CATALOG OF HUMBOLDT COUNTY STREAM CROSSINGS WITH CULVERTS LOCATED ON ANADROMOUS STREAM REACHES

Prepared for Humboldt County - Department of Public Works

By Ross Taylor and Associates

<u>NOTE</u>: This catalog contains two pages for each culvert inventoried. The first page consists of location information, site-specific data, passage assessment, habitat notes, treatment recommendations, 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. In any watershed, sites are ordered in an upstream direction, and from lowermost to uppermost road/stream intersection within a watershed.



Stitz Creek/Shivley Road

Ross Taylor and Associates 1254 Quail Run Court McKinleyville, CA 95519 (707)-839-5022 rossntaylor@sbcglobal.net Site ID#HUM-001 : Dinner Creek #1/Briceland-Thorne Road; China Creek; Redwood Creek; South Fork Eel River; Eel River; Road Ownership: Humboldt County Ranking: High-Priority Location: Road ID# F5A010; County Map Sheet #2E. USGS Quad: Briceland. T4S, R2E, Section 23. Lat/Long: 40° 05' 39.86" 123° 55' 47.18" Post Mile: 3.74 Drainage Area upstream of crossing: 1.01 square miles.

Culvert Type: Circular, SSP. **Corrugations:** $22/3^{\circ} x \frac{1}{2^{\circ}}$. **Dimensions: diameter = 6.0'. Length:** 91.6' **Slope:** 1.90% **Modifications:** 11 steel-ramp baffles and concrete tail-water control weir. **Rustline Height:** 2.6'. **Average Active Channel Width:** 11.6'. **Fill Estimate:** 907 cubic yards. **Overall Condition:** Poor– culvert invert is rusted-through. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. Briceland-Thorne Road is overtopped on approximately an 18-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 over 89% of the estimated range of migration flows (6.5 – 33.4 c.f.s.) and fails to meet the passage criteria for all age classes of juvenile salmonids. The FishXing analysis of adult passage assumed that the concrete weir was fully functional in controlling tail-water elevatior; however an inspection of the structure revealed that substantial leakage occurred around and under the weir. The two Hewitt-ramps downstream of the concrete weir have also failed creating a substantial drop over the weir, thus 2 points were added to the "extent of barrier" score in the initial ranking matrix.

Additional Stream Crossings: <u>Downstream</u> – ($\approx 2,000^{\circ}$) to at-grade culvert on private driveway that appears passable, ($\approx 4,900^{\circ}$) to at-grade SSP arch-culverts (two pipes) on private road that appears passable, ($\approx 7,600^{\circ}$) to crossing on private road to Blue Slide Creek – status unknown, ($\approx 9,800^{\circ}$) to bridge on Briceland-Thorne Road, and ($\approx 12,500^{\circ}$) to confluence of Dinner Creek and Redwood Creek. <u>Upstream</u> – ($\approx 3,000^{\circ}$) to Site ID #HUM-002.

Habitat: <u>Quantity</u> = approximately 7,400' of potential fish-bearing habitat upstream of Site ID# HUM-001. <u>Quality</u> = rated as "good" for the ranking matrix based on Taylor and Associates survey crew's field notes. CDFG conducted habitat typing survey in 1995 and confirmed the presence of juvenile coho and steelhead. The crossing was surveyed by Taylor and Associates on 6/27/03 and there was continuous surface flow in the channel. At 9:15AM the air temp = 16° C and the water temp = 13° C. The survey crew noted a dense riparian zone of conifers and hardwoods, streambed substrate of mostly gravels and cobbles, and several good-quality rearing pools adjacent to the crossing. Numerous (>100 fish) juvenile salmonids of several age classes were observed in the stream channel adjacent to Site ID# HUM-001.

Preferred Treatment: A replacement with a properly sized open-bottom arch set on concrete footings or a bridge is the best long-term solution to provide unimpeded passage.



Site ID# HUM-001: Dinner Creek/Briceland-Thorne Road; China Creek; Redwood Creek; South Fork Eel River; Eel River



Site ID#HUM-002: Dinner Creek #2/Briceland-Thorne Road; China Ck; Redwood Creek; South Fork Eel River; Eel River

Road Ownership: Humboldt County **Ranking: High-Priority Location:** Road ID# F5A010; County Map Sheet #2E. USGS Quad: Briceland. T4S, R2E, Section 22. Lat/Long: 40° 05' 29.43" 123° 56' 9.57" **Post Mile:** 3.27 **Drainage Area upstream of crossing:** 0.37 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 2/3" x $\frac{1}{2}$ ". **Dimensions:** diameter = 4.0'. **Length:** 72.0' **Slope:** 3.13% **Modifications:** None. **Rustline Height:** 1.1'. **Average Active Channel Width:** 7.9'. **Fill Estimate:** 687 cubic yards. **Overall Condition:** Fair– culvert invert is abraded and starting to rusted-through. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval. Briceland-Thorne Road is overtopped on approximately a five-year storm flow. The Taylor and Associates field crew noted that the channel was highly aggraded on the upstream side of the crossing. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 – 12.3 c.f.s.). The extremely perched outlet (approximately five feet) is the crossing's main feature that creates a migration barrier for all salmonids. **Additional Stream Crossings:** Downstream – (\approx 3,000') to Site ID #HUM-001, (\approx 5,000') to at-grade culvert on private driveway that appears passable, (\approx 7,900') to at-grade SSP arch-culverts (two pipes) on private road that appears passable, (\approx 10,600') to crossing on private road to Blue Slide Creek – status unknown , (\approx 12,800') to bridge on Briceland-Thorne Road, and (\approx 15,500') to confluence of Dinner Creek and Redwood Creek. <u>Upstream</u> – none indicated on the USGS topographic map within the fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 2,000' of potential fish-bearing habitat upstream of Site ID# HUM-002. <u>Quality</u> = rated as "good" for the ranking matrix based on Taylor and Associates survey crew's field notes. CDFG conducted habitat typing survey in 1995 and confirmed the presence of juvenile coho salmon and steelhead. The crossing was surveyed by Taylor and Associates on 6/27/03 and there was continuous surface flow in the channel. At 11:30AM the air temp = 25° C and the water temp = 13° C. The survey crew noted a dense riparian zone of conifers and hardwoods, streambed substrate of mostly gravels and cobbles, and several good-quality rearing pools adjacent to the crossing. A moderate abundance (10-50 fish) of juvenile salmonids of two age classes was observed in the stream channel downstream of Site ID# HUM-002.

Preferred Treatment: A replacement with a properly sized open-bottom arch set on concrete footings or a bridge is the best long-term solution to provide unimpeded passage. Grade control may be required to minimize potential head-cutting.





Site ID#HUM-003: Stitz Creek/Shivley Road; Eel River Road Ownership: Humboldt County

Ranking: High-Priority Location: Road ID# C4F012; County Map Sheet #1D55. USGS Quad: Scotia. T1N, R1E, Section 15. Lat/Long: 40° 27' 52.86" 124° 03' 6.69" Post Mile: 0.98 Drainage Area upstream of crossing: 3.92 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 2/3" x $\frac{1}{2}$ ". **Dimensions:** diameter = 8.0'. **Length:** 119.8' **Slope:** 2.43% **Modifications:** None. **Rustline Height:** 3.1'. **Average Active Channel Width:** 20.7'. **Fill Estimate:** 6,274 cubic yards. **Overall Condition:** Fair– culvert invert rusted-through and then re-lined with concrete. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval. Shivley Road is overtopped on approximately a 28-year storm flow. The Taylor and Associates field crew noted that the channel was highly aggraded on the upstream side of the crossing. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 89.3 c.f.s.). The extremely perched outlet (approximately five feet) is the crossing's main feature that creates a migration barrier for all salmonids; and if adult salmonids were able to access the culvert it would encounter excessive velocities within the moderately-sloped concrete invert.

