APPENDIX B:

CATALOG OF SISKIYOU COUNTY CULVERTS LOCATED ON FISH-BEARING STREAM REACHES

Prepared for the Siskiyou County Public Works Department

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NOTE: This catalog contains two pages for each culvert included 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. All inventoried sites are located within the Klamath River basin, and are generally ordered from west to east in an upstream direction, and from lowermost to uppermost road/stream intersection within sub-watersheds.

For proposal development purposes, 8.5" x 11" full-scale USGS 7.5 Series copies are available on request.

Site #1: Merrill Creek/ Salmon River Road; Salmon River; Klamath River Ranking: #2 = High-Priority

Location: Road ID # 2B01; County Map #2. USGS Quad: Somes Bar. T11N, R6E, Section 3. Milepost = 1.0 miles

Culvert Type: Circular pipe, SSP. **Dimensions:** diameter = 11.3' **Length:** 117.5' **Slope:** 6.04 %

Modifications: notched, steel-plate weirs within culvert, mostly non-functional because of storm damage.

Fill Estimate: 3,457 cubic yards **Overall condition:** Fair, culvert has abraded bottom, and some damage to inlet.

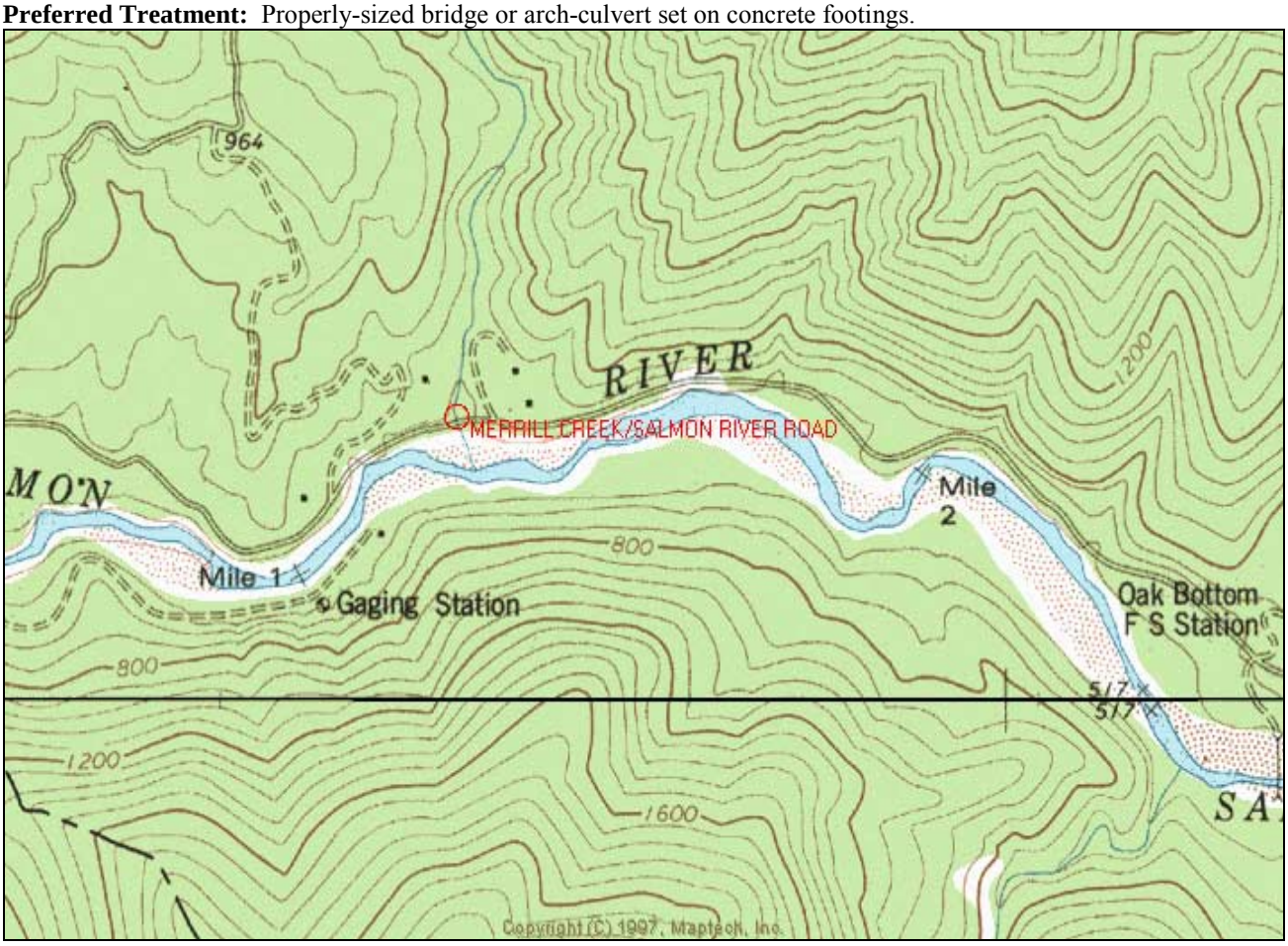
Sizing: Properly sized; HW/D = 1 on a storm flow with approximately a 219-year recurrence interval. Salmon River Road overtops on more than a 250 -year storm flow.

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. The extremely perched outlet is the main feature that prevents fish migration. The outlet pool also lacks depth for fish to execute a successful leap attempt.

Additional Road Crossings: Downstream, none Merrill Creek enters the Salmon River approximately 50' downstream of the Salmon River Road. Upstream, no access, but none appear on available maps or aerial photos.

Habitat: No completed formal stream surveys were available. Quantity = approximately 2.4 miles of potential fish-bearing habitat. Quality = good; dense riparian zone of hardwoods and conifers, relatively unembedded gravels, numerous pools, cool summer water temperatures. Numerous adult steelhead observed were leaping unsuccessfully at culvert outlet on 2/20-21/02 by Toz Soto (fisheries biologist for the Karuk Tribe). USFS biologists consider Merrill Creek a "high-priority" tributary to the Salmon River sub-basin and feel re-establishing access to the creek should benefit both steelhead and coho salmon populations (Grunbaum, pers. comm.)

Preferred Treatment: Properly-sized bridge or arch-culvert set on concrete footings.



Site #1: Merrill Creek/ Salmon River Road; Salmon River; Klamath River

Site #2: Hotelling Gulch/Callahan-Cecilville Road; South Fork Salmon River; Salmon River; Klamath River

Ranking: #4 = High Priority

Location: Road ID # 1C02; County Map #2. USGS Quad: Young's Peak. T10W, R8E, Section 28. Milepost = 3.5 miles.

Culvert Type: Circular pipes (2), CSP. **Dimensions:** diameter, both pipes = 3.0' **Length:** 36.5' **Slope:** left bank pipe = 5.56%; right bank pipe = 4.36%.

Modifications: None. **Fill Estimate:** 158 cubic yards **Overall condition:** Fair, both culverts have abraded bottoms.

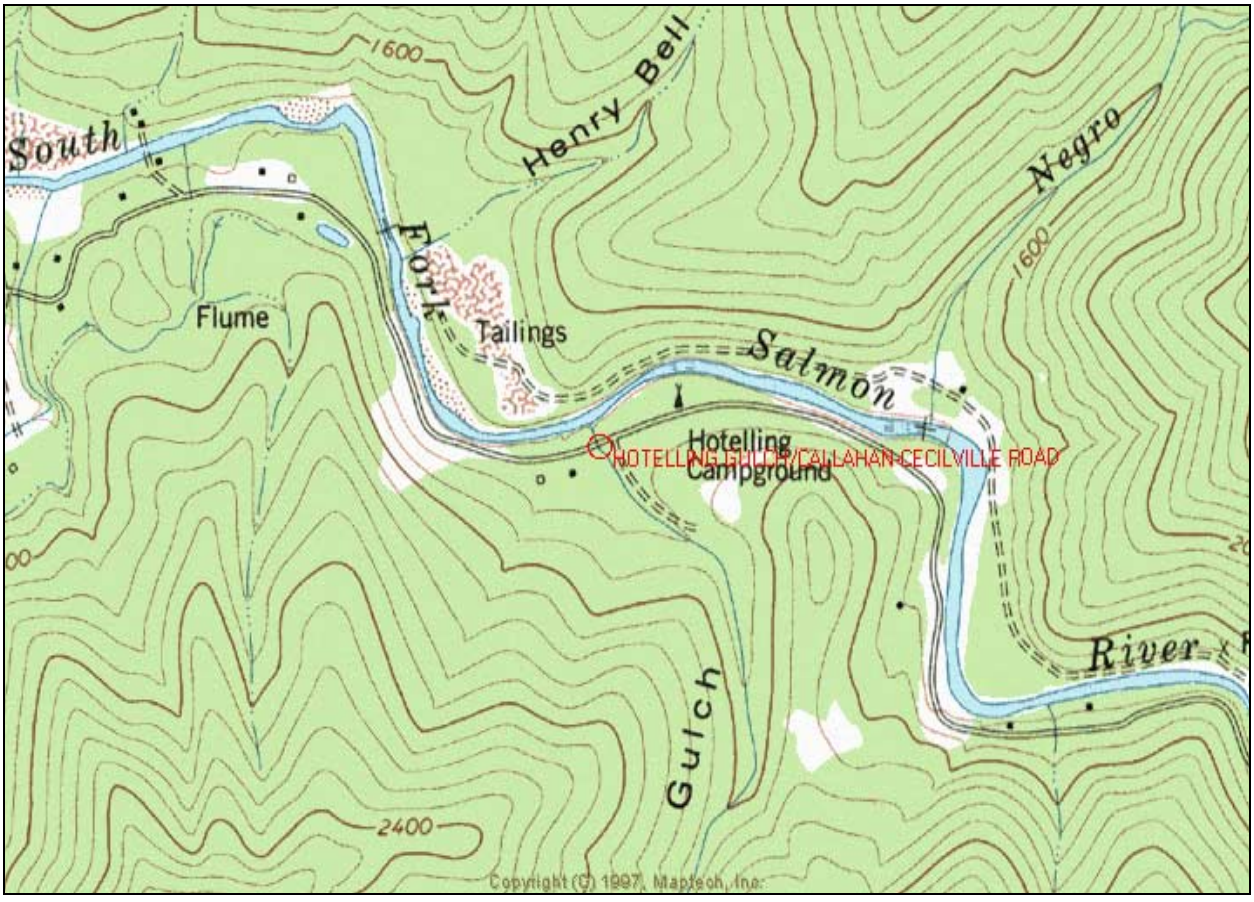
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a five-year recurrence interval. Callahan-Cecilville Road overtops on approximately a nine-year storm flow.

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.

Additional Road Crossings: Downstream, none Hotelling Gulch enters the South Fork Salmon River approximately 75' downstream of the Salmon River Road. Upstream, no crossings appear on available maps.

Habitat: No formal surveys were available. Quantity = approximately 1.4 miles of potential anadromous fish-bearing habitat. Quality = Fair/good. Approximately 1,000' of channel above culvert was walked: dense riparian of hardwoods and conifers, creek was dry at culvert, but wetted upstream, small pools with cool summer water temperatures, no juvenile fish were observed.

Preferred Treatment: Properly-sized bridge or arch-culvert set on concrete footings. Proper treatment of this site should consider feasibility of relocating stream channel back into its natural/original location. Remains of an abandoned bridge (or box culvert) and channel are evident approximately 500' down road towards the Forks of Salmon.



Site #2: Hotelling Gulch/Callahan-Cecilville Road; South Fork Salmon River; Salmon River; Klamath River

Site #3: Sixmile Creek/Callahan-Cecilville Road; South Fork Salmon River; Salmon River; Klamath River

Ranking: #28 = Low-Priority

Location: Road ID #1C02; County Map #3. USGS Quad: Grasshopper Ridge. T39N, R10W, Section 21. Milepost = 28.5 miles.

Culvert Type: Circular pipes (2), SSP. **Dimensions:** diameters = 13.0' **Length:** 207.0' **Slope:** only surveyed left bank culvert = 8.91%. Right bank culvert appears steeper.

Modifications: None. **Fill Estimate:** 8,172 cubic yards **Overall condition:** Good.

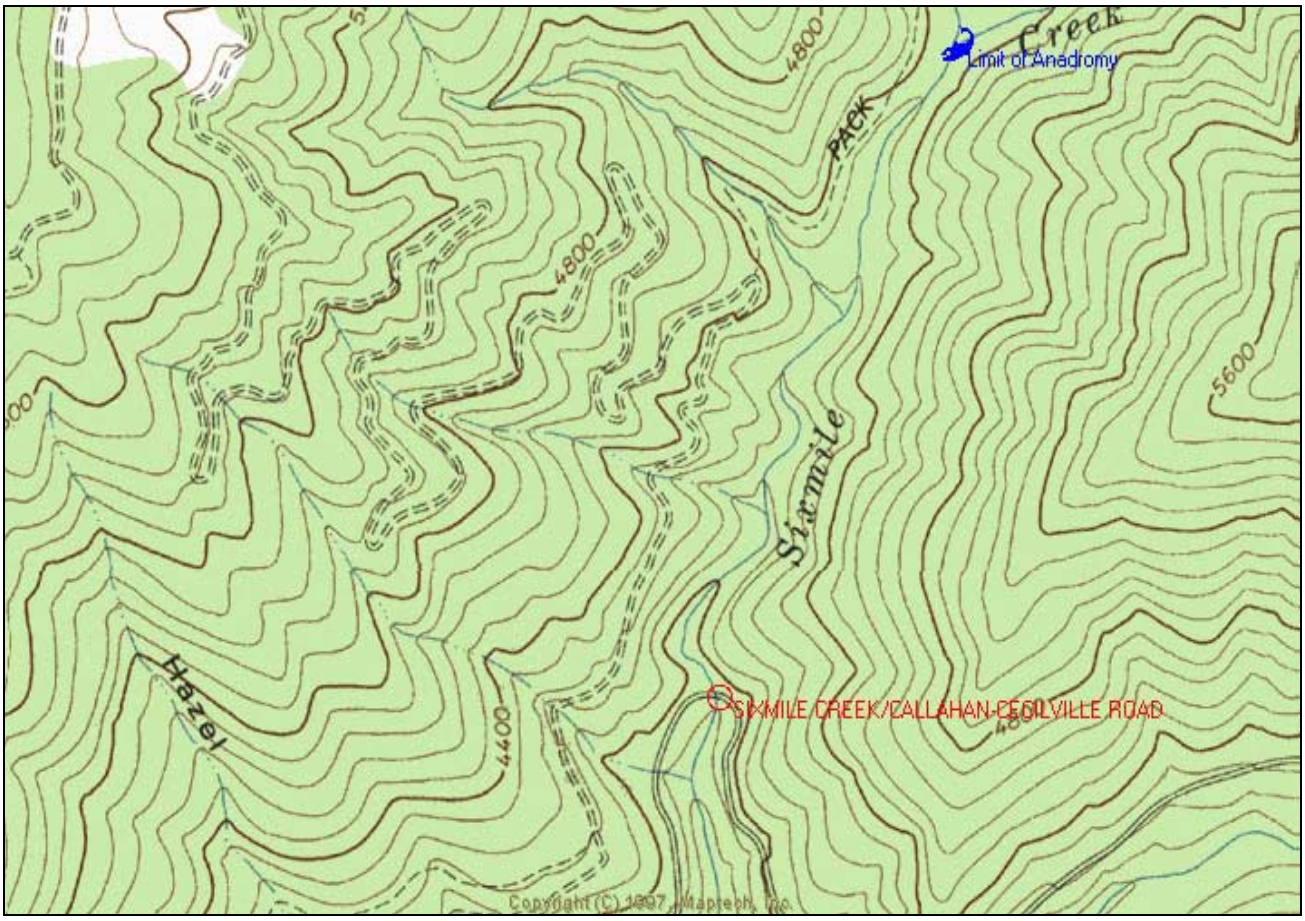
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Callahan-Cecilville Road overtops on more than a 250-year storm flow.

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. Excessive drop at both outlets (perched about eight feet) and excessive slopes are the main features of this crossing that prevent fish migration.

Additional Road Crossings: Downstream, none. Upstream, none.

Habitat: Quantity = approximately 5,700' of potential anadromous fish-bearing habitat. Quality = Fair. USFS stream survey conducted on 9/19-21/94. Channel described as steep, incised, bedrock and boulder dominated, numerous debris jams, and dense riparian of brush, hardwoods and conifers. Survey noted that suitable spawning habitat was limited throughout and very few fish were observed. In the 1,000' reach between the mouth and county culvert most fish observed were in the three lower-most pool units.

Preferred Treatment: No treatment recommended because: current culverts are in good condition and properly sized; high cost and difficulty of providing passage; and stream has limited potential for anadromous fisheries.



Site #3: Sixmile Creek/Callahan-Cecilville Road; South Fork Salmon River; Salmon River; Klamath River

Site #4: Trail Creek/Callahan-Cecilville Road; South Fork Salmon River; Salmon River; Klamath River

Ranking: #32 = Low-Priority

Location: Road ID #1C02; County Map #3. USGS Quad: Deadman Peak. T39N, R10W, Section 23. Milepost = 31.3 miles

Culvert Type: Circular pipe, SSP. **Dimensions:** diameter = 11.0' **Length:** 114.5' **Slope:** = 6.69%.

Modifications: None. **Fill Estimate:** 3,031 cubic yards **Overall condition:** Good/fair: culvert floor starting to abrade.

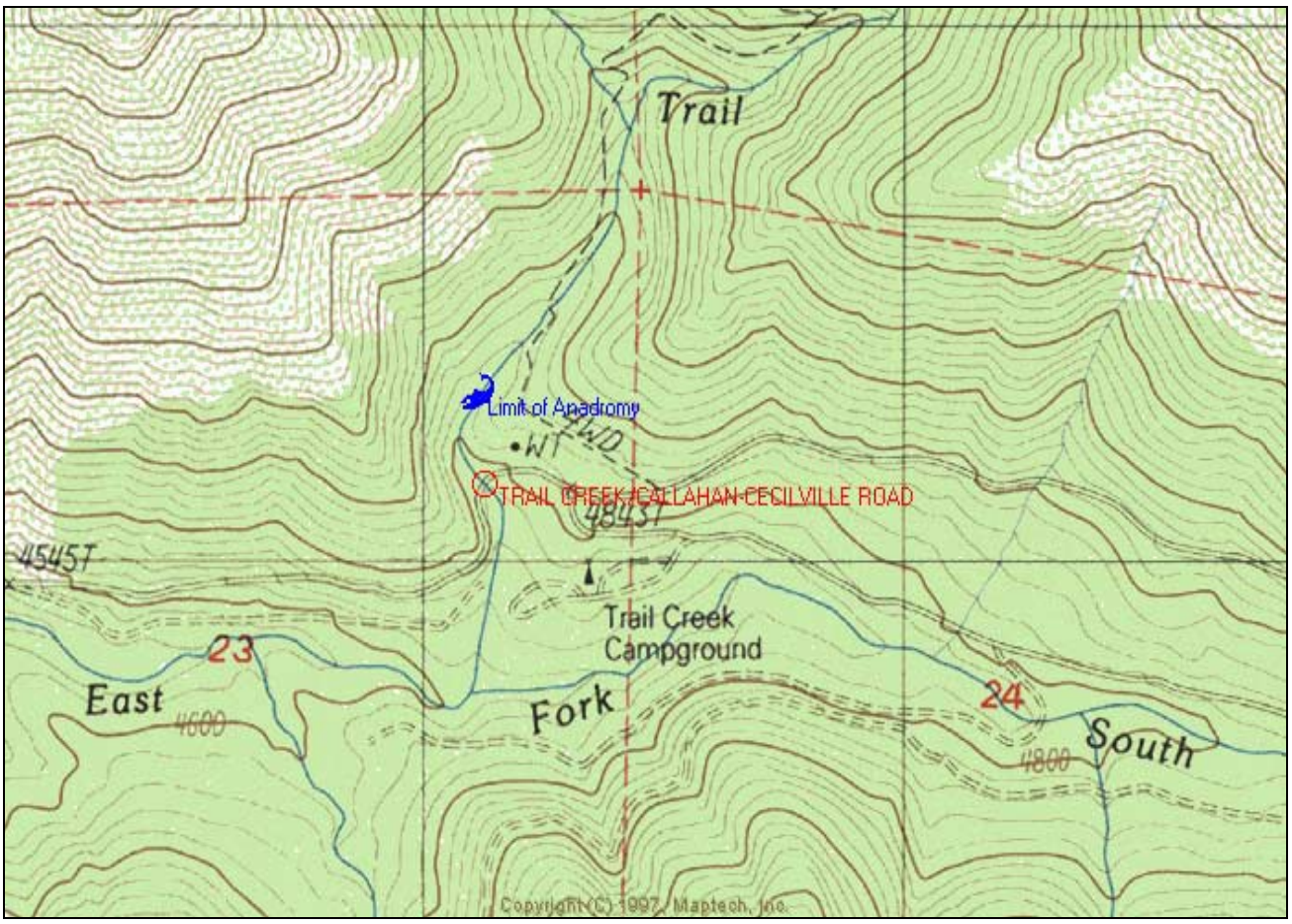
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Callahan-Cecilville Road overtops on more than a 250-year storm flow.

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.

Additional Road Crossings: Downstream, none. Upstream, none.

Habitat: Quantity = approximately 700' of potential fish-bearing habitat above county road. Quality = No surveys or memos found in CDFG and USFS files regarding Trail Creek. Habitat is fair to poor for anadromous fisheries because of extremely steep channel. The 1,500' of channel from Trail Creek's mouth to the county road has an overall slope of 8.5% with numerous drops over bedrock and boulder cascades.

Preferred Treatment: No treatment recommended because: current culvert is in relatively good condition and properly sized; high cost and difficulty of providing passage; and stream has limited potential for anadromous fisheries.



Site #4: Trail Creek/Callahan-Cecilville Road; South Fork Salmon River; Salmon River; Klamath River

Site #5: Cronan Gulch/Sawyer's Bar Road; North Fork Salmon River; Salmon River; Klamath River.

Ranking: Dropped from ranking because survey data suggests this is not a fish-bearing stream.

Location: Road ID #1C01; County Map #3. **USGS Quad:** Sawyers Bar. T40N, R12W, Section 14. **Milepost =** 10.0 miles

Culvert Type: Rectangular concrete box. **Dimensions:** 14.8' H x 14.0'W. **Length:** 110.0'

Slope: 17.55%. **Modifications:** None. **Fill Estimate:** 891 cubic yards. **Overall condition:** Good.

