality score = 0.59) as based on CDFG's 1996 habitat typing survey of approximately 4,800' of channel. Three age classes of juvenile steelhead were sampled by CDFG. Pool habitat lacked depth and cover. Shade canopy averaged 77% and good-quality spawning habitat appeared to be limited. The crossing was surveyed by Taylor and Assoc. on 1/29/02 and there was continuous surface flow in the channel. At 3:30PM air temp = 6°C and water temp = 5°C. The survey crew described the habitat as "good" and noted a dense riparian canopy of hardwoods and a cobble/gravel streambed interspersed with boulders. No fish were observed.

Preferred Treatment: None recommended because current crossing allows adequate adult passage and some juvenile passage. Crossing is also adequately sized and conveys more than a 100-year storm flow.





Site ID #S-110: Gird Creek #1/Geysers Road; Russian River **Road Ownership:** County

County Ranking: #72 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 0901B; County Map Sheet #4J12. USGS Quad: Jim Town. T10N, R9W. Lat/Long: 38° 41'30.50" 122° 49' 59.61" Milepost = 10.44 miles

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 8.1' height x 16.0' width **Length:** 63.5' **Slope:** -0.63% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.0' **Fill Estimate:** 945 cubic yards. **Overall Condition:** Good.

Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Geysers Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for all species of adult salmonids and all age classes of juveniles. Box culvert is fully embedded with streambed substrate.

Additional Stream Crossings: Downstream = (~ 1,600') to private crossing – status unknown, (~ 4,600') to Highway 128 crossing – status unknown, and (~6,900') to confluence with Russian River. Upstream = (~ 400') to RB tributary with approximately 4,300 feet of habitat, (~550') to Site ID #S-111, (~ 2,750') to Site ID #S-112, and (~4,350') to private crossing – status unknown.

Habitat: Quantity = approximately 10,550' of potential fish-bearing habitat upstream of Site ID# S-110. Quality = rated as “poor” for the ranking matrix as based on CDFG’s professional judgment (Coey, pers. comm.). Grid Creek was habitat-typed by CDFG in 2001, but the data were not available for the fish passage project. The crossing was surveyed by Taylor and Assoc. on 9/25/01 and the channel was dry. The survey crew described the habitat as “poor” and noted a moderately dense riparian canopy of hardwoods and a highly-aggraded streambed with few habitat features such as pools.

Preferred Treatment: None recommended because current crossing provides unimpeded passage for all age classes of steelhead. Crossing is also adequately sized and conveys more than a 250-year storm flow.





Site ID #S-111: Gird Creek #2/Wilson Road; Russian River **Road Ownership:** County

County Ranking: Tied for #68 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 09004; County Map Sheet #4J12. USGS Quad: Jim Town. T10N, R9W. Lat/Long: 38° 41'34.18" 122° 49' 57.76" Milepost=0.05 miles to Geysers Road.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.1' height x 11.9' width **Length:** 25.5' **Slope:** -0.55% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.1'

Fill Estimate: 166 cubic yards. **Overall Condition:** Good.

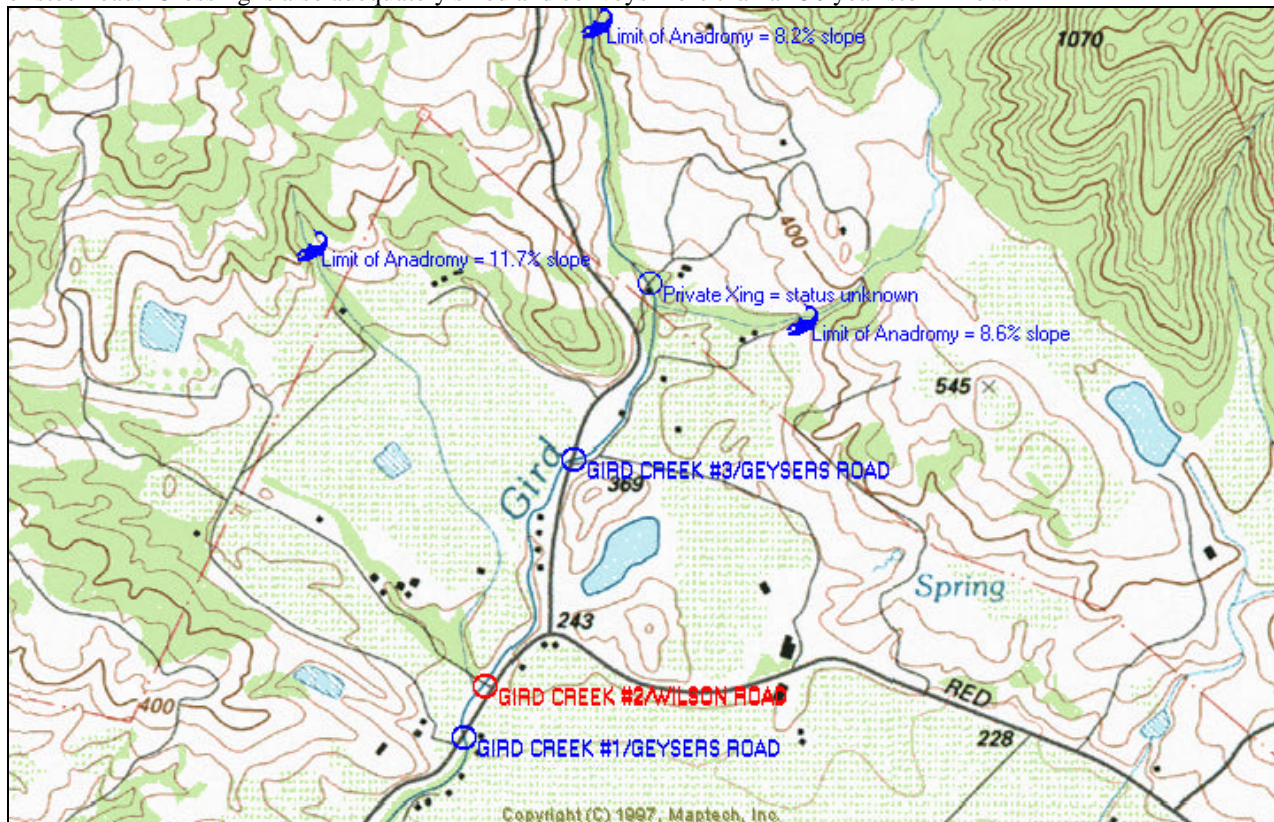
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Wilson Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 82% of the range of estimated migration flows, meets passage criteria for resident trout/2+ juveniles on 57% of the range of estimated migration flows, and meets passage criteria for 1+/young-of-year juveniles on 2% of the range of estimated migration flows.

Additional Stream Crossings: Downstream = (~ 550') to Site ID #S-110, (~ 2,150') to private crossing – status unknown, (~ 5,150') to Highway 128 crossing – status unknown, and (~7,450') to confluence with Russian River. Upstream = (~ 2,200') to Site ID #S-112, and (~ 3,800') to private crossing – status unknown.

Habitat: Quantity = approximately 6,150' of potential fish-bearing habitat upstream of Site ID# S-111. Quality = rated as “poor” for the ranking matrix as based on CDFG’s professional judgment (Coey, pers. comm.). Grid Creek was habitat-typed by CDFG in 2001, but the data were not available for the fish passage project. The crossing was surveyed by Taylor and Assoc. on 9/25/01 and the channel was dry. The survey crew described the habitat as “poor” and noted a moderately dense riparian canopy of hardwoods and a highly-aggraded streambed with few habitat features such as pools.

Preferred Treatment: None recommended because current crossing provides adequate passage for most age classes of steelhead. Crossing is also adequately sized and conveys more than a 250-year storm flow.