Additional Stream Crossings: <u>Downstream</u> – (\approx 1,100') to Railroad crossing – a bridge with a concrete invert that is 8' wide x 40'long. <u>Upstream</u> – none indicated on the USGS topographic map within the fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 8,900' of potential fish-bearing habitat upstream of Site ID# HUM-003. <u>Quality</u> = rated as "fair" for the ranking matrix based on Taylor and Associates survey crew's field notes. CDFG conducted habitat surveys in 1997, 1992, 1990, 1988, 1987, and 1979. Each survey noted numerous potential barriers at the railroad crossing, Shivley Road, and numerous debris jams throughout the lower several thousand feet of channel. The 1997 survey noted that most of the available spawning gravels were highly embedded. The crossing was surveyed by Taylor and Associates on 6/12/03 and there was continuous surface flow in the channel. At 8:30AM the air temp = 12° C and the water temp = 11° C. The survey crew noted a dense riparian zone of conifers and hardwoods, streambed substrate of mostly cobbles and small boulders, and several good-quality rearing pools adjacent to the crossing. Several juvenile salmonids (<10 fish) were observed in the stream channel downstream of Site ID# HUM-003.

Preferred Treatment: A replacement with a properly sized open-bottom arch set on concrete footings or a bridge is the best long-term solution to provide unimpeded passage. Grade control may be required to minimize probable head-cutting.





Site ID#HUM-004: Unnamed Tributary to the Eel River/Shivley Road; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# C4F012; County Map Sheet #2D51. USGS Quad: Redcrest. T1N, R2E, Section 19. Lat/Long: 40° 27' 38.48" 123° 59' 57.49" Post Mile: 5.18 Drainage Area upstream of crossing: 0.51 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 2/3" x $\frac{1}{2}$ ". **Dimensions:** diameter = 4.0'. **Length:** 81.0' **Slope:** 6.47% **Modifications:** None. **Rustline Height:** 1.4'. **Average Active Channel Width:** 20.7'. **Fill Estimate:** 758 cubic yards. **Overall Condition:** Fair– culvert invert rusted-through and then re-lined with 0.5' layer of concrete. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval. Shivley Road is overtopped on approximately a nine-year storm flow. The Taylor and Associates field crew noted that the channel was highly aggraded on the upstream side of the crossing. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 11.7 c.f.s.). The extremely perched outlet (approximately six feet) is the crossing's main feature that creates a migration barrier for all salmonids; and if adult salmonids were able to access the culvert it would encounter excessive velocities over the steeply-sloped concrete invert.

Additional Stream Crossings: <u>Downstream</u> – (\approx 2,200') to Railroad crossing – status unknown. <u>Upstream</u> – none indicated on the USGS topographic map within the fish-bearing stream reach.

Habitat: <u>Quantity</u> = probably less than 500' of potential fish-bearing habitat upstream of Site ID# HUM-004. The channel slope downstream of Shivley Road is >8% and is probably not an anadromous stream reach. <u>Quality</u> = rated as "poor" for the ranking matrix based on Taylor and Associates survey crew's field notes due primarily to the steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/12/03 and there was continuous surface flow in the channel. At 9:00AM the air temp = 16° C and the water temp = 10° C. The survey crew noted a dense riparian zone of conifers and hardwoods, streambed substrate of mostly gravel and cobble. However; the surrounding hill-slopes were heavily logged with numerous fresh clear-cuts. No fish were observed in the stream channel adjacent to Site ID# HUM-004.





Site ID#HUM-005: Darnell Creek/Shivley Road; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# C4F012; County Map Sheet #2D51. USGS Quad: Redcrest. T1N, R2E, Section 20. Lat/Long: 40° 27' 8.20" 123° 58' 58.72" Post Mile: 6.74 Drainage Area upstream of crossing: 0.80 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 2/3" x $\frac{1}{2}$ ". **Dimensions:** diameter = 5.0°. **Length:** 60.6° **Slope:** 4.83% **Modifications:** None. **Rustline Height:** 1.4°. **Average Active Channel Width:** 20.7°. **Fill Estimate:** 521 cubic yards. **Overall Condition:** Fair– culvert invert rusted-through and then re-lined with 0.6° layer of concrete. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval. Shivley Road is overtopped on approximately a 12-year storm flow. The Taylor and Associates field crew noted that the channel was highly aggraded on the upstream side of the crossing. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 11.7 c.f.s.). The extremely perched outlet (approximately six feet) that cascades over rip-rap is the crossing's main feature that creates a migration barrier for all salmonids; and if adult salmonids were able to access the culvert it would encounter excessive velocities over the steeply-sloped concrete invert.

Additional Stream Crossings: <u>Downstream</u> – (\approx 1,200') to Railroad crossing – trestle bridge that permits passage. <u>Upstream</u> – none indicated on the USGS topographic map within the fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 1,300' of potential fish-bearing habitat upstream of Site ID# HUM-005. <u>Quality</u> = rated as "fair" for the ranking matrix based on Taylor and Associates survey crew's field notes due primarily to the steep channel slope. Approximately 1,300' of Darnell Creek was habitat-typed by CDFG in 1992. The CDFG survey noted highly embedded gravels, moderate shelter ratings in pool habitats, and several juvenile steelhead in the lower survey reach. The crossing was surveyed by Taylor and Associates on 6/12/03 and there was continuous surface flow in the channel. At 9:00AM the air temp = 16° C and the water temp = 10° C. The survey crew noted a dense riparian zone of conifers and hardwoods, streambed substrate of mostly gravel and cobble. However; the surrounding hill-slopes were heavily logged with numerous fresh clear-cuts. No fish were observed in the stream channel adjacent to Site ID# HUM-005.





Site ID#HUM-006: Panther Creek/Shivley Road; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# C4F012; County Map Sheet #2D51. USGS Quad: Redcrest. T1N, R2E, Section 28. Lat/Long: 40° 26' 33.21" 123° 57' 53.19" Post Mile: 8.64 Drainage Area upstream of crossing: 0.69 square miles.

Culvert Type: Circular, SSP. **Corrugations:** $2 \frac{2}{3}$ " x $\frac{1}{2}$ ". **Dimensions:** diameter = 7.0'. **Length:** 77.2' **Slope:** 8.98% **Modifications:** None. **Rustline Height:** 1.4'. **Average Active Channel Width:** 12.0'. **Fill Estimate:** 521 cubic yards. **Overall Condition:** Fair– culvert invert is rusted/abraded and sections of pipe starting to bow and separate. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 33-year recurrence interval. However, Shivley Road is overtopped on approximately more than a 250-year storm flow.

Barrier Status: RED: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 17.4 c.f.s.). The culvert's steep slope is the crossing's main feature that creates a migration barrier for all salmonids.

Additional Stream Crossings: <u>Downstream</u> – (\approx 4,300') to Northwestern railroad crossing – status unknown. <u>Upstream</u> – none indicated on the USGS topographic map within the fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 2,100' of potential fish-bearing habitat upstream of Site ID# HUM-006. However; there is a steep channel reach approximately 1,500' downstream of Shivley Road that may prevent anadromous salmonids from even reaching the County-maintained crossing. <u>Quality</u> = rated as "fair" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/12/03 and there was continuous surface flow in the channel. At 3:00PM the air temp = 19° C and the water temp = 13° C. The survey crew noted a dense riparian zone of conifers and hardwoods, streambed substrate of mostly gravel and cobble. No fish were observed in the stream channel adjacent to Site ID# HUM-006.