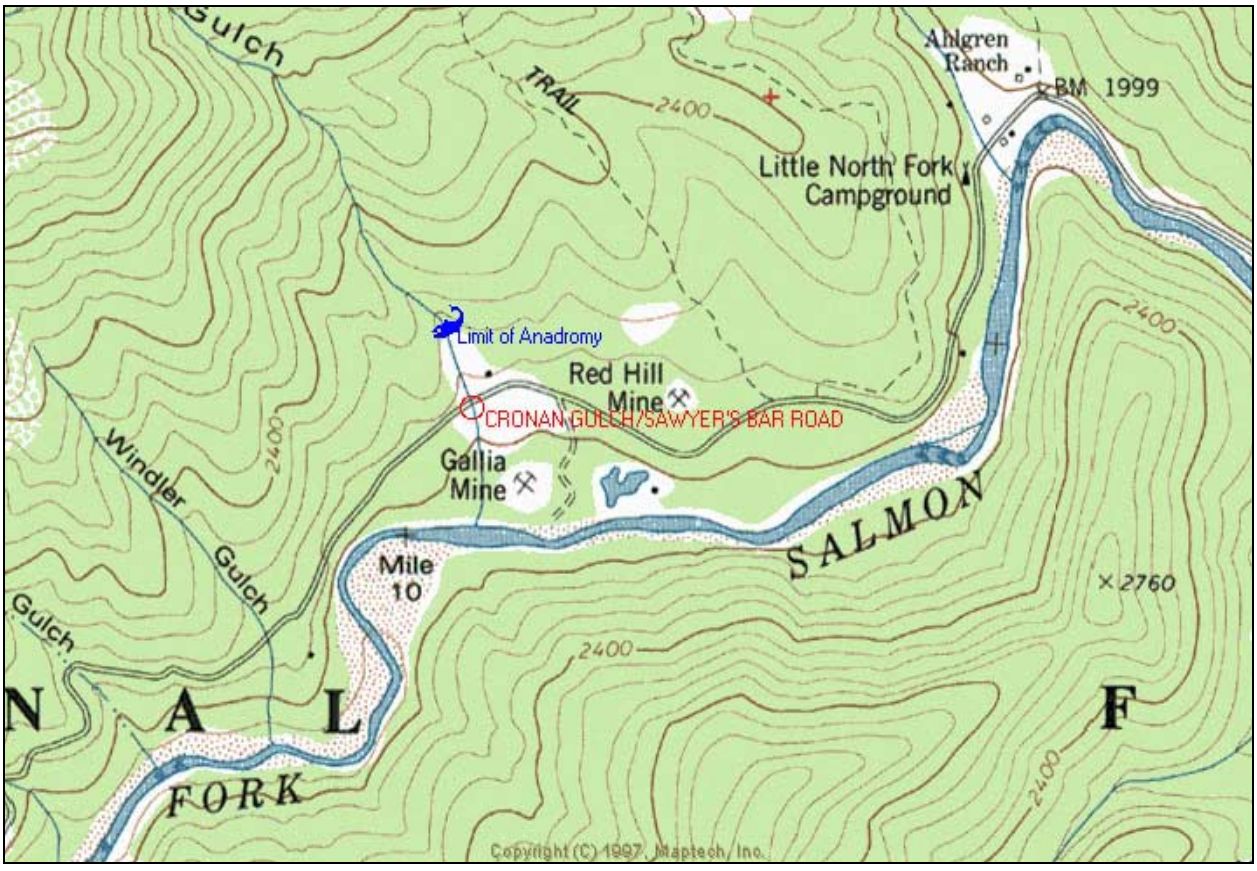
Sizing: Properly sized; HW/D = 1 on a storm flow with more than a 250-year recurrence interval. Sawyers Bar Road overtops on more than a 250-year storm flow.

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. Excessive slope and lack-of-depth are crossing features that create migration barrier.

Additional Road Crossings: Downstream, none Cronan Gulch enters the North Fork Salmon River approximately 900' downstream of Sawyer's Bar Road. Upstream, none within fish-bearing reach.

Habitat: Quantity = approximately 500' of potential fish-bearing habitat. Quality = CDFG survey on 6/27/75 covered 0.5 miles, described channel as steep with limited spawning and rearing habitat. CDFG described the county culvert as a barrier, but 100 yards upstream was a series of impassable cascades. USFS survey on 9/20/72 described creek as: lacking spawning habitat, no pools other than below culvert, and steep cascades immediately upstream of county road.

Preferred Treatment: None recommended. This adequately sized crossing is a migration barrier, yet there is insignificant fisheries habitat upstream due to the steep natural channel slope.



Site #5: Cronan Gulch/Sawyer's Bar Road; North Fork Salmon River; Salmon River; Klamath River

Site #6: Kelly Gulch/Sawyer's Bar Road; North Fork Salmon River; Salmon River; Klamath River

Ranking: #6 = High-Priority

Location: Road ID #1C01; County Map #3. USGS Quad: Sawyers Bar. T40N, R12W, Section 13. Milepost = 11.8 miles

Culvert Type: Circular pipe; SSP. **Dimensions:** diameter = 6.0'. **Length:** 60.8' **Slope:** 5.31%.

Modifications: None. **Fill Estimate:** 243 cubic yards. **Overall condition:** Fair, culvert floor is abraded.

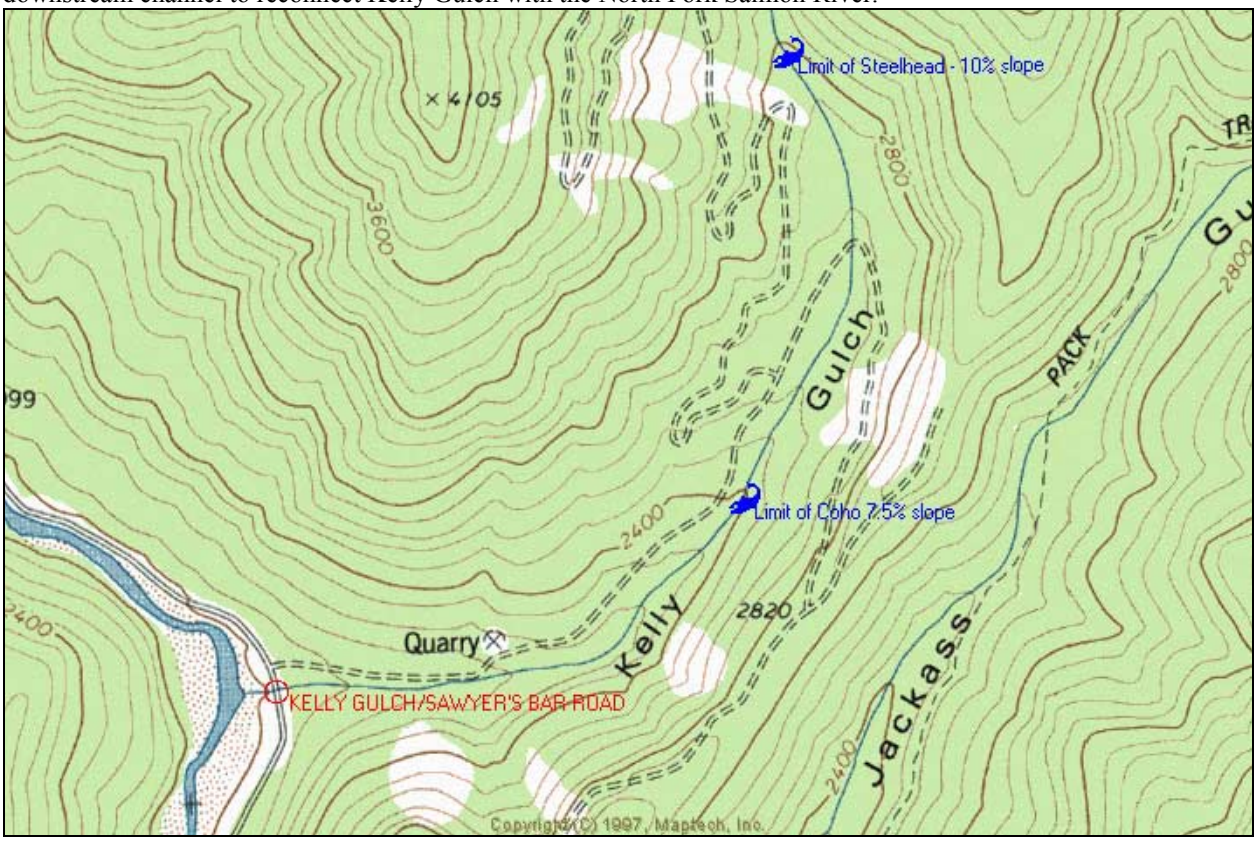
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 14-year recurrence interval. Sawyer's Bar Road overtops on approximately a 26-year storm flow.

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. Excessive slope and lack-of-depth are the crossing's features that create migration barrier.

Additional Road Crossings: Downstream (≈ 50'): a low-water ford on a discontinued Forest Service spur road. Upstream (≈ 1.1 miles), map indicates a Forest Service road crossing.

Habitat: Quantity = approximately 4,100' of potential coho salmon habitat and approximately 1.5 miles of potential steelhead habitat. Quality = USFS survey conducted in 1983 rated habitat as "fair" = riffles comprised 60-65% of channel length. The survey noted a potential natural barrier (bedrock cascades) about 0.2 and 0.6 miles above the county culvert, however the Salmon River Restoration Council walked the lower mile in February of 2002 and observed no natural impediments to fish migration (Villeponteaux, pers. comm.). Direct quote from a CDFG memo dated 3/16/76: "the culvert under the county road could not be negotiated by steelhead and there is resident trout in the stream above culvert." Ross Taylor and Associates observed numerous juvenile salmonids in pool below the culvert: two age classes of steelhead and possibly four young-of-year coho salmon on 5/1/01.

Preferred Treatment: Properly-sized bridge or arch-culvert set on concrete footings. Treatment project should also address the Forest Service spur road immediately downstream of the county road and reconstruction of the downstream channel to reconnect Kelly Gulch with the North Fork Salmon River.



Site #6: Kelly Gulch/Sawyer's Bar Road; North Fork Salmon River; Salmon River; Klamath River

Site #7: Whites Gulch/Whites Gulch Road; North Fork Salmon River; Salmon River; Klamath River

Ranking: #1 = High-Priority

Location: Road ID #2E002; County Map #3. USGS Quad: Tanners Peak. T40N, R11W, Section 35. Milepost = 0.3 miles to Sawyers Bar Road.

Culvert Type: Pipe Arch; SSP. **Dimensions:** 10.1' Rise x 16.5' Span. **Length:** 48.2' **Slope:** 2.41%.

Modifications: None. **Fill Estimate:** 1,999 cubic yards. **Overall condition:** Fair.

Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 13-year recurrence interval. Whites Gulch Road overtops on approximately a 33-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. Excessive slope and lack-of-depth are crossing's features that create migration barrier. Outlet is also perched.

Additional Road Crossings: Upstream, six crossings: three private crossings on Count's Gulch (800', 4,800', and 5,300'). One crossing at confluence of West and East Forks (1.4 miles above county crossing) and two crossings on West Fork White's Gulch (1.8 and 2.2 miles above county crossing). There is also a dam on mainstem White's Gulch approximately 1,200' upstream of the county crossing.

Habitat: Quantity = approximately 4.8 miles of potential anadromous fish-bearing habitat (1.4 miles in mainstem, 1.2 miles in East Fork, 1.1 miles in West Fork, and 1.1 miles in Count's Gulch). Quality = Good. Recent, but undated, USFS survey of over 10,000' of mainstem channel: dense riparian, numerous pools, ample spawning gravels with low percentage of fines. CDFG memo dated 6/11/70 noted that Jumbo Mine dam had about a 10' drop on downstream side, as well as lots of siltation from roads and mining activity. CDFG memo from 1967 stated that steelhead are sometimes seen in lower ¼ mile of channel.

Preferred Treatment: Due to size of drainage area above the county road, the potential for high-intensity rain and rain-on-snow events, and the remote location; a properly-sized bridge is the preferred treatment.

Site #7: Whites Gulch/Whites Gulch Road; North Fork Salmon River; Salmon River; Klamath River

Site #8: Robinson Gulch/Sawyer's Bar Road; North Fork Salmon River; Salmon River; Klamath River

Ranking: #31 = Low-Priority

Location: Road ID #1C01; County Map #3. USGS Quad: Tanners Peak. T40N, R10W, Section 19. Milepost = 19.4 miles

Culvert Type: Circular pipe; CSP. **Dimensions:** diameter = 6.0'. **Length:** 60.6' **Slope:** 4.03%.

Modifications: None. **Fill Estimate:** 819 cubic yards. **Overall condition:** Good, no apparent signs of wear.

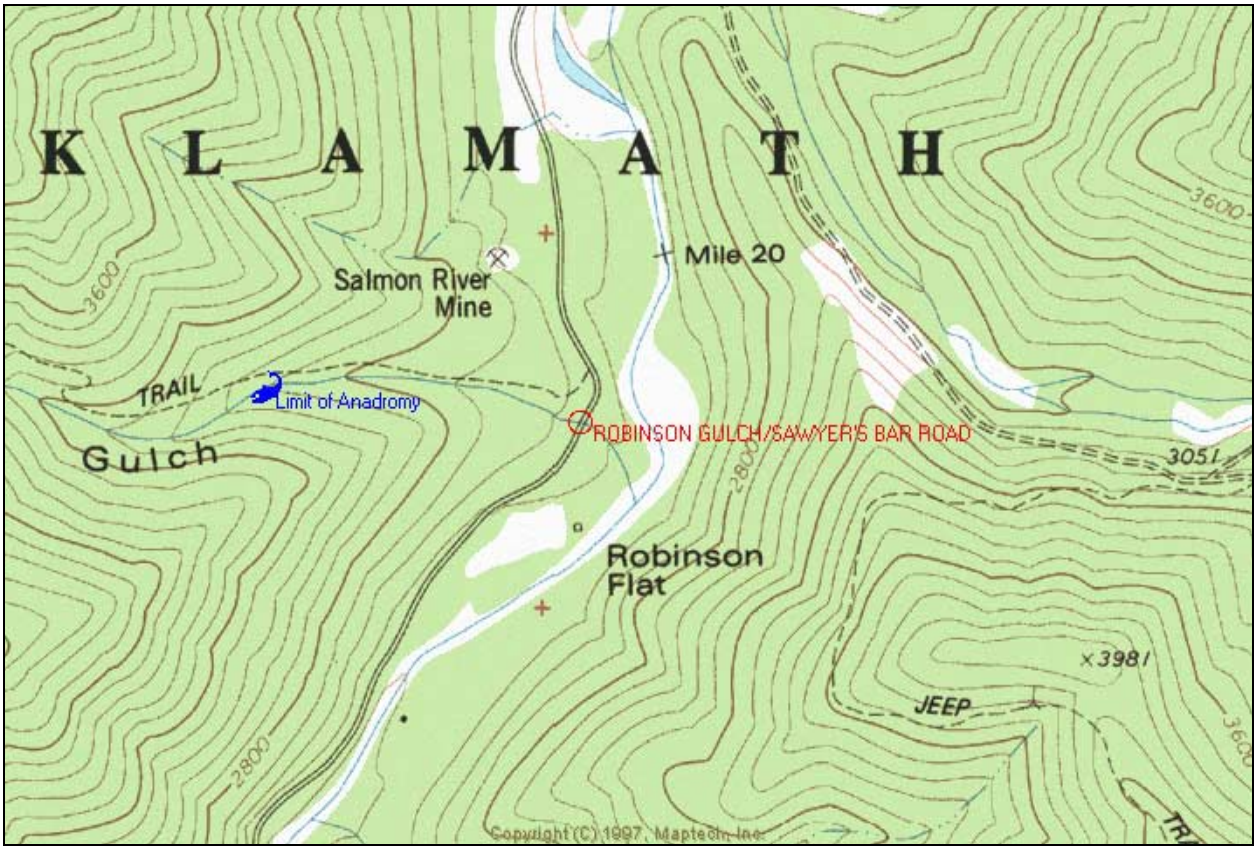
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 14-year recurrence interval. Sawyer's Bar Road overtops on approximately a 60-year storm flow.

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. Excessive slope and perched outlet are crossing's features that create migration barrier.

Additional Road Crossings: Downstream, none Robinson Gulch flows directly into the North Fork Salmon River approximately 900'. Upstream, none appear on maps within the limit of anadromy.

Habitat: Quantity = approximately 3,100' of potential anadromous fish-bearing habitat. Quality = Fair. No formal habitat or fish surveys were found in CDFG and USFS files. A CDFG memo from 8/12/78 from mouth to 1/3 mile upstream of county road – a diversion dam and pond above the county road was considered a migration barrier. No fish observed until upstream of dam/small pond that was stocked with trout. It is unknown if this diversion dam and pond still exist 1,700' upstream of the county road.

Preferred Treatment: When site is due for replacement (or fails) construct either a properly-sized bridge or arch-culvert set on concrete footings. The limited amount of upstream habitat makes this site a poor candidate for treatment with fisheries restoration funds.



Site #8: Robinson Gulch/Sawyer's Bar Road; North Fork Salmon River; Salmon River; Klamath River

Site #9: Ottley Gulch/China Road; Klamath River. **Ranking: #22 = Low-Priority**

Location: Road ID # 7C002; County Map #11. USGS Quad: Slater Butte. T16N, R8E, Section 18. Milepost = 5.3 miles

Culvert Type: Circular pipe; CSP, spiral corrugations. **Dimensions:** diameter = 4.0'. **Length:** 40.0'

Slope: 6.65%. **Modifications:** None. **Fill Estimate:** 110 cubic yards. **Overall condition:** Fair, culvert floor is rusted and abraded throughout.

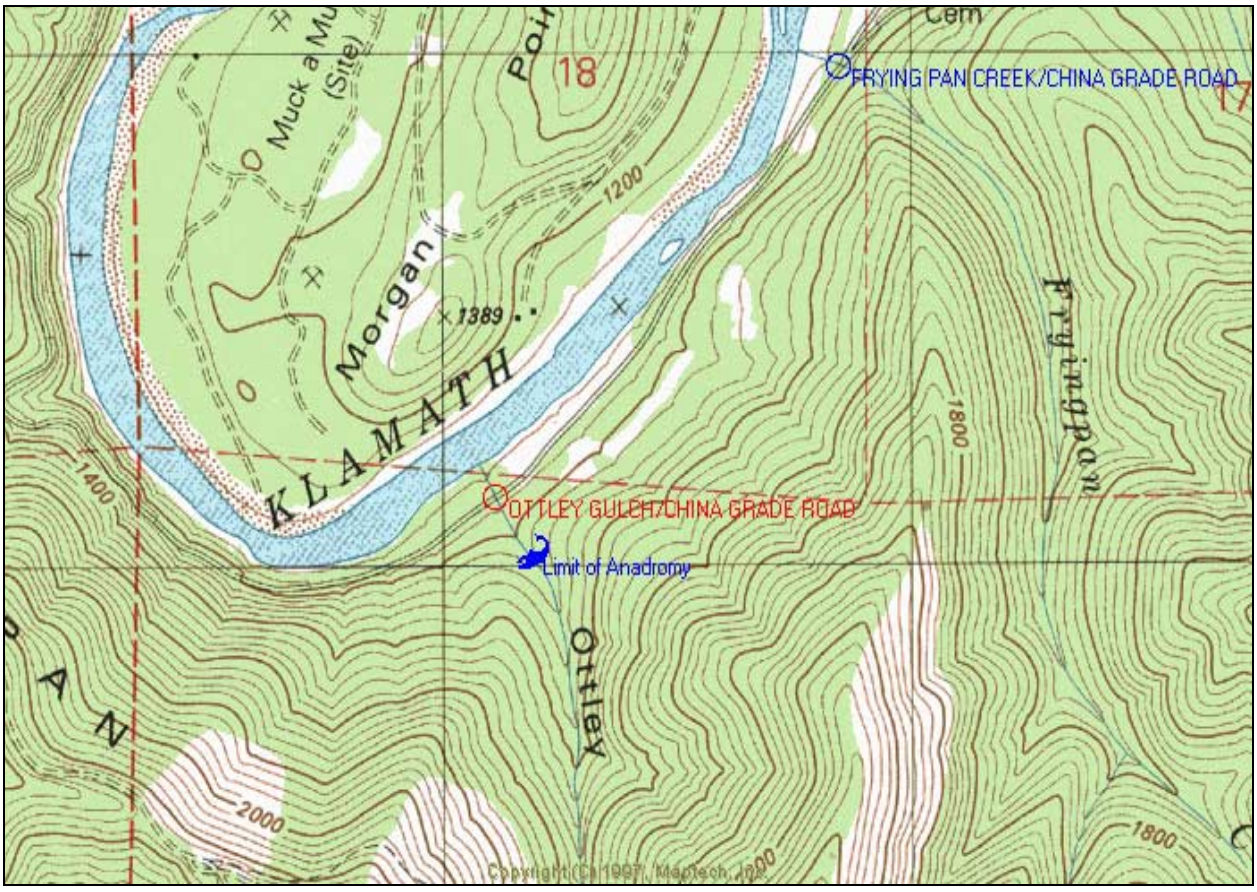
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a six-year recurrence interval. China Road overtops on approximately an 11-year storm flow.

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. Excessive slope is the crossing's feature that creates a migration barrier.

Additional Road Crossings: Downstream, none channel enters the Klamath River approximately 350' below China Road. Upstream, map indicates no crossings within the fish-bearing stream reach.

Habitat: Quantity = approximately 500' of potential fish-bearing habitat. Quality = Poor. No formal habitat of fisheries surveys found in CDFG or USFS files. Channel appears small, steep, and confined. There is limited upstream habitat for either anadromous spawning or rearing.

Preferred Treatment: When crossing is due for replacement (or fails) replace with a properly-sized embedded circular SSP pipe or an arch-culvert set on concrete footings. Lack of upstream fisheries benefit makes this site a poor candidate for replacement with fisheries restoration funds.



Site #9: Ottley Gulch/China Road; Klamath River.

Site #10: Frying Pan Creek/China Road; Klamath River. **Ranking: #21 = Low-Priority**

Location: Road ID # 7C002; County Map #11. USGS Quad: Slater Butte. T16N, R8E, Section 18. Milepost = 6.1 miles

Culvert Type: Circular pipe; CSP, spiral corrugations. **Dimensions:** diameter = 4.0'.

Length: 43.1' **Slope:** 1.58%. **Modifications:** None. **Fill Estimate:** 169 cubic yards.

Overall condition: Fair, culvert floor is rusted and abraded throughout.

