# APPENDIX B:

# CATALOG OF HUMBOLDT COUNTY CULVERTS LOCATED ON FISH-BEARING STREAM REACHES

**NOTE: This catalog contains a single page for each culvert included in the inventory. Generally, they are ordered in location from north to south, and from lowermost to uppermost tributary within a watershed. For most sites, inlet and outlet photographs are provided, with the inlet photo on the left side (or top) and the outlet photo on either the right side or bottom.**

**Maps are also provided of all sites. For proposal development purposes, full-scale USGS 7.5 Series copies are available on request.**

# SITE-SPECIFIC CULVERT INFORMATION

**Site #1**: Luffenholtz Creek #1; Trinidad Scenic Drive **Priority Ranking =** #33

**Location:** County Map # 1C34. T8N, R1W, Section 36 **Culvert Type:** Concrete box. **Dimensions:** 12' x 12'

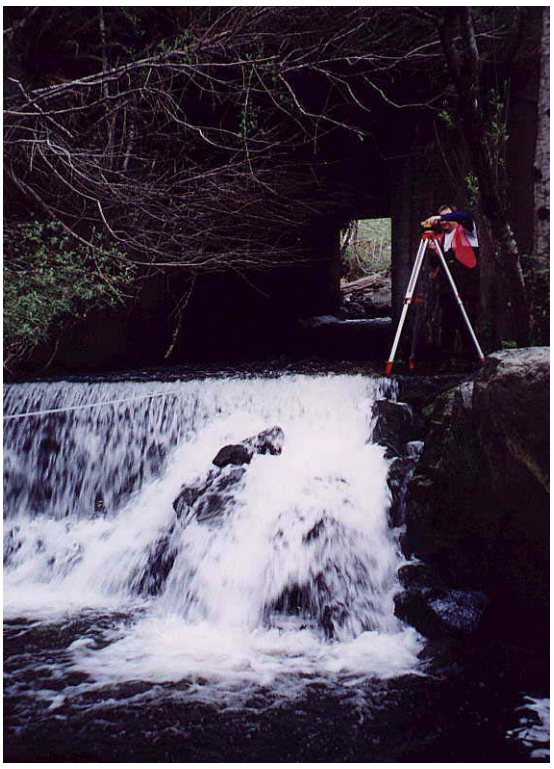
**Length:** 83' **Slope:** 6.6% **Modifications:** None **Fill Estimate:** 7,783 cubic yards

**Overall condition:** Good, floor shows some signs of wear. **Sizing:** Good.

**Barrier Status:** Complete at moderate to high flows for excessive jump required into culvert and high velocities caused by steep slope. Lack of depth also a problem at lower migration flows.

**Additional Barriers:** Downstream, natural falls/steep cascade that drops 20-25 feet over short distance (<200') to beach. Upstream, Highway 101 culvert, about1,500' upstream. Then second county culvert on Westhaven Drive.

**Habitat:** Quantity = 38,900' of potential fish-bearing habitat. Falls below culvert are probably a anadromous barrier. Quality = good/fair, dense riparian of second-growth conifer and hardwoods, cool water temperatures, good amount of summer flow.



**Site #2:** Luffenholtz Creek #2; Westhaven Drive **Priority Ranking =** #28

**Location:** County Map # 1C34. T8N, R1E, Section 30 **Culvert Type:** Concrete box w/divider.

**Dimensions:** 8'W x 6'H (each bay) **Length:** 141' **Slope:** 2-3% **Modifications:** None

**Fill Estimate:** Not measured, but at least several 1000 cubic yards.

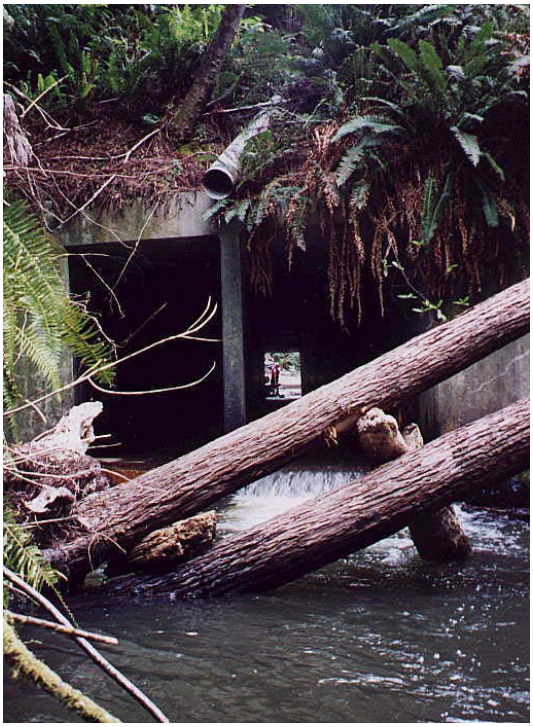
**Overall condition:** Good, although large debris jam present when visited. The divider wall limits the size of woody debris that may pass through culvert. Height of debris line indicates that culvert inlet was topped during recent storms and initiated failure of hillslope fill from inlet to road surface.

**Sizing:** Appears adequately-sized for 50-year storm flow. However, center divider retained debris during peak flows in 1999 and overtopped inlet. The ponding initiated a hillslope failure up to roadbase (note foot of slide on top of inlet in photo).

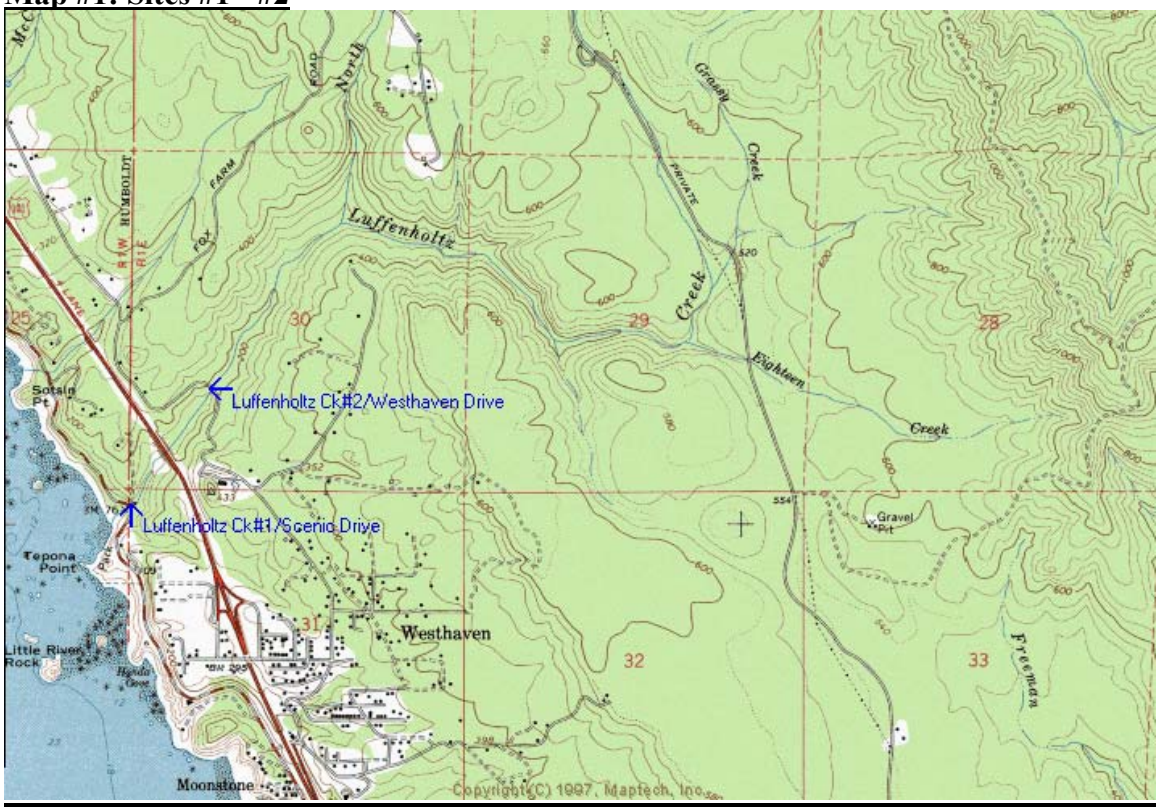
**Barrier Status:** Probably a barrier at most flows to resident trout because of excessive length and moderate slope.

**Additional Barriers:** Upstream, none. Downstream, Highway 101may pose problems to resident trout due to excessive length.

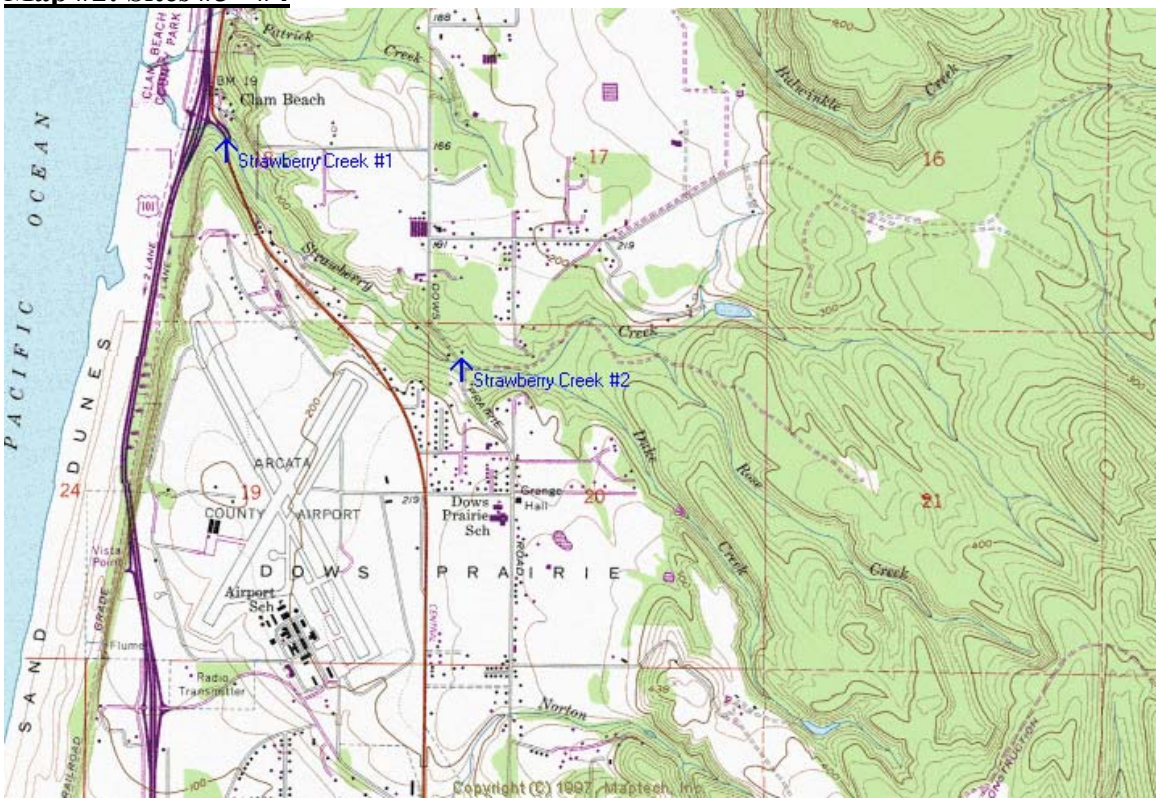
**Habitat:** Quantity = nearly 36,000 feet of potential resident trout habitat in several channels above culvert. Quality = Good/fair, dense riparian of second-growth conifer and hardwoods, cool water temperatures, good amount of summer flow.