Site ID#HUM-007: Mill Creek/Alderpoint Road; Larabee Creek; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# F6B165; County Map Sheet #2E. USGS Quad: Larabee Valley. T1S, R4E, Section 8. Lat/Long: 40° 23' 17.26" 123° 44' 21.52" Post Mile: 38.94 Drainage Area upstream of crossing: 3.55 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 6" x 2". **Dimensions:** diameter = 13.0'. **Length:** 144.7' **Slope:** 10.35% **Modifications:** Steel plates installed to protect invert from abrasion during bedload transport. **Rustline Height:** 1.4'. **Average Active Channel Width:** 17.6'. **Fill Estimate:** 4,604 cubic yards. **Overall Condition:** Poor– culvert invert is rusted-through. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 40-year recurrence interval. However, Alderpoint Road is overtopped on approximately more than a 250-year storm flow.

Barrier Status: RED: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 113.9 c.f.s.). The culvert's extremely steep slope is the crossing's main feature that creates a migration barrier for all salmonids.

Additional Stream Crossings: <u>Downstream</u> – none indicated on the USGS topographic map. Approximately 4,100' to confluence of Mill Creek and Larabee Creek. <u>Upstream</u> – none indicated on the USGS topographic map.

Habitat: <u>Quantity</u> = approximately 1,300' of potential fish-bearing habitat upstream of Site ID# HUM-007. However; there is are two steep channel reaches (16% and 12%) downstream of Alderpoint Road that may prevent anadromous salmonids from even reaching the County-maintained crossing. <u>Quality</u> = rated as "fair to poor" for the ranking matrix based on Taylor and Associates survey crew's field notes due primarily to steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/17/03 and there was continuous surface flow in the channel. At 10:45AM the air temp = 15°C and the water temp = 12°C. The survey crew noted a dense riparian zone of mostly hardwoods and a steep, boulder-strewn channel. Several (<10 fish) juvenile fish of unknown species were observed in the stream channel downstream of Site ID# HUM-007.





Site ID#HUM-008: Knack Creek/Alderpoint Road; Larabee Creek; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# F6B165; County Map Sheet #2E. USGS Quad: Larabee Valley. T1S, R4E, Section 17. Lat/Long: 40° 22' 45.99" 123° 44' 27.65" **Post Mile:** 38.13 **Drainage Area upstream of crossing:** 1.03 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 - 2/3" x 1/2". **Dimensions:** diameter = 7.0'. **Length:** 103.7' **Slope:** 10.71% **Modifications:** None. **Rustline Height:** 2.5'. **Average Active Channel Width:** 8.7'. **Fill Estimate:** 7,625 cubic yards. **Overall Condition:** Poor– culvert invert is rusted-through and has a new floor weldedin. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 11-year recurrence interval. However, Alderpoint Road is overtopped on approximately a 137-year storm flow.

Barrier Status: RED: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 33.1 c.f.s.). The culvert's perched inlet and extremely steep slope are the crossing's two main features that create a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> – none indicated on the USGS topographic map. Approximately 4,100' to confluence of Knack Creek and Larabee Creek. <u>Upstream</u> – none indicated on the USGS topographic map.

Habitat: <u>Quantity</u> = less than 500 feet of potential fish-bearing habitat upstream of Site ID# HUM-008 and there is a steep channel reach (slope = 16.6%) downstream of Alderpoint Road that probably prevents anadromous salmonids from even reaching the County-maintained crossing. <u>Quality</u> = rated as "fair to poor" for the ranking matrix based on Taylor and Associates survey crew's field notes due primarily to steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/17/03 and there was continuous surface flow in the channel. At 2:00PM the air temp = 15° C and the water temp = 12° C. The survey crew noted a dense riparian zone of mostly hardwoods and a steep, boulder-strewn channel. No fish were observed in the stream channel adjacent to Site ID# HUM-008.





Site ID#HUM-009: Frost Creek/Alderpoint Road; Larabee Creek; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# F6B165; County Map Sheet #2E. USGS Quad: Larabee Valley. T1S, R4E, Section 17. Lat/Long: 40° 22' 31.34" 123° 44' 18.25" Post Mile: 37.76 Drainage Area upstream of crossing: 0.66 square miles.

Culvert Type: Circular, CSP. **Corrugations:** $2 - 2/3^{\circ} \times 1/2^{\circ}$ with spiral corrugations. **Dimensions:** diameter = 4.0'. **Length:** 121.2' **Slope:** 3.99% **Modifications:** None. **Rustline Height:** 2.5'. **Average Active Channel Width:** 8.7'. **Fill Estimate:** 7,625 cubic yards. **Overall Condition:** Fair– invert is abraded in several areas. **Sizing:** Extremely Undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. However, Alderpoint Road is overtopped on approximately a 26-year storm flow. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 21.3 c.f.s.). The culvert's perched inlet (at least seven feet) is the crossing's main feature that creates a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> – none indicated on the USGS topographic map. Approximately 1,600' to confluence of Frost Creek and Larabee Creek. <u>Upstream</u> – none indicated on the USGS topographic map; however the Taylor and Associates field crew observed a concrete box culvert approximately 100' upstream of Alderpoint Road which appeared passable.

Habitat: <u>Quantity</u> = less than 500 feet of potential fish-bearing habitat upstream of Site ID# HUM-009 and there is a steep channel reach (slope = 13.3%) downstream of Alderpoint Road that probably prevents anadromous salmonids from even reaching the County-maintained crossing. <u>Quality</u> = rated as "fair to poor" for the ranking matrix based on Taylor and Associates survey crew's field notes due primarily to steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/17/03 and there was continuous surface flow in the channel. At 3:25PM the air temp = 20° C and the water temp = 14° C. The survey crew noted a dense riparian zone of mostly hardwoods and a steep boulder-strewn channel. No fish were observed in the stream channel adjacent to Site ID# HUM-009.





Site ID#HUM-010: Bosworth Creek/Alderpoint Road; Larabee Creek; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# F6B165; County Map Sheet #2E. USGS Quad: Larabee Valley. T1S, R4E, Section 22. Lat/Long: 40° 21' 21.85" 123° 43' 3.76" Post Mile: 35.67 Drainage Area upstream of crossing: 1.07 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 -2/3" x 1/2". However, invert is lined with 0.8' of concrete **Dimensions:** diameter = 7.0'. **Length:** 191.8' **Slope:** 18.15% **Modifications:** None. **Rustline Height:** no observable rustline. **Average Active Channel Width:** 10.9'. **Fill Estimate:** 2,074 cubic yards. **Overall Condition:** Fair– invert is abraded in several areas. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately an 11-year recurrence interval. However, Alderpoint Road is overtopped on approximately a 156-year storm flow.

Barrier Status: RED: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 34.3 c.f.s.). The culvert's extremely steep slope (>18%) is the crossing's main feature that creates a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> – none indicated on the USGS topographic map. Approximately 1,100' to confluence of Bosworth Creek and Larabee Creek. <u>Upstream</u> – none indicated on the USGS topographic map.

Habitat: <u>Quantity</u> = less than 500 feet of potential fish-bearing habitat upstream of Site ID# HUM-010 and there is a steep channel reach (slope = 16.3%) downstream of Alderpoint Road that probably prevents anadromous salmonids from even reaching the County-maintained crossing. <u>Quality</u> = rated as "fair to poor" for the ranking matrix based on Taylor and Associates survey crew's field notes due primarily to steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/18/03 and there was continuous surface flow in the channel. At 9:00AM the air temp = 14°C and the water temp = 12°C. The survey crew noted a dense riparian zone of mostly hardwoods and a steep boulder-strewn channel. Several (<10 fish) juvenile salmonids were observed in the stream channel downstream of Site ID# HUM-010.