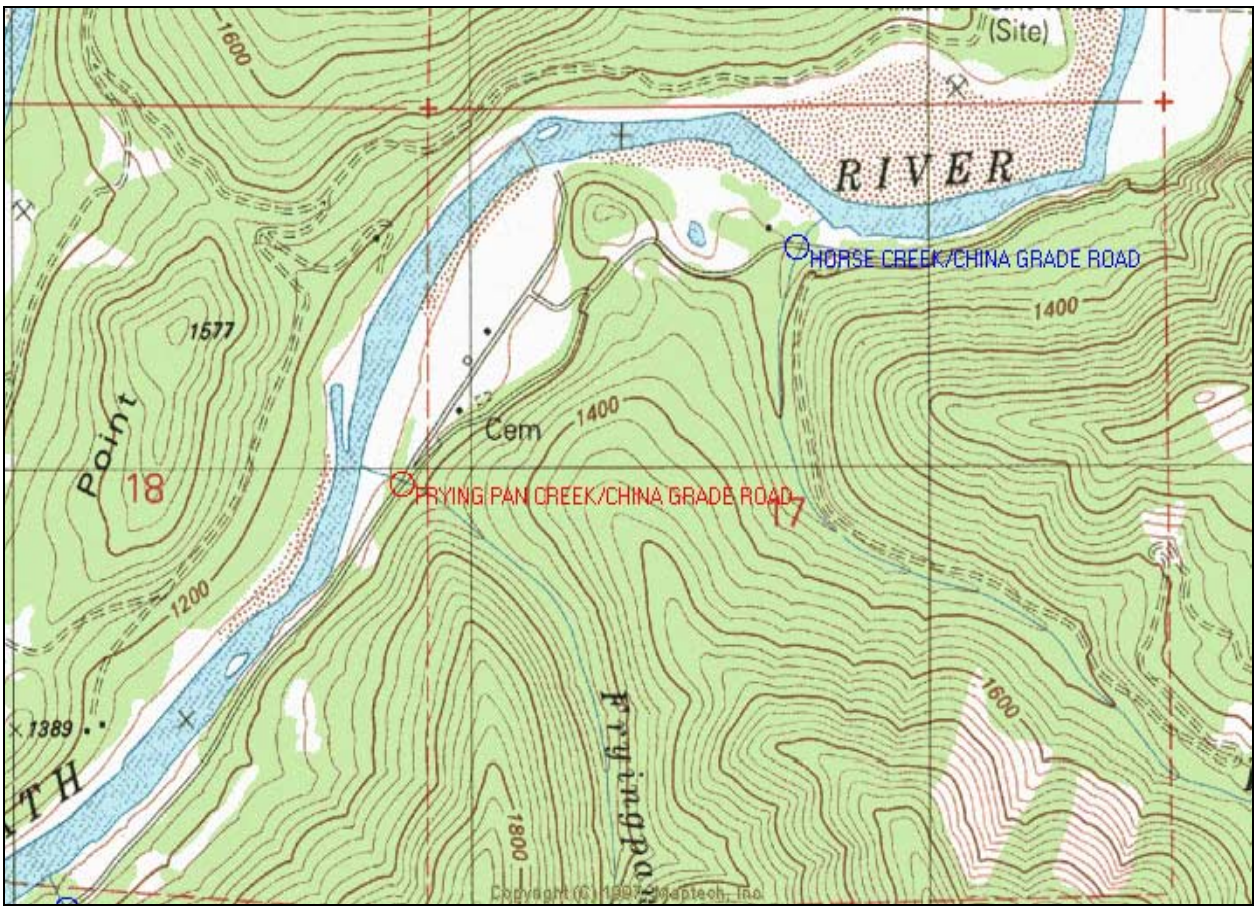
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a five-year recurrence interval. China Road overtops on approximately a seven-year storm flow.

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. Lack of depth through the culvert and the steep drop over riprap below the outlet are the crossing's features that create a migration barrier.

Additional Road Crossings: Downstream, none creek enters Klamath River approximately 400' below China Road. Upstream, map indicates no crossings within the limited reach of anadromy.

Habitat: Quantity = approximately 500' of potential fish-bearing habitat. Quality = Poor. No formal habitat of fisheries surveys found in CDFG or USFS files. Channel appears small, steep, and confined. There is limited upstream habitat for either anadromous spawning or rearing.

Preferred Treatment: When crossing is due for replacement (or fails) replace with a properly-sized embedded circular SSP pipe or an arch-culvert set on concrete footings. Lack of upstream fisheries benefit makes this site a poor candidate for replacement with restoration funds.



Site #10: Frying Pan Creek/China Road; Klamath River.

Site #11: Horse Creek/China Road; Klamath River **Ranking: #15 = Moderate-Priority**

Location: Road ID # 7C002; County Map #11. USGS Quad: Slater Butte. T16N, R8E, Section 17. Milepost = 6.8 miles

Culvert Type: Circular pipe; SSP. **Dimensions:** diameter = 6.0'. **Length:** 36.3' **Slope:** 5.62%.

Modifications: None. **Fill Estimate:** 356 cubic yards. **Overall condition:** Poor, culvert floor is rusted through in numerous places.

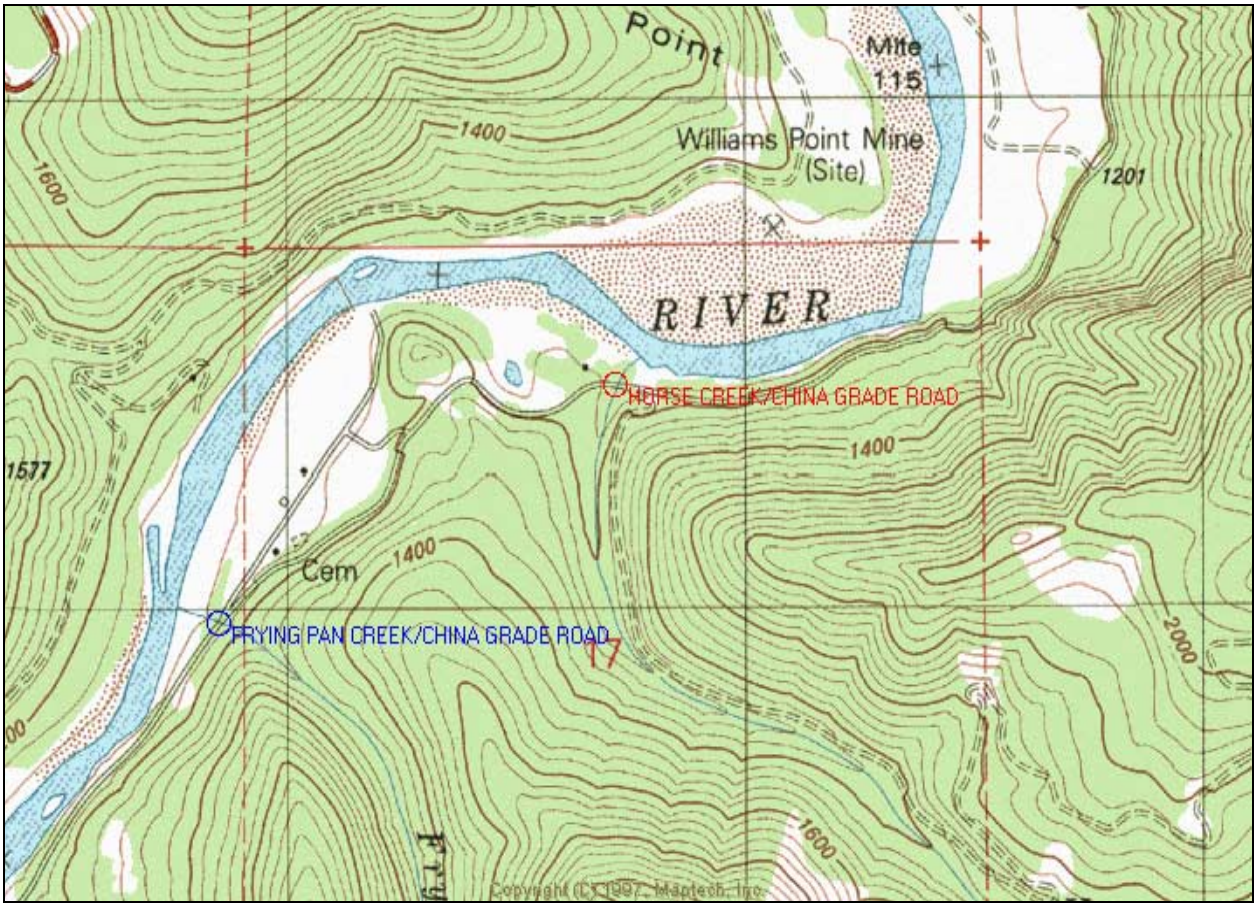
Sizing: Undersized; HW/D = 1 on a storm flow with approximately an eight-year recurrence interval. China Road is overtopped on approximately a 17-year storm flow.

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. Excessive slope through the culvert is the crossing's feature that creates a migration barrier.

Additional Road Crossings: Downstream, none creek enters directly into the Klamath River approximately 300' below China Road. Upstream, map indicates no crossings within the anadromous stream reach.

Habitat: No formal surveys were found. Quantity = approximately 3,000' of potential anadromous fish-bearing habitat upstream of China Road. Quality = Poor, discussions with Forest Service fisheries biologists suggested that Horse Creek is of limited biological significance to salmonids. The channel is small and steepens quickly upstream of China Road (##########, pers. comm.).

Preferred Treatment: Properly-sized bridge or arch-culvert set on concrete footings.



Site #11: Horse Creek/China Road; Klamath River.

Site #12: Slater Creek a.k.a. Ikes Creek/Indian Creek Road; Indian Creek; Klamath River

Ranking: #19 = Low-Priority

Location: Road ID # 7C01; County Map #11. USGS Quad: Happy Camp. T17N, R7E, Section 26. Milepost = 3.0 miles

Culvert Type: Circular pipe; SSP. **Dimensions:** diameter = 5.0'. **Length:** 40.3' **Slope:** 1.71%.

Modifications: None. **Fill Estimate:** 274 cubic yards. **Overall condition:** Poor, culvert floor is rusted through.

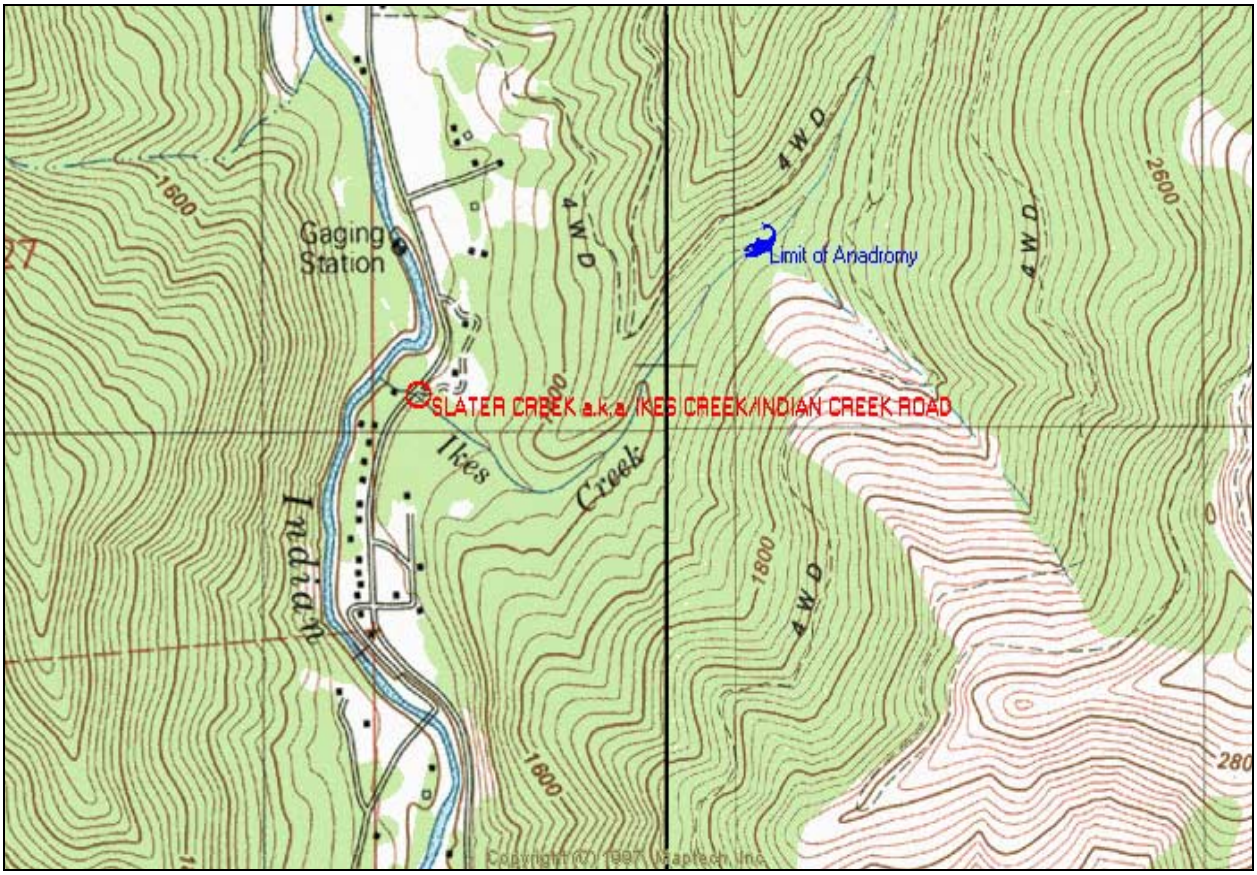
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a six-year recurrence interval. Indian Creek Road overtops on approximately a 15-year storm flow.

Barrier Status: GREY: FishXing estimated that fish passage criteria are met on 0% of the expected migration flows for adult anadromous salmonids, 0% for resident/two-year old juveniles, and 33% for one-year old and young-of-year juveniles. A lack of depth on lower flows and excessive velocities at higher flows create the migration barrier.

Additional Road Crossings: Downstream, none. Upstream, map indicates none within fish-bearing reach.

Habitat: Quantity = approximately 4,100' of potential anadromous fish-bearing habitat. Quality = Poor. CDFG survey conducted on 10/1/71 by A. Bernstein. Reach surveyed = mouth to 0.75 miles upstream. Spawning = areas limited and impacted with fines. Pools = very few and shallow. Fishes = none observed. Commented that culvert at county road was probably not a migration barrier. Bernstein also noted that entire drainage was burnt, cut-over, and impacted by fine sediments.

Preferred Treatment: When crossing is due for replacement (or fails) replace with a properly-sized embedded circular SSP pipe or an arch-culvert set on concrete footings. Lack of upstream fisheries benefit makes this site a poor candidate for replacement with restoration funds.



Site #12: Slater Creek a.k.a. Ikes Creek/Indian Creek Road; Indian Creek; Klamath River

Site #13: Luther Gulch/Indian Creek Road; Indian Creek; Klamath River **Ranking: #23 = Low-Priority**

Location: Road ID #7C01. County Map #11. USGS Quad: Happy Camp. T17N, R7E, Section 15. Milepost = 5.5 miles

Culvert Type: Concrete box. **Dimensions:** 6.3'H x 6.0'W. **Length:** 36.0' **Slope:** 4.08%.

Modifications: None. **Fill Estimate:** 428 cubic yards. **Overall condition:** Poor, culvert floor is cracked and broken through in numerous places.

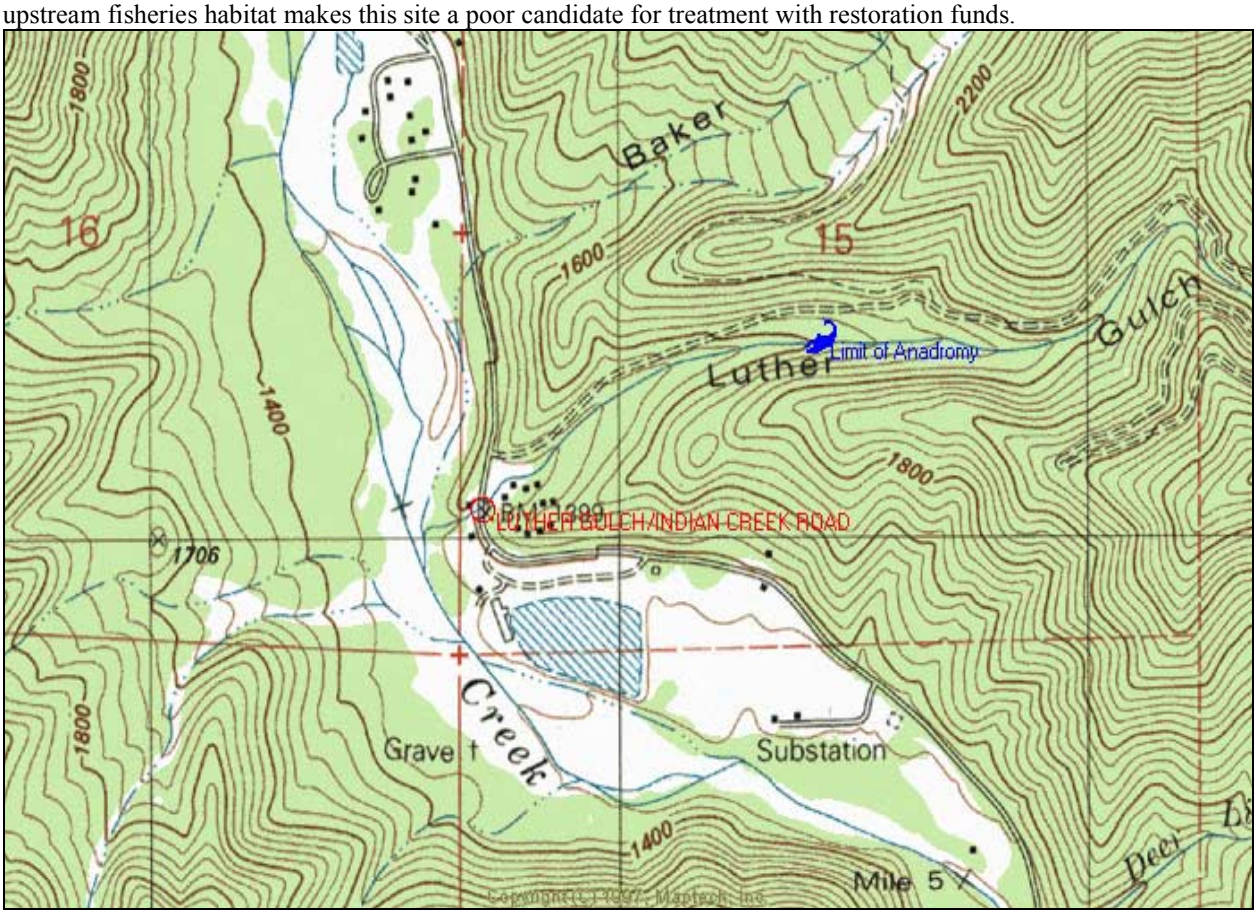
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 12-year recurrence interval. Indian Creek Road overtops on approximately a 53-year storm flow.

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. Excessive slope and a wide smooth concrete floor cause a lack of depth on lower migration flows and excessive velocities at higher flows.

Additional Road Crossings: Downstream, none. Upstream, map indicates no crossings within the fish-bearing stream reach.

Habitat: Quantity = approximately 2,800' of potential anadromous fish-bearing habitat. Quality = Poor. No formal CDFG or USFS habitat or fisheries surveys on file. CDFG files had numerous memos and water quality reports from the 1960's-70's regarding high and chronic copper toxicity in the creek from the Gray Eagle Mine. The mine was then re-opened in 1980 by Noranda Mining Inc. NOTE: Surveys never noted salmonids or fish observations in Luther Gulch.

Preferred Treatment: County Public Works should examine current box culvert and assess if cracks in floor are of structural concern. The County should also determine if the water diversion pipes and braces (see site photo) may impair flow conveyance, as well as catch storm debris. If crossing is in need of repair or replacement the lack of upstream fisheries habitat makes this site a poor candidate for treatment with restoration funds.



Site #13: Luther Creek/Indian Creek Road; Indian Creek; Klamath River

Site #14: Darkey Creek/Seiad Creek Road; Seiad Creek; Klamath River **Ranking: #18 = Low-Priority**

Location: Road ID # 8D002. County Map #10. USGS Quad: Seiad Valley. T46N, R11W, Section 7. Milepost = 1.4 miles

Culvert Type: Circular pipe. **Dimensions:** diameter = 3.5'. **Length:** 77.7' **Slope:** 4.80%.

Modifications: None. **Fill Estimate:** 886 cubic yards.

Overall condition: Poor, culvert floor is rusted through in numerous places.

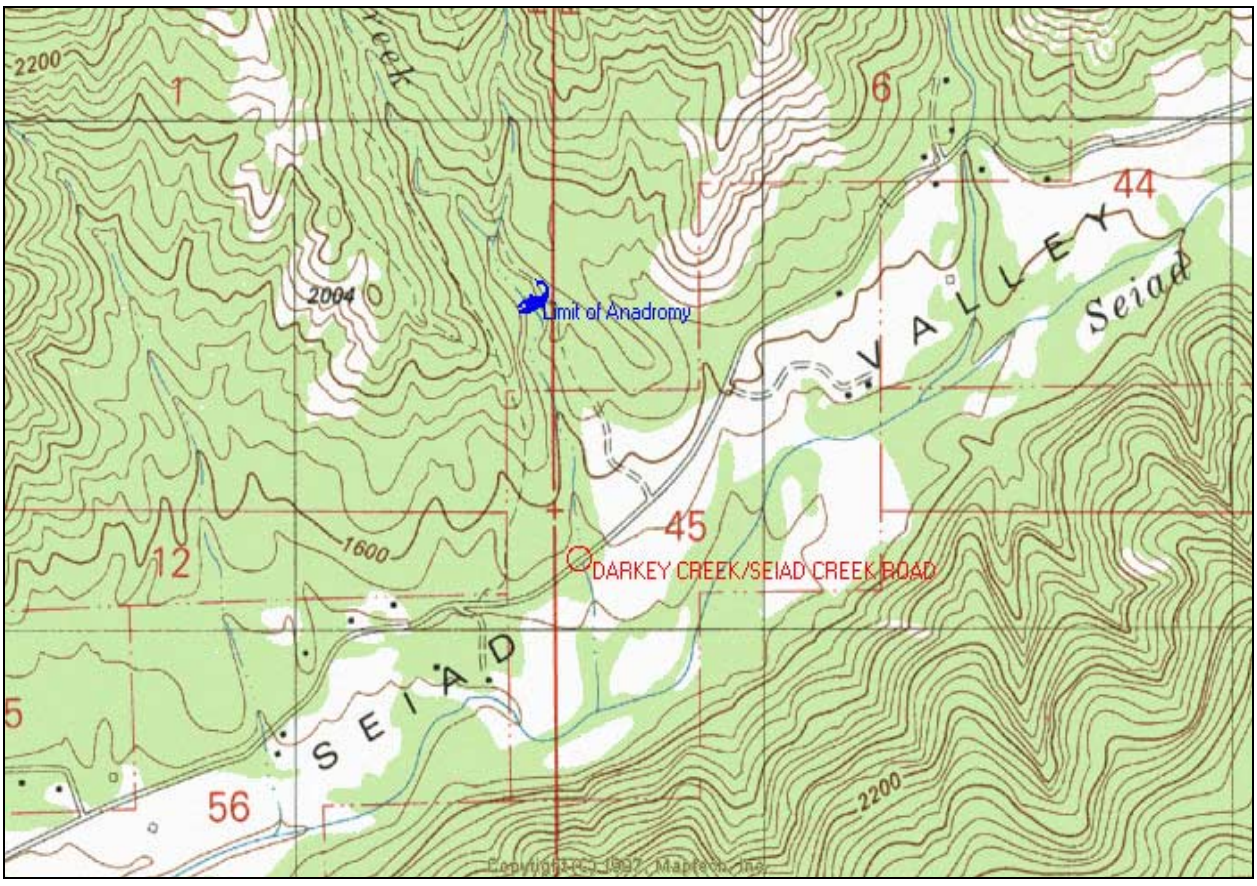
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a four-year recurrence interval. Seiad Creek Road overtops on approximately a 14-year storm flow.

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. Excessive slope and perched outlet are the crossing's features that create a migration barrier.

Additional Road Crossings: Downstream, none. Upstream, none.

Habitat: Quantity = approximately 1,800' of potential fish-bearing habitat with an overall slope of five percent. Quality = Poor. No habitat or fisheries surveys in CDFG or USFS files. A recent permit request for a water withdrawal was granted by CDFG. Habitat is limited, the stream channel is small and gets very steep shortly upstream from Seiad Creek Road culvert (D. Maria, pers. com.).

Preferred Treatment: Current culvert is extremely undersized, in poor condition, and probably due for replacement. Replace with a properly-sized embedded circular SSP pipe or an arch-culvert set on concrete footings. Lack of upstream fisheries benefit makes this site a poor candidate for replacement with restoration funds.