**Map #1: Sites #1 - #2**




**Map #2: Sites #3 - #4**



**Site #3:** Strawberry Creek #1; Central Avenue **Priority Ranking =** #32

**Location:** County Map # 1C44. T7N, R1E, Section 18 **Watershed** Coastal

**Culvert Type:** Concrete box. **Dimensions:** 5'W x 4'H **Length:** 108' **Slope:** 0.5%

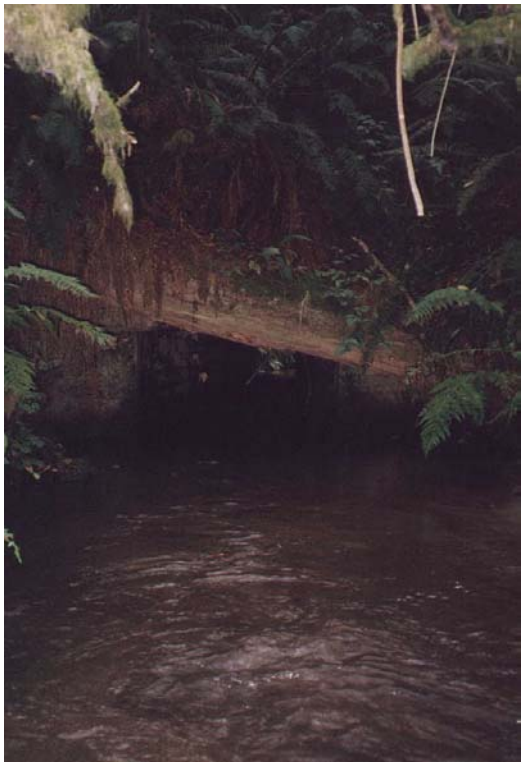
**Modifications:** None **Fill Estimate:** 9,057 cubic yards **Overall condition:** Good.

**Sizing:** Poor, inlet would over top on less than a 10-year storm flow

**Barrier Status:** Complete barrier to adult coastal cutthroat and juvenile cutthroat, steelhead and coho salmon. Partial barrier to adult steelhead and coho salmon (passable on 49% of predicted migration flows). Too long of swim, excessive velocities at a range of migration flows.

**Additional Barriers:** Downstream box culvert with concrete channel at Highway 101 (< 500'). Upstream = County culvert at Dow's Prairie Road (about 1 mile upstream).

**Habitat:** Quantity = approximately 5.1 miles of potential anadromous habitat upstream of Dows Prairie Road. Quality = Not recently habitat-typed. CDFG last sampled in 1969, electrofished below Highway 101 culvert – 20 coho juveniles and 2 cutthroat trout. Has excellent flow volume and cool water temperature throughout summer.



**Site #4:** Strawberry Creek #2; Dows Prairie Road **Priority Ranking =** #26

**Location:** County Map # 1C34. T7N, R1E, Section 20 **Watershed:** Coastal

**Culvert Type:** Concrete circular pipe. **Dimensions:** 4' diameter **Length:** 33' **Slope:** 0.5%

**Modifications:** None **Fill Estimate:** 452 cubic yards **Overall condition:** Fair, inside of pipe exhibits minimal wear.

**Sizing:** Extremely undersized, culvert inlet overtops on about two to five-year storm flow. Culvert inlet is also at a 90$^{o}$ alignment to upstream channel (in ditch along road for about 40'). Any replacement should consider placing crossing with channel straight through crossing.

**Barrier Status:** Fish Xing indicates a partial barrier to adult coho salmon, steelhead and cutthroat trout. Culvert is a partial barrier for juveniles. Undersized culvert creates a velocity barrier on a wide range of migration flows. Is backflooded at low flows – swimthrough.

**Additional Barriers:** Downstream = box culvert at Central Avenue (about 1 mile) and box culvert with concrete channel at Highway 101. Upstream = none.

**Habitat:** Quantity = approximately 4.1 miles of potential anadromous habitat upstream of Dows Prairie Road. Quality = Not recently habitat-typed. CDFG last sampled in 1969, electrofished below Highway 101 culvert – 20 coho juveniles and 2 cutthroat trout. During initial site visit we observed two cutthroat above culvert, 7" and 12". Has excellent volume and temperature throughout summer.

**Site #5:** Widow White Creek #1; Murray Road **Priority Ranking =** #30

**Location:** County Map # 1C44. T7N, R1E, Section 30 **Watershed:** Coastal/lower Mad River

**Culvert Type:** Concrete box . **Dimensions:** 7'W x 8'H **Length:** 90' **Slope:** <1%

**Modifications:** Washington baffles constructed of redwood beams; riprap formed jump pools below outlet.

**Fill Estimate:** 142 cubic yards. **Overall condition:** Fair. Culvert is in good condition, however retaining walls below outlet are collapsing. Baffles near inlet are partially buried in sediment.

**Barrier Status:** Passable for adult steelhead, coho salmon, and chinook salmon on most migration flows. Partial barrier for adult coastal cutthroat trout (especially residents). Total barrier to all juveniles –coho, steelhead, cutthroat trout. Excessive jump is main problem for juveniles, plus a velocity barrier if juveniles enter culvert. Lack of depth at lower flows may inhibit adult passage.

**Additional Barriers:** Downstream = Highway 101. Recent southerly migration of lower Mad River has isolated mouth of Widow White Creek – may prevent or reduce opportunities for adults to access from ocean. Upstream = Box culverts at McKinleyville and Central Avenues and culvert under private lot.

**Habitat:** Quantity = approximately 10,600' of potential anadromous habitat above Central Avenue. Quality = Not recently habitat typed. CDFG records indicate adult steelhead last observed in 1987. Past electrofishing sampled only juvenile steelhead and adult coastal cutthroat trout. Typical urban stream problems– potentially poor water quality of paved runoff and litter, residential encroachment of riparian zone, and channelization. Runs through Humboldt Sanitation and Recycling with historic auto wrecking yard. Upper watershed managed for commercial timber harvest.

**Site #6:** Widow White Creek #2; McKinleyville Avenue **Priority Ranking =** #31

**Location:** County Map # 1C44. T7N, R1E, Section 31 **Watershed:** Coastal/lower Mad River

**Culvert Type:** Concrete box. **Dimensions:** 10'W x 6'H **Length:** 73' **Slope:** 0.4%

**Modifications:** None. **Fill Estimate:** 1,430 cubic yards **Overall condition:** Good. **Sizing:** Good

**Barrier Status:** Passable for adult steelhead, coho salmon, and chinook salmon on most migration flows. Partial and temporary barrier for adult coastal cutthroat trout (especially residents). Total barrier to all juveniles –coho, steelhead, cutthroat trout. Excessive jump is main problem for juveniles, plus a velocity barrier if juveniles enter the culvert. Lack of depth at lower migration flows may inhibit adult passage.

**Additional Barriers:** Downstream = box culvert at Murray Road and Highway 101. Recent southerly migration of the lower Mad River has isolated mouth of Widow White Creek – may prevent or reduce opportunities anadromous adult access from ocean. Upstream = Box culvert at Central Avenue and culvert under parking lot of Eureka Glass on north side of Central Avenue.

**Habitat:** Quantity = approximately 9,400' of potential anadromous habitat above Central Avenue. Quality = Not recently habitat typed. CDFG records indicate that adult steelhead were last observed in Widow White Creek in 1987. Past electrofishing has sampled only juvenile steelhead and adult coastal cutthroat trout. Has typical urban stream problems– potentially poor water quality of paved runoff and litter, residential encroachment of riparian zone, and channelization. Runs through Humboldt Sanitation and Recycling with historic auto wrecking yard. Upper watershed managed for commercial timber harvest.

**Site #7:** Widow White Creek #3; Central Avenue **Priority Ranking =** #39

**Location:** County Map # 1C44. T7N, R1E, Section 32

**Culvert Type:** Concrete box . **Dimensions:** 8'W x 3'H **Length:** 44' **Slope:** 0.8%

**Modifications:** None. **Fill Estimate:** 273 cubic yards **Overall condition:** Good.

**Sizing:** Good, should pass nearly a 50-year storm flow.

**Barrier Status:** Not an adult barrier at most flows, except possible low-flow barrier. A partial velocity barrier to juveniles and resident trout.

**Additional Barriers:** Downstream, concrete box culvert at McKinleyville Avenue, concrete box culvert at Murray Road with jump, 230' long CSP under highway 101 at 2% gradient. Downstream, CSP under private business (Eureka Glass and Auto Pro) parking lot, east of Central Avenue (access denied by landowner to casually observe this culvert).

**Habitat:** Quantity = approximately 6,400' of potential anadromous habitat above Central Avenue. Quality = Not recently habitat typed. CDFG records indicate that adult steelhead were last observed in Widow White Creek in 1987. Past electrofishing has sampled only juvenile steelhead and adult coastal cutthroat trout (no coho or chinook). Has typical problems associated with urban streams – water quality of paved runoff and litter, residential encroachment of riparian zone, and channelization of stream corridor. Runs through Humboldt Sanitation and Recycling with historic auto wrecking yard. Upper watershed managed for commercial timber harvest.

**Site #8:** Norton Creek; McKinleyville Avenue **Priority Ranking =** #37

**Location:** County Map # 1C44. T7N, R1E, Section 30

**Culvert Type:** Concrete circular pipe. **Dimensions:** 5' diameter. **Length:** 60' **Slope:** 0.6%

**Modifications:** None. **Fill Estimate:** 3,773 cubic yards

**Overall condition:** Fair. Culvert is in good condition, however retaining walls below outlet are collapsing.

**Sizing:** Extremely undersized, inlet overtops on a 5-year storm flow.

**Barrier Status:** Passable for adult steelhead, temporary barrier for adult cutthroat and all juveniles (excessive velocities starting at moderate migration flows). Short entry jump (1') may pose problems for juveniles and smaller resident trout.

**Additional Barriers:** Downstream, Highway 101 on Widow White Creek may be a partial barrier. Upstream, flows out of Little Pond and Beau Pre golf course.

**Habitat:** Quantity = approximately 15,000' (unless Little Pond is a barrier) Quality = Poor, channel directly above McKinleyville Avenue impacted by unfenced cattle grazing. Upstream of pasture is newly constructed (and still growing) residential development. Upstream of Little Pond development is Beau Pre Golf Course – has bermed creek to create water hazards and probably contributes high levels of fertilizer to Norton Creek.

**Site #9**: Mill Creek #1; Turner Road **Priority Ranking =** #45

**Location:** County Map # 1C44. T6N, R1E, Section 6

**Culvert Type:** Concrete box . **Dimensions:** 6'W x 6'H **Length:** 125'

**Slope:** not measured, but probably 5-7%. **Modifications:** None. **Fill Estimate:** 3,591 cubic yards

**Overall condition:** Good. **Sizing:** Undersized, overtops inlet on about a 5-year storm flow.

**Barrier Status:** Not evaluated by Fish X-ing, but is steep and is most likely a velocity barrier for all juveniles and most adults. However, the culvert is located less than 300' downstream of a natural set of falls (>20' high) that prohibits all upstream migration.

**Additional Barriers:** Downstream, culvert under Highway 101. Upstream approximately 150', Mill Creek falls (bottom photo).