Site ID#HUM-011: Unnamed Tributary #1 to Larabee Creek/Alderpoint Road; Larabee Creek; Eel River

Road Ownership: Humboldt County Ranking: Low-Priority

Location: Road ID# F6B165; County Map Sheet #2E. USGS Quad: Blocksburg. T1S, R4E, Section 27. Lat/Long: 40° 21' 4.84" 123° 42' 57.94" **Post Mile:** 35.27 **Drainage Area upstream of crossing:** 0.41 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 -2/3" x 1/2". However, invert is lined with 0.3' of concrete **Dimensions:** diameter = 5.0'. **Length:** 57.9' **Slope:** 5.91% **Modifications:** None. **Rustline Height:** 1.3'. **Average Active Channel Width:** 9.2'. **Fill Estimate:** 406 cubic yards. **Overall Condition:** Extremely Poor – sections at outlet have broken-off. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately an nine-year recurrence interval and Alderpoint Road is overtopped on approximately a 20-year storm flow.

Barrier Status: RED: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 13.0 c.f.s.). The culvert's steep slope (>5%) is the crossing's main feature that creates a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> – none indicated on the USGS topographic map. Approximately 350' to confluence of unnamed tributary and Larabee Creek. <u>Upstream</u> – none indicated on the USGS topographic map.

Habitat: <u>Quantity</u> = less than 500 feet of potential fish-bearing habitat upstream of Site ID# HUM-011 and the crossing is located in a steep channel reach (slope = 14%). <u>Quality</u> = rated as "fair to poor" for the ranking matrix based on Taylor and Associates survey crew's field notes due primarily to steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/18/03 and there was continuous surface flow in the channel. At 11:15AM the air temp = 16°C and the water temp = 13°C. The survey crew noted a dense riparian zone of mostly hardwoods and a steep, boulder-strewn channel. No fish were observed in the stream channel adjacent to Site ID# HUM-011.

Preferred Treatment: Although the upstream channel has limited,, if any, salmonid habitat the crossing is in very poor condition and should be replaced before it fails. Recommend replacement with a properly sized SSP pipe to improve storm-flow capacity. The stream should be surveyed for fish presence to determine if meeting fish-passage design criteria is required for a replacement crossing.



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Site ID#HUM-012: Unnamed Tributary #2 to Larabee Creek/Alderpoint Road; Larabee Creek; Eel River

Road Ownership: Humboldt County Ranking: Low-Priority

Location: Road ID# F6B165; County Map Sheet #2E. USGS Quad: Blocksburg. T1S, R4E, Section 27. Lat/Long: 40° 20' 49.07" 123° 42' 36.10" **Post Mile:** 34.79 **Drainage Area upstream of crossing:** 0.55 square miles.

Culvert Type: Circular, CSP. **Corrugations:** $2 - 2/3^{\circ} \times 1/2^{\circ}$. However, invert is lined with 0.3' of concrete **Dimensions:** diameter = 4.0'. **Length:** 81.8' **Slope:** 11.98% **Modifications:** None. **Rustline Height:** 1.6'. **Average Active Channel Width:** 11.4'. **Fill Estimate:** 1,452 cubic yards. **Overall Condition:** Poor – culvert is squashed and invert is rusted-through. **Sizing:** Extremely Undersized; HW/D = 1 on a storm flow with approximately an four-year recurrence interval and Alderpoint Road is overtopped on approximately a 18-year storm flow.

Barrier Status: RED: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 13.0 c.f.s.). The culvert's extremely steep slope (>11%) is the crossing's main feature that creates a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> – none indicated on the USGS topographic map. Approximately 150' to confluence of unnamed tributary and Larabee Creek. <u>Upstream</u> – none indicated on the USGS topographic map.

Habitat: <u>Quantity</u> = less than 500 feet of potential fish-bearing habitat upstream of Site ID# HUM-012 and the crossing is located in a steep channel reach (slope = 11.3%). <u>Quality</u> = rated as "fair to poor" for the ranking matrix based on Taylor and Associates survey crew's field notes due primarily to steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/18/03 and there was continuous surface flow in the channel. At 12:00PM the air temp = 20°C and the water temp = 14.5°C. The survey crew noted a dense riparian zone of mostly hardwoods and a steep, boulder-strewn channel. No fish were observed in the stream channel adjacent to Site ID# HUM-012.

Preferred Treatment: Although the upstream channel has limited, if any, salmonid habitat the crossing is in very poor condition and should be replaced before it fails. Recommend replacement with a properly sized SSP pipe to improve storm-flow capacity. The stream should be surveyed for fish presence to determine if meeting fish-passage design criteria is required for a replacement crossing.





Site ID#HUM-013: Mountain Creek/Alderpoint Road; Larabee Creek; Eel River Road Ownership: Humboldt County

Ranking: Medium-Priority Location: Road ID# F6B165; County Map Sheet #2E. USGS Quad: Blocksburg. T2S, R5E, Section 18. Lat/Long: 40° 17' 39.74" 123° 38' 54.59" Post Mile: 29.05 Drainage Area upstream of crossing: 1.73 square miles.

Culvert Type: Circular, SSP. **Corrugations:** $2 - 2/3^{\circ} \times 1/2^{\circ}$. However, invert is lined with 0.3' of concrete **Dimensions:** diameter = 8.0'. **Length:** 81.0' **Slope:** 1.31% **Modifications:** None. **Rustline Height:** 2.2'. **Average Active Channel Width:** 13.6'. **Fill Estimate:** 755 cubic yards. **Overall Condition:** Poor – culvert invert is rusted-through and torn in several places. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 10-year recurrence interval and Alderpoint Road is overtopped on approximately a 33-year storm flow.

Barrier Status: GRAY: FishXing determined this crossing meet the 8-16-16 ft/sec passage criteria for all adult salmonids over 33% of the range of estimated of migration flows (between 11.7 - 29.0 c.f.s.). At lower migration flows FishXing predicted a lack-of-depth and between 30 and 55 c.f.s. FishXing predicted excessive velocities through the culvert. FishXing determined this crossing failed to meet the passage criteria for all age classes of juvenile salmonids.

Additional Stream Crossings: <u>Downstream</u> – none indicated on the USGS topographic map. Approximately 300' to confluence of Mountain Creek and Larabee Creek. <u>Upstream</u> – none indicated on the USGS topographic map within the fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 2,400 feet of potential fish-bearing habitat upstream of Site ID# HUM-013. <u>Quality</u> = rated as "good" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/19/03 and there was continuous surface flow in the channel. At 2:00PM the air temp = 19°C and the water temp = 14° C. The survey crew noted a moderately dense riparian zone of mostly hardwoods through agricultural fields on both sides of the road. Extremely abundant numbers (>100 fish) of juveniles salmonids were observed in the stream channel both upstream and downstream of Site ID# HUM-013. Two fish appeared to be in the 3"-6" size class and the rest were young-of-year fry.

Preferred Treatment: Recommend replacement with a properly sized open-bottom arch set on concrete footings provide unimpeded passage and to improve storm-flow capacity. The replacement should also correct the poor alignment the existing crossing has with the stream channel.