Site #14: Darkey Creek/Seiad Creek Road; Seiad Creek; Klamath River.

Site #15: Walker Gulch/Ladd Road; Klamath River **Ranking: #27 = Low-Priority**

Location: Road ID # 8D004. County Map #10. USGS Quad: Seiad Valley. T46N, R11W, Section 17. Milepost = 2.1 miles

Culvert Type: Circular pipes (2); CSP. **Dimensions:** diameter = 4.0'. **Length:** left bank = 30.3'; right bank = 28.3'. **Slope:** left bank = 9.11%; right bank = 11.28%.

Modifications: None. **Fill Estimate:** 167 cubic yards. **Overall condition:** Good.

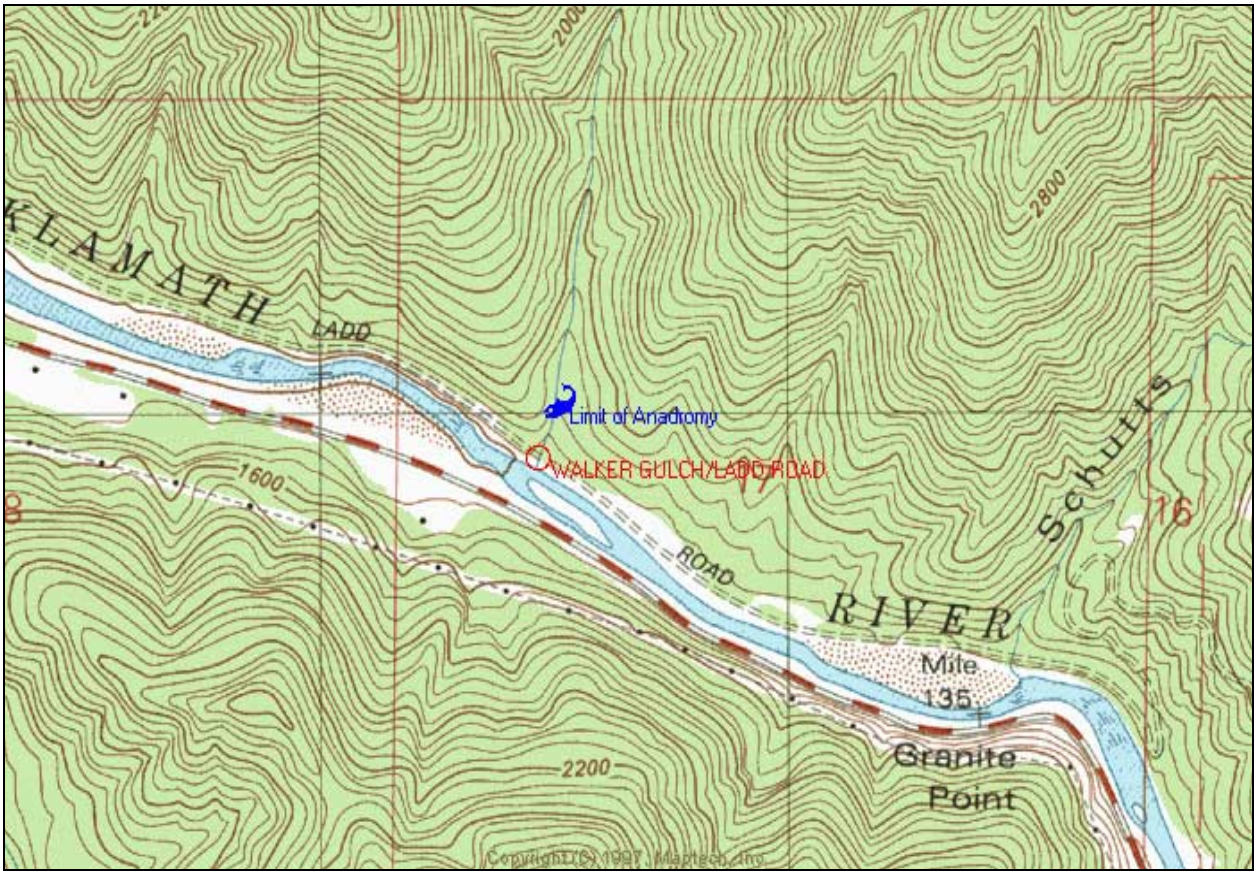
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 20-year recurrence interval. Ladd Road overtopped on approximately a 117-year storm flow.

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. Excessive slope and perched outlet are the crossing's features that create a migration barrier.

Additional Road Crossings: Downstream, none. Upstream, maps indicate none within fish-bearing stream reach.

Habitat: Quantity = approximately 500' of potential fish-bearing habitat. Quality = Poor. No formal habitat or fisheries surveys on file with CDFG or USFS. Channel gets very steep only several 100 feet upstream of the county road.

Preferred Treatment: When crossing is due for replacement (or fails) replace with a properly-sized embedded circular SSP pipe or an arch-culvert set on concrete footings. Lack of upstream fisheries benefit makes this site a poor candidate for replacement with restoration funds.



Site #15: Walker Gulch/Ladd Road; Klamath River.

Site #16: Mill Creek/Mill Creek Road; Scott River; Klamath River **Ranking: #26 = Low-Priority**

Location: Road ID # 6G003B. County Map #10. USGS Quad: Russell Peak. T45N, R10W, Section 21. Milepost = 0.7 miles

Culvert Type: Circular pipes (2); CSP. **Dimensions:** diameters = 6.0'. **Length:** left bank = 40.5'; right bank = 40.5'. **Slope:** left bank = 3.78%; right bank = - 0.17%.

Modifications: None. **Fill Estimate:** 313 cubic yards. **Overall condition:** Fair, culvert floors abraded.

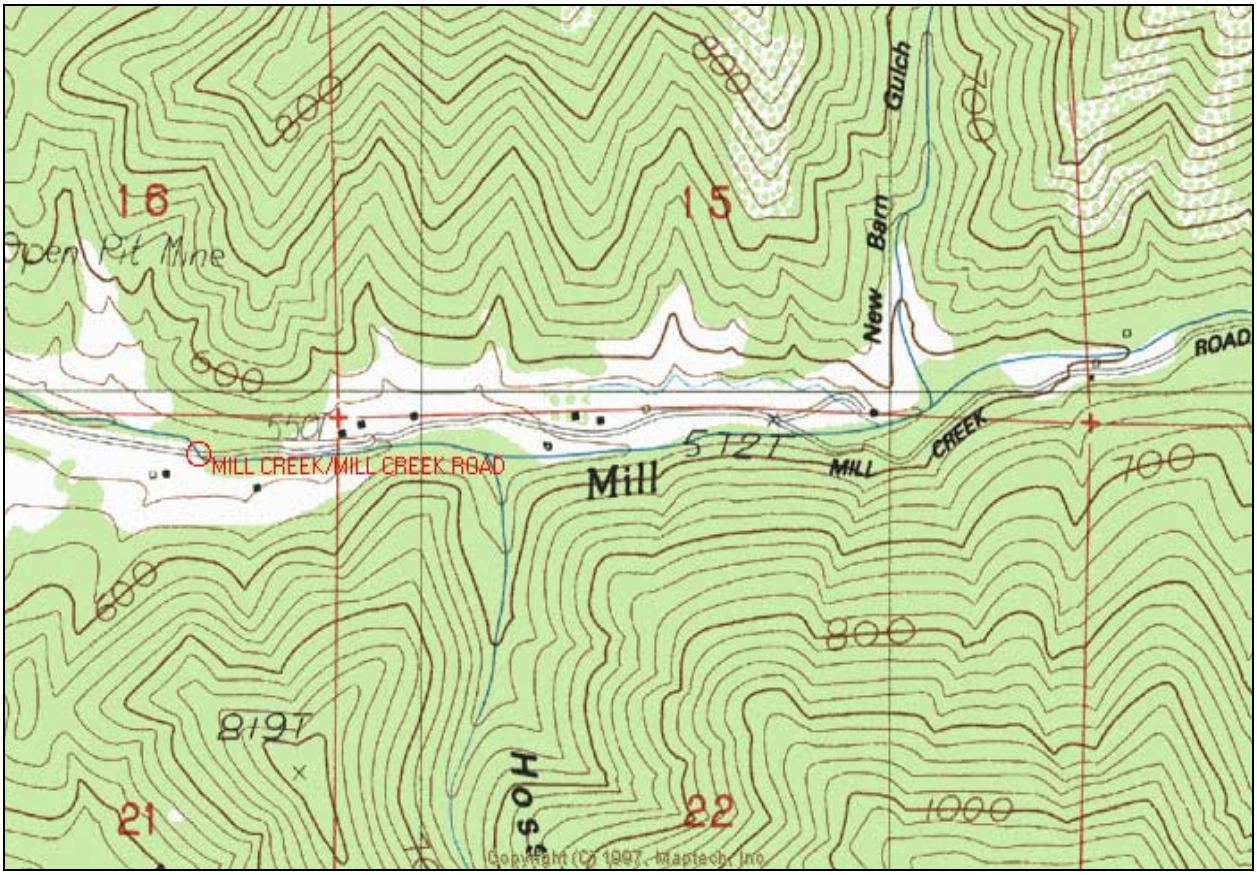
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a four-year recurrence interval. Mill Creek Road overtops on approximately a four-year storm flow.

Barrier Status: GREY: FishXing estimated that fish passage criteria are met on 89% of the expected migration flows for adult anadromous salmonids, 91% for resident/two-year old juveniles, and 24% for one-year old and young-of-year juveniles.

Additional Road Crossings: Downstream, one on private road to Quartz Hill mine. CDFG has modified this crossing to improve passage with unknown success - appears to still be a partial/temporal barrier. An in-depth evaluation of this crossing is recommended. Upstream, maps indicate four USFS maintained crossings; 4,400', 2.0 miles, 2.1 miles, and 5.0 miles from the County-maintained crossing at Mill Creek Road.

Habitat: Quantity = approximately 6.5 miles of potential anadromous fish-bearing habitat. Quality = Good to fair. Past surveys have confirmed use by steelhead, coho salmon, and chinook salmon. CDFG 1970 memo confirmed over 100 chinook spawning in lower 0.8 mile – none observed past county crossing. CDFG/USFS conducted a survey between 4/13-16/70 over 6.5 mile reach = numerous small pools - some larger ones; ample spawning areas - but cemented with fines; numerous young-of-year and 1+ juvenile steelhead observed throughout 6.5 mile reach.

Preferred Treatment: Current crossing provides passage on most migration flows, but is extremely undersized for the large drainage area upstream (22.2 mi.^{2}). Bridge is most appropriate long-term treatment.



Site #16: Mill Creek/Mill Creek Road; Scott River; Klamath River.

Site #17: Meamber Creek/Scott River Road; Scott River; Klamath River **Ranking: #11 = Moderate Priority**

Location: Road ID # 7F01; County Map #10. USGS Quad: Russell Peak. T44N, R10W, Section 27. Milepost = 9.3 miles

Culvert Type: Pipe Arch, SSP. **Dimensions:** 3.5' Rise x 5.5' Span. **Length:** 32.3' **Slope:** 7.42%.

Modifications: None. **Fill Estimate:** 186 cubic yards. **Overall condition:** Fair, culvert floor is abraded.

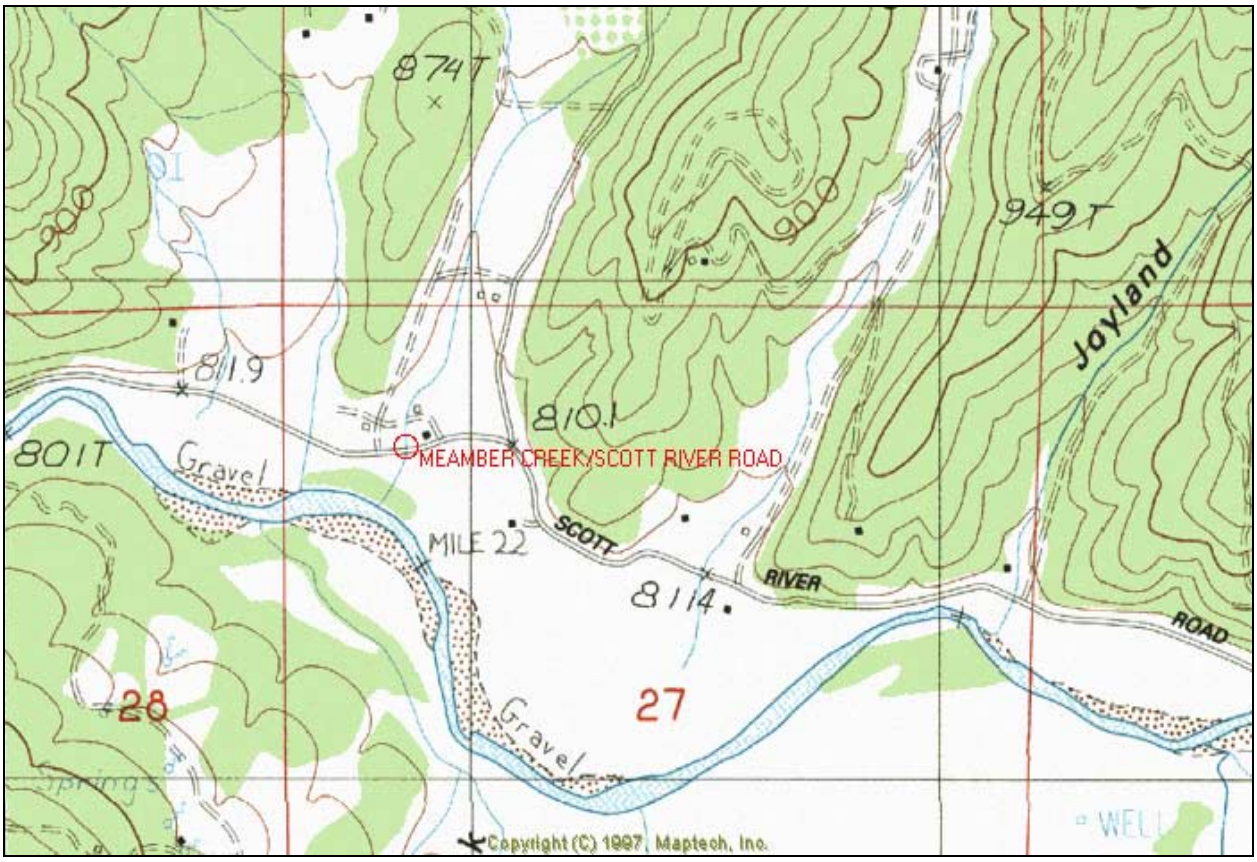
Sizing: Under-sized; HW/D = 1 on a storm flow with approximately a five-year recurrence interval. Scott River Road overtops on approximately a seven-year storm flow.

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. Excessive slope is crossing's features that create migration barrier.

Additional Road Crossings: Upstream (250'; 1,400'; 2,800'; and 3,700'): map indicates four private crossings upstream of Scott River Road. No access, so barrier status of these crossings is unknown.

Habitat: Quantity = approximately 2.2 miles of potential anadromous fish-bearing habitat. Quality = Poor/fair. Lower channel is aggraded with minimal pool habitat and a denuded riparian corridor. Upper channel was not inspected because of posted, private property. No complete habitat typing or fisheries surveys in CDFG or USFS files. CDFG conducted a fish rescue on 7/97 in the lower 0.5 miles; 74 juvenile steelhead were captured and relocated from the drying channel. An undated and unsigned CDFG memo stated that adult steelhead are "sometimes observed".

Preferred Treatment: Although upstream habitat is of marginal quality, there is over two miles of accessible habitat above county road (depending on status of private crossings). Also, the county culvert and road fill are undersized and the culvert is starting to abrade. Replace with a properly-sized open bottom arch or bridge.



Site #17: Meamber Creek/Scott River Road; Scott River; Klamath River

Site #18: Sniktaw Creek/Big Meadows Road; Scott River; Klamath River **Ranking: #13 = Moderate-Priority**

Location: Road ID # 16F001; County Map #10. USGS Quad: Greenview. T44N, R10W, Section 34. Milepost = 0.1 miles to Quartz Valley Road.

Culvert Type: Circular Pipe, SSP. **Dimensions:** diameter=7.0 **Length:** 43.9' **Slope:** 8.27%.

Modifications: None. **Fill Estimate:** 370 cubic yards. **Overall condition:** Fair.

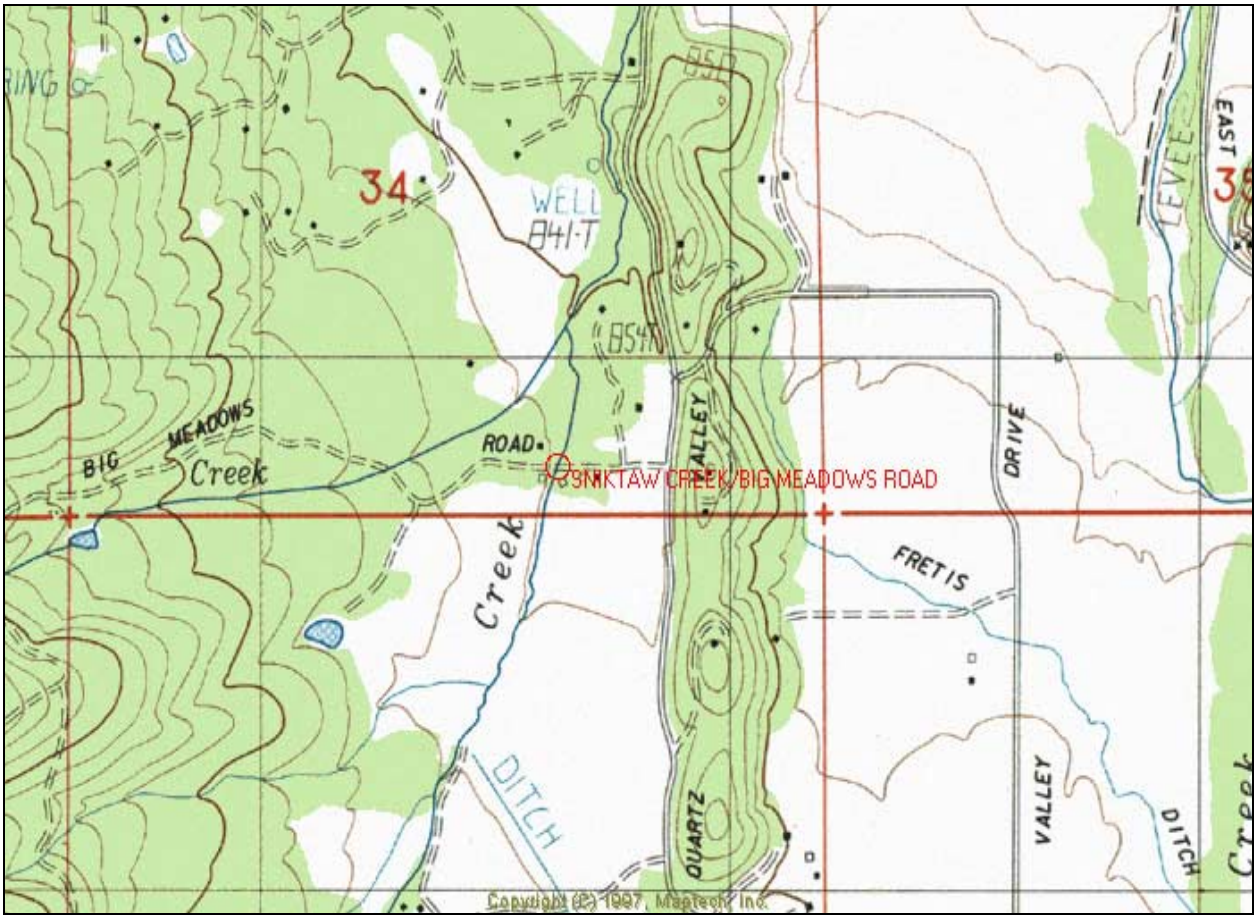
Sizing: Properly sized; HW/D = 1 on a storm flow with approximately an eight-year recurrence interval. Big Meadows Road overtops on approximately an 11-year storm flow.

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. Excessive slope and perched outlet are crossing's features that create migration barrier.

Additional Road Crossings: Upstream, maps indicate no crossings**.** Downstream, USGS Quad indicates two crossings - private road 2,900' and crossing 4,200' (county-maintained?) from Big Meadows Road. However, County road map shows no downstream county crossings.

Habitat: Quantity = approximately 9,800' of potential anadromous fish-bearing habitat. Quality = Poor. CDFG survey on 5/13/74 from mouth to 3.0 miles upstream, noted abundant spawning areas in lower reach, but a relative lack of riparian vegetation, pools, or in-stream cover. Survey noted a barrier at a diversion dam (five foot drop) on the Hiedie Ranch – do not know if this dam still exists. Some juveniles were observed

Preferred Treatment: Properly-sized bridge or open bottom arch-culvert set on concrete footings.



Site #18: Sniktaw Creek/Big Meadows Road; Scott River; Klamath River

Site #19: Rattlesnake Creek/Rattlesnake Creek Road; Scott River; Klamath River **Ranking:** Not ranked because this is a USFS-maintained crossing. However, this site would rank around #10 or #11 if included.

Location: Road ID # 6G001; County Map #10. USGS Quad: Russell Peak. T44N, R9W, Section 16. Milepost = 3.17 miles

Culvert Type: Concrete box. **Dimensions:** 4.1' Height x 6.0' Width. **Length:** 22.9'. **Slope:** 5.28%.

Modifications: None. **Fill Estimate:** 131 cubic yards. **Overall condition:** Good.

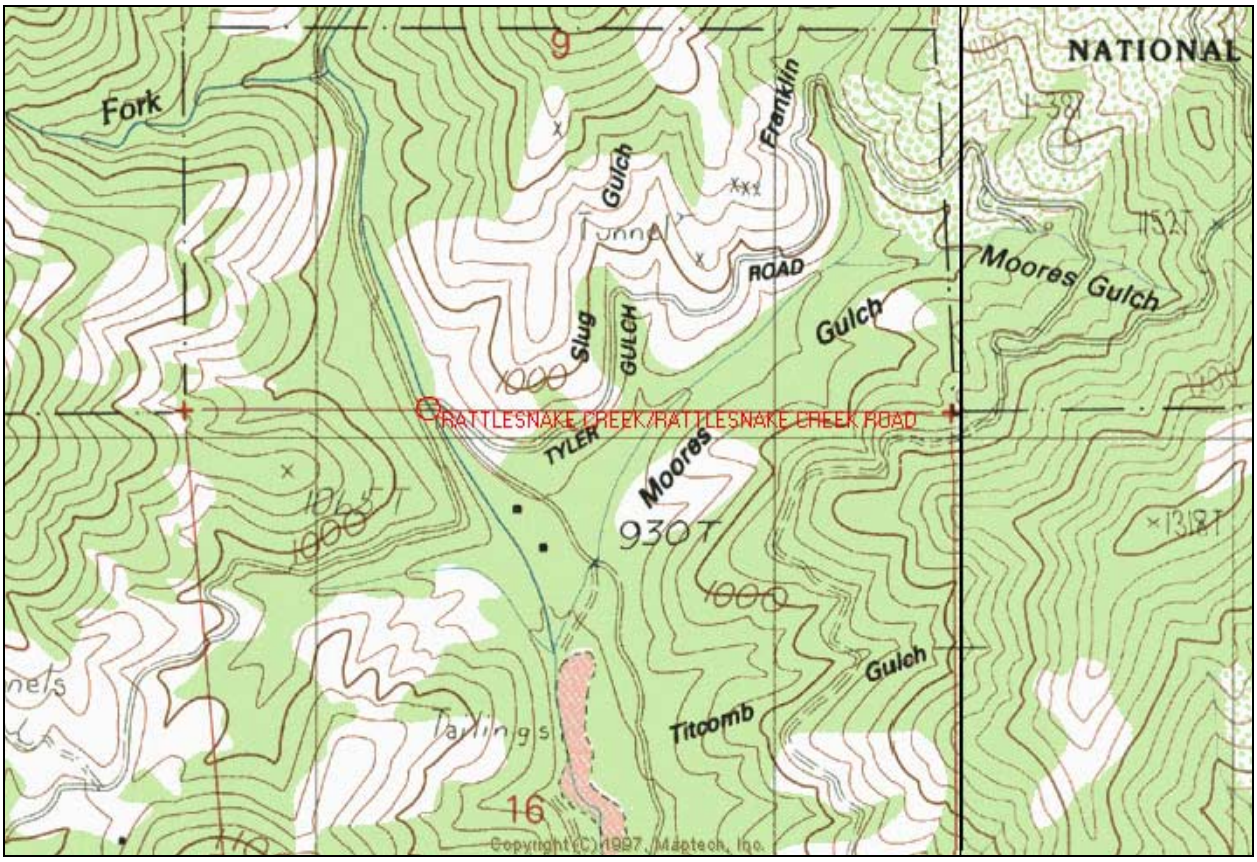
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a four-year recurrence interval. Rattlesnake Creek Road overtopped on approximately a six-year storm flow.