**Habitat:** Quantity = Less than 200' of channel above culvert. Between Turner Road and Highway 101 there is approximately 3,900' of fair/good anadromous habitat, includes a marshy area just east of 101. Last surveyed by CDFG in 1968 and 1961, coho, steelhead and coastal cutthroat present.

**Site #10:** Mill Creek #2; Central Avenue **Priority Ranking =** #41

**Location:** County Map # 1C44. T6N, R1E, Section 5

**Culvert Type:** Concrete box. **Dimensions:** 6'W x 6'H **Length:** 120' **Slope:** <1.0%

**Modifications:** None. **Fill Estimate:** N/A **Overall condition:** Good.

**Sizing:** Undersized, backfloods on less than a 25-year storm flow and may influence flooding of Bartow's Road.

**Barrier Status:** Not evaluated by Fish X-ing, but is backflooded at low flow and is most likely a not barrier for all juveniles and most adults. Fish passage is of little concern because the culvert is located less than 300' upstream of the natural set of falls (>20' high) that prohibits all upstream migration.

**Additional Barriers:** Mill Creek falls located less than 300' downstream. Upstream approximately 6,000', culverts at Azalea Road.

**Habitat:** Quantity = approximately 34,400' of potential fish-bearing channel above culvert – limited to resident rainbow and coastal cutthroat trout due to Mill Creek falls. Quality = Fair, lots of recent residential development has encroached on flood plain and riparian area along Mill Creek. Excessive siltation evident at Bartow'' Road, appears to have originated off of a new subdivision. Lots of trash in channel as well. However, Mill Creek has an excellent volume of flow during summer of cool water.

**Site #11:** Mill Creek #3; Bartows Road **Priority Ranking=** #44

**Location:** County Map # 1C44. T6N, R1E, Section 5 **Culvert Type:** Concrete box with divider.

**Dimensions:** 10'W x 5'H (each side). **Length:** 42' **Slope:** <1.0% **Modifications:** None.

**Fill Estimate:** 194 cubic yards **Overall condition:** Good, installed after 11/21/98 flood flow.

**Sizing:** Adequate, should pass at least a 50-year storm flow. Because residential development has encroached on Mill Creek, flows of this magnitude would probably flood over road to the east of new box culvert.

**Barrier Status:** Not evaluated by program, but is backflooded at low flow and is most likely a not barrier for all juveniles and most adults. Fish passage is of minor concern because the culvert is located less than 500' upstream of the natural set of falls (>20' high) that prohibits all upstream migration.

**Additional Barriers:** Yes, Mill Creek falls located approximately 500' downstream. Upstream, Azalea Road culverts (two 36" diameter CSP's) approximately 5,400' upstream.

**Habitat:** Quantity = approximately 33,800' of potential fish-bearing channel above culvert – limited to resident rainbow and coastal cutthroat trout due to Mill Creek falls. Quality = Fair, lots of recent residential development has encroached on flood plain and riparian area along Mill Creek. Excessive siltation evident at Bartows Road, appears to have originated off of a new subdivision. Lots of trash in channel as well. However, Mill Creek has an excellent volume of flow during summer of cool water.

**Site #12:** Mill Creek #4; Azalea Avenue **Priority Ranking =** #25

**Location:** County Map # 1C44. T6N, R1E, Section 5/6 (road follows line between Sections 5 and 6).

**Culvert Type:** Corrugated Steel Pipe - CSP (2) . **Dimensions:** both 3' diameter **Length:** 40' **Slope:** 3.0%

**Modifications:** None. **Fill Estimate:** 194 cubic yards. **Overall condition:** Fair. Both pipes starting to corrode.

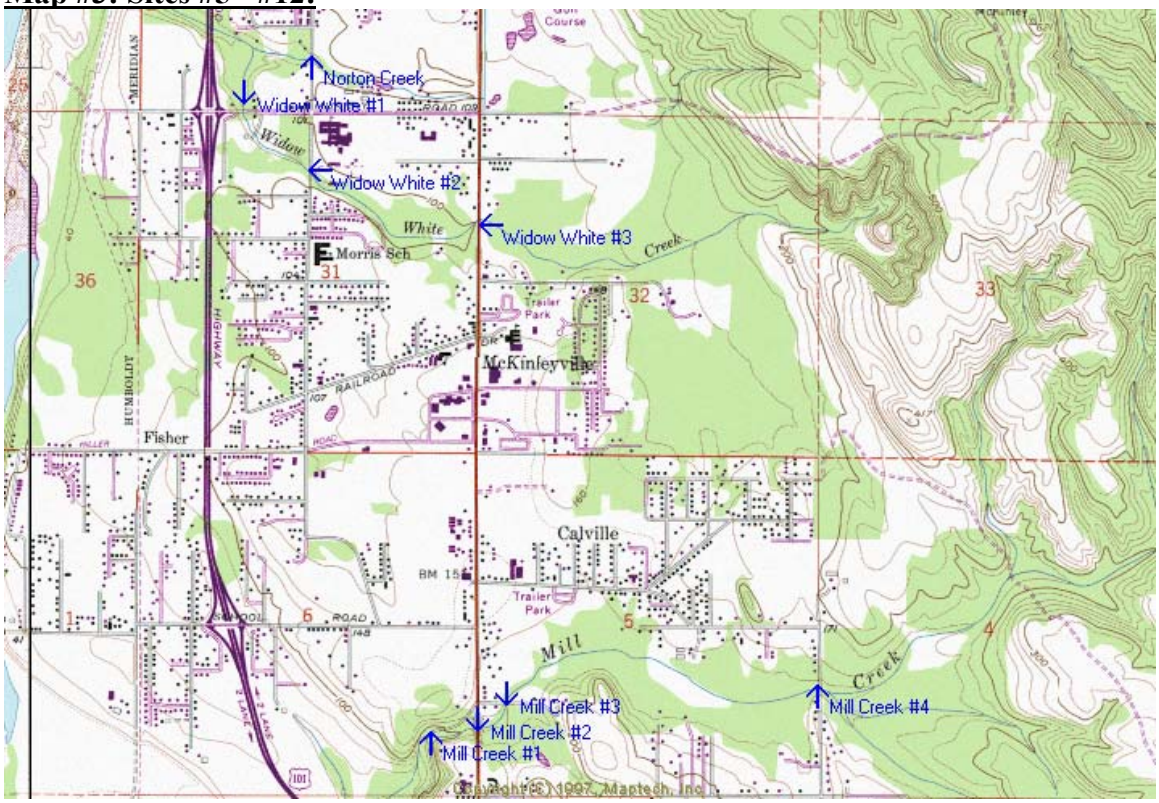
**Sizing:** Extremely undersized, inlets of pipes overtop on less than a 5-year storm flow. Evidence of creek recently flooding across road.

**Barrier Status:** Yes, total barrier for adult cutthroat trout (especially smaller resident fish) and juveniles. Would expect only resident coastal cutthroat and rainbow trout in this reach of Mill Creek because of natural falls below Central Avenue. Culverts are barriers because of excessive jump into outlet on most flows and excessive velocity in pipes during a wide range of fall/winter migration flows.

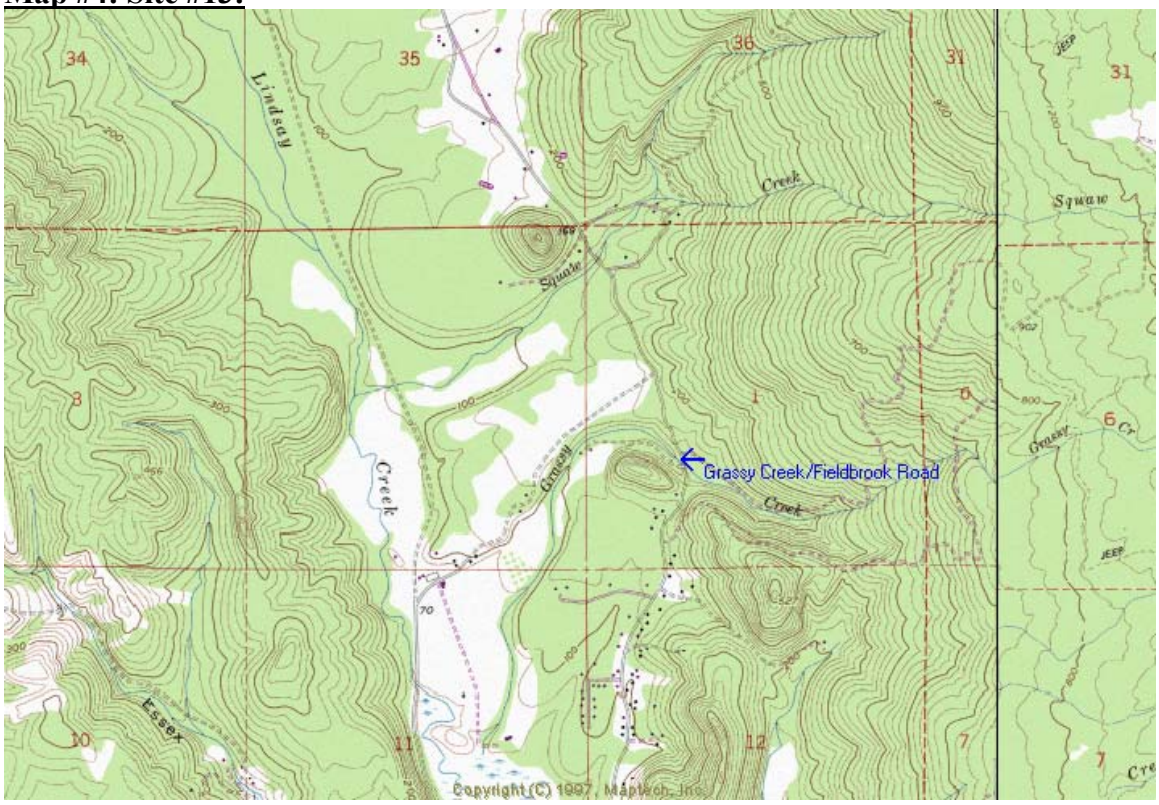
**Additional Barriers:** Downstream, Bartow's Road culvert at grade (not a barrier), then Central Ave culvert at grade (not a barrier), then natural falls – definite barrier. Upstream, unknown, no access to private property.

**Habitat:** Quantity = approximately 28,000' of potential fish-bearing channel above culvert – for resident salmonids only because of Mill Creek falls below Central Avenue. Quality = No survey information available and no access to private property. However, Mill Creek has an excellent volume of flow during summer of cool water.

**Map #3: Sites #5 - #12:**




**Map #4: Site #13:**



**Site #13:** Grassy Creek; Fieldbrook Road **Priority Ranking =** #27

**Location:** County Map # 1C45. T6N, R1E, Section 1

**Culvert Type:** Concrete box . **Dimensions:** 8'W x 6'H **Length:** 31' **Slope:** 1.3%

**Modifications:** Washington baffles (redwood); outlet beam with low flow notch; riprap outlet pool. Note: two new weirs installed prior to 1999 rains, appears to have raised pool elevation so that jump is about 1' – 2', depending on amount of flow.