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Site ID#HUM-013: Mountain Creek/Alderpoint Road; Larabee Creek; Eel River



Site ID#HUM-014: Poison Oak Creek/Dyerville Loop Road; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# 6D100; County Map Sheet #2E. USGS Quad: Weott. T1S, R2E, Section 36. Lat/Long: 40° 20' 18.17" 123° 53' 55.85" Post Mile: 2.56 Drainage Area upstream of crossing: 1.61 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 - 2/3" x 1/2". **Dimensions:** diameter = 7.0'. **Length:** 71.2' **Slope:** -0.17% **Modifications:** None. **Rustline Height:** 5.0'. **Average Active Channel Width:** 14.2'. **Fill Estimate:** 345 cubic yards. **Overall Condition:** Poor – culvert invert is rusted-through. **Sizing:** Extremely Undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval and Dyerville Loop Road is overtopped on approximately a four-year storm flow. **Barrier Status: GRAY:** FishXing determined this crossing meet the 8-16-16 ft/sec passage criteria for all adult salmonids over 86% of the range of estimated of migration flows (meets criteria between 9.0 - 46.3 c.f.s.), meets passage criteria for resident trout and 2+ year-old juvenile salmonids over 52% of the range of estimated migration flows (meets criteria between 3.5 - 12.5 c.f.s.), and meets passage criteria for 1+ year old and young-of-the-year juvenile salmonids over 16% of the range of estimated migration flows (meets 1.0 - 2.5 c.f.s.). For adults, at lower migration flows, FishXing predicted a lack-of-depth; thus actual passage may be higher.

Additional Stream Crossings: <u>Downstream</u> – none indicated on the USGS topographic map. Approximately 2,400' to confluence Eel River. <u>Upstream</u> – Less than 100 feet to Northwestern Railroad crossing = embedded pipe-arch.

Habitat: <u>Quantity</u> = approximately 3,200 feet of potential fish-bearing habitat upstream of Site ID# HUM-014. <u>Quality</u> = rated as "good" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/10/03 and there was continuous surface flow in the channel. At 9:00AM the air temp = 19° C and the water temp = 13° C. The survey crew noted a moderately dense riparian zone of redwood and alder. Upstream land-use appeared to be commercial timber harvest. The survey crew talked to local landowners who said the lower reach of the creek dries-up later in the summer on a regular basis. This person also the outlet area of the crossing is dredged on an annual basis. A moderate abundance (10 - 50 fish) of juveniles salmonids (<3" in length) were observed in the stream channel downstream of Site ID# HUM-014.

Preferred Treatment: None immediately recommended because crossing provides ample fish passage. However, the crossing is severely undersized and is in poor condition. The recommended replacement is a properly sized open-bottom arch set on concrete footings to provide unimpeded passage and improve storm-flow capacity.



Site ID#HUM-014: Poison Oak Creek/Dyerville Loop Road; Eel River



Site ID#HUM-015: Bloyd Creek/Dyerville Loop Road; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# 6D100; County Map Sheet #2E. USGS Quad: Myers Flat. T1S, R3E, Section 32. Lat/Long: 40° 20' 10.45" 123° 51' 21.99" Post Mile: 5.30 Drainage Area upstream of crossing: 0.25 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 - 2/3" x 1/2". **Dimensions:** diameter = 3.0'. **Length:** 40.8' **Slope:** 5.51% **Modifications:** None. **Rustline Height:** 1.2'. **Average Active Channel Width:** 6.9'. **Fill Estimate:** 180 cubic yards. **Overall Condition:** Good. **Sizing:** Extremely Undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval and Dyerville Loop Road is overtopped on approximately a four-year storm flow. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 7.3 c.f.s.). The culvert's steep slope (>5%) is the crossing's main feature that creates a migration barrier for all age classes of salmonids. The perched outlet that cascades over rip-rap and a shallow outlet also makes entering the culvert problematic.

Additional Stream Crossings: <u>Downstream</u> – (\approx 800') to Northwestern Railroad crossing – status unknown. <u>Upstream</u> – none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 750 feet of potential fish-bearing habitat upstream of Site ID# HUM-015. <u>Quality</u> = rated as "fair to poor" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/26/03 and there was continuous surface flow in the channel. At 9:30AM the air temp = 15° C and the water temp = 13° C. The survey crew noted a dense riparian zone of redwood and alder and the streambed was comprised of gravel and cobble. Upstream land-use appeared to be commercial timber harvest. No fish were observed in the stream channel adjacent to Site ID# HUM-015.

Preferred Treatment: The crossing is severely undersized and is in poor condition and should be upgraded with properly sized embedded SSP culvert or an open-bottom arch set on concrete footings to provide unimpeded passage and improve storm-flow capacity. Prior to treatment, the County should conduct a thorough field survey to assess the potential fisheries benefit (if any) within Bloyd Creek – including the highly-aggraded, intermittent lower channel between the Dyerville Loop Road crossing and the Eel River.



Site ID#HUM-015: Bloyd Creek/Dyerville Loop Road; Eel River



Site ID#HUM-016: Bell Creek/Dyerville Loop Road; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# 6D100; County Map Sheet #2E. USGS Quad: Myers Flat. T1S, R3E, Section 33. Lat/Long: 40° 20' 0.15" 123° 50' 50.84" Post Mile: 5.83 Drainage Area upstream of crossing: 0.51 square miles.

Culvert Type: Pipe-arch, SSP. **Corrugations:** $2 - 2/3'' \ge 1/2''$. **Dimensions:** 4.6' rise $\ge 7.2'$ span . **Length:** 60.7'**Slope:** 8.57% **Modifications:** None. **Rustline Height:** 0.6'. **Average Active Channel Width:** 6.1'. **Fill Estimate:** 246 cubic yards. **Overall Condition:** Good. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 14-year recurrence interval; Dyerville Loop Road is overtopped on more than a 250-year storm flow.

Barrier Status: RED: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 14.6.s.). The culvert's steep slope (>8%) and the perched outlet that cascades over rip-rap are the crossing's two features that create a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> – (\approx 500') to Northwestern Railroad crossing – defined as "no barrier" by 1997 Eel Basin railway fish passage assessment. <u>Upstream</u> – none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 300 feet of potential fish-bearing habitat upstream of Site ID# HUM-016. <u>Quality</u> = rated as "fair" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/10/03 and there was continuous surface flow in the channel. At 11:30AM the air temp = 27° C and the water temp = 14° C. The survey crew noted a dense riparian zone of redwood and alder and the streambed was comprised of gravel and cobble. The survey crew noted that the channel was a bit steep. No fish were observed in the stream channel adjacent to Site ID# HUM-016.

Preferred Treatment: The crossing should be eventually upgraded with properly sized embedded SSP culvert or an openbottom arch set on concrete footings to provide unimpeded passage and improve storm-flow capacity. Prior to treatment, the County should conduct a thorough field survey to assess the potential fisheries benefit (if any) within Bell Creek – including the highly-aggraded, intermittent lower channel between the Dyerville Loop Road crossing and the Eel River.



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Site ID#HUM-017: McCann Creek/Dyerville Loop Road; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# 6D100; County Map Sheet #2E22. USGS Quad: Myers Flat. T1S, R3E, Section 33. Lat/Long: 40° 19' 42.65" 123° 50' 31.40" Post Mile: 5.83 Drainage Area upstream of crossing: 0.68 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 -2/3" x 1/2". **Dimensions:** diameter = 4.5' **Length:** 53.0' **Slope:** 7.02% **Modifications:** None. **Rustline Height:** 2.5'. **Average Active Channel Width:** 10.5'. **Fill Estimate:** 359 cubic yards. **Overall Condition:** Fair – inverted is abraded. **Sizing:** Extremely Undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval and Dyerville Loop Road is overtopped on approximately a six-year storm flow.

Barrier Status: RED: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 19.5.s.). The culvert's steep slope (>7%) and the perched outlet are the crossing's two features that create a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> – (\approx 75') to Northwestern Railroad crossing – concrete open-bottom arch that appeared passable. <u>Upstream</u> – none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 450 feet of potential fish-bearing habitat upstream of Site ID# HUM-017. <u>Quality</u> = rated as "fair" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/10/03 and there was continuous surface flow in the channel. At 1:00AM the air temp = 21° C and the water temp = 13° C. The survey crew noted a dense riparian zone of redwood and alder and the streambed was comprised of gravel and cobble. The survey crew noted that the channel was a bit steep. No fish were observed in the stream channel adjacent to Site ID# HUM-017.