Site ID #S-112: Gird Creek #3/Geysers Road; Russian River **Road Ownership:** County

County Ranking: Tied for #78 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 0901B; County Map Sheet #4J12. USGS Quad: Jim Town. T10N, R9W. Lat/Long: 38° 41'50.02" 122° 49' 49.88" Milepost = 10.86 miles

Culvert Type: Open Bottom Arch, SSP. **Corrugations:** 6" x 2" **Dimensions:** 7.2' rise x 19.2' span
Length: 116.5' **Slope:** 1.51% **Modifications:** None. **Rustline Height:** None.
Average Active Channel Width: 11.7' **Fill Estimate:** 1,107 cubic yards. **Overall Condition:** Good.

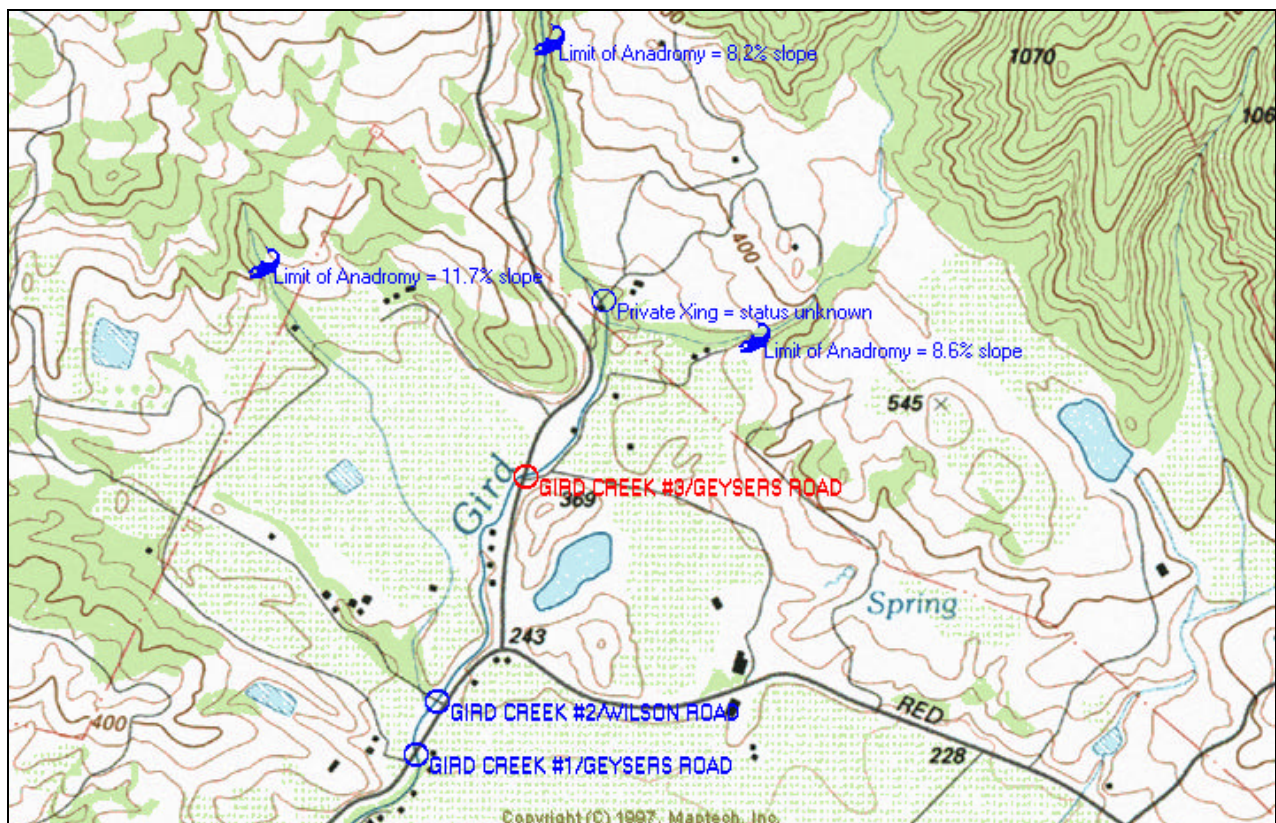
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Geysers Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GREEN:** the Green-Gray-Red filter determined this crossing meets passage criteria for all species of adult salmonids and all age classes of juveniles. The arch culvert is fully embedded with cobbles and gravels and is wider than the average active channel width.

Additional Stream Crossings: Downstream = (~ 2,200') to Site ID #S-111, (~2,750') to Site ID #S-110, (~ 4,350') to private crossing – status unknown, (~ 7,350') to Highway 128 crossing – status unknown, and (~9,650') to confluence with Russian River. Upstream = (~ 1,600') to private crossing – status unknown.

Habitat: Quantity = approximately 4,250' of potential fish-bearing habitat upstream of Site ID# S-112. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). Grid Creek was habitat-typed by CDFG in 2001, but the data were not available for the fish passage project. The crossing was surveyed by Taylor and Assoc. on 9/25/01 and the channel was dry (NOTE: site photos taken on 2/02). The survey crew described the habitat as "poor" and noted a moderately dense riparian canopy of hardwoods and a highly-aggraded streambed with few habitat features such as pools. The survey crew noted extensive areas of vineyards downstream of Site ID #S-112.

Preferred Treatment: None recommended because current crossing provides unimpeded passage of all age classes of steelhead. Crossing is also adequately sized and conveys more than a 250-year storm flow.



Site ID #S-112: Gird Creek #3/Geysers Road; Russian River



Site ID #S-113: Indian Creek/Highway 128; Russian River **Road Ownership:** State

County Ranking: Tied for #32 = Moderate -Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #4J12. USGS Quad: Jim Town. T10N, R9W. Lat/Long: 38° 41' 44.81" 122° 51' 24.57"
Milepost = 8.26 miles

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 6.0' height x 7.9' width **Length:** 26.2'
Slope: 0.99% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 8.1'
Fill Estimate: 261 cubic yards. **Overall Condition:** Fair.

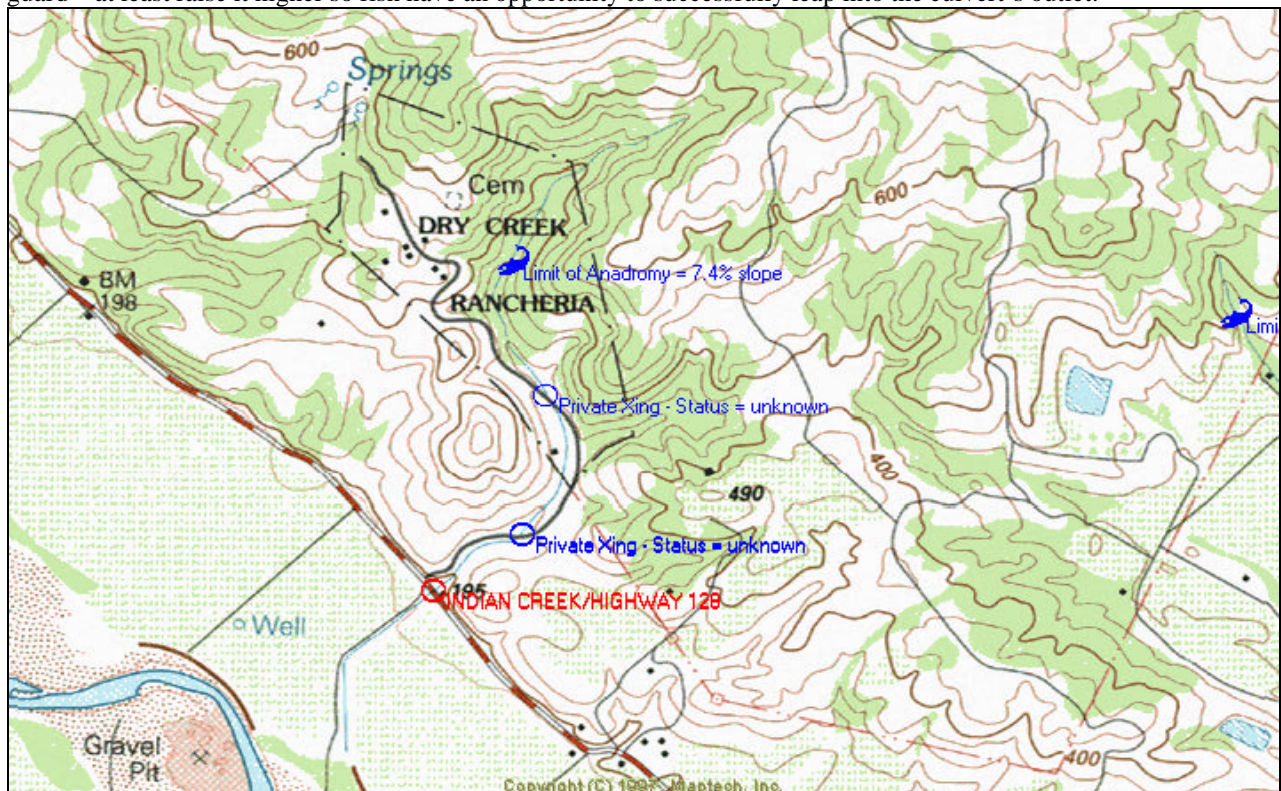
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Highway 128 is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** FishXing determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for adult steelhead and all age classes of juvenile salmonids. For adults the only violation of the passage criteria is lack-of-depth - however the cattle exclusion gate across the outlet probably works effectively in preventing fish migration too. For all age classes of juvenile salmonids the perched outlet impedes migration.