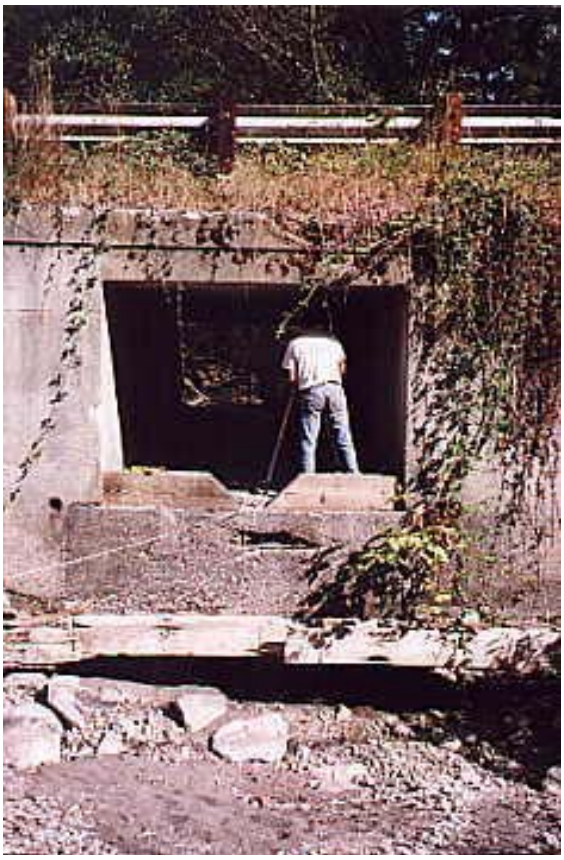
**Fill Estimate:** 1,453 cubic yards. **Overall condition:** Fair/poor, redwood beam under-supports starting to rot and wear away.

**Sizing:** Extremely undersized, inlet overtops on about a 5-year storm flow. Creek channel is also at nearly a 90% angle to culvert inlet.

**Barrier Status:** Excessive jump creates total barrier for all species of juvenile salmonids and coastal cutthroat trout. Is a partial barrier to adult coho, chinook, and steelhead. Elevation of backflood pools recently (10/99) increased, may provide better access. Over four winters of observations, only a handful of juveniles seen at this culvert (all failed attempts).

**Additional Barriers:** Downstream, none. Upstream, none.

**Habitat: :** Quantity = approximately 2,200' of potential anadromous habitat above Fieldbrook Road culvert. Quality = unknown, but creek has no summer flow. During winter, Grassy Creek is the flashiest tributary in Lindsay Creek watershed and runs with the visually highest turbidity. Would recommend that local Lindsay Creek watershed group conduct habitat typing survey.



**Site #14:** South Fork Anker Creek #2; Anker Road **Priority Ranking** = #9

**Location:** County Map # 1C45. T7N, R1E, Section 26

**Culvert Type:** CSP. **Dimensions:** 4.5' **Length:** 120' **Slope:** <1.0%

**Modifications:** Concrete lined floor. **Fill Estimate:** N/A

**Overall condition:** Extremely poor. **Sizing:** Extremely undersized (in photo, note collection of woody debris above inlet).

**Barrier Status:** Fish Xing determined was a total barrier to all species and lifestages, excessive jump height and excessive velocities.

**Additional Barriers:** Downstream, yes culvert on county Fieldbrook Road. Upstream, partial barrier at private road culvert (approximately 1500').

**Habitat:** Quantity = approximately 3,600' of potential anadromous habitat above Fieldbrook Road culvert. Quality = unknown, but creek has good summer flow with cool temperatures and dense riparian canopy. Spawning substrate appears suitable. Would recommend that local Lindsay Creek watershed group conduct habitat typing survey.

**Site #15:** South Fork Anker Creek #1; Fieldbrook Road **Priority Ranking =** #8

**Location:** County Map # 1C45. T7N, R1E, Section 26

**Culvert Type:** CSP. **Dimensions:** 7.5' **Length:** 71.6'

**Slope:** 4.1% (break-in-slope over lower 15'accounts for most of gradient)

**Modifications:** Bottom lined with concrete. **Fill Estimate:** 3,129 cubic yards

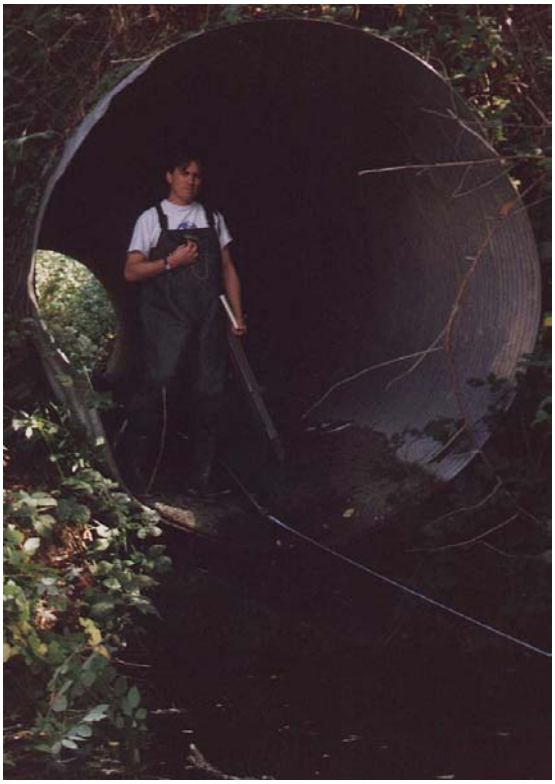
**Overall condition:** Poor, rusted through bottom, then lined with concrete.

**Sizing:** Properly sized, should pass greater than a 100-year storm flow.

**Barrier Status:** Total barrier for all juvenile salmonids and adult coastal cutthroat trout. Passable for adult coho, chinook, and steelhead on about 40% of the range of expected migration flows. Lack of depth at lower flows and excessive velocities at higher flows are main problems. Fish X-ing also calculated velocities on a 4.1% gradient averaged through the pipe's entire length, actual velocities may be greater over the extreme break-in-slope at culvert outlet. Known poaching spot for adults stacked below culvert.

**Additional Barriers:** Downstream, none. Upstream, YES, barrier at county culvert on Anker Road (about 500' upstream) Adults are sometimes seen above this culvert. Above Anker Road is a culvert on a private road, probably a barrier for juveniles.

**Habitat:** Quantity = approximately 4,000' of potential anadromous habitat above Fieldbrook Road culvert. Quality = unknown, but creek has good summer flow with cool temperatures and dense riparian canopy. Spawning substrate appears suitable. Would recommend that local Lindsay Creek watershed group conduct habitat typing survey.



**Site #16:** North Fork Anker Creek; Fieldbrook Road **Priority Ranking =** #6

**Location:** County Map # 1C45. T7N, R1E, Section 26

**Culvert Type:** CSP. **Dimensions:** 6.0' diameter **Length:** 60' **Slope:** 2.1%

**Modifications:** Bottom lined with concrete. **Fill Estimate:** 951 cubic yards

**Overall condition:** Poor, floor rusted through and then lined with concrete.

**Sizing:** Extremely undersized, especially with concrete lining further reducing the pipe's capacity. Inlet overtops on less than a 5-year storm flow. Floods over Fieldbrook Road on a regular basis. Note inlet photo where overhanging trees have caught debris which increases likelihood of culvert plugging.

**Barrier Status:** Fish Xing indicates is a complete barrier to all juveniles and adult coastal cutthroat trout and a partial barrier to adult coho, chinook, and steelhead. Lack of depth at lower flows, then a velocity barrier at moderate to high migration flows. Short, steep drop down concrete lining at outlet probably increases passage problems.

**Additional Barriers:** Downstream, one culvert on private road is at stream grade, but appears undersized (and has failed during recent winters). Upstream, swim-through culvert below grade on private property appears adequately sized.

**Habitat:** Quantity = approximately 7,600' of potential anadromous habitat upstream of Fieldbrook Road. Quality = unknown, but creek has good summer flow with cool temperatures and dense riparian canopy. Looks like decent spawning substrate. Would recommend that local Lindsay Creek watershed group conduct habitat typing surveys.

**Site #17:** Lindsay Creek; Murray Road **Priority Ranking =** #3

**Location:** County Map # 1C45. T7N, R1E, Section 23

**Culvert Type:** CSP. **Dimensions:** 7.0' diameter **Length:** 91.3' **Slope:** 0.3%

**Modifications:** Bottom lined with concrete. **Fill Estimate:** 3,636 cubic yards

**Overall condition:** Poor, floor completely rusted in places to extent that low flow fails to reach outlet.

**Sizing:** Undersized, inlet overtops on a about a 10-year storm flow. During our study this culvert failed and was patched together by county road's crew.

**Barrier Status:** Excessive length and undersizing create a total velocity barrier to all juvenile salmonids and adult coastal cutthroat trout. Is a temporary barrier to adult coho, chinook, and steelhead. Adult salmon and steelhead have been observed spawning upstream of this culvert. Note: after crossing failed in 1998, passage may be harder due to steep drop at inlet which formed after culvert was "repaired".

**Additional Barriers:** Downstream, none. Upstream, six crossings on private roads off of Railroad Grade. First, Simpson Timber installed a railcar bridge on Railroad Grade after 11/99 blow-out of old crossing. Second private crossing is 0.2 miles upstream of Simpson bridge (two 5' diameter CSP). Third is Crockett Crossing, about 400' above first private crossing. Fourth is Stump Lane, about 0.5 miles above Simpson bridge (two 4' diameter CSP lined with concrete, slightly perched, high rustlines). Fifth is about 0.7 miles above Simpson bridge. Sixth is on Old Round House Road, about 0.75 miles above Simpson bridge (single 5' diameter CSP).

**Habitat:** Quantity = approximately 13,800' of potential anadromous habitat above Murray Road culvert. Quality = Good, cool summer water temperature, dense riparian zone of second-growth conifer and hardwoods, numerous pools with undercut banks. Lindsay Creek is the best coho salmon and coastal cutthroat trout tributary within the Mad River watershed.

**Site #18:** Mather Creek; Murray Road **Priority Ranking =** #11

**Location:** County Map # 1C45. T7N, R1E, Section 22

**Culvert Type:** CSP. **Dimensions:** 6.0' diameter **Length:** 135.5' **Slope:** 0.4%

**Modifications:** Riprap placed right at outlet (for possible flow dissipation).

**Fill Estimate:** 3,287 cubic yards **Overall condition:** Poor, rusted-through bottom.

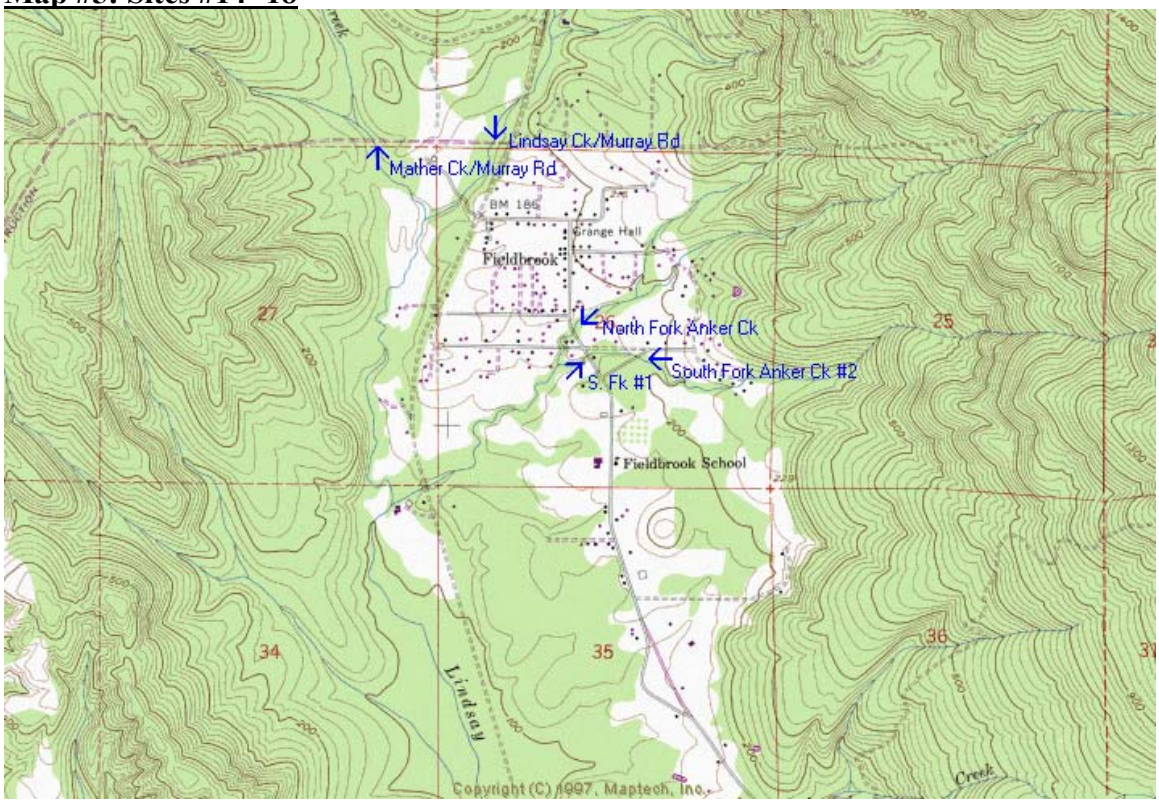
**Sizing:** Extremely undersized, inlet is overtopped by about a 5-year storm flow.