Preferred Treatment: The crossing should be eventually upgraded with properly sized embedded SSP culvert or an openbottom arch set on concrete footings to provide unimpeded passage and improve storm-flow capacity. Prior to treatment, the County should conduct a thorough field survey to assess the potential fisheries benefit (if any) within MCann Creek. If the creek is not fish-bearing then a replacement should focus on improving storm-flow conveyance only.





Site ID#HUM-018: Unnamed Tributary #1/McCann Road; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# 6D090; County Map Sheet #2E22. USGS Quad: Myers Flat. T2S, R3E, Section 3. Lat/Long: 40° 19' 25.65" 123° 49' 31.50" Post Mile: 0.93 Drainage Area upstream of crossing: 1.40 square miles.

Culvert Type: Circular, SSP. **Corrugations:** $2 - 2/3^{\circ} \times 1/2^{\circ}$. **Dimensions:** diameter = 5.0° **Length:** 90.6° **Slope:** 3.63% **Modifications:** None. **Rustline Height:** 2.2° . **Average Active Channel Width:** 16.1° . **Fill Estimate:** 1,242 cubic yards. **Overall Condition:** Fair – inverted is abraded and seams are leaking. **Sizing:** Extremely Undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval and McCann Road is overtopped on approximately a seven-year storm flow. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 45.4 c.f.s.). The culvert's moderately steep slope (>3%) and the perched outlet are the crossing's two features that create a migration barrier for all age classes of salmonids. The culvert's inlet is also poorly aligned with the stream channel and there may be turbulence and unfavorable hydraulic conditions at the inlet during migration-level flows.

Additional Stream Crossings: <u>Downstream</u> - none were noted by the Taylor and Associates field crew. <u>Upstream</u> - none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 450 feet of potential fish-bearing habitat upstream of Site ID# HUM-018. <u>Quality</u> = rated as "fair" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/10/03 and there was continuous surface flow in the channel. At 2:45PM the air temp = 17° C and the water temp = 12° C. The survey crew noted a dense riparian zone of redwood and the streambed was comprised of cobbles and small boulders. Abundant numbers (50-100 fish) of juvenile salmonids (<3" in length) were observed in the stream channel upstream of Site ID# HUM-018.

Preferred Treatment: The crossing should be eventually upgraded with properly sized embedded SSP culvert or an openbottom arch set on concrete footings to provide unimpeded passage and improve storm-flow capacity. However; prior to treatment, the County should conduct a thorough field survey to assess the potential fisheries benefit within this unnamed creek. However; the limited fish-bearing reach makes this site a poor candidate to treat with restoration funding sources.





Site ID#HUM-019: Unnamed Tributary #2/McCann Road; Eel River Road Ownership: Humboldt County

Ranking: Low-Priority Location: Road ID# 6D090; County Map Sheet #2E22. USGS Quad: Myers Flat. T2S, R3E, Section 2. Lat/Long: 40° 19' 12.36" 123° 48' 39.52" Post Mile: 1.80 Drainage Area upstream of crossing: 0.70 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 6" x 2". **Dimensions:** diameter = 10.0' **Length:** 118.6' **Slope:** 8.25% **Modifications:** Steel beams along invert. **Rustline Height:** N/A. **Average Active Channel Width:** 9.8'. **Fill Estimate:** 3,856 cubic yards. **Overall Condition:** Poor – inverted is rusted-through, but has been reinforced with steel beams. **Sizing:** Properly-sized; HW/D = 1 on a storm flow with a recurrence interval >250 years and McCann Road is overtopped on a storm flow with a recurrence interval >250 years.

Barrier Status: RED: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 22.7 c.f.s.). The culvert's steep slope (>8%) and the extremely perched outlet are the crossing's two features that create a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> - none were noted by the Taylor and Associates field crew. <u>Upstream</u> - none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 450 feet of potential fish-bearing habitat upstream of Site ID# HUM-019. <u>Quality</u> = rated as "poor" for the ranking matrix based on Taylor and Associates survey crew's field notes due mainly to steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/10/03 and there was continuous surface flow in the channel. At 4:20PM the air temp = 20° C and the water temp = 12.5° C. The survey crew noted a dense riparian zone of redwood and the streambed was comprised of cobbles and small boulders. Several cascades and waterfalls were noted in the channel reach upstream and downstream of McCann Road. No fish were observed in the stream channel adjacent to Site ID# HUM-019.

Preferred Treatment: Although the current crossing fails to provide any passage, no treatment is recommended because of the lack of viable salmonid habitat upstream of McCann Road. The current crossing is properly-sized for storm-flow conveyance, but should still be periodically inspected for condition and performance.



Site ID#HUM-019: Unnamed Tributary #2/McCann Road; Eel River



Site ID#HUM-020: Sequoia Creek/Whitlow Road; Sonoma Creek; Eel River Road Ownership: Humboldt County

Ranking: Medium-Priority Location: Road ID# 6D070; County Map Sheet #2E22. USGS Quad: Myers Flat. T2S, R3E, Section 14. Lat/Long: 40° 17' 57.18" 123° 48' 7.15" Post Mile: 1.82 Drainage Area upstream of crossing: 1.22 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 -2/3" x 1/2". **Dimensions:** diameter = 5.5' **Length:** 70.7' **Slope:** 7.41% **Modifications:** None. **Rustline Height:** 2.0'. **Average Active Channel Width:** 9.8'. **Fill Estimate:** 905 cubic yards. **Overall Condition:** Extremely Poor – invert is rusted-through and is falling apart. A section of the floor is missing about mid-length (under the road) and flow is undermining the fill prism. **Sizing:** Extremely Undersized; HW/D = 1 on a storm flow with approximately a two-year recurrence interval and Whitlow Road is overtopped on approximately a eight-year storm flow. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 39.5 c.f.s.). The culvert's steep slope (>7%) is the crossing's main feature that creates a migration barrier for all age classes of salmonids. **Additional Stream Crossings:** <u>Downstream</u> - (≈2,100') to bridge on Whitlow Road, (≈3,500') to bridge on Whitlow Road, (≈6,000') to bridge on Whitlow Road, and (≈7,600') to Northwestern railroad crossing is a trestle bridge = no barrier. <u>Upstream</u> – none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 1,100 feet of potential fish-bearing habitat upstream of Site ID# HUM-020. <u>Quality</u> = rated as "fair" for the ranking matrix based on Taylor and Associates survey crew's field notes. Approximately 2,100' of Sequoia Creek was habitat typed by CDFG in 1998. The survey noted low shelter ratings in pool habitats, moderately high levels of embeddedness in spawning gravels, and a dense riparian canopy (mean of 90% shade canopy). The crossing was surveyed by Taylor and Associates on 6/26/03 and there was continuous surface flow in the channel. At 10:30AM the air temp = 18.5°C and the water temp = 13°C. The survey crew noted a dense riparian zone of redwood and the streambed was comprised of silted-in gravels and cobbles. No fish were observed in the stream channel adjacent to Site ID# HUM-020.

Preferred Treatment: This crossing is in extremely poor condition, severely undersized, and should be replaced before the road fails. However, the limited fish-bearing stream reach makes this replacement a poor candidate to fund with fisheries restoration funding sources – unless a road failure that released a couple of thousand cubic yards of sediment would significantly impact spawning and rearing habitat in Sonoma Creek.