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. Excessive slope and perched outlet are the crossing's features that prevent fish migration.

Additional Road Crossings: Downstream (4,200', 1.1, 2.0, 2.2, 2.5, and 2.6 miles), USGS map indicates six crossings on private roads to ranches – several appear to be at least partial/temporal migration barriers. Upstream (1.5 miles), map indicates a USFS maintained crossing just upstream of Brushy Gulch.

Habitat: Quantity = approximately 2.1 miles of potential fish-bearing habitat above surveyed culvert. Quality = downstream of Rattlesnake Road = poor, channel subjected to un-fenced grazing. Above Rattlesnake Road = good, confined channel in a dense riparian of hardwoods and conifers, numerous pools, ample spawning locations. When site was surveyed in early fall lower channel was dry, yet upper channel was wetted and had cool temperatures. Approximately 20-30 juvenile 1+ salmonids observed in outlet pool, no fish observed upstream of box culvert.

Preferred Treatment: Properly-sized bridge or open bottom arch-culvert set on concrete footings.



Site #19: Rattlesnake Creek/Rattlesnake Creek Road; Scott River; Klamath River.

Site #20: French Creek- Eaton Lakes tributary/French Creek Road; Scott River; Klamath River

Ranking: #24 = Low-Priority

Location: Road ID # 3G002; County Map #3. USGS Quad: Eaton Peak. T40N, R9W, Section 5.
Milepost = 6.5 miles

Culvert Type: CSP Pipe-arch. **Dimensions:** 2.4' Rise x 3.2' Span. **Length:** 30.0. **Slope:** 2.07%.

Modifications: None. **Fill Estimate:** 109 cubic yards. **Overall condition:** Fair, culvert floor is abraded.

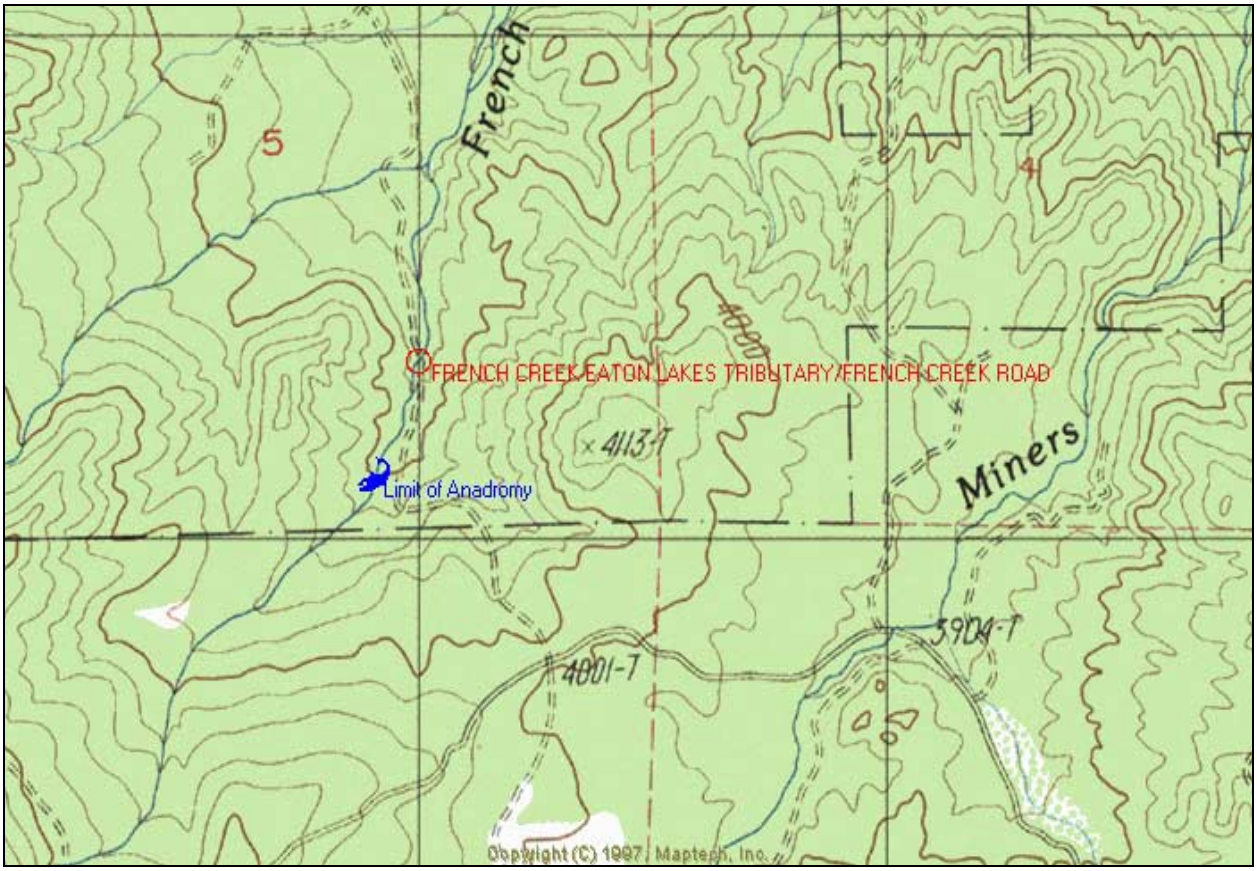
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. French Creek Road overtops on approximately a four-year storm flow.

Barrier Status: GREY: FishXing estimated that fish passage criteria are met on 33% of the expected migration flows for adult anadromous salmonids, 0% for resident/two-year old juveniles, and 0% for one-year old and young-of-year juveniles. Excessive slope and slightly perched outlet are the crossing's features that create a migration barrier.

Additional Road Crossings: Downstream, none. Upstream, map indicates one crossing on Forest Service road #N2G03, however this is located above the limit of anadromy.

Habitat: Quantity = approximately 1,000' of potential anadromous fish-bearing habitat. Quality = Fair. No formal USFS or CDFG habitat or fisheries surveys on file for this upper reach of French Creek. Channel had a dense riparian zone of hardwoods and conifers, as well as ample flow of cool water when the crossing was surveyed in the early fall prior to rainy season. Approximately 300' of channel above and below the county crossing were examined: it was confined and small with numerous small pools that were aggraded with fines. Several 3-5" salmonids were observed above and below the county culvert.

Preferred Treatment: Properly sized open-bottom arch culvert set on concrete footings.



Site #20: French Creek – Eaton Lakes tributary/French Creek Road; Scott River; Klamath River.

Site #21: Duzel Creek/Duzel Creek Road; Moffett Creek; Scott River; Klamath River

Ranking: #17 = Low-Priority.

Location: Road ID # 5H001; County Map #4. USGS Quad: Duzel Rock. T43N, R8W, Section 13. Milepost = 0.2 miles to East Moffett Creek Road.

Culvert Type: Two bay box, Concrete. **Dimensions:** 7.0' Height x 24.2' Width. **Length:** 20.0.

Slope: 1.20%. **Modifications:** None. **Fill Estimate:** 208 cubic yards. **Overall condition:** Good.

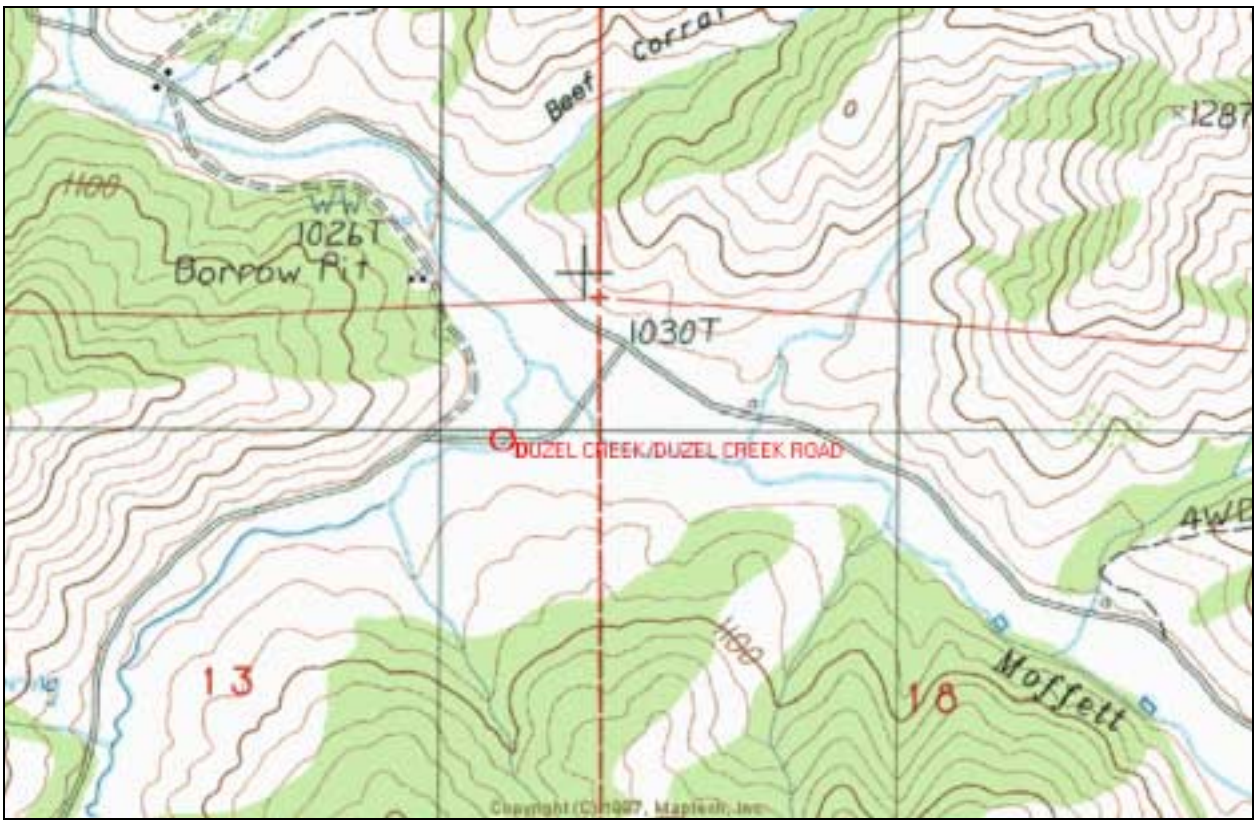
Sizing: Undersized; HW/D = 1 on a storm flow with approximately an 18-year recurrence interval. Duzel Creek Road overtops on approximately a 60-year storm flow.

Barrier Status: GREY: although "Grey", FishXing estimated that fish passage criteria are met on 0% of the expected migration flows for adult anadromous salmonids, 0% for resident/two-year old juveniles, and 0% for one-year old and young-of-year juveniles. The box culvert's width and smooth concrete floor create both a lack of depth and moderately excessive velocities that inhibit migration.

Additional Road Crossings: Upstream, USGS map indicates at least five road crossings within the fish-bearing stream reach at the following distances, measured from county crossing: 1.5 miles, 2.4 miles, 3.0 miles (just below confluence with Long Gulch), 4.1 miles, and 5.3 miles (just above confluence with White's Gulch). Downstream, USGS map indicates three crossings on Moffet Creek that are 4,500', 1.1 miles, and 2.8 miles below the Duzel Creek crossing on Duzel Creek Road.

Habitat: Quantity = approximately 5.5 miles of potential fish-bearing habitat. Quality = Poor. A 1979 CDFG memo noted there was at least five miles of potential steelhead spawning habitat in poor condition and infrequent pools for rearing. A CDFG survey was conducted on 7/15/75 over seven miles of channel: spawning = marginal to fair. Pools/shelter = little streamside or in-stream cover. Fishes = none observed. Diversions = several. CDFG 1968 memo: steelhead sometimes seen 1.5 miles up Duzel Ck., none this year.

Preferred Treatment: Offset baffles would increase depth and reduce water velocities within box culvert.



Site #21: Duzel Creek/ Duzel Creek Road; Moffett Creek; Scott River; Klamath River

Site #22: Collins Creek/Walker Road; Klamath River **Ranking: #12 = Moderate-Priority**

Location: Road ID # 8G004; County Map #10. USGS Quad: Horse Creek. T46N, R10W, Section 14. Milepost = 0.3 miles

Culvert Type: Circular pipe, CSP. **Dimensions:** diameter = 4.0'. **Length:** 57.0'. **Slope:** 4.19%.

Modifications: None. **Fill Estimate:** 297 cubic yards. **Overall condition:** Fair/poor; floor is abraded and culvert is slightly crushed and slumping under road fill.

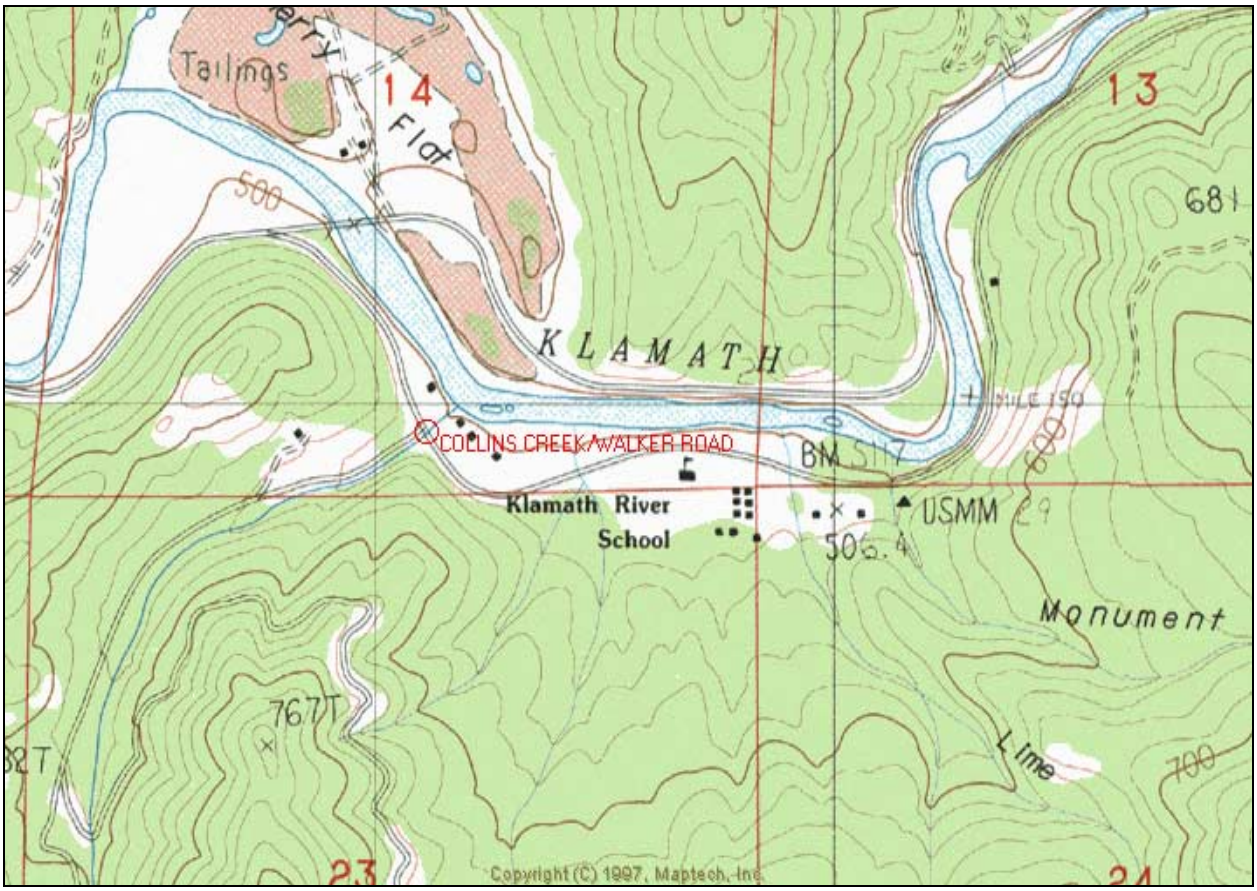
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. Walker Road overtops on approximately a six-year storm flow.

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. Excessive slope is the crossing's main feature that creates a migration barrier. The slightly perched outlet probably impedes juvenile migration too. Large tree growing right at inlet probably creates excessive turbulence that impedes fish passage.

Additional Road Crossings: Downstream, none. Collins Creek enters the Klamath River approximately 200' downstream. Upstream (4,300'), map indicates one crossing on Forest Service road #46N14.

Habitat: Quantity = 7,800' of potential fish-bearing habitat. Quality = Rated as "fair". No formal habitat or fisheries surveys were found at CDFG and USFS offices. However, Collins Creek is known to support steelhead and resident rainbow trout populations. Approximately 500' of the channel was walked above Walker Road. The creek had a dense riparian canopy of hardwoods and conifers, numerous small pools, and cool water temperatures at low flow prior to rainy season. Talked to long-time landowner who has never observed adult steelhead in Collins Creek, only "smaller trout" in channel below county road.

Preferred Treatment: Replace with a properly sized open-bottom arch culvert set on concrete footings or a bridge.



Site #22: Collins Creek/Walker Road; Klamath River.

Site #23: Dona Creek/Walker Road; Klamath River **Ranking: #14 = Moderate-Priority**

Location: Road ID # 8G004; County Map #10. USGS Quad: Horse Creek. T46N, R9W, Section 8. Milepost = 3.8 miles

Culvert Type: Circular pipe, SSP. **Dimensions:** diameter = 3.0'. **Length:** 38.0'. **Slope:** 4.29%.

Modifications: None. **Fill Estimate:** 67 cubic yards. **Overall condition:** Poor; culvert floor is abraded throughout and rusted through in numerous places. Inlet is slightly crushed.

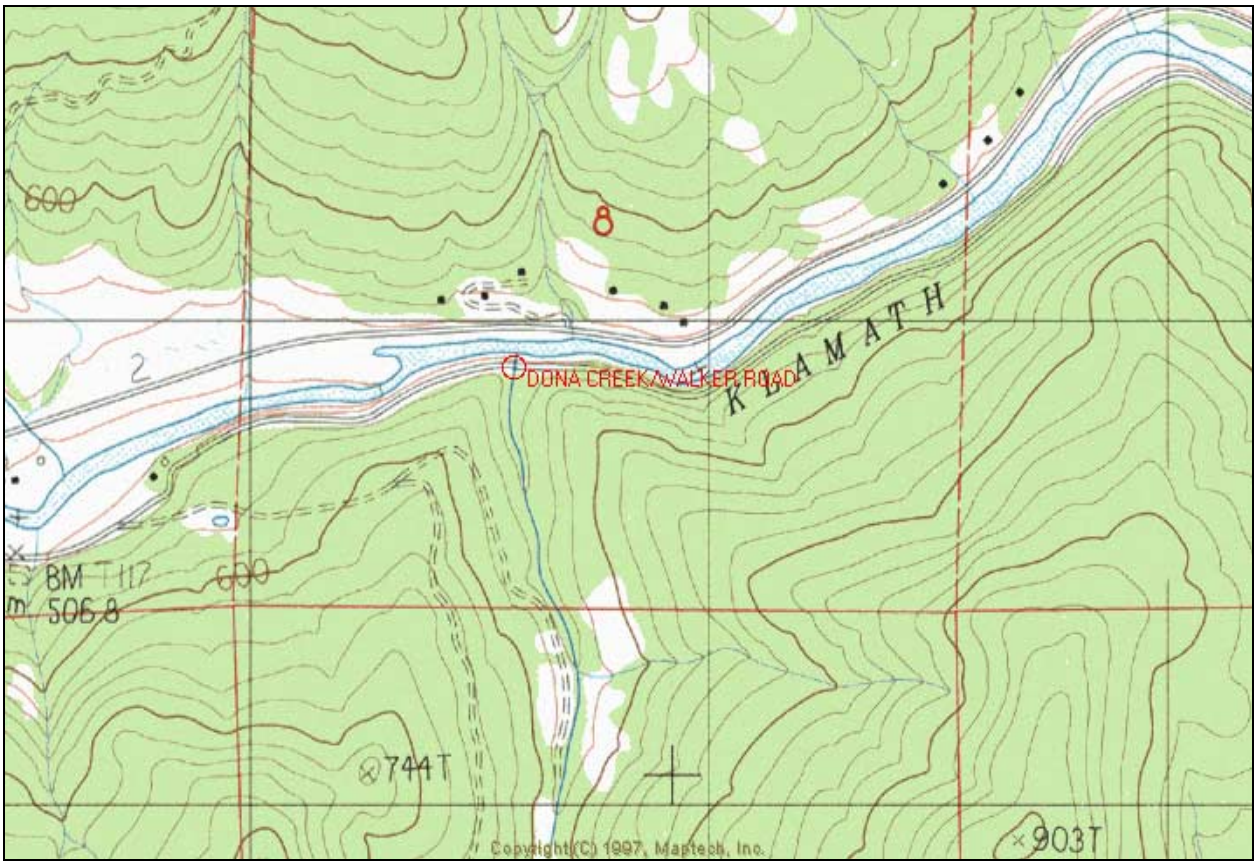
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. Walker Road overtops on approximately a three-year storm flow.

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. Excessive slope and perched outlet are crossing's features that create a migration barrier.

Additional Road Crossings: Downstream, none. Dona Creek enters the Klamath River approximately 30' downstream. Upstream; two crossings: 50' above county road there is a flatcar bridge on a private road. Approximately 3,100' upstream, the USGS map indicates a private road may cross the creek.

Habitat: Quantity = approximately 6,000' of potential fish-bearing habitat. Quality = poor. No formal habitat or fisheries surveys were found at CDFG and USFS offices. Two memos were found at CDFG regarding Dona Creek: the first dated 10/25/67 was from R.J. Lanse who inspected the lower reach of the creek and noted that, "if the culvert were improved, steelhead may use this stream". An undated/unsigned memo that appear older than the 1967 memo stated, "No fish have been able to ascend the creek since a culvert was installed near the mouth. Possibly this situation could be remedied, but the stream is not an important one".