**Barrier Status:** Fish Xing determined culvert is not a barrier to adult salmonids, but is a velocity barrier to juveniles. However, analysis could not consider the steep drop down riprap just below outlet which may be a velocity barrier to adults at some flows. Adult coho have been observed upstream of this crossing.

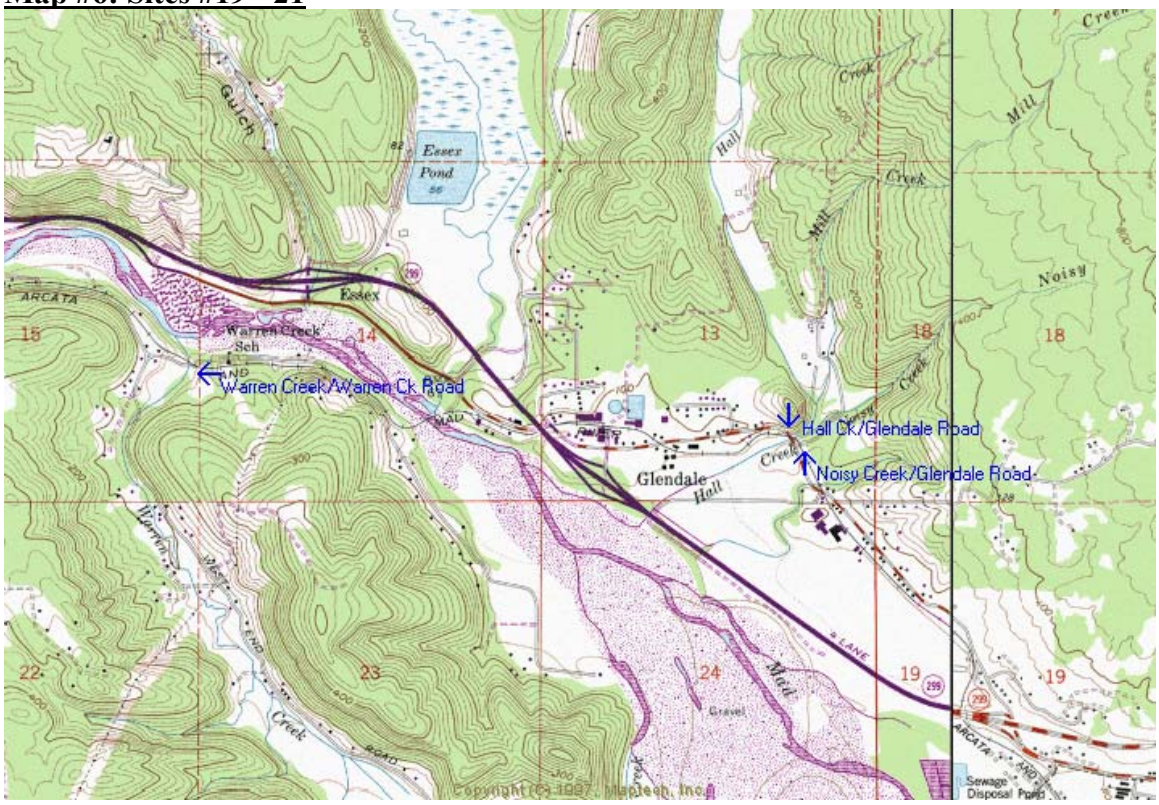
**Additional Barriers:** Downstream, none. Upstream, currently none (used to be a complete barrier at the old mill pond located about 500' upstream, but this failed several years ago).

**Habitat:** Quantity = approximately 15,000' of potential anadromous channel above culvert. Quality = Fair, small creek, dense riparian of second-growth conifer and hardwoods, cool summer water temperatures; however very limited amounts of gravel suitable for spawning.

## Map #5: Sites #14 -18




## Map #6: Sites #19 - 21



**Site #19:** Warren Creek; Warren Creek Road **Priority Ranking** = #24

**Location:** County Map # 1C55. T6N, R1E, Section 15

**Culvert Type:** Lower 25' section = concrete; upper 65' = round iron pipe. **Dimensions:** 5.6' diameter

**Length:** 80' **Slope:** 2.0% mostly over lower 10 feet.

**Modifications:** floor of iron pipe lined with cement; Washington baffles (16 sets) throughout pipe; four sets of riprap weirs creating approach pools below outlet.

**Fill Estimate:** 2,270 cubic yards.

**Overall condition:** Good/fair. Rip rap below outlet in need of repair to maintain functionality of approach pools. Concrete lining has stopped leakage through iron pipe, yet has reduced the flow capacity of culvert.

**Sizing:** Undersized, inlet overtops on about a 25-year storm flow (this estimate was generated from pipe diameter without baffles, so actual capacity is less).

**Barrier Status:** Not evaluated by Fish X-ing, but approach pools below outlet have improved passage for adult salmon and steelhead. Baffles appear to reduce velocity within culvert. However, the series of jump pools up to culvert inlet appear excessive for juveniles. Direct observation has confirmed their inability to reach the culvert outlet.

**Additional Barriers:** Downstream, none. Upstream, none.

**Habitat:** Quantity = approximately 14,200' of potential anadromous habitat above culvert. Quality = A 1989 CDFG survey noted "good pool/riffle habitat with some siltation". Has cool summer water temperatures. CDFG also electrofished in 1989 and sampled juvenile coho and steelhead as well as adult coastal cutthroat trout.

**Site #20**: Hall Creek; Glendale Road **Priority Ranking** = #53

**Location:** County Map # 1C55. T6N, R1E, Section 13

**Culvert Type:** CSP. **Dimensions:** 7.5' diameter **Length:** 91.3'

**Slope:** 0.5% (over ½ full with fine sediment at outlet) **Modifications:** None.

**Fill Estimate:** 1,282 cubic yards **Overall condition:** Fair.

**Sizing:** Undersized, a 7.5' diameter pipe would pass about a 25-year flow, except the extensive aggradation decreases pipe's capacity (has flooded Glendale Road in recent years).

**Barrier Status:** Probably a velocity barrier at higher range of migration flows due to undersized pipe. Is at channel grade, so low-flow passage is not a problem.

**Additional Barriers:** Downstream, goes under private road culvert, then culvert Highway 199. Upstream, unknown on private property.

**Habitat:** Quantity = approximately 14,200' of potential anadromous channel. Quality = last surveyed by CDFG in 1984, poor pool development for nearly two miles upstream. Electrofishing in 1993, 89, and 84 captured coho, steelhead, chinook, and lamprey. However, from evidence of excessive aggradation and lack of inchannel LWD within reach above and below Glendale Road would consider habitat as "poor to fair". Unfenced grazing downstream of Glendale Road has resulted in extremely poor habitat in the lower reach of Hall Creek.

**Site #21:** Noisy Creek; Glendale Road **Priority Ranking** = #21

**Location:** County Map # 1C55. T6N, R1E, Section 13

**Culvert Type:** Concrete pipe (2). **Dimensions:** 4.0' diameter

**Length:** 69.4' **Slope:** -0.7% (backflooded and nearly full at low flow)

**Modifications:** None. **Fill Estimate:** 894 cubic yards **Overall condition:** Fair.

**Sizing:** Extremely undersized, nearly ½ full at low summer flows. Floods Glendale Road on moderate storms.

**Barrier Status:** Probably a velocity barrier at higher range of migration flows due to undersized pipe. Is at channel grade, so low-flow passage is not a problem.

**Additional Barriers:** Downstream, goes under private road culvert, then culvert at Highway 199. Upstream, unknown on private property – no mention of barriers in past CDFG stream surveys.

**Habitat:** Quantity = approximately 1,800' of potential anadromous channel (to natural falls). Quality = no known recent surveys. Last CDFG survey, 1969 which sampled juvenile steelhead, coho, and lamprey above culverts up to falls. However, from evidence of excessive aggradation and lack of inchannel LWD within reach above and below Glendale Road would consider habitat as "poor to fair". Unfenced grazing downstream of Glendale Road has resulted in extremely poor habitat in lower reach of Hall Creek.

**Site #22:** Sullivan Gulch; Riverside Drive **Priority Ranking =** #2

**Location:** County Map # 2C51. T6N, R2E, Section 28 **Culvert Type:** SSP pipe.

**Dimensions:** 10.5' diameter **Length:** 60.2' **Slope:** 1.3%
**Modifications:** Culvert floor line with concrete; Washington steel-ramp baffles; 12" x 6" redwood outlet beam with low flow notch; riprapped formed jump pool

**Fill Estimate:** 1,282 cubic yards **Overall condition:** Fair. **Sizing:** Slightly undersized, a 50-year would start to pond-up on upstream side of culvert. However, sizing did not account for baffles.

**Barrier Status:** Extensive observations conclude that adult passage is adequate (although entry jump is difficult for some fish), but culvert is nearly a complete barrier for juveniles of all age-classes. Over five winters, extremely high levels of avian predation on juveniles observed.

**Additional Barriers:** Downstream, none, flows into North Fork Mad River about 500' from culvert. Upstream about 700' is a concrete sill at Simpson Timber's flow gauge station. Adults observed above sill.

**Habitat:** Quantity = approximately 4,500' of anadromous habitat, then steep gorge. However, gradient lessens above gorge and there exists several thousand feet of channel with resident salmonids present. Quality = Good, dense riparian of second-growth conifer and hardwoods. Numerous pools with inchannel LWD. Cool summer water temperatures. Decent quality spawning substrate, a bit high in fines.

**Site #23:** Mill (Watek) Creek; Riverside Drive **Priority Ranking =** #47

**Location:** County Map # 2C51. T6N, R2E, Section 32

**Culvert Type:** Two - CSP and concrete circular pipe. **Dimensions:** Both = 3' diameter.

**Length:** 30.5' **Slope:** 0.2% **Modifications:** None **Fill Estimate:** 110 cubic yards

**Overall condition:** Fair.

**Sizing:** Extremely undersized, less than a five-year flow. Has flooded Riverside Drive on several recent storms and caused damage to Simpson Timber Company's nursery.