Additional Stream Crossings: Downstream = none indicated on the USGS map - (~ 2,700') to confluence with Russian River. Upstream = (~ 900') to private crossing – status unknown and (~2,150') to a second private crossing – status unknown.

Habitat: Quantity = approximately 3,050' of potential fish-bearing habitat upstream of Site ID# S-113. Quality = rated as “poor” for the ranking matrix as based on Taylor and Associates survey crew’s field notes. The crossing was surveyed on 1/17/02 and there was continuous flow in the channel. At 4:30PM the air temp = 11°C and the water temp = 8.5°C. The survey crew described the habitat as “poor” and noted a channelized stream reach bordered on both sides by vineyards with no riparian zone and a straight, featureless channel with a cobble/gravel bed that was highly embedded with fines. No fish were observed.

Preferred Treatment: Because the current crossing is properly sized, a retrofit is recommended to improve passage. Three to four downstream boulder weirs are needed to raise the tail-water elevation and corner baffles within the box culvert will increase depths and decrease velocities. Also recommend immediate removal or modification of the cattle guard – at least raise it higher so fish have an opportunity to successfully leap into the culvert’s outlet.





Site ID #S-114: Crocker Creek/River Road; Russian River **Road Ownership:** County

County Ranking: Tied for #64 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 1001B; County Map Sheet #4H51. USGS Quad: Asti. T11N, R10W. Lat/Long: 38° 46' 13.59" 122° 58' 13.90" Milepost= 0.05 miles to Riparian Lane.

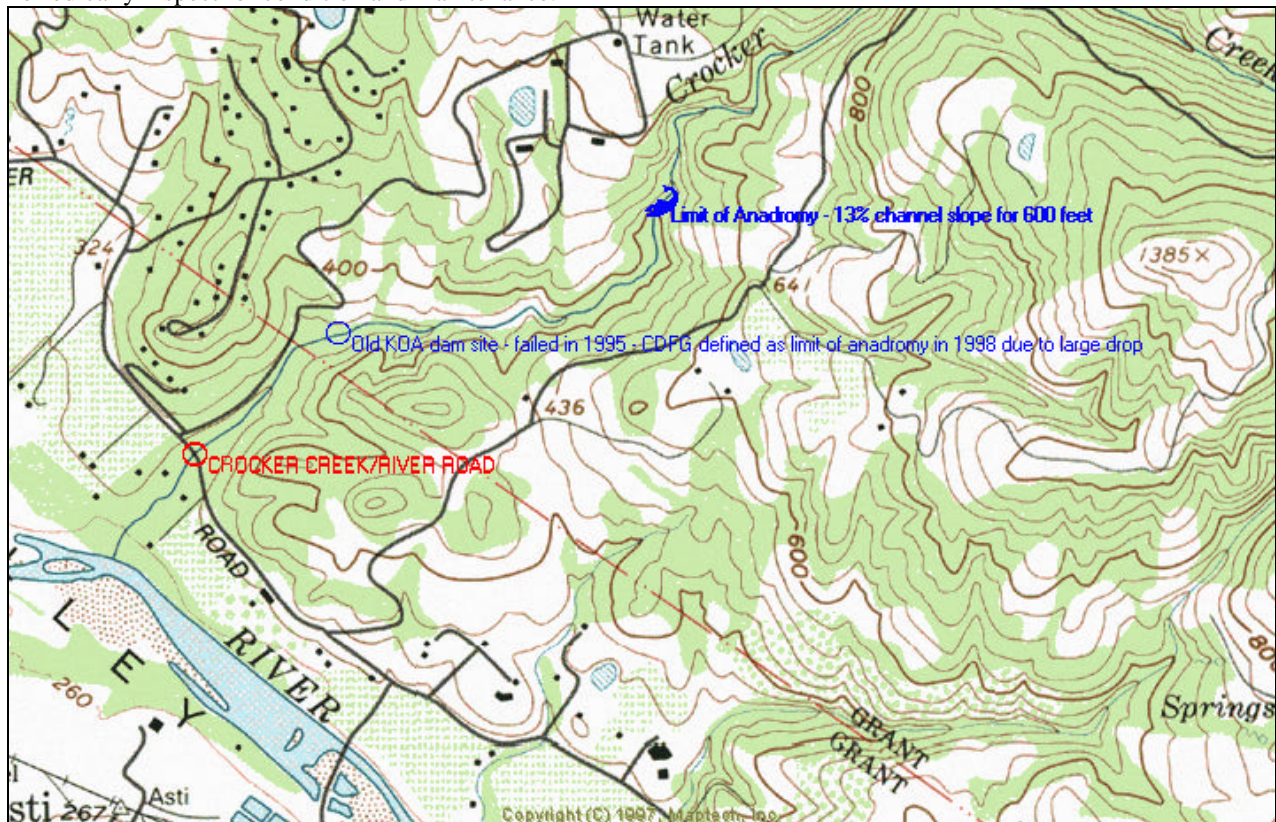
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 3.1' height x 10.0' width **Length:** 29.8' **Slope:** 0.13% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 14.9' **Fill Estimate:** 159 cubic yards. **Overall Condition:** Good. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a one-year recurrence interval. River Road is overtopped on approximately a three-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 96% of the range of estimated migration flows, meets passage criteria for resident trout/2+ juveniles on 92% of the range of estimated migration flows, and meets passage criteria for 1+/young-of-year juveniles on 31% of the range of estimated migration flows.

Additional Stream Crossings: Downstream = none indicated on CDFG's habitat typing survey - (~ 1,200') to confluence with Russian River. Upstream = none indicated on CDFG's habitat typing survey.

Habitat: Quantity = approximately 3,050' of potential fish-bearing habitat upstream of Site ID# S-114 – up to a channel reach with a slope of 13% over a 600-foot distance. It is only 1,600 feet from the crossing to the old dam site that may currently act as the upper limit of anadromy. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates survey crew's field notes. CDFG conducted a habitat typing survey in 1998 of approximately 14,400' of channel. The crossing was surveyed on 1/17/02 and there was continuous flow in the channel. At 4:30PM the air temp = 11°C and the water temp = 8.5°C. The survey crew described the habitat as "poor" and noted a channelized stream reach bordered on both sides by vineyards with no riparian zone and a straight, featureless channel with a cobble/gravel bed that was highly embedded with fines. No fish were observed.