Preferred Treatment: Replace with a properly sized embedded circular or oval culvert. Although creek has minimal fisheries potential, the crossing is extremely undersized, is in poor condition, and has a high potential for failure. Site scored fairly high due to sizing and condition.



Site #23: Dona Creek/Walker Road; Klamath River.

Site #24: McKinney Creek/Walker Road; Klamath River **Ranking: #7 = High-Priority**

Location: Road ID # 8G004; County Map #10. USGS Quad: Horse Creek. T46N, R9W, Section 9. Milepost = 5.6 miles

Culvert Type: Circular pipes (2), CSP. **Dimensions:** diameters: left bank = 4.0'; right bank = 3.5'.

Length: 32.0'. **Slope:** left bank = 3.44%; right bank = 2.53%.

Modifications: None. **Fill Estimate:** 110 cubic yards. **Overall condition:** Fair; culvert floors are abraded throughout.

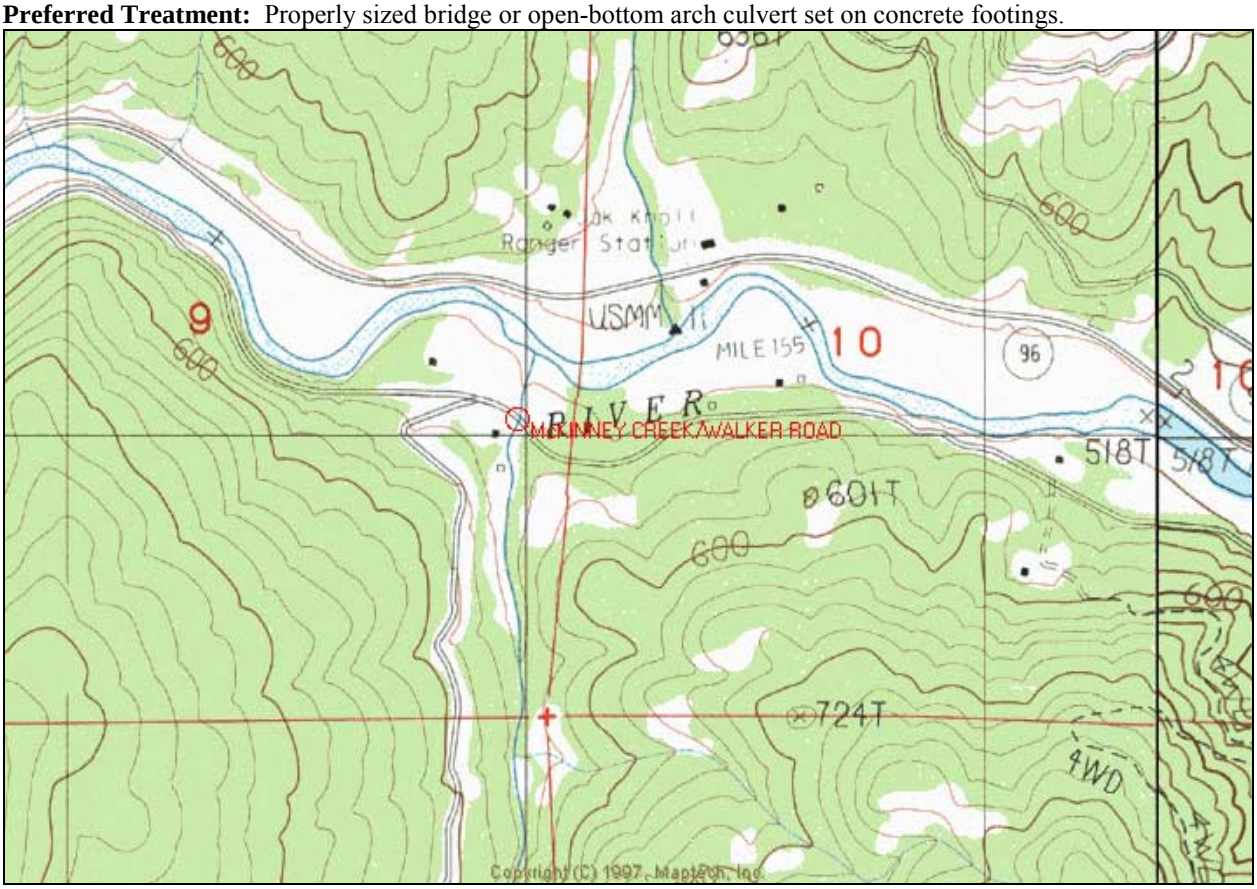
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a three -year recurrence interval. Walker Road overtops on approximately a three-year storm flow.

Barrier Status: LB= 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. RB= GREY: although "Grey", FishXing estimated that fish passage criteria are met on 0% of the expected migration flows for adult anadromous salmonids, 0% for resident/two-year old juveniles, and 0% for one-year old and young-of-year juveniles. Excessive slope is the crossing's feature that creates a migration barrier.

Additional Road Crossings: Downstream, none. McKinney Creek enters the Klamath River approximately 30' downstream. Upstream, maps indicate two crossings on Forest Service road #N8G01.

Habitat: Quantity = approximately 2.0 miles of potential anadromous fish-bearing habitat – surveys have documented a natural bedrock waterfall as the limit of anadromy. Quality = Fair. CDFG conducted a survey on 3/27/74 from the mouth to 2.2 miles upstream. Channel widths = range 3-20', average = 10'. Spawning areas = abundant in lower mile. Pools = 35% of habitat; mostly 2-5' deep and 6-12' wide. Fishes = none observed. Barriers = debris jam at 1.2 miles and natural bedrock falls at 2.0 miles. CDFG removed two debris jams on 1/2/78 between county road and bedrock falls, no fish observed during barrier removal.

Preferred Treatment: Properly sized bridge or open-bottom arch culvert set on concrete footings.



Site #24: McKinney Creek/Walker Road; Klamath River.

Site #25: Little Humbug Creek/Walker Road; Klamath River **Ranking: #8 = High-Priority**

Location: Road ID # 8G004; County Map #10. USGS Quad: McKinley Mountain. T46N, R9W, Section 13. Milepost = 1.8 miles to Highway 96.

Culvert Type: SSP pipe-arch. **Dimensions:** 4.5' Rise x 7.2' Span. **Length:** 40.6'. **Slope:** 1.75%.

Modifications: None. **Fill Estimate:** 251 cubic yards. **Overall condition:** Fair; culvert floor is abraded throughout.

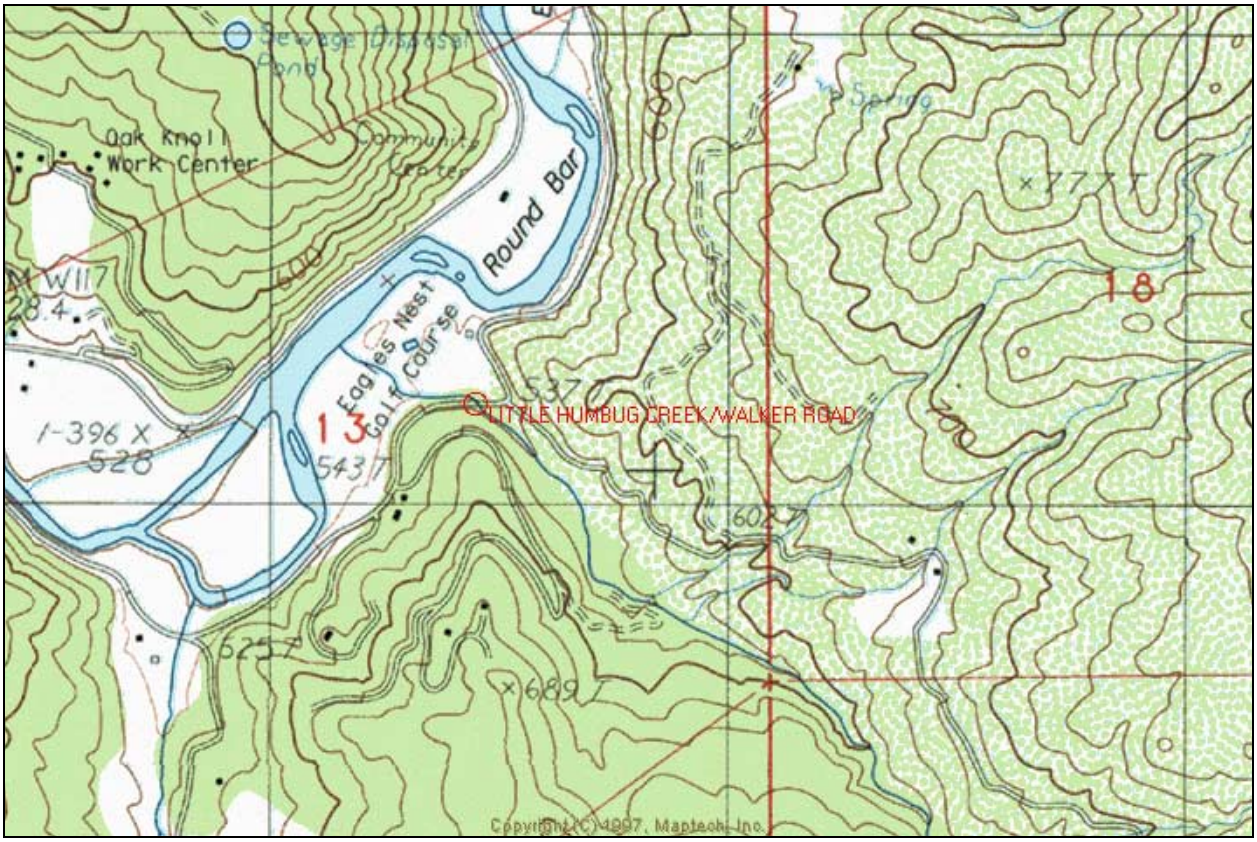
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a four-year recurrence interval. Walker Road overtops on approximately a four-year storm flow.

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. Excessive slope and perched outlet are crossing's features that create migration barrier.

Additional Road Crossings: Downstream, none, enters the Klamath River approximately 300' downstream. Upstream (approximately 10,000') map indicates a crossing on Forest Service property, however this crossing is located about 1,000' upstream of the suspected limit of anadromy.

Habitat: Quantity = approximately 9,000' of potential fish-bearing habitat. Quality = Fair. No formal habitat or fisheries surveys were located at the CDFG office. Most memos on file were in regards to the extensive damage inflicted on the stream channel by the Hegler and Black Mine during the 1960's. The memos included photo documentation of the damage. At this time CDFG considered Little Humbug a steelhead stream that went intermittent in its lower reaches, but supported several year classes of juveniles farther upstream. A 1982 CDFG memo by Lonna Carvelho noted there was about 1.2 miles of "marginal" steelhead habitat in Little Humbug Creek.

Preferred Treatment: Crossing was replaced with a properly sized bridge during the summer of 2000. See before and after photos of crossing's downstream side.



Site #25: Little Humbug Creek/Walker Road; Klamath River.

Site #26: Fish Gulch/Beaver Creek Road; Beaver Creek; Klamath River

Ranking: Dropped from ranking because (regardless of name) information suggests this is **not** a fish-bearing stream.

Location: Road ID # 8J01; County Map Sheet #9. USGS Quad: Buckhorn Bally. T47N, R8W, Section 31. Milepost = 0.6.

Culvert Type: Circular pipe, CSP. **Dimensions:** diameter = 4.0'. **Length:** 47.9'. **Slope:** 8.89%.

Modifications: None. **Fill Estimate:** 156 cubic yards. **Overall condition:** Good.

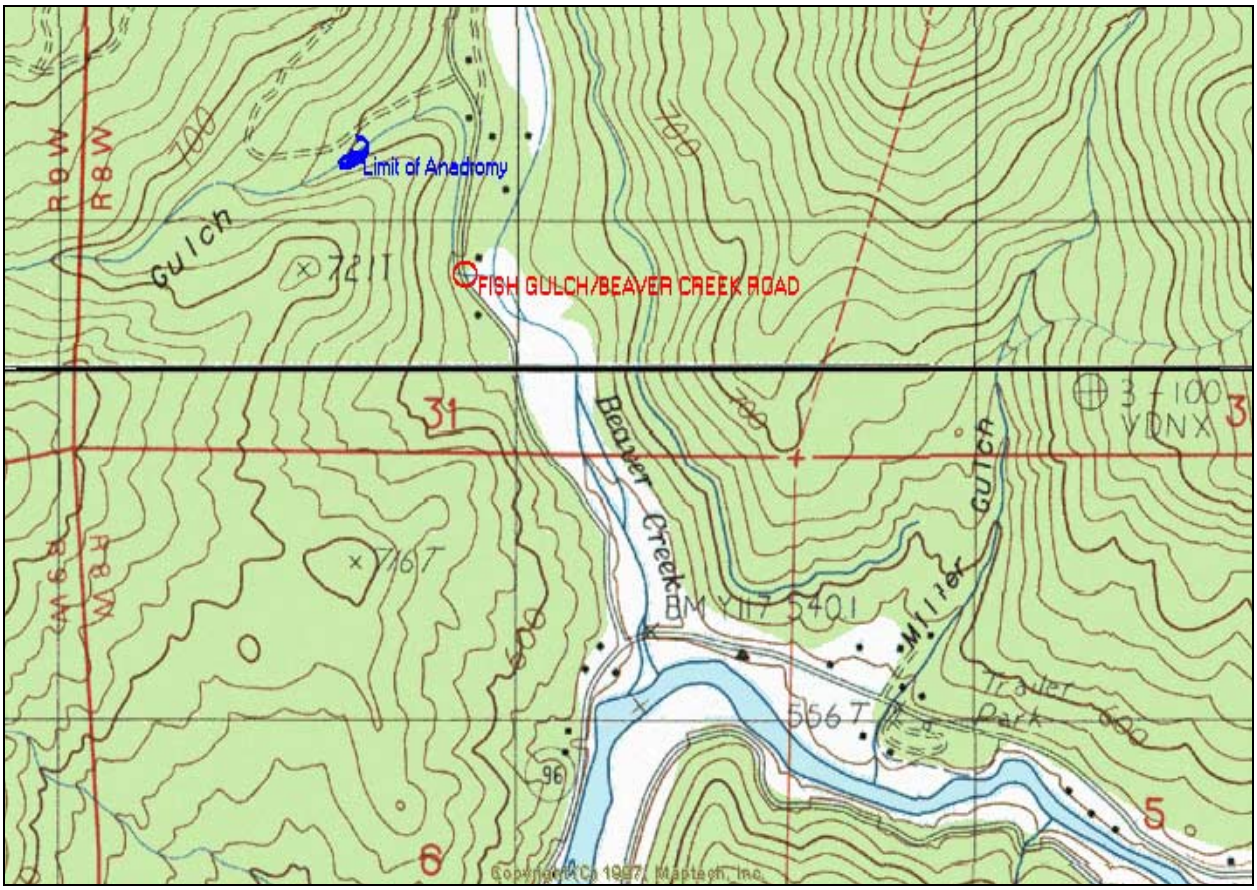
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a four-year recurrence interval. Beaver Creek Road overtops on approximately a four-year storm flow.

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. Excessive slope and perched outlet are the crossing's features that create a migration barrier.

Additional Road Crossings: Downstream, none. enters the Klamath River approximately 400' downstream. Upstream, none.

Habitat: Quantity = approximately 2,000' of potential fish-bearing habitat. Quality = Poor. No information found in CDFG and USFS files. Discussions with biologists familiar with the Beaver Creek watershed suggest Fish Gulch does not support anadromous fisheries. Downstream channel was incised and overgrown with brush – appears to convey storm flow but does not have features consistent with fisheries habitat.

Preferred Treatment: Replace with a culvert that can convey at least a 50-year storm flow when the current crossing is due for replacement (or fails).



Site #26: Fish Gulch/Beaver Creek Road; Beaver Creek; Klamath River.

Site #27: Vesa Creek/Klamath River Road; Klamath River **Ranking: #30 = Low-Priority**

Location: Road ID # 8J001; County Map Sheet #9. USGS Quad: McKinley Mountain. T46N, R8W, Section 10. Milepost = 6.3 miles.

Culvert Type: Two bay box, Concrete. **Dimensions:** Each bay: 6.0' Height x 10.0' Width. **Length:** 26.5'. **Slope:** LB=4.68%, RB=3.17%.

Modifications: None. **Fill Estimate:** 221 cubic yards. **Overall condition:** Good.

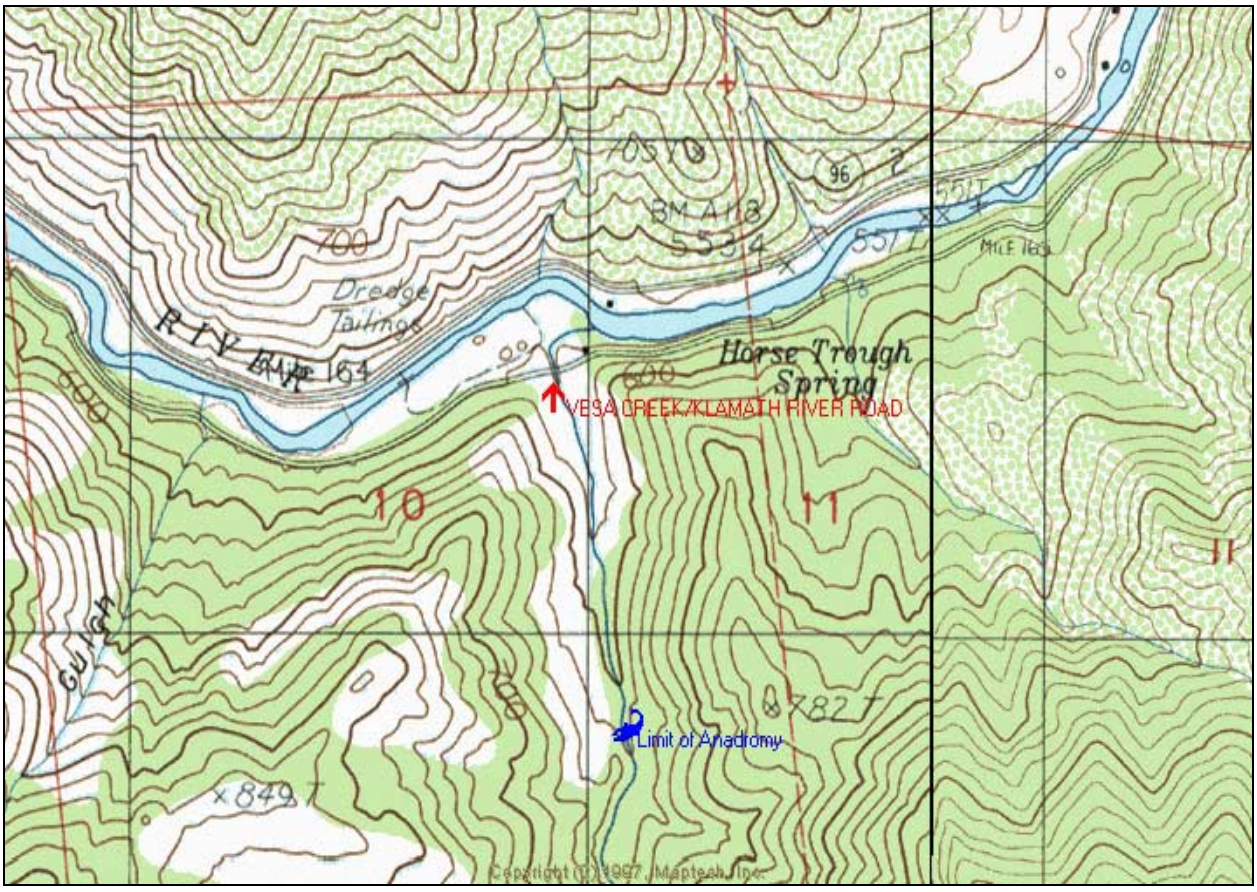
Sizing: Adequately sized; HW/D = 1 on a storm flow with approximately a 58-year recurrence interval. Klamath River Road overtops on more than a 250-year storm flow.

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. Excessive slope and wide shallow concrete floor are the crossing's features that create a migration barrier.

Additional Road Crossings: Downstream, none. Vesa Creek enters the Klamath River approximately 500' downstream. Upstream, USGS map shows no crossings within the fish-bearing stream reach.

Habitat: Quantity = approximately 2,800' of potential anadromous fish-bearing habitat. Quality = Poor. No formal surveys or memos on file at CDFG and USFS offices. Channel appears to seasonally transport storm flow.

Preferred Treatment: No treatment recommended. The current crossing is sized close to NMFS guidelines and is in good condition. If upstream habitat was of significance, offset baffles could be installed to reduce water velocities and increase depths within the box culvert.



Site #27: Vesa Creek/Klamath River Road; Klamath River

Site #28: Clear Creek/Humbug Creek Road; Humbug Creek; Klamath River **Ranking: #10 = Moderate-Priority**

Location: Road ID # 8J001; County Map Sheet #9. USGS Quad: Badger Mountain. T46N, R7W, Section 21. Milepost = 0.4 miles to Klamath River Road.

Culvert Type: Pipe Arch, CSP. **Dimensions:** 2.5' Rise x 3.5' Span. **Length:** 28.0'. **Slope:** 7.68%.

Modifications: None. **Fill Estimate:** 75 cubic yards. **Overall condition:** Fair, culvert is abraded.

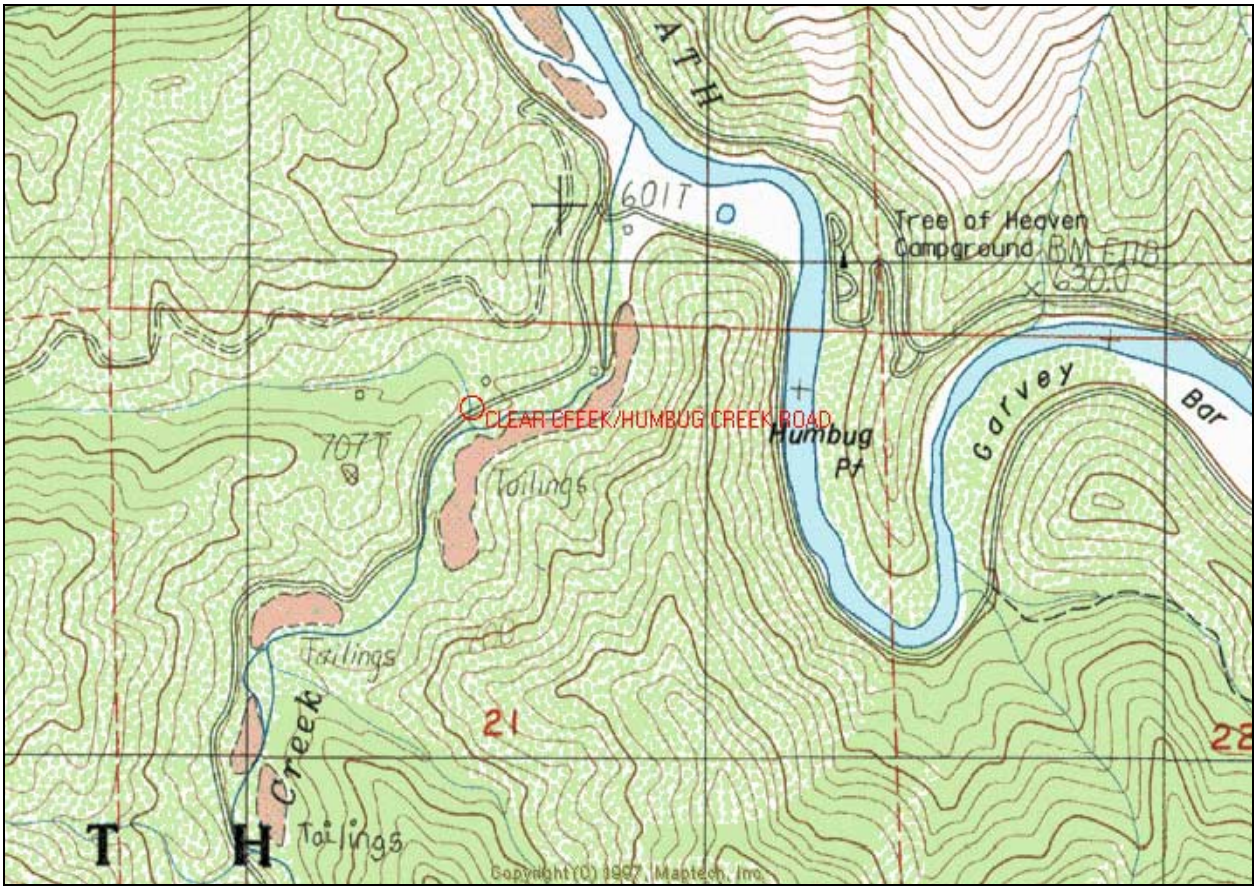
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a three-year recurrence interval. Humbug Creek Road overtops on approximately a three-year storm flow.