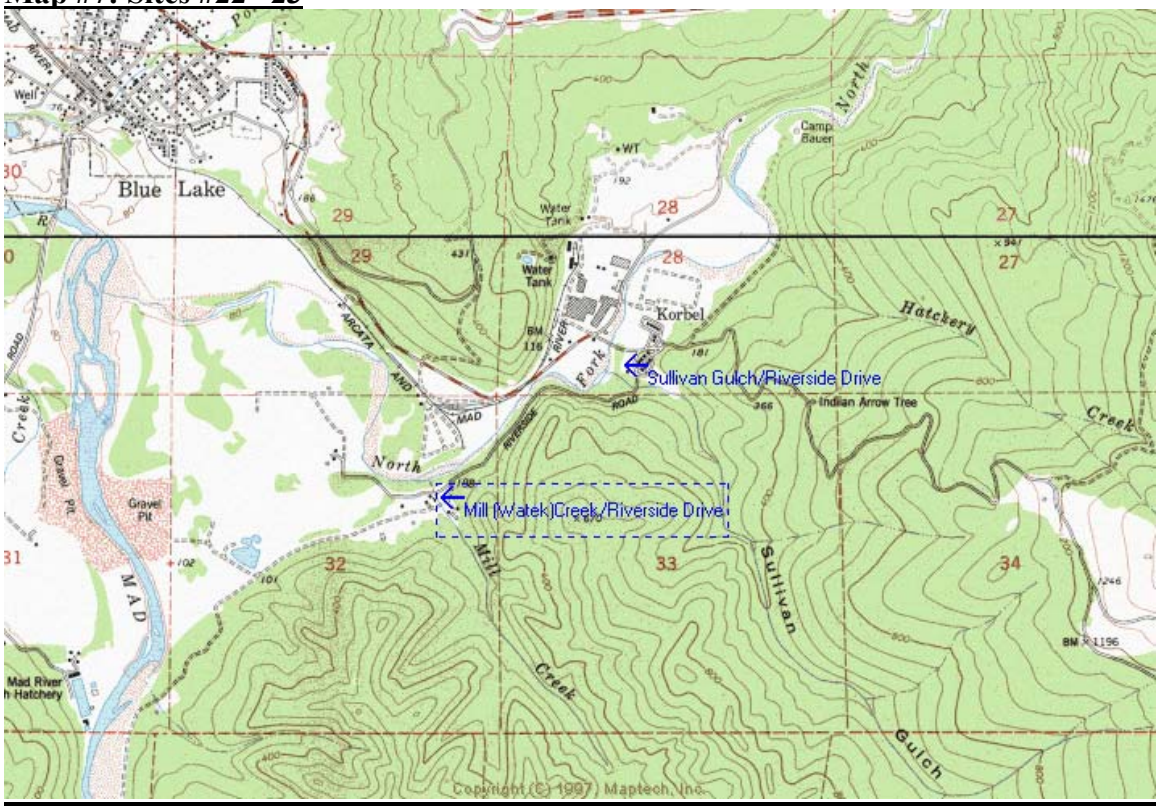
**Barrier Status:** Not evaluated with Fish Xing software, however both pipes are at stream grade, with minimal slope. However, this crossing is extremely undersized and may create a velocity barrier at the high range of expected migration flows.

**Additional Barriers:** Downstream, none flows directly into North Fork Mad River. Upstream, less than 200' upstream a double concrete pipe crossing on Simpson's road out to the Mad River (appears extremely undersized). Then about 3,000' above county culvert there is a slightly perched culvert on Simpson's property.

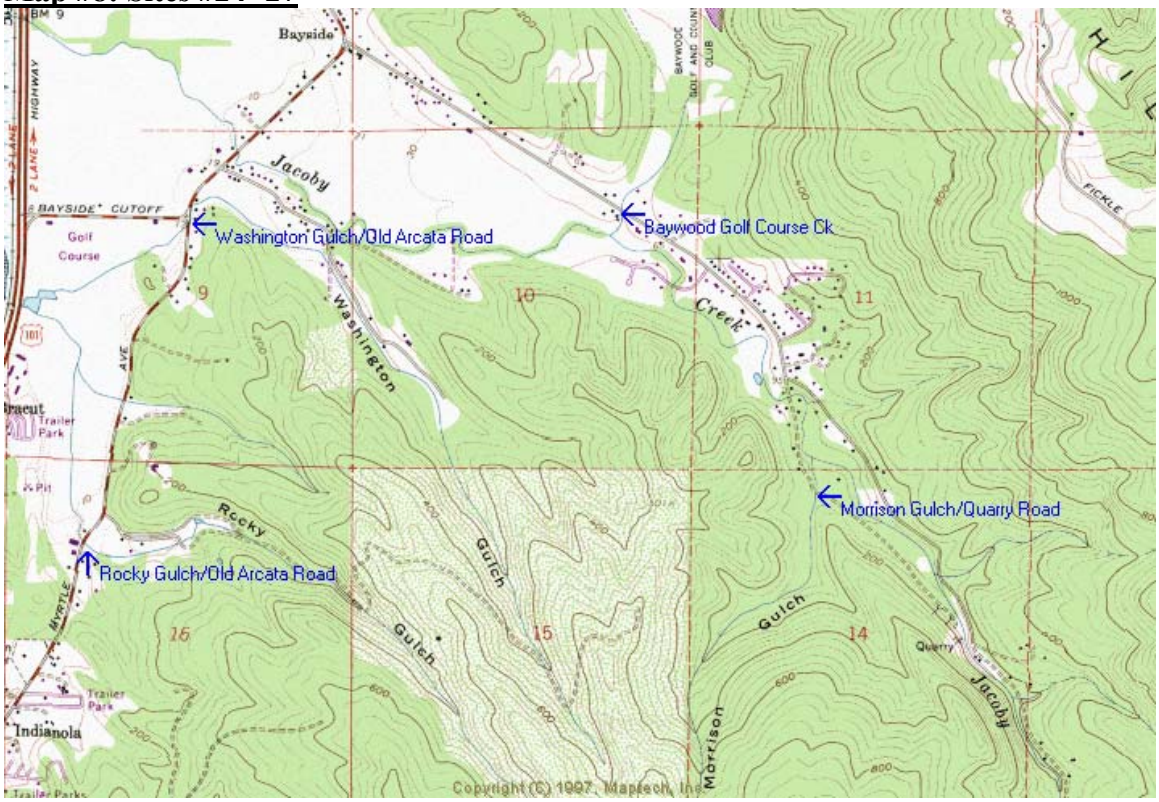
**Habitat:** Quantity = approximately 5,000' of potential anadromous habitat upstream of Riverside Drive. Quality = poor, highly aggraded channel from past logging and road building practices which occurred on a highly unstable geology. Dense riparian, but no pool formation due to high inputs of sandy sediment.

**Photo note:** Inlet photo only.

## Map #7: Sites #22 –23




## Map #8: Sites #24 -27



**Site #24:** Washington Gulch; Old Arcata Road **Priority Ranking** = #52

**Location:** County Map # 2C51. T6N, R2E, Section 28

**Culvert Type:** Concrete circular pipes (2). **Dimensions:** 4.0' diameter

**Length:** 60' **Slope:** <2.0 % **Modifications:** None **Fill Estimate:** not measured.

**Overall condition:** Fair, some wear to floor of concrete pipes. **Sizing:** undersized, inlets overtops on less than a 25-year storm flow.

**Barrier Status:** Temporary and partial for adults (excludes smaller cutthroat trout), nearly complete for juveniles because of slightly perched outlet. Adult chinook salmon observed spawning upstream of culverts in 1998.

**Additional Barriers:** Downstream, possible tide gate at Humboldt Bay and Highway 101. Upstream, two culverts on private driveways immediately upstream of county culvert.

**Habitat:** Quantity = approximately 8,500' of potential anadromous habitat. Quality = Appears poor, unfenced cattle grazing along ditched channel below Old Arcata Road. Upstream, flows through residential area with highly silted in channel with minimal habitat complexity.

**Site #25:** Baywood Golf Course Creek; Jacoby Creek Road **Priority Ranking =** #38

**Location:** County Map # 1C55. T5N, R1E, Section 10 **Culvert Type:** SSP. **Dimensions:** 9.1' diameter

**Length:** 116.8' **Slope:** 0.3% **Modifications:** None **Fill Estimate:** 1,755 cubic yards

**Overall condition:** Fair, some rusting through culvert floor. SSP is placed at or slightly below channel grade, slight backflooding at low flows.

**Sizing:** Adequate, should pass a 50-year storm flow.

**Barrier Status:** Adults, no, is a swim-through at low flows. Proper sizing and minimal slope do not create a velocity barrier at migration flows. Fish Xing indicates a temporary velocity barrier for juveniles, but does not account for culvert margins.

**Additional Barriers:** Downstream, none. Upstream, unknown flows through private property after leaving Baywood Golf Course.

**Habitat:** Quantity = 1,800' of potential anadromous habitat upstream of county culvert. Quality = CDFG had recent (1994) survey on file, juvenile coho and steelhead observed. Cool summer water temperatures, fair pool development and dense riparian of second-growth conifer and hardwoods.

**Site #26:** Morrison Gulch; Quarry Road **Priority Ranking =** #1

**Location:** County Map # 1D15. T5N, R1E, Section 14

**Culvert Type:** CSP. **Dimensions:** 5.0' diameter **Length:** 50.0' **Slope:** 1.0%

**Modifications:** None **Fill Estimate:** 1,592 cubic yards

**Overall condition:** Poor, culvert floor is rusted, low flow fails to reach outlet.

**Sizing:** Undersized, inlet tops on about a five to 10-year storm flow.

**Barrier Status:** Yes, high entry jump (>5') prevents all juveniles and most adults (all species) from entering CSP. Excessive velocities occur in pipe at a moderate range of expected migration flows. Highest levels of observed jump attempts by adult coho salmon.

**Additional Barriers:** A bottomless pipe-arch is located on a Simpson Timber Company road about 1,200' upstream of Quarry Road, an recent upgrade from two, parallel undersized CMP pipes.

**Habitat:** Quantity = 3,200' of potential anadromous habitat exists above the county culvert. Quality = Fair to good; dense riparian zone of hardwoods and second-growth redwoods, cool summer water temperature, ample amounts of inchannel LWD with undercut banks. High amounts of fine sediment may limit spawning success. Appears to provide excellent rearing habitat.

**Site #27:** Rocky Gulch; Old Arcata Road **Priority Ranking =** #22

**Location:** County Map # 1D15. T5N, R1E, Section 16

**Culvert Type:** Concrete circular pipes (2). **Dimensions:** 3.0' diameter

**Length:** 48.0' **Slope:** 0.3% **Modifications:** None **Fill Estimate:** 153 cubic yards

**Overall condition:** Poor, one culvert is overgrown and completely plugged with fine sediment. Entire channel flows through one 3' pipe (nearly full at low summer flow).

**Sizing:** Extremely undersized, especially with one pipe completely overgrown. Floods Old Arcata Road on a regular basis.

**Barrier Status:** Yes, excessive velocities occur in pipe at a moderate range of expected migration flows.

**Additional Barriers:** Downstream, private landowner has culvert (CMP) immediately downstream of Old Arcata Road, appears at channel grade, yet extrememly undersized. Also, tide gate near Humboldt Bay by Highway 101. Upstream, yes perched CMP on private property currently being sub-divided for residential development.