Preferred Treatment: None recommended because current crossing provides adequate passage of most steelhead life stages. Culvert is currently aggraded with sediment moving through Crocker Creek from 1995 dam failure. Periodically inspect for condition and maintenance.





Site ID #S-115: Barrelli Creek/Dutcher Creek Road; Russian River **Road Ownership:** County

County Ranking: Tied for #24 = Moderate-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 0002; County Map Sheet #4H51. USGS Quad: Asti. T11N, R10W, Section 32. Lat/Long: 38° 45' 35.96" 122° 59' 24.13" Milepost=0.5 miles to Theresa Road.

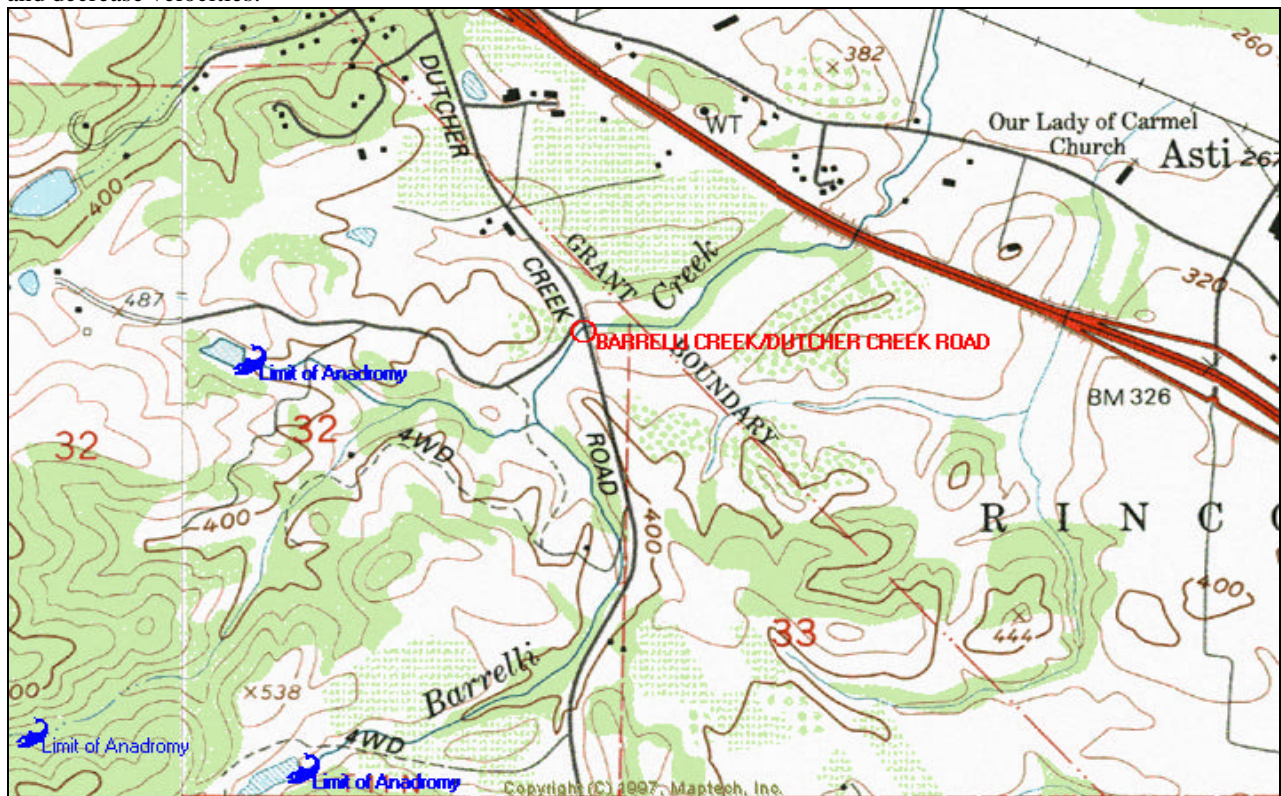
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 5.5' height x 12.0' width **Length:** 111.4' **Slope:** 2.20% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 10.1' **Fill Estimate:** 3,205 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Dutcher Ck Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** FishXing determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for adult steelhead and the passage criteria for all age classes of juvenile salmonids. The culvert's length (>100 feet), set at a moderate slope (2.2%), and a smooth invert (concrete) creates both a lack-of-depth and excessive velocities that impede migration.

Additional Stream Crossings: Downstream = (~2,500') to Highway 101 – status unknown, (~3,600') to bridge on Asti Road, (~4,700') to Railroad crossing – status unknown, and (~5,800') to confluence with Russian River. Upstream = (~950') to fork in Barrelli Creek – Southern fork = (~2,350') to private crossing – status unknown and (~5,400') to private crossing – status unknown, and (~5,750') to dam/reservoir. Northern fork = (~2,100') channel splits again – (~3,600') to dam/reservoir on larger fork, (~3,050') private crossing on smaller tributary – status unknown and (~3,400') to second private crossing on smaller tributary to the Northern fork of Barrelli Creek.

Habitat: Quantity = approximately 13,200' of potential fish-bearing habitat upstream of Site ID# S-115. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.) and Taylor and Associates survey crew's field notes. The crossing was surveyed on 9/26/01 and the channel was dry. The survey crew described the habitat as "poor" and noted a stream reach bordered on both sides by vineyards with a sparse riparian zone and a relatively featureless channel.

Preferred Treatment: Because the current crossing is properly sized and in good condition a retrofit is recommended to improve conditions for fish passage. Construct one to two downstream boulder weirs to raise the tail-water elevation and possibly back-water the culvert. Install corner baffles within the culvert to increase depths and decrease velocities.



Site ID #S-115: Barrelli Creek/Dutcher Creek Road; Russian River



Site ID #S-116: Unnamed Tributary #1 to Russian River/River Road; Russian River **Road Ownership:** County

County Ranking: #39 = Low-Priority

Basin-wide Ranking: less than 20.0 points – not ranked

Location: Road ID# 1001B; County Map Sheet #4H51. USGS Quad: Asti. T11N, R10W. Lat/Long: 38° 46' 34.97" 122° 58' 52.48" Milepost = 0.8 miles to Riparian Lane.

Culvert Type: Circular, SSP. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameter = 4.0' **Length:** 69.8'
Slope: 1.56% **Modifications:** None. **Rustline Height:** 1.3' **Average Active Channel Width:** 7.2'
Fill Estimate: 248 cubic yards. **Overall Condition:** Fair – culvert invert is abraded.