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. Excessive slope and perched outlet are crossing's features that create migration barrier. Riprap and boulders at outlet probably create unfavorable, turbulent conditions during migration flows.

Additional Road Crossings: Downstream, none. Clear Creek enters Humbug Creek approximately 250' downstream of Humbug Creek Road. Upstream (1.2 miles), USGS map shows one crossing.

Habitat: Quantity = approximately 1.6 miles of potential fish-bearing habitat. Quality = Poor/fair. However, little information exists to accurately assess current habitat quality. A 1983 USFS memo for timber sales in the Humbug Creek watershed states there is 1.6 miles of anadromous habitat. A 1970 CDFG survey by R.J. Lanse covered only the 250' between mouth and county road. Lanse noted an old miner's dam about 30 yards upstream as a possible barrier. A direct quote by Lanse: "Known from prior surveys that steelhead ascend past lower impediments. The steep drop near mouth is not typical of upper stream habitat". **NOTE**: "prior surveys" were not found in CDFG or USFS files.

Preferred Treatment: Properly sized bridge or open-bottom arch culvert set on concrete footings.



Site #28: Clear Creek/Humbug Creek Road; Humbug Creek; Klamath River

Site #29: Middle Fork Humbug Creek/Yreka-Walker Road; Humbug Creek; Klamath River

Ranking: #9 = High-Priority

Location: Road ID #7J001; County Map Sheet #13. USGS Quad: Badger Mountain. T45N, R8W, Section 1. Milepost = 0.2 miles to Humbug Road.

Culvert Type: Circular pipe, SSP. **Dimensions:** diameter = 7.0'. **Length:** 47.9'. **Slope:** 2.47%.

Modifications: None. **Fill Estimate:** 346 cubic yards. **Overall condition:** Fair; culvert floor is abraded throughout.

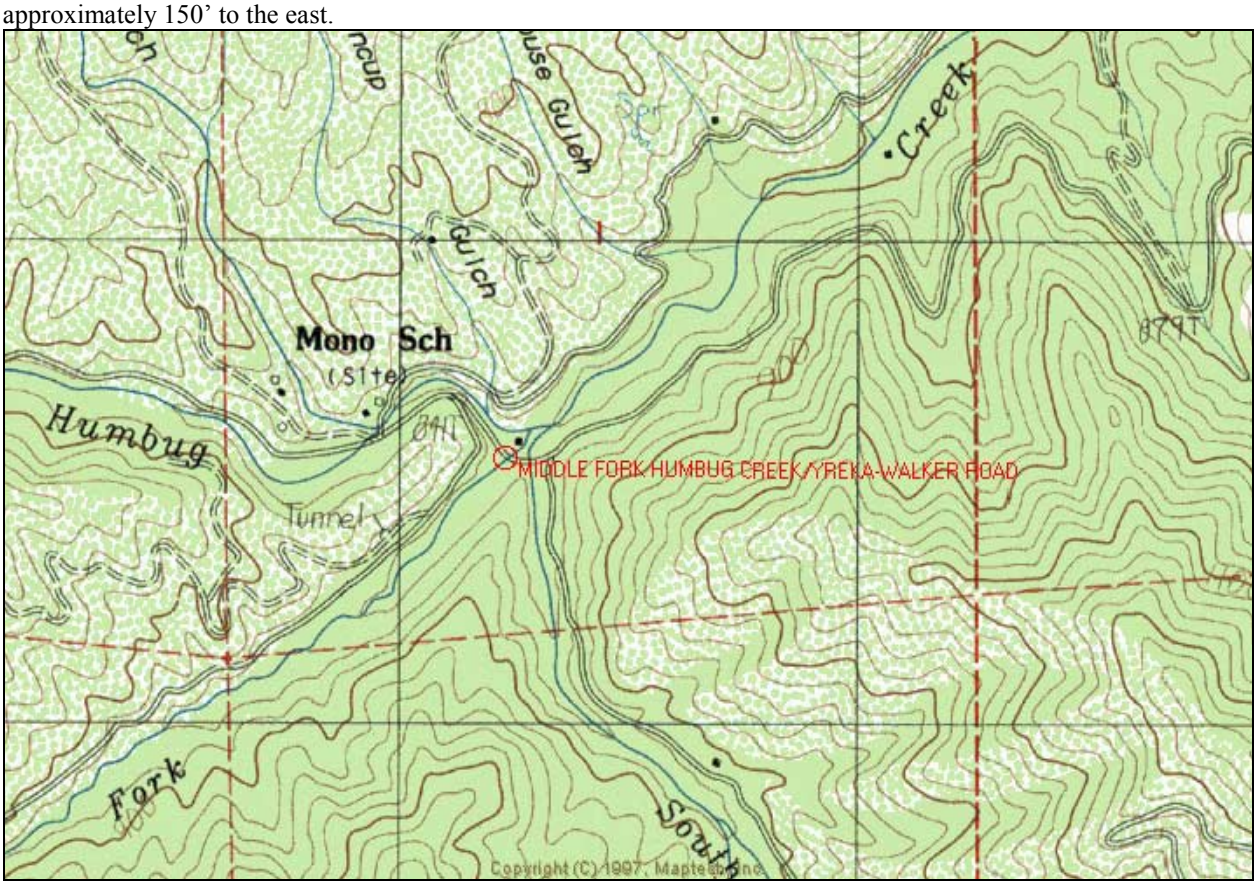
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a six-year recurrence interval. Yreka- Walker Road overtops on approximately a 13-year storm flow.

Barrier Status: GREY FishXing estimated that fish passage criteria are met on 23% of the expected migration flows for adult anadromous salmonids, 74% for resident/two-year old juveniles, and 23% for one-year old and young-of-year juveniles.

Additional Road Crossings: Downstream, none. Upstream, maps indicate no crossings within the expected range of anadromy. A 1970 CDFG survey documented a dam just below the Siskiyou Mine at 1.6 miles upstream.

Habitat: Quantity = approximately 2.0 miles of potential anadromous fish-bearing habitat, with an additional 1.0 miles of resident trout habitat. Quality = Good. Past surveys by R.J. Lanse/CDFG (1967 and 1970) indicate that the creek provides good spawning and rearing habitat for steelhead. No coho salmon were noted in the Middle Fork by Lanse, but a CDFG memo by E. Miller documented juvenile coho in mainstem Humbug Creek in August of 1992 nearly one mile above the confluence with the Middle Fork.

Preferred Treatment: Although the current culvert allows for partial passage it is undersized and starting to wear-out. A properly sized bridge or open-bottom arch culvert set on concrete footings is the best long-term solution. This site should be treated concurrently with the replacement of the South Fork Humbug Creek culvert, located approximately 150' to the east.



Site #29: Middle Fork Humbug Creek/Yreka-Walker Road; Humbug Creek; Klamath River.

Site #30: South Fork Humbug Creek/Yreka-Walker Road; Humbug Creek; Klamath River **Ranking: #3 = High-Priority**

Location: Road ID # 7J001; County Map Sheet #13. USGS Quad: Badger Mountain. T45N, R8W, Section 1. Milepost = 0.3 miles to Humbug Road.

Culvert Type: Circular pipe, SSP. **Dimensions:** diameter = 6.0'. **Length:** 54.8'. **Slope:** 7.26%.

Modifications: None. **Fill Estimate:** 324 cubic yards. **Overall condition:** Extremely poor; culvert floor is rusted through and torn apart.

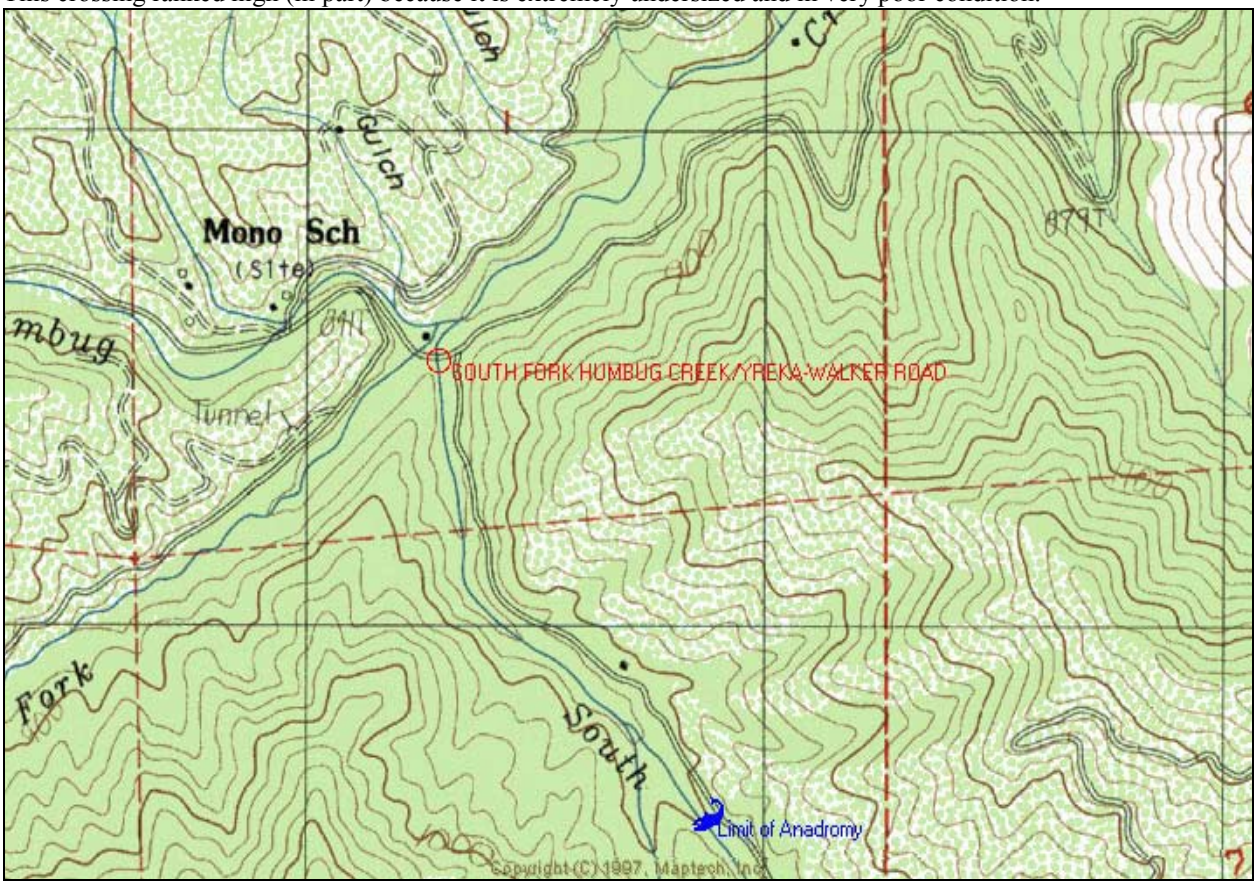
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a six-year recurrence interval. Yreka-Walker Road overtops on approximately a 15-year storm flow.

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. Excessive slope and slightly perched outlet are the crossing's features that create a migration barrier. Also, the steep inlet drop caused by the severe aggradation of substrate on the upstream side of the culvert (see photo) is probably a velocity barrier too.

Additional Road Crossings: Downstream, none. Upstream, a USFS GIS map indicates a crossing on the South Fork right at Punch Creek.

Habitat: Quantity = approximately 1.2 miles of potential anadromous fish-bearing habitat: 3,400' in South Fork Humbug Creek and 2,500' in Punch Creek. Quality = Fair. USFS 1983 timber harvest memo: 3.0 miles of resident trout and 0.7 miles of anadromous habitat. CDFG conducted a survey on 6/30/70 from mouth to 0.6 miles upstream. Spawning areas = very good. Pools = numerous, small, mostly bedrock formed. Barriers = intermittent flow at mouth and at county culvert. Fishes = two adult steelhead observed (one carcass) and numerous juveniles seen throughout 0.6 mile reach.

Preferred Treatment: Replace with a properly sized bridge or open-bottom arch culvert set on concrete footings. This crossing ranked high (in part) because it is extremely undersized and in very poor condition.



Site #30: South Fork Humbug Creek/Yreka-Walker Road; Humbug Creek; Klamath River.

Site #31: Willow Creek #1/Gazelle-Callahan Road; Shasta River; Klamath River **Ranking: #25 = Low-Priority**

Location: Road ID # 2H01; County Map Sheet #4. USGS Quad: China Mountain. T42N, R6W, Section 19. Milepost = 20.5.

Culvert Type: Concrete box, two bays. **Dimensions:** Each bay = 7.1'H x 11.7'W. **Length:** 29.5'.

Slope: 0.95%. **Modifications:** None. **Fill Estimate:** 190 cubic yards. **Overall condition:** Good.

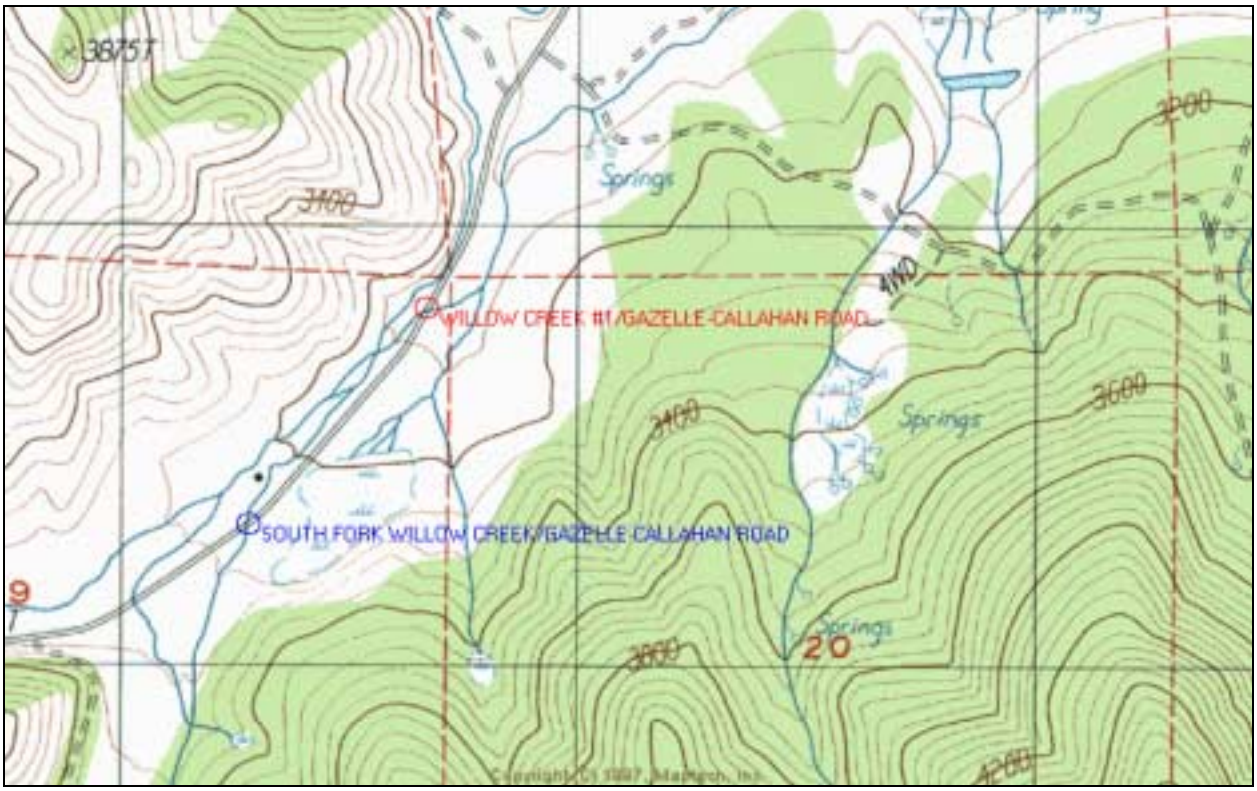
Sizing: Undersized; HW/D = 1 on a storm flow with approximately an eight-year recurrence interval. Gazelle-Callahan Road overtops on approximately an eight-year storm flow.

Barrier Status: GREY: FishXing estimated that fish passage criteria are met on 50% of the expected migration flows for adult anadromous salmonids, 0% for resident/two-year old juveniles, and 0% for one-year old and young-of-year juveniles.

Additional Road Crossings: Downstream (2,600', 1.7 miles, and 1.9 miles) three private road crossings are visible on the USGS Quad. Below the 3rd crossing the channel is difficult to follow due to the maze of diversion ditches; however there appears to be numerous additional crossings. Upstream, two culverts on Gazelle-Callahan Road: at milepost 20.0 on South Fork Willow Creek and at milepost 17.8 on Willow Creek.

Habitat: Quantity = approximately 6.5 miles of potential anadromous fish-bearing habitat. Quality = Poor. No habitat typing or fisheries surveys or memos were found at the CDFG or USFS offices. Lower Willow Creek is diverted for irrigation and runs through a series of irrigation canals. When the site was surveyed, the lower channel was dry, however it was wetted at this crossing with several juvenile salmonids observed upstream of the box culvert. Overall, the channel appears to lack pool habitat and is aggraded with fine sediment. The riparian consists of a sparse band of willows and alders. The stream banks appear subjected to unfenced grazing and are in poor condition.

Preferred Treatment: No treatment is recommended due to the poor quality of habitat and the high probability of downstream migration barriers at private crossings and diversion structures. However, if the crossing were to fail Siskiyou County should replace with a properly sized bridge or open-bottom arch culvert set on concrete footings that is better aligned with the upstream channel.



Site #31: Willow Creek #1/Gazelle-Callahan Road; Shasta River; Klamath River.

Site #32: South Fork Willow Creek/Gazelle-Callahan Road; Shasta River; Klamath River **Ranking: #20 = Low-Priority**

Location: Road ID # 2H01; County Map Sheet #4. USGS Quad: China Mountain. T42N, R6W, Section 19. Milepost = 20.0.

Culvert Type: Pipe-arch, SSP. **Dimensions:** 6.6' span x 9.2' rise. **Length:** 101.4'

Slope: 3.80%. **Modifications:** None. **Fill Estimate:** 605 cubic yards. **Overall condition:** Good, new installation.

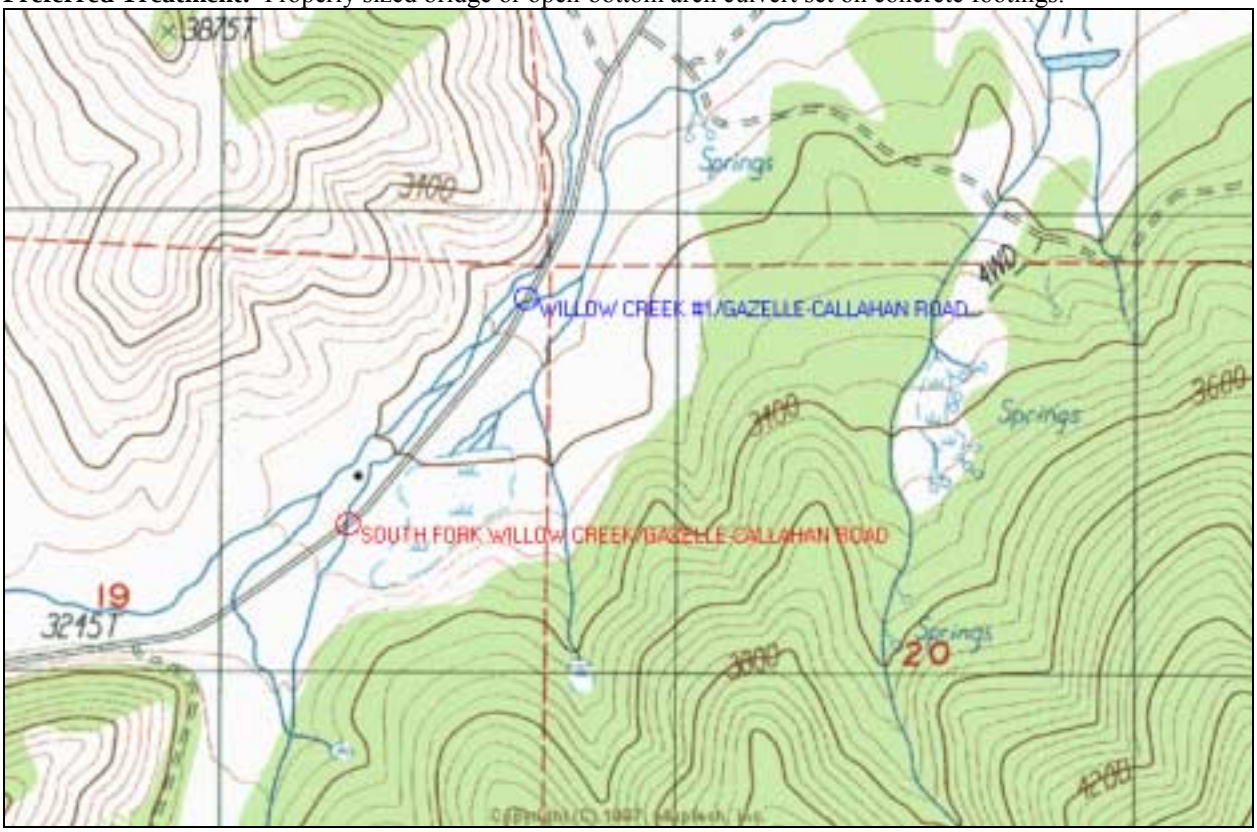
Sizing: Undersized; HW/D = 1 on a storm flow with approximately an eight-year recurrence interval. Gazelle-Callahan Road overtops on approximately an eight-year storm flow.

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. Excessive slope and perched outlet are crossing's features that create a migration barrier. The riprap placed at the culvert outlet probably creates excessive turbulence at migration flows.