**Habitat:** Quantity = 9,200' of potential anadromous habitat. Quality = Fair/poor. Past records indicate that prior to 1958 habitat supported strong runs of coastal cutthroat, steelhead, and coho salmon. Major, repeated landuse activities have degraded instream habitat. Illegal timber harvest with inchannel use of heavy equipment occurred in late 1950's. Recent berming and channelization has occurred along lower creek, just above county culvert. Timber harvesting presently occurring. Creek-side property just east of Old Arcata Road being sub-divided for gated community of residential homes.

**Site #28:** Eureka Slough#1 (Cochran Creek); Old Arcata Road **Priority Ranking =** #58

**Location:** County Map # 1D15. T5N, R1E, Section 20

**Culvert Type:** Concrete circular pipes (2). **Dimensions:** 3.0' diameter

**Length:** 42.2' **Slope:** 1.4% **Modifications:** None **Fill Estimate:** 420 cubic yards

**Overall condition:** Good. **Sizing:** Extremely undersized, inlet over tops on less than a 10-year storm flow. Poor alignment, channel takes $90^0$ right below outlet.

**Barrier Status:** Not for adults, temporary for juveniles, excessive velocities at higher migration flows.

**Additional Barriers:** Downstream = possible tide gate near Humboldt Bay. Upstream = county culvert on Ole Hanson Road about 3,500' upstream and possible second culvert on private property.

**Habitat:** Quantity = 6,800' of potential anadromous habitat upstream of culvert. Quality = poor, below culvert creek is a channelized ditch with minimal complexity. Upstream, creek is through cattle pastures and residential area, highly aggraded with fines sediment and minimal amounts of inchannel LWD.

**Site #29:** Cochran Creek #2; Ole Hanson Road **Priority Ranking =** #59

**Location:** County Map # 1D15. T5N, R1E, Section 21

**Culvert Type:** Concrete box. **Dimensions:** 1.8'H x 7.0'W ( is a 5' x 7' but is filled with sediment).

**Length:** 22.5' **Slope:** 0.0% **Modifications:** None **Fill Estimate:** 119 cubic yards

**Overall condition:** Good. **Sizing:** Undersized, especially with large amount of deposited sediment.

**Barrier Status:** Swim through, not a barrier at most migration flows. However, box culvert is undersized and may be a velocity barrier to juveniles at higher migration flows.

**Additional Barriers:** Upstream, may be a culvert on private property (appears as a county road culvert on maps, but is posted as private). Downstream 3,400', county culvert on Old Arcata Road, possible tidegate at Highway 101.

**Habitat:** Quantity = 3,400' of potential anadromous habitat upstream of culvert. Quality = Unknown no records on file at CDFG and no access to private property, but channel around culvert is highly aggraded with fines. Lower creek is channelized with cattle grazing. Below Old Arcata Road habitat is poor, basically a channelized ditch.

**Photo Note:** Inlet at low flow and peak of 11/21/98 storm.

**Site #30:** Tributary to Ryan Creek; Mitchell Road **Priority Ranking =** #4

**Location:** County Map # 1D14. T5N, R1E, Section 31

**Culvert Type:** Upper 44' concrete pipe; lower 16' CSP . **Dimensions:** 4.0' diameter

**Length:** 60' **Slope: -**0.6% **Modifications:** None. **Fill Estimate:** 732 cubic yards

**Overall condition:** Extremely poor, CSP section is heavily rusted, lower six feet of pipe missing.

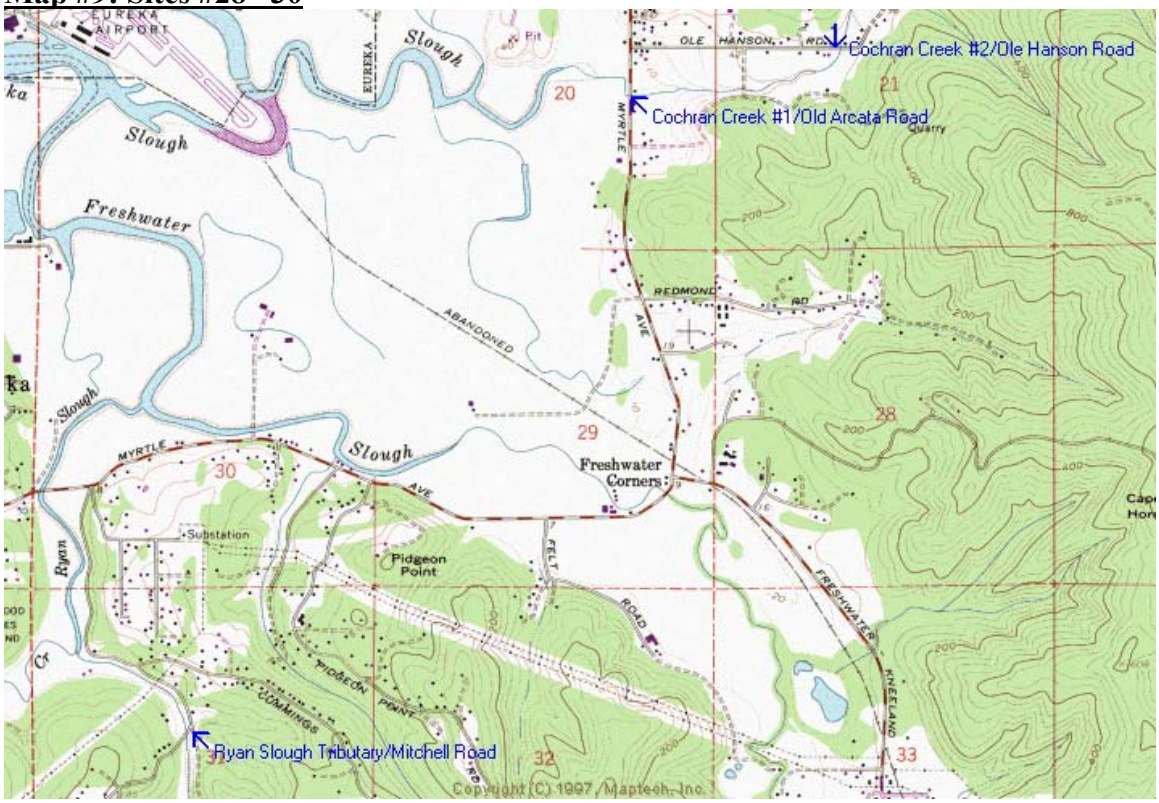
**Sizing:** Extremely poor – fails to pass a two-year flow. Floods Mitchell Road on a regular basis.

**Barrier Status:** Partial for most adults and complete barrier for all juveniles. Outlet pool lacks depth for jump attempts. Fish Xing determined that jump height is a problem at some flows. The inadequate sizing also creates a velocity barrier at a wide range of migration flows.

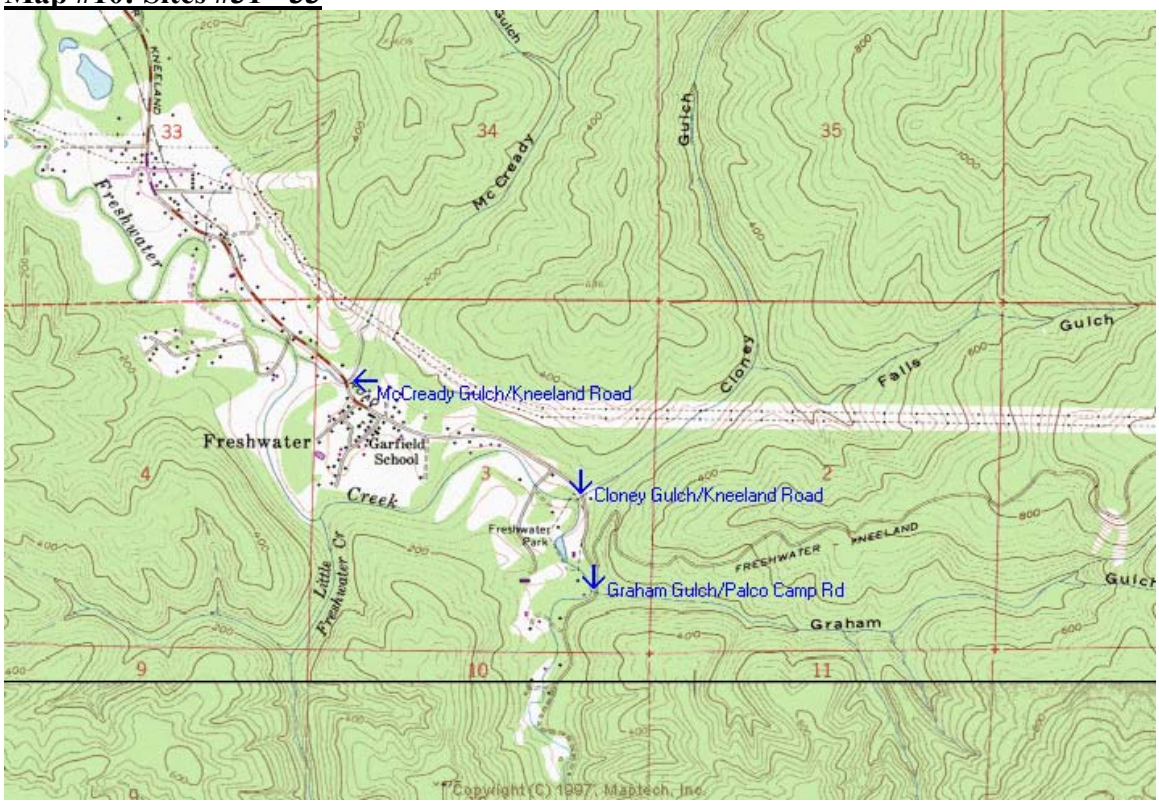
**Additional Barriers:** None downstream, Old Arcata Road is bridged over Ryan Slough. Upstream, unknown. No access to private property.

**Habitat:** Quantity = 19,000' of anadromous channel accessible. Quality = Unknown, no information available in Fish and Game files in Eureka, no access to private property.

## Map #9: Sites #28 –30




## Map #10: Sites #31 - 33



**Site #31:** McCready Gulch; Kneeland Road **Priority Ranking =** #35

**Location:** County Map # 1D15. T4N, R1E, Section 3

**Culvert Type:** Concrete box. **Dimensions:** 7.0'H x 10.0'W - natural channel bottom.

**Length:** 93.0' **Slope:** 0.3% **Modifications:** None **Fill Estimate:** 4,628 cubic yards

**Overall condition:** Good. **Sizing:** Good – should pass greater than a 50-year flow.

**Barrier Status:** Not a barrier at most flows. Low flow passage is possible due to natural channel bottom. At high end of migration flows may be a velocity barrier for juveniles.

**Additional Barriers:** Yes, old county road (now private) is a boxed culvert that is perched. Adult salmon, steelhead, and cutthroat trout are known to spawn upstream of this perched culvert. However, the jump may be excessive for juveniles. This culvert is baffled (WA-style, redwood) with outlet beam (with low flow notch).

**Habitat:** Quantity = 15,000' of potential anadromous habitat upstream of the county culvert. Quality = Good, one of the better spawning and rearing tributaries of the Freshwater Creek watershed.

**Site #32:** Cloney Gulch; Kneeland Road **Priority Ranking =** #12

**Location:** County Map # 1D15. T4N, R1E, Section 3 **Culvert Type:** SSP half-arch with concrete floor.

**Dimensions:** 7.9'H x 16.0'W. **Length:** 60.0' **Slope:** 1.1%

**Modifications:** For ½ the width, Washington-style baffles with redwood beam across both inlet and outlet. Other ½ of width, no baffles, but completely enclosed by inlet and outlet beams.