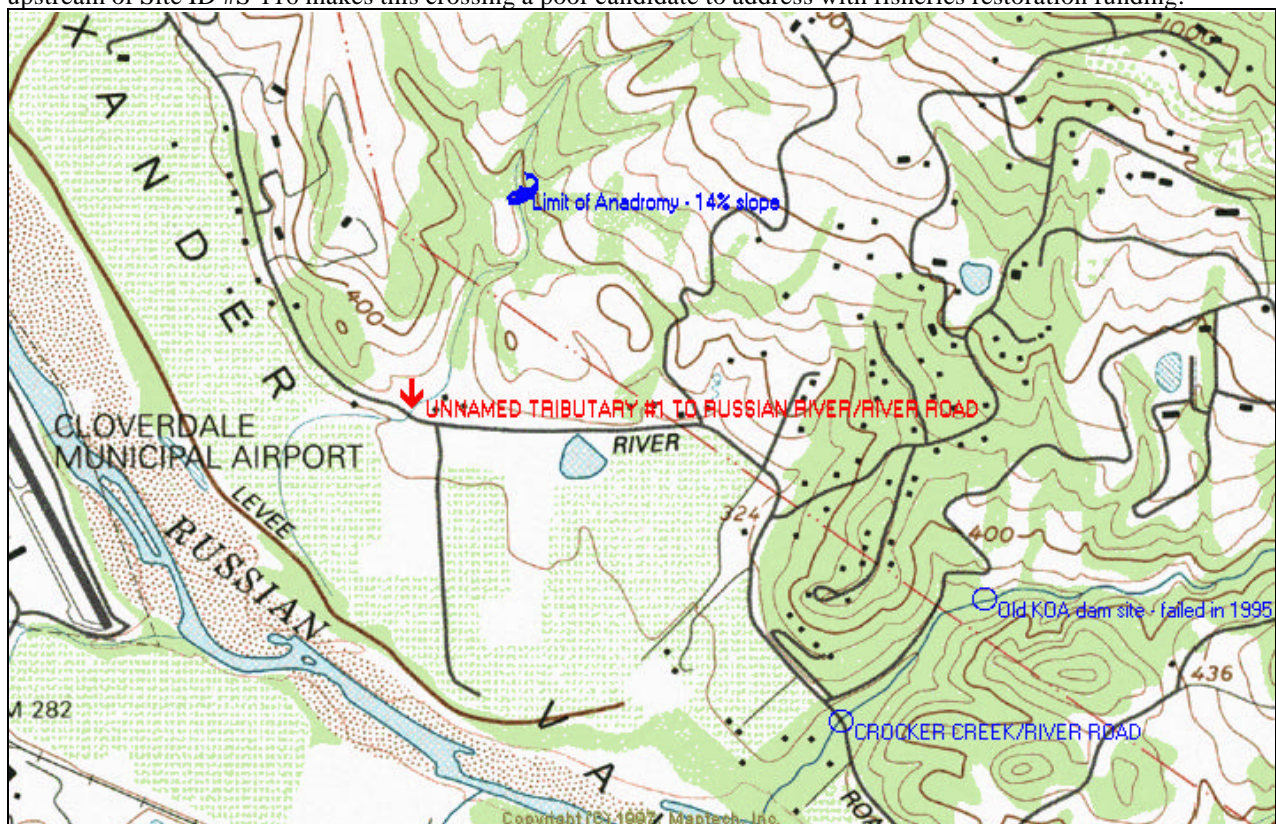
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. River Road is overtopped on approximately a 19-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 98% of the range of estimated migration flows and fails to meet the passage criteria for all age classes of juvenile salmonids. For adults, passage was scored as lower (40-50%) because FishXing failed to account for the lack-of-depth in the outlet pool for a fish to attempt a leap from.

Additional Stream Crossings: Downstream = none indicated on the USGS map - (~ 3,400') to confluence with Russian River. Upstream = none indicated on the USGS map within the fish-bearing stream reach.

Habitat: Quantity = approximately 1,450' of potential fish-bearing habitat upstream of Site ID# S-116. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.) and Taylor and Associates survey crew's field notes. The crossing was surveyed on 9/27/01 and the channel was dry. The survey crew described the habitat as "poor" and noted an aggraded stream reach with a sparse riparian zone and a relatively featureless channel. Survey crew noted storm debris line on upstream side of crossing suggested that culvert is undersized and extensive ponding occurs.

Preferred Treatment: Because the current crossing is undersized, a replacement is the only feasible option for providing fish passage and increasing storm flow capacity. However, the limited reach of poor-quality habitat upstream of Site ID #S-116 makes this crossing a poor candidate to address with fisheries restoration funding.



Site ID #S-116: Unnamed Tributary #1 to Russian River/River Road; Russian River



Site ID #S-117: Icaria Creek/Asti Road; Russian River **Road Ownership:** County

County Ranking: #67 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 0902C; County Map Sheet #4H51. USGS Quad: Asti. T11N, R10W. Lat/Long: 38° 46'30.30" 122° 59' 57.45" Milepost = 0.5 miles to Chrome Iron Road.

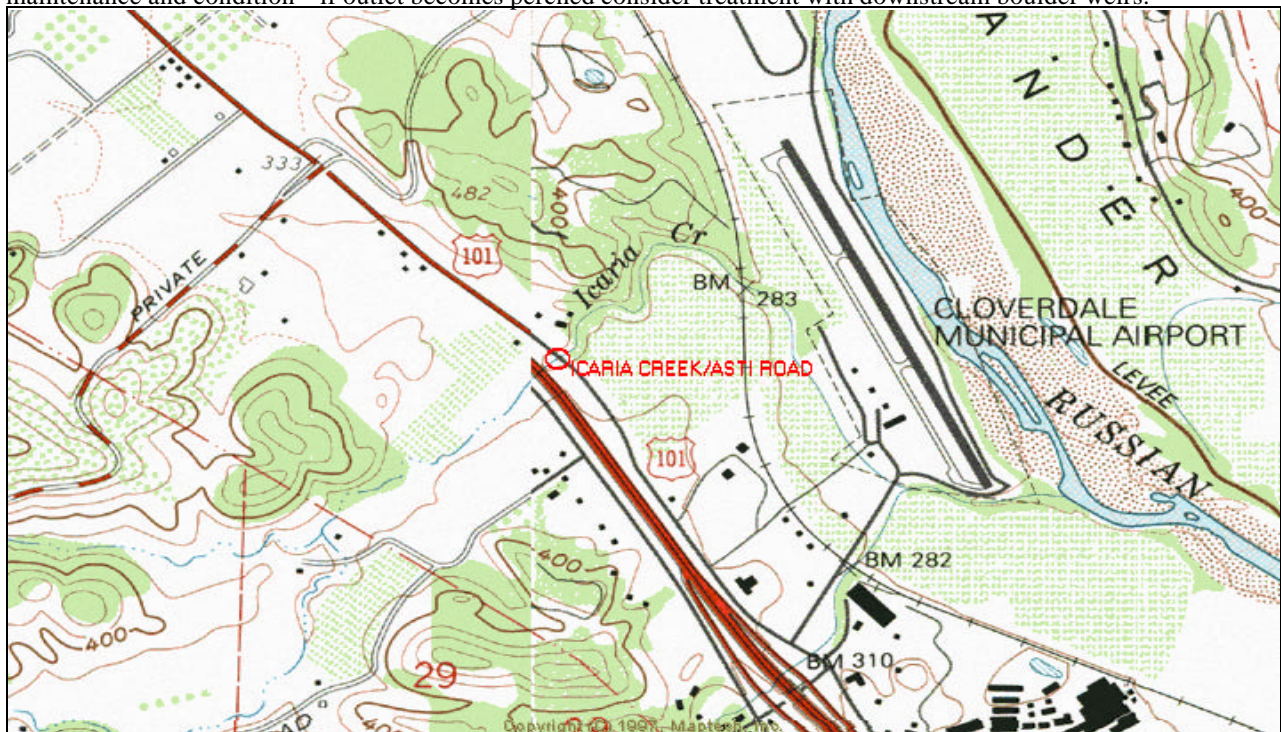
Culvert Type: Two Bay Box, Concrete. **Corrugations:** None. **Dimensions:** 8.1' height x 17.0' width
Length: 33.5' **Slope:** -0.24% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 13.0' **Fill Estimate:** 304 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 42-year recurrence interval. Asti Road is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 100% of the range of estimated migration flows, meets passage criteria for resident trout/2+ juveniles on 72% of the range of estimated migration flows, and meets passage criteria for 1+/young-of-year juveniles on 35% of the range of estimated migration flows.

Additional Stream Crossings: Downstream = (~2,350') to Railroad crossing – status unknown, (~4,200') to crossing at Cloverdale Airport – status unknown, (~4,600') to second crossing at Cloverdale Airport – status unknown, and (~5,900') to confluence with Russian River. Upstream = (~300') to Highway 101 – status unknown, (~2,850') to private crossing, and (~2,800') to split in Icaria Creek channel. Northern tributary = (~6,000') to private crossing on Kelly Road. Southern fork = (~3,150') to private crossing, (~6,900') to split in southern fork – Southern-most fork = (~7,000') to private crossing, (~8,650') to private crossing, (~11,000') to private crossing, and (~12,200') to dam/reservoir. Northern-south fork = (~7,400') to private crossing, (~10,550') to private crossing on Kelly Road, (~11,350') to private crossing on Kelly Road, and (~12,250') to private crossing on Kelly Road. **NOTE:** status of all private crossings is unknown.