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Site ID#HUM-021: Unnamed tributary to Conley Creek/Alderpoint Road; Conley Creek; Dobbyn Creek; Eel River

Road Ownership: Humboldt County Ranking: Medium-Priority

Location: Road ID# 6D070; County Map Sheet #2E. USGS Quad: Alderpoint. T2S, R5E, Section 33. Lat/Long: 40° 14' 51.69" 123° 37' 20.14" Post Mile: 24.70 Drainage Area upstream of crossing: 0.76 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 - 2/3" x 1/2". **Dimensions:** diameter = 5.0' **Length:** 71.3' **Slope:** 4.00% **Modifications:** None. **Rustline Height:** 1.6'. **Average Active Channel Width:** 8.6'. **Fill Estimate:** 1,725 cubic yards. **Overall Condition:** Poor – invert is rusted-through. **Sizing:** Extremely Undersized; HW/D = 1 on a storm flow with approximately a four-year recurrence interval and Alderpoint Road is overtopped on approximately a 38-year storm flow. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 24.1 c.f.s.). The culvert's steep slope (>7%) and perched outlet are the crossing's two features that create a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> - none indicated on the USGS topographic map. <u>Upstream</u> – none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: <u>Quantity</u> = less than 500 feet of potential fish-bearing habitat upstream of Site ID# HUM-021. This crossing is probably not within a fish-bearing stream reach due to the 13% channel slope downstream of Alderpoint Road. <u>Quality</u> = rated as "poor" for the ranking matrix based on Taylor and Associates survey crew's field notes based on the steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/18/03 and there was continuous surface flow in the channel. At 4:00PM the air temp = 19°C and the water temp = 16°C. The survey crew noted a dense riparian zone of conifers and hardwoods. No fish were observed in the stream channel adjacent to Site ID# HUM-021.

Preferred Treatment: This crossing is in poor condition, severely undersized, and should be replaced before the road fails. However, the limited fish-bearing stream reach makes this replacement a poor candidate to treat with fisheries restoration funding sources – unless a road failure that released several thousand cubic yards of sediment would impact spawning and rearing habitat in Conley Creek.



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Site ID#HUM-022: Line Gulch/Alderpoint Road; Dobbyn Creek; Eel River Road Ownership: Humboldt County

Ranking: Medium-Priority

Location: Road ID# 6D070; County Map Sheet #2E34. USGS Quad: Alderpoint. T2S, R5E, Section 33. Lat/Long: 40° 14' 24.41" 123° 37' 14.65" **Post Mile:** 23.96 **Drainage Area upstream of crossing:** 1.44 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2 - 2/3" x 1/2". **Dimensions:** diameter = 5.0' **Length:** 60.5' **Slope:** 9.98% **Modifications:** None. **Rustline Height:** 2.7'. **Average Active Channel Width:** 13.5'. **Fill Estimate:** 1,301 cubic yards. **Overall Condition:** Fair – invert is abraded and rusted. **Sizing:** Extremely Undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval and Alderpoint Road is overtopped on approximately a seven-year storm flow. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 – 45.8 c.f.s.). The culvert's steep slope (>9%) and perched outlet are the crossing's two features that create a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> - none indicated on the USGS topographic map. <u>Upstream</u> – none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: <u>Quantity</u> = less than 500 feet of potential fish-bearing habitat upstream of Site ID# HUM-022. This crossing is probably not within a fish-bearing stream reach due to the 16.9% channel slope downstream of Alderpoint Road. <u>Quality</u> = rated as "poor" for the ranking matrix based on Taylor and Associates survey crew's field notes based on the steep channel slope. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/19/03 and there was continuous surface flow in the channel. At 12:30PM the air temp = 15° C and the water temp = 15° C. The survey crew noted a dense riparian zone of conifers and hardwoods and a steep, boulder-strewn channel. No fish were observed in the stream channel adjacent to Site ID# HUM-022.

Preferred Treatment: This crossing is severely undersized and should be replaced before the road fails. However, the lack of viable fisheries habitat makes this replacement a poor candidate to treat with fisheries restoration funding sources – unless a road failure that released several thousand cubic yards of sediment would impact spawning and rearing habitat in Dobbyn Creek. Recommend periodic inspection for maintenance to keep the inlet free of storm debris.





Site ID#HUM-023: Carter Creek/Alderpoint Road; Eel River Road Ownership: Humboldt County

Ranking: Medium-Priority Location: Road ID# 6D070; County Map Sheet #2E. USGS Quad: Alderpoint. T3S, R5E, Section 27. Lat/Long: 40° 10' 29.46" 123° 35' 52.83" Post Mile: 17.92 Drainage Area upstream of crossing: 2.35 square miles.

Culvert Type: Concrete box. **Corrugations:** smooth invert. **Dimensions:** 8.0' H x 8.0'W. **Length:** 44.3' **Slope:** 1.56% **Modifications:** None. **Rustline Height:** N/A. **Average Active Channel Width:** 16.1'. **Fill Estimate:** 822 cubic yards. **Overall Condition:** Poor – invert is worn through and outlet apron is breaking off. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a 12-year recurrence interval and Alderpoint Road is overtopped on approximately a 149-year storm flow. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 – 65.4 c.f.s.). For adult salmonids, there is a lack-of-depth at lower migration flows and then excessive velocities at higher migration flows. Some adult passage probably occurs at lower flows when lack-of-depth is the only criteria violation, and at flows above the high passage flow (at 68 c.f.s. there is no longer excessive velocities through the box culvert). However; the log wedged across the culvert inlet most likely creates unfavorable hydraulic conditions too.

Additional Stream Crossings: <u>Downstream</u> - none indicated on the USGS topographic map. <u>Upstream</u> – none indicated on the USGS topographic map within the limited fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 3,300 feet of potential fish-bearing habitat upstream of Site ID# HUM-023. <u>Quality</u> = rated as "good" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/19/03 and there was continuous surface flow in the channel. At 10:00AM the air temp = 16.5°C and the water temp = 15° C. The survey crew noted a moderately dense riparian zone of mostly hardwoods and a mixture of riffle-and-pool habitats. No fish were observed in the stream channel adjacent to Site ID# HUM-023.

Preferred Treatment: Short-term: remove the log jammed across the box culvert's inlet and thoroughly assess the culvert's longevity. Long-term: install two or three downstream boulder weirs to raise tail-water elevation to back-flood the culvert outlet – this should increase depths during lower migration flows and reduce velocities during higher flows; or replace with a properly sized open-bottom arch on concrete footings or a bridge.





Site ID#HUM-024: Telegraph Creek/Telegraph Creek Road; Coastal Road Ownership: Humboldt County

Ranking: High-Priority Location: Road ID# 4A150; County Map Sheet #1E55. USGS Quad: Shelter Cove. T5S, R1E, Section 10. Lat/Long: 40° 02' 38.03" 124° 03' 43.76" Post Mile: 2.11 Drainage Area upstream of crossing: 2.43 square miles.

Culvert Type: Circular, SSP (three pipes). **Corrugations:** 2-2/3" x $\frac{1}{2}$ ". **Dimensions:** each pipe = 5.5". **Length:** each pipe = 68.0" **Slope:** LB pipe = 2.96%; middle pipe = 2.31%; RB pipe = 1.71% **Modifications:** None. **Rustline Height:** LB pipe = 5.5"; middle pipe = 5.0"; RB pipe = 4.0". **Average Active Channel Width:** 21.0". **Fill Estimate:** 466 cubic yards. **Overall Condition:** Poor – invert is rusted-thorough on each culvert. **Sizing:** Extremely Undersized; HW/D = 1 (all three pipes combined) on a storm flow with approximately a three-year recurrence interval and Telegraph Creek Road is overtopped on approximately a 17-year storm flow.