Additional Road Crossings: Downstream, concrete box culvert on Gazelle-Callahan Road at milepost 20.5 and the three private crossings previously described on mainstem Willow Creek (see site #32). Upstream (4,600' and 1.1 miles) the USGS map indicates two private crossings on an unimproved road.

Habitat: Quantity = approximately 1.6 miles of potential anadromous fish-bearing habitat. Quality = Poor. CDFG conducted a survey on 6/15/77 from the mouth to 4.0 miles upstream. Fish habitat = fair overall, but better above the 4,000' of lower meadow reach. Three, unscreened diversions were noted in the meadow reach, as well as damaged stream banks and riparian vegetation due to unfenced cattle grazing. Above the meadow the channel was noted as steeper and more confined. Fish = more observed in the upper reach, but some observed in the meadow reach. NOTE: no indication of relative abundance, age classes, or species. Finally, the survey failed to provide descriptions of pool habitat, condition of spawning gravels, or condition of riparian zone along upper reach. NOTE: when the site was surveyed, the meadow upstream of the culvert still appeared to be impacted by cattle grazing.

Preferred Treatment: Properly sized bridge or open-bottom arch culvert set on concrete footings.



Site #32: South Fork Willow Creek/Gazelle-Callahan Road; Shasta River; Klamath River.

Site #33: Willow Creek #2/Gazelle-Callahan Road; Shasta River; Klamath River **Ranking: #33 = Low-Priority**

Location: Road ID #2H01; County Map Sheet #4. USGS Quad: China Mountain. T42N, R7W, Section 26. Milepost = 17.8.

Culvert Type: Circular pipe, SSP. **Dimensions:** diameter = 4.5'. **Length:** 45.4'.

Slope: 0.77%. **Modifications:** None. **Fill Estimate:** 149 cubic yards. **Overall condition:** Good.

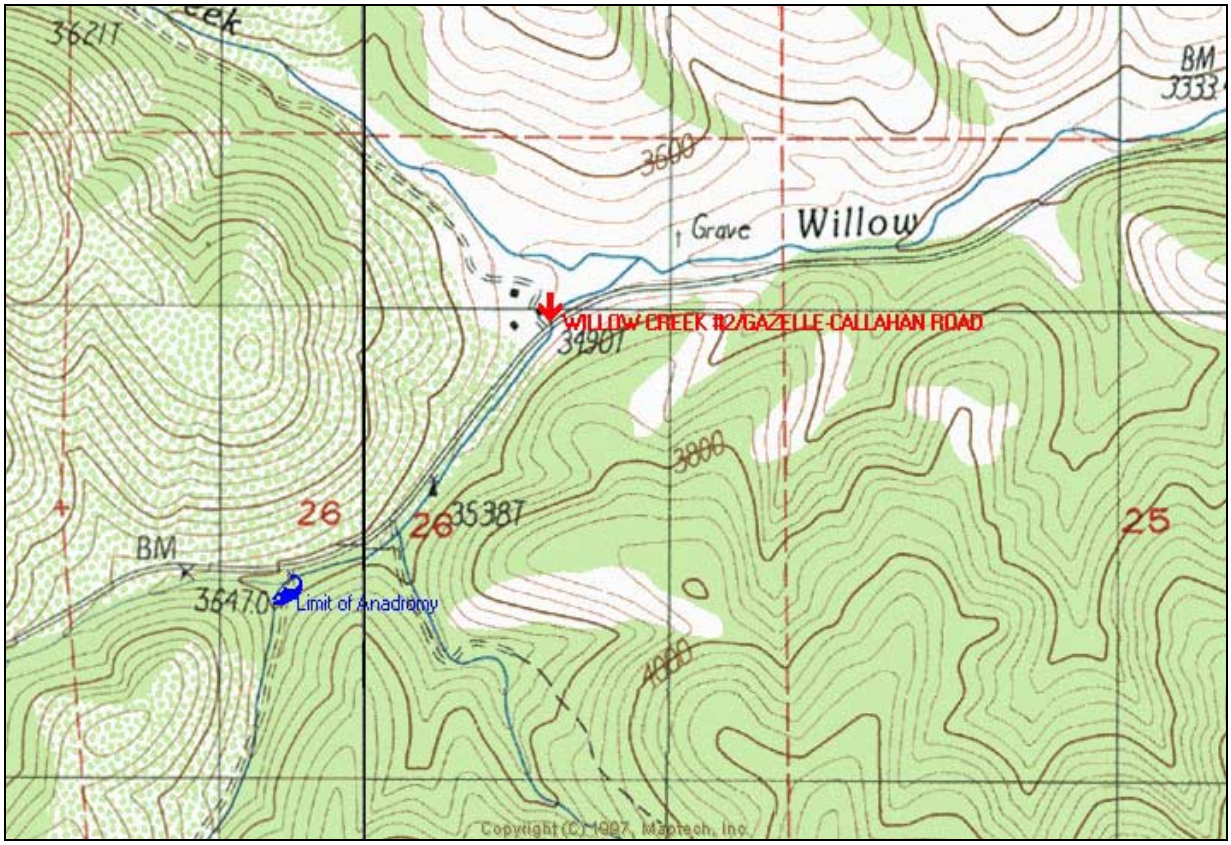
Sizing: Extremely undersized; HW/D = 1 on a storm flow with approximately a six-year recurrence interval. Gazelle-Callahan Road overtopped on approximately a six-year storm flow.

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 Road Crossings: Downstream, two culverts on Gazelle-Callahan Road: at milepost 20.0 on South Fork Willow Creek and at milepost 20.5 on Willow Creek. Upstream (2,100' and 3,000'), the map indicates two private crossings off of the Gazelle-Callahan Road.

Habitat: Quantity = approximately 3,400' of potential anadromous fish-bearing habitat. Quality = Poor. No habitat typing or fisheries surveys, notes, or memos were found in CDFG and USFS files. The channel above the County culvert was spotted checked in numerous places along the road. Overall, the channel is narrow and confined to the inboard ditch of the road with limited pool habitat for rearing and suitable gravels for spawning.

Preferred Treatment: No treatment recommended because the current culvert meets fish passage criteria. However, the current culvert is undersized and should be replaced with a properly-sized embedded circular or oval culvert when the current structure is due for replacement (or fails). The new installation should also be properly aligned with the upstream channel.



Site #33: Willow Creek #2/Gazelle-Calahan Road; Shasta River; Klamath River.

Site #34: Williams Creek/Klamathon Road; Klamath River **Ranking: #5 = High-Priority**

Location: Road ID #8K003; County Map Sheet #9. USGS Quad: Hawkinsville. T46N, R6W, Section 8. Milepost = 0.15 miles to Highway 96.

Culvert Type: Two bay box, concrete **Dimensions:** Each Bay:5.9' Height x 10.0' Width. **Length:** 60.0'.

Slope: LB=0.05%; RB=0.20%. **Modifications:** None. **Fill Estimate:** 522 cubic yards. **Overall condition:** Good.

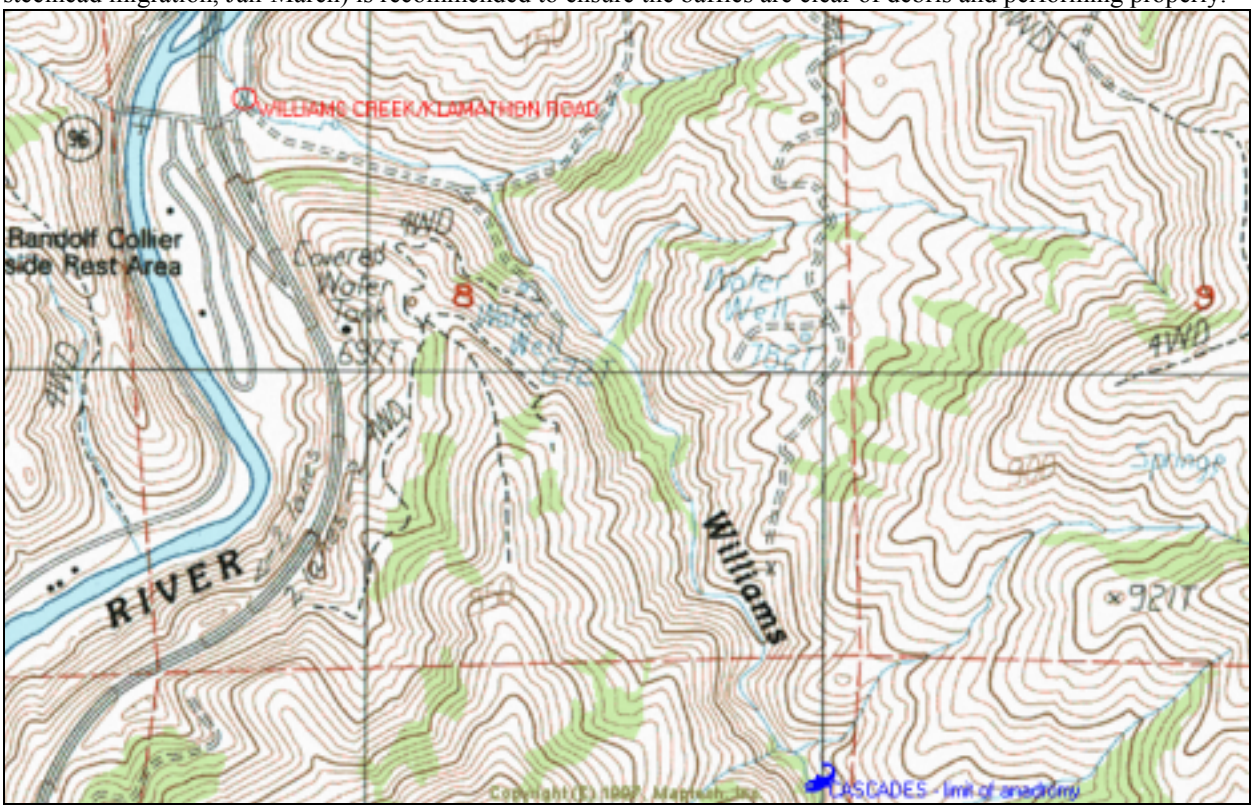
Sizing: Adequately-sized; HW/D = 1 on a storm flow with approximately a 53-year recurrence interval. Klamathon Road overtops on more than a 250-year storm flow.

Barrier Status: LB= Due to the large amounts of embedded substrate, this bay of the culvert may provide conditions suitable for adult passage when Williams Creek is flowing at a discharge higher than the expected high-passage flow. RB=GREY: although "Grey",FishXing estimated that fish passage criteria are met on 0% of the expected migration flows for adult anadromous salmonids, 0% for resident/two-year old juveniles, and 0% for one-year old and young-of-year juveniles. Lack of depth is the crossing's feature that creates a migration barrier.

Additional Road Crossings: Downstream - none, Williams Creek enters directly into the Klamath River approximately 600' from the county box culvert. Upstream (2,300') the USGS map indicates a private crossing. This crossing was also noted in a CDFG spawning survey from 1968 – current status is unknown. Landowners were contacted for upstream access, but no one responded to our requests.

Habitat: Quantity = approximately 2.0 miles of potential fish-bearing habitat – past surveys stated limit of anadromy was a natural cascade/waterfall. Quality = Good, however lower reach is intermittent. CDFG files contained several older surveys and memos. Memo dated 11/22/72 notes that annually upwards of 50,000 fry are rescued from drying up pools in lower Williams Creek. Memo dated 4/8/72 notes fry already getting stranded. Memo dated 12/18/69 states that the box culvert is probably not a migration barrier. Spawning survey on 2/26/68 documented 216 adult steelhead in the two mile reach of anadromy. Spawning survey on 2/6/67 along the lower 0.5 miles produced no fish, but biologist R. J. Lanse rated Williams Creek as an "excellent steelhead stream".

Preferred Treatment Passage can be improved by installing corner baffles and an outlet beam in both bays of box culvert to increase depth and reduce velocities. Periodic maintenance (prior to and during period of expected steelhead migration, Jan-March) is recommended to ensure the baffles are clear of debris and performing properly.



Site #34: Williams Creek/Klamathon Road; Klamath River

Site #35: Cape Horn Creek/Copco Road; Klamath River **Ranking: #29 = Low-Priority**

Location: Road ID #9K02; County Map Sheet #9; M3J. USGS Quad: Hornbrook. T47N, R6W, Section 26. Milepost = 0.2 miles to Ager Road.

Culvert Type: Circular pipe, SSP. **Dimensions:** diameter = 7.8'. **Length:** 84.7'. **Slope:** 1.95%.

Modifications: None. **Fill Estimate:** 659 cubic yards. **Overall condition:** Fair, culvert floor is abraded and rusted.

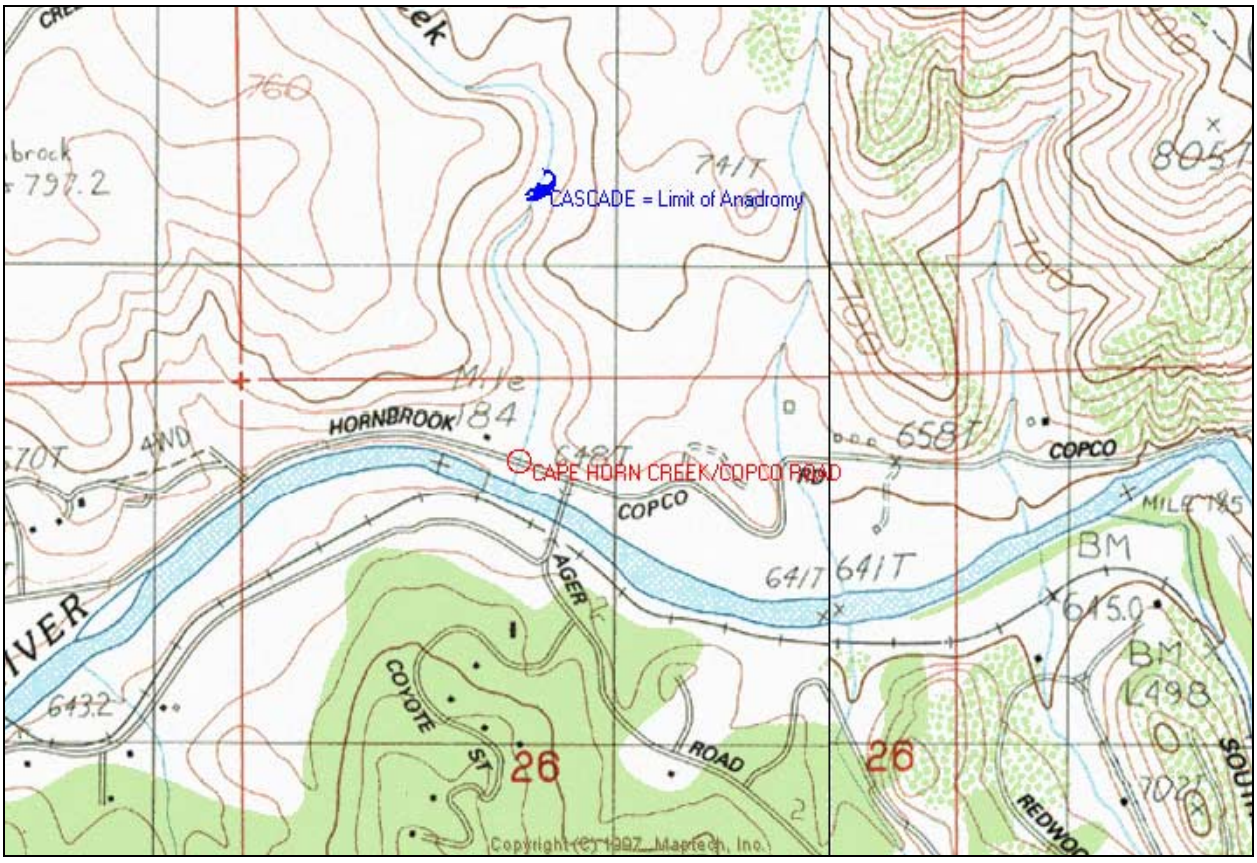
Sizing: Undersized; HW/D = 1 on a storm flow with approximately a 13-year recurrence interval. Copco Road overtops on approximately a 37-year storm flow.

Barrier Status: GREY FishXing estimated that fish passage criteria are met on 21% of the expected migration flows for adult anadromous salmonids, 0% for resident/two-year old juveniles, and 0% for one-year old and young-of-year juveniles. A moderate slope and perched outlet are crossing's features that create a migration barrier.

Additional Road Crossings: Downstream, none creek enters Klamath within 100' of Copco Road. Upstream, one county-maintained crossing on Dry Creek Road, located upstream of the cascade defined as the limit of anadromy. Channel does not appear to be fish-bearing in this upper stream reach.

Habitat: Quantity = approximately 2,100' of potential anadromous fish-bearing habitat – limit at set of natural falls/cascade. Quality = Poor. Approximately 500' of the channel above Copco Road was walked when the site was surveyed – it appears to seasonally convey storm flow, but had few defined pools for suitable rearing habitat. CDFG files had a brief memo by R.J. Lanse who walked the creek from the mouth to the falls five times between 1967-71. Several adult steelhead were observed in three out of five years. No habitat description or locations of where fish were seen. On 2/26/68 Lanse noted signs of poaching in the 100' stream reach below the county culvert.

Preferred Treatment: No treatment recommended because of the limited benefit of upstream habitat gains. However, the current culvert is undersized and should be replaced with a properly-sized embedded circular or oval culvert when the current structure is due for replacement (or fails).



Site #35: Cape Horn Creek/Copco Road; Klamath River.

Site #36: Little Bogus Creek/Desevado Road; Klamath River **Ranking: #16 = Moderate-Priority**

Location: Road ID #9L001; County Map Sheet #9. USGS Quad: Iron Gate Reservoir T47N, R5W, Section 28. Milepost = 1.4miles to Ager-Beswick Road.

Culvert Type: Concrete box; two bays. **Dimensions:** each bay = 8.0'W x 8.0'H. **Length:** 47.0'.

Slope: left bank bay = 1.57%; right bank bay = 1.71%. **Modifications:** None. **Fill Estimate:** 427 cubic yards. **Overall condition:** Good.

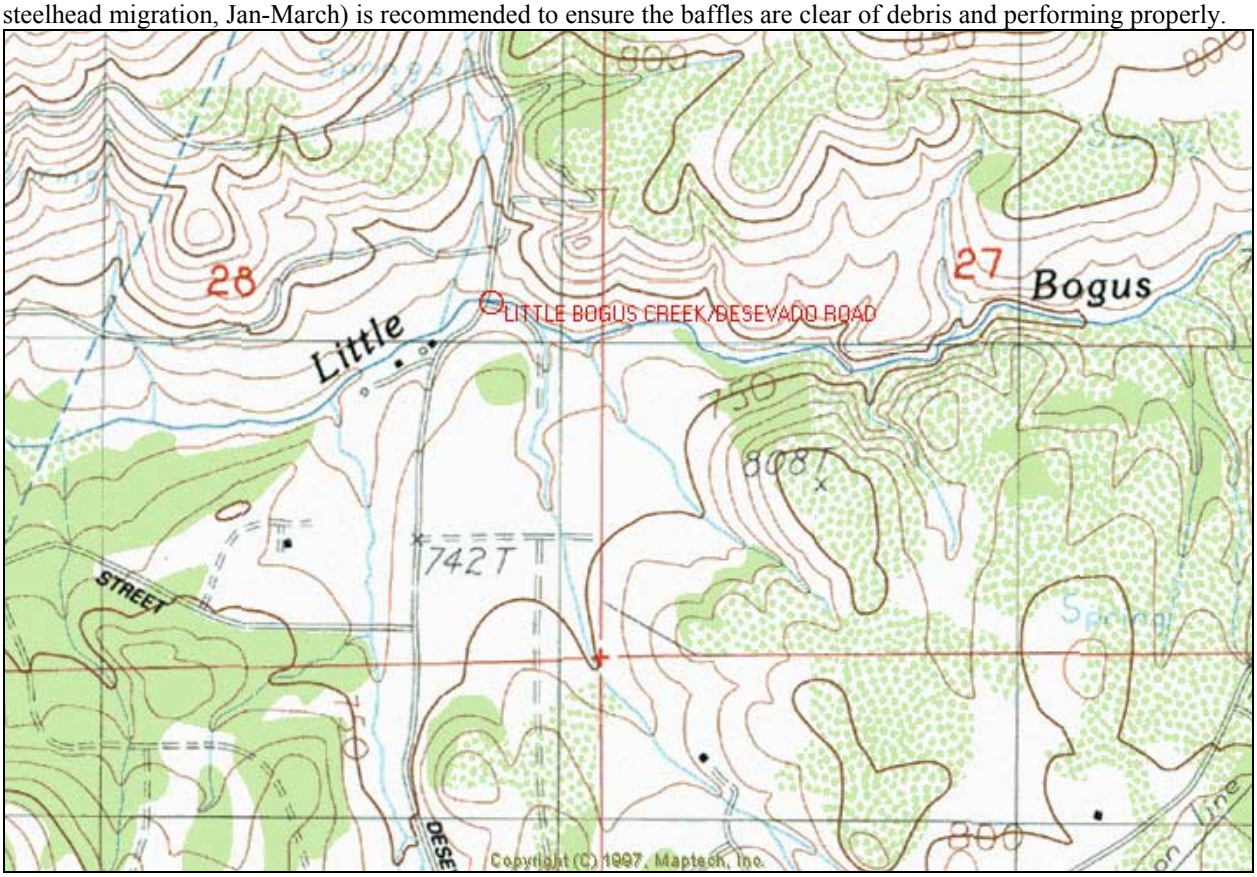
Sizing: Adequately sized; HW/D = 1 on a storm flow with approximately a 47-year recurrence interval. Desevado Road overtopped on approximately a 209-year storm flow.

Barrier Status: GREY: although "Grey", FishXing estimated that fish passage criteria are met on 0% of the expected migration flows for adult anadromous salmonids, 0% for resident/two-year old juveniles, and 0% for one-year old and young-of-year juveniles. The moderate slope, slightly perched outlet, and a lack of depth are the crossing's features that create a migration barrier.

Additional Road Crossings: Downstream, none. Upstream, one county-maintained crossing on Ager-Beswick Road – does not look like a fish-bearing channel in this upper stream reach.

Habitat: Quantity = approximately 1.7 miles of potential fish-bearing habitat. Quality = Fair. CDFG files contained several memos and spawning surveys. CDFG rescued 395 y-o-y coho in 1995 and 37 y-o-y coho 1996 from drying-up pools in the lower channel. CDFG field note dated 1/19/78 – spawning survey documented 12 adult steelhead in lower 1.5 miles of channel. Field note dated 4/16/75 – D. Rogers walked 0.5 miles above Copco Road, direct quote: "it is doubtful steelhead ever spawn this far upstream". Memo dated 1/15/70 by R.J. Lanse – measured depths and velocities at county box culvert: 2"-5" deep and flowing at 3'-5'/second. A 1967 memo from R.J. Lanse documented 850 adult steelhead observed on a single spawning survey.

Preferred Treatment: Passage can be improved by installing angled corner baffles and an outlet beam in both bays of box culvert to increase depth and reduce velocities. Periodic maintenance (prior to and during period of expected steelhead migration, Jan-March) is recommended to ensure the baffles are clear of debris and performing properly.



Site #36: Little Bogus Creek/Desevado Road; Klamath River.