Habitat: Quantity = approximately 42,250' of potential fish-bearing habitat upstream of Site ID# S-117. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates survey crew's field notes. The crossing was surveyed on 9/27/01 and the channel was dry. The survey crew described the habitat as "poor" and noted an aggraded stream reach with a moderate riparian zone and a relatively featureless channel. However, a habitat typing survey is recommended to better assess Icaria Creek's habitat quality, fisheries potential, and status of private crossings.

Preferred Treatment: None recommended because the current crossing provides adequate passage for all lifestages of steelhead, is sized to convey nearly a 50-year storm flow, and is in good condition. Periodically inspect for maintenance and condition – if outlet becomes perched consider treatment with downstream boulder weirs.





Site ID #S-118: Unnamed Tributary #2 to Russian River/River Road; Russian River **Road Ownership:** County

County Ranking: Tied for #28 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 4.0' height x 8.1' width **Length:** 31.0'
Slope: 3.90% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 11.7'
Fill Estimate: 136 cubic yards. **Overall Condition:** Good.

Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 13-year recurrence interval. River Road is overtopped on approximately a 118-year storm flow.

Barrier Status: **RED:** FishXing determined this crossing fails to meet the 8-16-16 ft/sec passage criteria adult steelhead and all age classes of juveniles. For adults, the only passage criteria violation for adults was lack-of-depth, so some passage probably occurs. For all age classes of juveniles, the nearly 4% slope over a smooth concrete invert creates excessive velocities.

Additional Stream Crossings: Downstream = none indicated on the USGS map - (~ 2,000') to confluence with Russian River. Upstream = none indicated on the USGS map within the fish-bearing stream reach.

Habitat: Quantity = approximately 800' of potential fish-bearing habitat upstream of Site ID# S-118. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coe, pers. comm.) and Taylor and Associates survey crew's field notes. The crossing was surveyed on 9/27/01 and the channel was dry (NOTE: site photos were taken in 2/02). The survey crew described the habitat as "poor" and noted an aggraded stream reach with a sparse riparian zone and a relatively featureless channel. Channel gradient appeared to increase upstream of crossing.

Preferred Treatment: Because the current crossing is sized for less than a 15-year storm flow, the use of downstream boulder weirs to raise tailwater elevation and corner baffles within the culvert to increase depths and decrease velocities should be cautiously considered. However, the very limited reach of poor-quality habitat upstream of Site ID #S-118 makes this crossing a poor candidate to address with fisheries restoration funding. Recommend dropping in final ranking.



Site ID #S-118: Unnamed Tributary #2 to Russian River/River Road; Russian River



Site ID #S-119: Porterfield Creek/South Cloverdale Boulevard; Russian River **Road Ownership:** City of Cloverdale

County Ranking: Tied for #34 = Moderate -Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: County Map Sheet #3H55. USGS Quad: Cloverdale. T11N, R10W, Section 19. Lat/Long: 38° 47' 29" 123° 01' 00" Milepost = 0.05 miles to Brookside Drive.

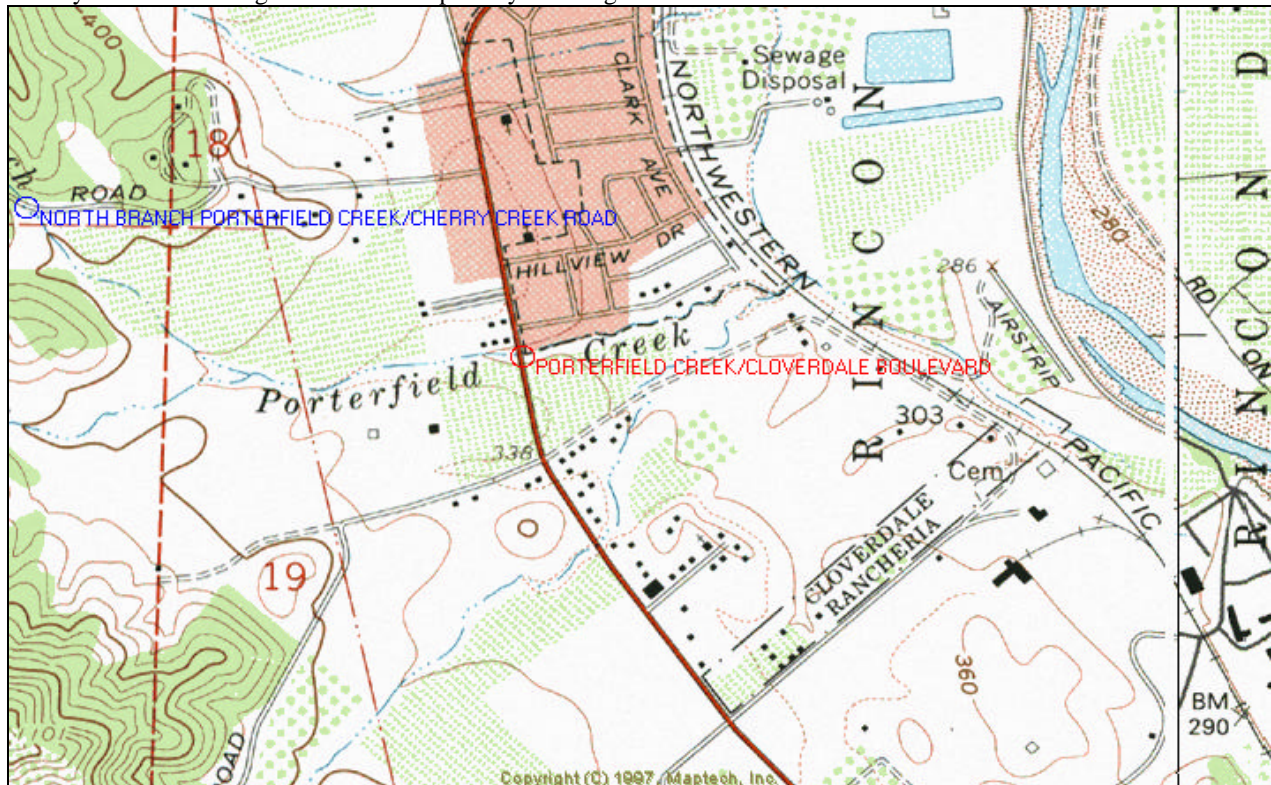
Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.0' height x 10.0' width **Length:** 83.3' **Slope:** 0.82% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 7.8' **Fill Estimate:** 1,196 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. South Cloverdale Boulevard is overtopped on more than a 250-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 70% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. For adults the only criteria violation is lack-of-depth – thus actual passage may be higher than predicted by FishXing. The perched outlet (2.0 feet) impedes the migration of all age classes of juveniles.

Additional Stream Crossings: Downstream = (~3,000') to Railroad crossing – status unknown, (~4,950') to crossing near Cloverdale airstrip – status unknown, and (~6,500') to confluence with Russian River. Upstream = (~4,400') to Site ID #S-120 on the North Branch of Porterfield Creek.

Habitat: Quantity = approximately 9,050' of potential fish-bearing habitat upstream of Site ID# S-119. Quality = rated as “fair” for the ranking matrix as based on Taylor and Associates survey crew’s field notes. The crossing was surveyed on 1/29/02 and there was continuous flow in the channel. At 9:30AM the air temp = 2°C and water temp = 5.5°C. The survey crew described the habitat as “fair” and noted a dense riparian zone of hardwoods and several pools near the crossing. No fish were observed.