Barrier Status: GRAY: FishXing determined at this crossing that the LB and middle culverts meet the 8-16-16 ft/sec passage criteria for adult salmonids over 59% and 45% (respectively) of the range of estimated migration flows (for adults = 3.0 - 102.1 c.f.s.). Each culvert outlet is perched approximately three-feet and fails to provide juvenile passage.

Additional Stream Crossings: <u>Downstream</u> – (\approx 150') to Shelter Cove Water District's concrete diversion weir with seven-foot drop and (\approx 4,900') to crossing on unpaved road indicated on USGS topographic map – current status is unknown. <u>Upstream</u> – (\approx 1,200') to Site ID# HUM-025 on Puma Creek/Puma Drive.

Habitat: <u>Quantity</u> = approximately 4,900 feet of potential fish-bearing habitat upstream of Site ID# HUM-024. <u>Quality</u> = rated as "good" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/26/03 and there was continuous surface flow in the channel. At 4:00PM the air temp = 21°C and the water temp = 18°C. The survey crew noted a moderately dense riparian zone of mostly hardwoods and a mixture of riffle-and-pool habitats with a cobble substrate. A localized channel slope upstream of the crossing was measured at 4%. Several (<10 fish) juvenile salmonids of 3"-6" in length were observed in the stream channel upstream and downstream of Site ID# HUM-024.

Preferred Treatment: Because the current crossing is undersized and in poor condition the only feasible option is a full replacement with a properly sized open-bottom arch on concrete footings or a bridge. Recommend that the Water District's downstream weir be modified with a fish ladder or a series of boulder weirs to provide fish passage.



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Site ID#HUM-025: Puma Creek/Telegraph Creek Road; Telegraph Creek; CoastalRoad Ownership: Humboldt CountyRanking: High-PriorityLocation: Road ID# 4A150; County Map Sheet #1E55.USGS Quad: Shelter Cove.T5S, R1E, Section 10. Lat/Long: 40° 02' 38.03" 124° 03' 31.02"Post Mile: 2.31Drainage Area upstream ofcrossing: 0.93 square miles.County Map Sheet #1E55.County Map Sheet #1E55.

Culvert Type: Circular, SSP. **Corrugations:** 2-2/3" x $\frac{1}{2}$ ". **Dimensions:** each pipe = 7.0'. **Length:** 86.0' **Slope:** 4.06% **Modifications:** None. **Rustline Height:** 1.4'. **Average Active Channel Width:** 11.9'. **Fill Estimate:** 1,999 cubic yards. **Overall Condition:** Poor – invert is rusted-thorough. **Sizing:** Undersized; HW/D = 1 on a storm flow with approximately a nine-year recurrence interval and Telegraph Creek Road is overtopped on more than a 250-year storm flow. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 – 39.2 c.f.s.). The culvert's steep slope (>4%) and extremely steep outlet apron (17.1% slope over a 16.6' distance) are the crossing's two features that create a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> – (\approx 1,200') to Site ID# HUM-024 on Puma Creek/Telegraph Creek Road (\approx 1,350') to Shelter Cove Water District's concrete diversion weir with seven-foot drop and (\approx 6,100') to crossing on unpaved road indicated on USGS topographic map – current status is unknown. <u>Upstream</u> – none indicated on the USGS topographic map within the fish-bearing stream reach.

Habitat: <u>Quantity</u> = approximately 2,400 feet of potential fish-bearing habitat upstream of Site ID# HUM-025. <u>Quality</u> = rated as "good" for the ranking matrix based on Taylor and Associates survey crew's field notes. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed by Taylor and Associates on 6/26/03 and there was continuous surface flow in the channel. At 6:00PM the air temp = 23°C and the water temp = 16°C. The survey crew noted a moderately dense riparian zone of mostly hardwoods and a mixture of riffle-and-pool habitats with a cobble substrate. The crew noted the channel was fairly steep; however a local said "rainbow trout" are in Puma Creek. Several (<10 fish) juvenile salmonids of 3"-6" in length were observed in the stream channel upstream of Site ID# HUM-025.

Preferred Treatment: Because the current crossing is undersized and in poor condition the only feasible option is a full replacement with a properly sized open-bottom arch on concrete footings or a bridge. Also, because the crossing is located right at the confluence of Puma and Telegraph Creeks, there is no space available for installation of boulder weirs to raise tail-water elevation. Downstream migration barriers should be treated prior to treatment of this crossing.



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Site ID#HUM-026: Essex Gulch/Glendale Drive; Mad River; Coastal Road Ownership: Humboldt County Ranking: High-Priority Location: Road ID#AL 765; County Map Sheet #1C55. USGS Quad: Arcata North. T6N, R1E, Section 14. Lat/Long: 40° 02' 38.03" 124° 03' 31.02" Post Mile: 2.31 Drainage Area upstream of crossing: 1.28 square miles.

Culvert Type: Circular, SSP. **Corrugations:** 2-2/3" x $\frac{1}{2}$ ". **Dimensions:** diameter = 6.0'. **Length:** 92.3' **Slope:** 7.70% **Modifications:** None. **Rustline Height:** 1.0'. **Average Active Channel Width:** 5.6'. **Fill Estimate:** Not measured, visually estiamted at least 5,000-8,000 cubic yards. Highway 299 has 40,000+ cubic yards of fill. **Overall Condition:** Fair – invert is rusted and outlet is being undercut. **Sizing:** Extremely undersized; HW/D = 1 on a storm flow with approximately a five-year recurrence interval and Glendale Drive is overtopped on more than a 250-year storm flow. **Barrier Status: RED**: the first-phase filter determined this crossing fails to meet the 8-16-16 ft/sec passage criteria for all age classes of salmonids over the entire range estimated of migration flows (for adults = 3.0 - 22.7 c.f.s.). The culvert's steep slope (>7%) and extremely perched outlet apron (> 6.0 feet) are the crossing's two features that create a migration barrier for all age classes of salmonids.

Additional Stream Crossings: <u>Downstream</u> – none, approximately 500 feet to confluence with the Mad River. <u>Upstream</u> – (\approx 85') to Highway 299 crossing (six-foot diameter SSP, 605' in length with a 2.1% slope. Assessed as GRAY, meets adult passage on 40% of migration flows. This culvert also passes under Timmons Road). At (\approx 3,000') USGS topographic map indicates a private crossing – status unknown and (\approx 5,000') a second private crossing – status unknown.

Habitat: <u>Quantity</u> = approximately 6,000 feet of potential fish-bearing habitat upstream of Site ID# HUM-026. <u>Quality</u> = rated as "fair" for the ranking matrix based on Taylor and Associates spot check on 11/09/04. No fisheries or habitat information was available in CDFG's files. The crossing was surveyed for the HSU/CalTrans' assessment on 6/04/03 and there was continuous surface flow in the channel. During the 11/09/04 spot-check the stream channel was noted as having a dense riparian zone of conifers and hardwoods, alternating riffle-and-pool habitats with a high percentage of fines. No fish were observed in the stream channel adjacent to Site ID# HUM-026. Essex Gulch has excellent potential as a coho salmon spawning and rearing stream due to over one mile of low-gradient channel with year-round flow.

Preferred Treatment: Because the current crossing is undersized and in fair condition the best feasible option is a full replacement. Due to the proximity with the Highway 299 crossing, a joint project with CalTrans is recommended. The extremely large fill volume on both culverts and the severely perched outlet at the county crossing make this a difficult site to design an effective, yet feasible and cost-effective solution. If current channel grade is to be maintained, a fish-way or a long series of downstream weirs would be required to "step" fish up to the crossing outlet.



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