Preferred Treatment: Because the current crossing is properly sized and in good condition a retrofit is recommended to improve conditions for fish passage. Construct one to two downstream boulder weirs to raise the tail-water elevation and possibly back-water the culvert. Install corner baffles within the culvert to increase depths and decrease velocities. However, this site provides adequate adult passage and treatment is a low-priority until the County addresses its high and moderate priority crossings.





Site ID #S-120: North Branch/Cherry Creek Road; Porterfield Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #32 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 10006; County Map Sheet #3H55. USGS Quad: Cloverdale. T11N, R11W, Section 13.
Lat/Long: 38° 47' 39.50" 123° 01' 42.83" Milepost = 0.5 miles to Foothill Boulevard.

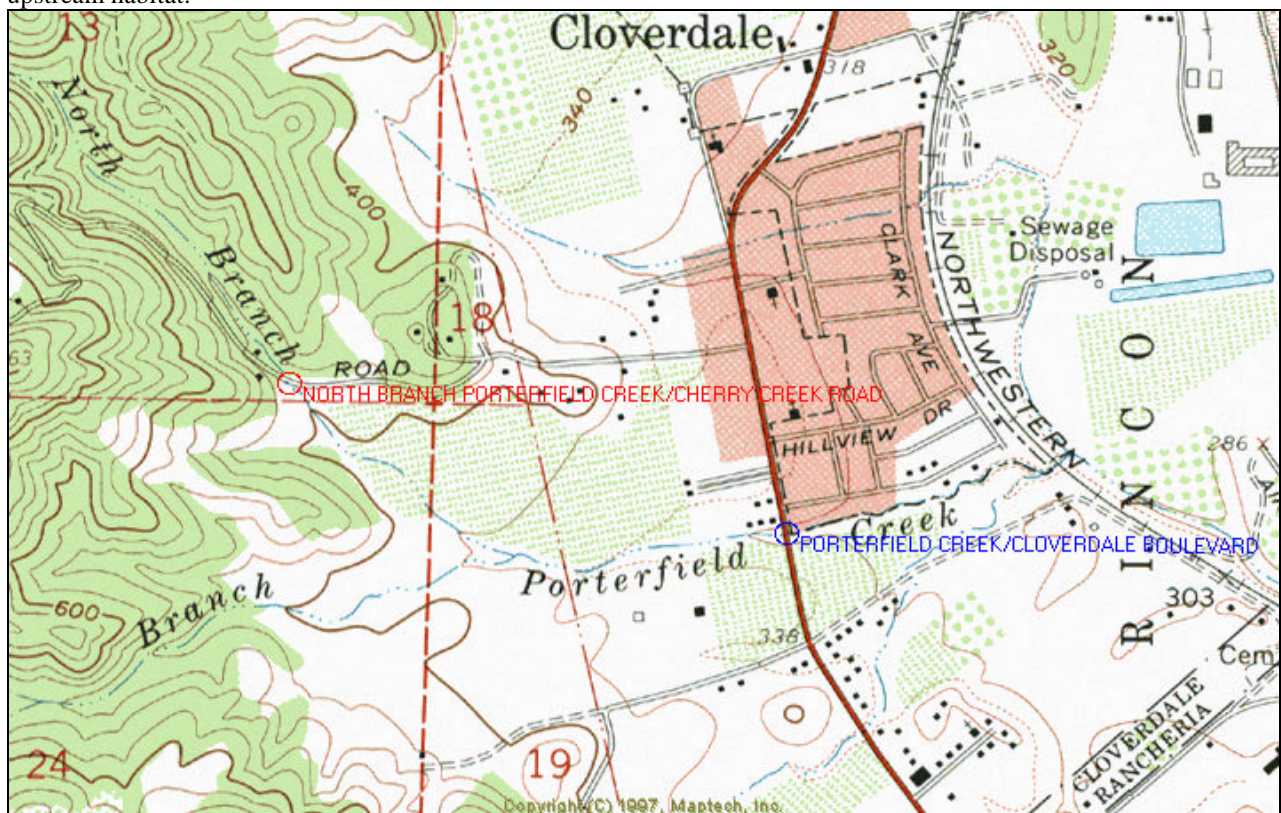
Culvert Type: Circular, CSP. **Corrugations:** 2-2/3" x 1/2" **Dimensions:** diameter = 4.0' **Length:** 60.0'
Slope: 5.58% **Modifications:** None. **Rustline Height:** 0.8' **Average Active Channel Width:** 7.1'
Fill Estimate: 202 cubic yards. **Overall Condition:** Poor – culvert invert is rusted through. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a six-year recurrence interval. Cherry Creek Road is overtopped on approximately a 15-year storm flow.

Barrier Status: **GRAY:** FishXing determined this crossing meets the 8-16-16 ft/sec passage criteria for adult steelhead on 54% of the range of estimated migration flows and fails to meet passage criteria for all age classes of juvenile salmonids. The perched outlet (1.9 feet) impedes the migration of all age classes of juveniles.

Additional Stream Crossings: Downstream = (~4,400') to Site ID #S-119, (~7,400') to Railroad crossing – status unknown, (~9,350') to crossing near Cloverdale airstrip – status unknown, and (~10,900') to confluence with Russian River. Upstream = none indicated on the USGS map within the fish-bearing stream reach.

Habitat: Quantity = approximately 3,100' of potential fish-bearing habitat upstream of Site ID# S-120. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates survey crew's field notes. The crossing was surveyed on 10/01/01 and the channel was dry. The survey crew described the habitat as "poor" and noted a dense riparian zone of hardwoods along a small over-grown channel. The survey crew talked to a local landowner who said the creek only had water in it during and immediately after rain storms and that he had never seen steelhead in this reach of the Porterfield Creek watershed.

Preferred Treatment: Because the current crossing is undersized and in poor condition a replacement with a properly sized embedded SSP culvert is the only feasible option to improve conditions for fish passage and increase the crossing's hydraulic capacity. The crossing is due for an upgrade, however this site provides some adult passage and treatment with fisheries restoration funding is a low-priority due to the limited fisheries significance of the upstream habitat.









Site ID #S-123: Unnamed Tributary/Geysers Road; Big Sulphur Creek; Russian River **Road Ownership:** County

County Ranking: Tied for #23 = Low-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 0901A; County Map Sheet #4H51. USGS Quad: Asti. T11N, R10W, Section 11. Lat/Long: 38° 49' 11.03" 122° 56' 45.74" Milepost= 4.3 miles

Culvert Type: Circular, Concrete. **Corrugations:** None. **Dimensions:** diameter = 4.0' **Length:** 57.1' **Slope:** 6.23% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 8.8'

Fill Estimate: 439 cubic yards. **Overall Condition:** Fair – culvert invert is abraded.

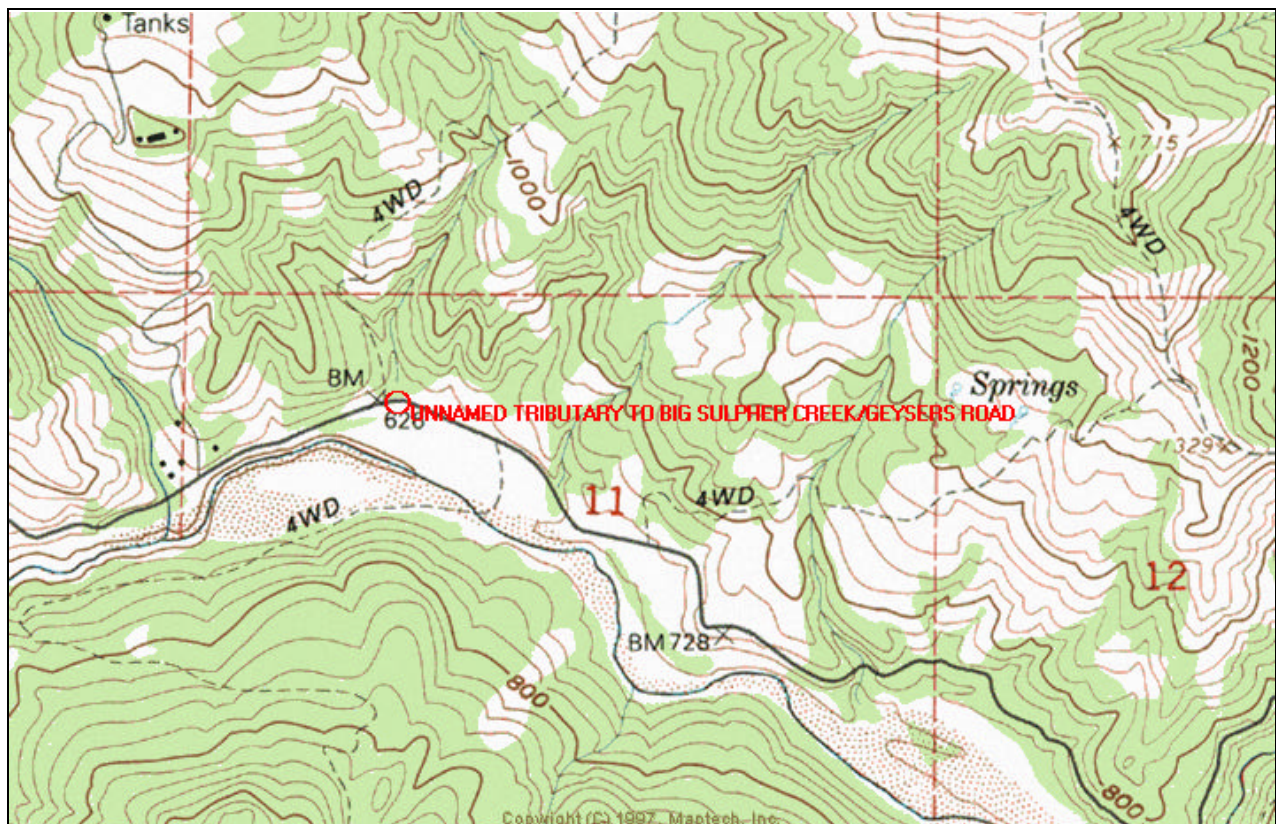
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a five-year recurrence interval. Geysers Road is overtopped on approximately a 32-year storm flow.

Barrier Status: **RED:** the Green-Gray-Red filter determined this crossing fails to meet passage criteria for of adult sateelhead and all age classes of juvenile salmonids due to the crossing's perched outlet and steep slope.

Additional Stream Crossings: Downstream = none - (~550') to confluence with Big Sulphur Creek. Upstream = none indicated on the USGS map within the limited fish-bearing stream reach.

Habitat: Quantity = approximately 650' of potential fish-bearing habitat upstream of Site ID# S-123. Quality = rated as "poor" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). The crossing was surveyed on 10/01/01 and the channel was dry. The survey crew described the habitat as "poor" and noted a sparse riparian zone of hardwoods along a steeply-sloped channel and questioned whether this is a fish-bearing stream channel.

Preferred Treatment: Because the current crossing is extremely undersized, a replacement with a properly sized embedded SSP culvert is the best option for improving fish passage and increasing the crossing's hydraulic capacity. However, due to the limited reach of poor-quality habitat this site should be **dropped** in the final ranking and is a poor candidate for treatment with fisheries restoration funding.





Site ID #S-124: Anna Belcher Creek/Pine Flat Road; Little Sulphur Creek; Big Sulphur Creek; Russian River

Road Ownership: County

County Ranking: Tied for #23 = Moderate-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 09001; County Map Sheet #4J. USGS Quad: Jintown. T10N, R8W, Section 5. Lat/Long: 38° 44' 44.49" 122° 45' 52.67" Milepost = 9.5 miles.

Culvert Type: Box, Concrete. **Corrugations:** None. **Dimensions:** 10.0' height x 13.7' width **Length:** 32.5' **Slope:** 3.51% **Modifications:** None. **Rustline Height:** N/A **Average Active Channel Width:** 13.1' **Fill Estimate:** 445 cubic yards. **Overall Condition:** Good. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Pine Flat Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** FishXing determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for adult steelhead and the passage criteria for all age classes of juvenile salmonids. For adults, some passage probably occurs because the only violation of the passage criteria is lack-of-depth. For all juveniles, the 3.5% slope over a smooth concrete invert creates excessive velocities.

Additional Stream Crossings: Downstream = none indicated on the USGS map - (~ 2,700') to confluence with Little Sulphur Creek. Upstream = none indicated on the USGS map within the fish-bearing stream reach.

Habitat: Quantity = approximately 4,350' of potential fish-bearing habitat upstream of Site ID# S-124. Quality = rated as "fair" for the ranking matrix as based on CDFG's professional judgment (Coey, pers. comm.). CDFG conducted a habitat typing survey of Big Sulphur Creek and its major tributaries, but the data were unavailable for this stream crossing evaluation project. The crossing was surveyed by Taylor and Associates on 9/25/01 and the channel was dry. The survey crew described the habitat as "fair" and noted a moderately dense riparian zone of hardwoods.

Preferred Treatment: Because the current crossing is properly sized and in good condition a retrofit is recommended to improve conditions for fish passage. Construct one to two downstream boulder weirs to raise the tail-water elevation and possibly back-water the culvert. Install corner baffles within the culvert to increase depths and decrease velocities.





Site ID #S-125: Hurley Creek/Pine Flat Road; Little Sulphur Creek; Big Sulphur Creek; Russian River

Road Ownership: County

County Ranking: #27 = Moderate-Priority **Basin-wide Ranking:** less than 20.0 points – not ranked

Location: Road ID# 09001; County Map Sheet #4J. USGS Quad: Jintown. T10N, R8W, Section 5. Lat/Long: 38° 44' 21.43" 122° 45' 57.79" Milepost = 9.0

Culvert Type: Open Bottom Arch, SSP. **Corrugations:** 9.0" x 2.5" **Dimensions:** 7.0' rise x 14.0' span
Length: 35.3' **Slope:** 2.78% **Modifications:** None. **Rustline Height:** 0.0' **Average Active Channel Width:** 9.2' **Fill Estimate:** 142 cubic yards. **Overall Condition:** Sides of culvert are abraded. **Sizing:** Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Pine Flat Road is overtopped on more than a 250-year storm flow.

Barrier Status: **RED:** FishXing determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for adult steelhead and the passage criteria for all age classes of juvenile salmonids. For adults, some passage probably occurs because the only violation of the passage criteria is lack-of-depth. For all juveniles, the small watershed drainage area above the crossing resulted in a narrow range of flows for passage assessment.

Additional Stream Crossings: Downstream = none indicated on the USGS map - (~ 2,700') to confluence with Little Sulphur Creek. Upstream = none indicated on the USGS map within the fish-bearing stream reach.

Habitat: Quantity = approximately 5,200' of potential fish-bearing habitat upstream of Site ID# S-125. Quality = rated as "poor" for the ranking matrix as based on Taylor and Associates survey crew's field notes. CDFG conducted a habitat typing survey of Big Sulphur Creek and its major tributaries, but the data were unavailable for this stream crossing evaluation project. The crossing was surveyed by Taylor and Associates on 9/25/01 and the channel was dry. The survey crew described the habitat as "poor" and noted a sparse riparian zone along a poorly defined channel of questionable value for anadromous salmonids.

Preferred Treatment: Because the current crossing is properly sized and in good condition a retrofit is recommended to improve conditions for fish passage. Construct one to two downstream boulder weirs to raise the tail-water elevation and possibly back-water the culvert to increase depths and decrease velocities. Recommend dropping site in final ranking and treat sites with higher fisheries value before treating Site ID #S-125.