**Fill Estimate:** 2,081 cubic yards **Overall condition:** Good. **Sizing:** Good – should pass greater than a 50-year flow.

**Barrier Status:** Partial for most adults and complete barrier for all juveniles. Fish Xing determined that jump height is a problem at some flows. However, direct observation revealed outlet flow was confusing to most fish, even at minimal jump heights. Relatively inexpensive treatment costs to improve passage.

**Additional Barriers:** None.

**Habitat:** Quantity = 11,200' of potential anadromous habitat. Quality = Good, one of the better spawning and rearing tributaries within the Freshwater Creek watershed.

**Site #33:** Graham Gulch; PALCO Camp Road **Priority Ranking =** #29

**Location:** County Map # 1D15. T4N, R1E, Section 3

**Culvert Type:** SSP, circular. **Dimensions:** 13.25' diameter

**Length:** 60.5' **Slope:** 2.7% **Modifications:** Baffles – WA steel ramps (11).

**Fill Estimate:** 1,853 cubic yards **Overall condition:** Floor and outlet are rusting, numerous holes in floor.

**Sizing:** Good – should pass greater than a 50-year flow.

**Barrier Status:** Partial for most adults and complete barrier for all juveniles. Fish Xing determined that jump height is a problem at some flows. However, because of baffles Fish Xing was unable to accurately model velocities.

**Additional Barriers:** Downstream, none empties directly into Freshwater Creek. Upstream, none

**Habitat:** Quantity = 13,400' of potential anadromous habitat. Quality = fair to poor, in the past ten years the channel has experienced excessive loading of fine sediments from hillslope failures. Instream restoration structures provided complexity, but have been buried by sediment inputs.

**Site #34:** Martin Slough #1; Herrick Road **Priority Ranking =** #60

**Location:** County Map # 1D14. T4N, R1W, Section 3

**Culvert Type:** Concrete circular (2) . **Dimensions:** Each 7.0' diameter

**Length:** 61' **Slope:** 0.1% **Modifications:** None. **Fill Estimate:** 1,366 cubic yards

**Overall condition:** Good. **Sizing:** Poor, sized for less than a 10-year flow.

**Barrier Status:** Passable for most adults and partial barrier for all juveniles. Fish Xing determined that the inadequate sizing created a velocity barrier for juveniles at the upper range of migration flows.

**Additional Barriers:** None downstream, Highway 101 is bridged over lower Martin Slough. Upstream, Campton Road has the five, 4' concrete pipes at grade.

**Habitat Upstream:** Quantity = 22,000' of potential anadromous habitat; Quality = poor, heavy siltation and lack of inchannel habitat from current and past land management activities. Huge sediment introduction from recent built residential developments.

**Site #35:** Martin Slough #2; Campton Road **Priority Ranking =** #61

**Location:** County Map # 1D14. T5N, R1W, Section 35

**Culvert Type:** Concrete circular (5) . **Dimensions:** Each 4.0' diameter

**Length:** 77.5' **Slope:** 0.1% **Modifications:** None. **Fill Estimate:** 1,341 cubic yards

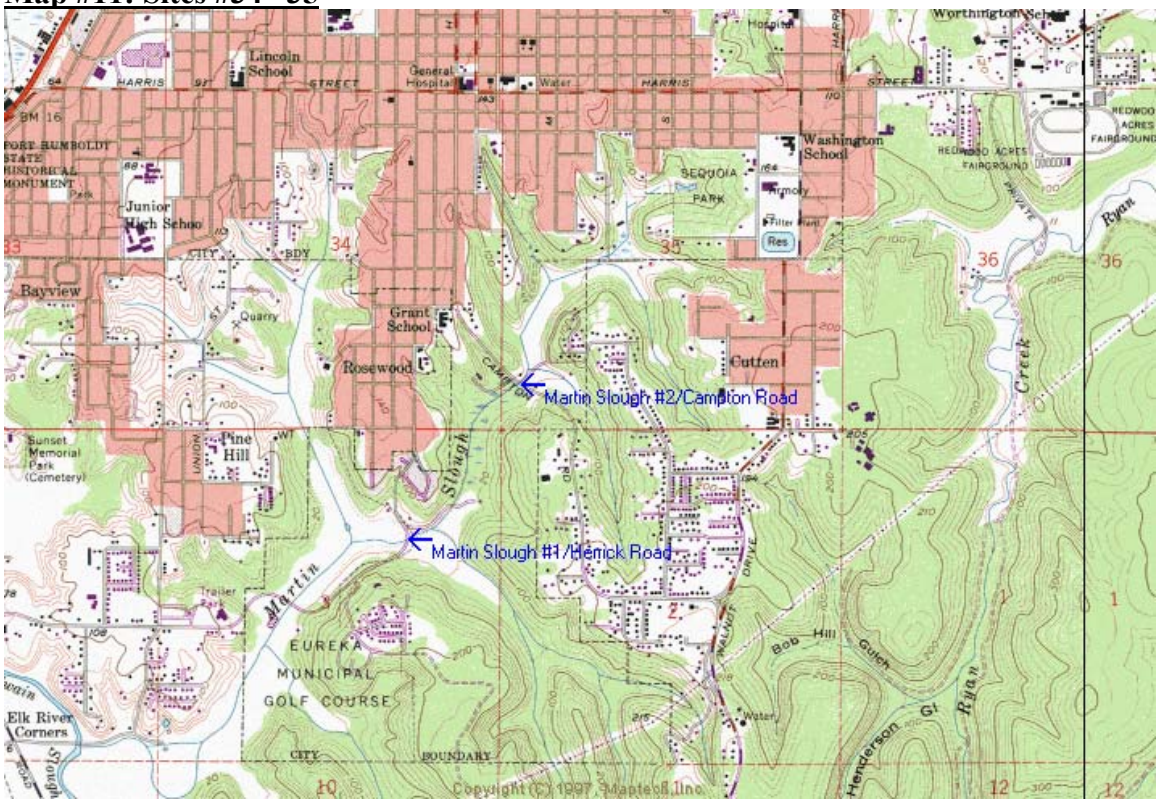
**Overall condition:** Good. **Sizing:** Poor, sized for less than a 10-year flow. Several pipes were partially filled with fine sediment.

**Barrier Status:** Passable about 40 to 60% of expected migration flows for most adults and nearly a complete barrier for all juveniles. Fish Xing determined that the inadequate sizing created a velocity barrier at a wide range of migration flows.

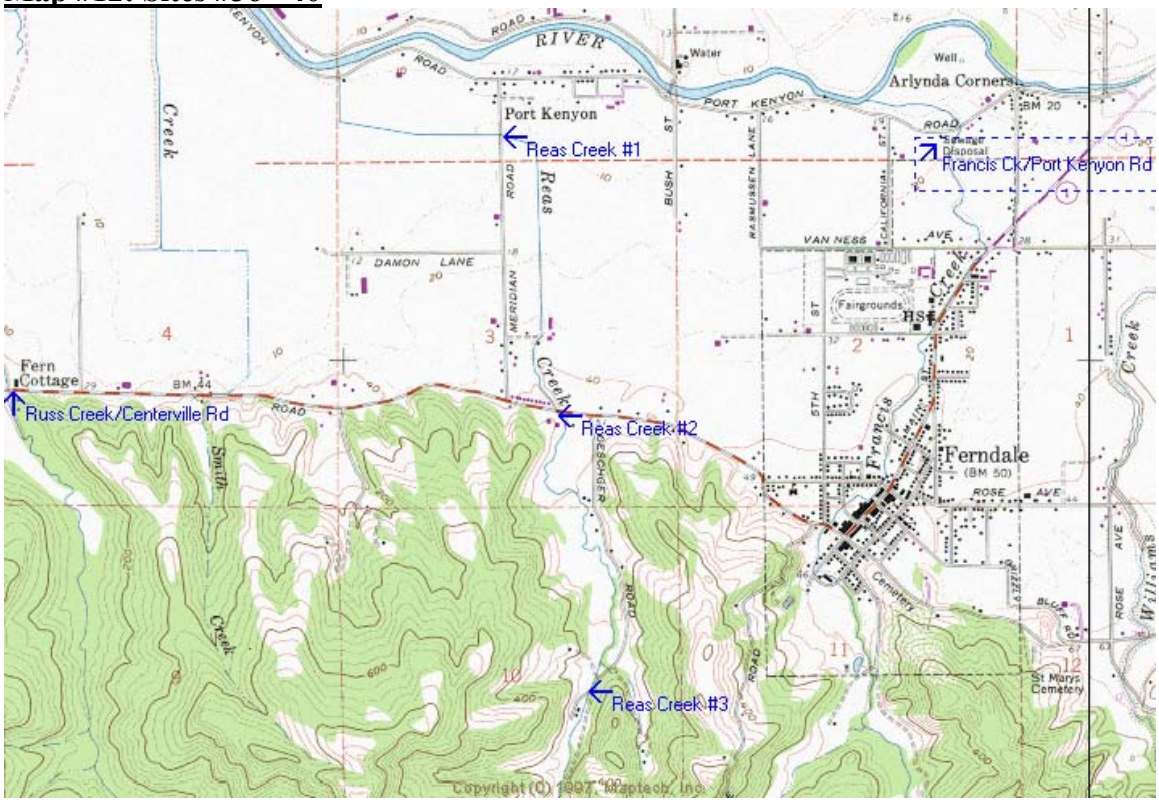
**Additional Barriers:** Downstream is Herrick Road culverts and then Highway 101 bridge over lower Martin Slough.

**Habitat Upstream:** Quantity = 13,200' of anadromy above culverts; Quality = poor, heavy siltation and lack of inchannel habitat from current and past land management activities. Huge sediment introduction from recent built residential developments.

## Map #11: Sites #34 –35




## Map #12: Sites #36 - 40



**Site #36:** Russ Creek; Centerville Road **Priority Ranking** = #62

**Location:** County Map # 1D43. T2N, R2W, Section 5

**Culvert Type:** Concrete box. **Dimensions:** 9.0' H x 12.0'W

**Length:** 33.8' **Slope:** 0.2% **Modifications:** None. **Fill Estimate:** 753 cubic yards

**Overall condition:** Good. **Sizing:** Good, sized to pass at least a 50-year storm flow.

**Barrier Status:** Passable for most adults and temporary barrier for all juveniles. Fish Xing determined that there's a lack of depth for adults at lower migration flows and a potential velocity barrier at higher migration flows for juveniles. The slightly perched outlet may be a problem for juveniles too.

**Additional Barriers:** None downstream, enters what is left of the lower Salt River. Upstream, none, however no access to private property.

**Habitat Upstream:** Quantity = approximately 18,000' of potential anadromous channel; Quality = poor, severe impacts from over a century of timber harvest, channelization, and unfenced dairy grazing.

**Site #37:** Reas Creek #1; Port Kenyon Road **Priority Ranking** = #63

**Location:** County Map # 1D33. T3N, R2W, Section 34

**Culvert Type:** Concrete box. **Dimensions:** 5.0'H x 6.0'W

**Length:** 29.2' **Slope:** -1.0% **Modifications:** None. **Fill Estimate:** 352 cubic yards

**Overall condition:** Good. **Sizing:** Poor, sized for less than a 5-year flow.

**Barrier Status:** Passable for most adults and partial barrier for all juveniles. Fish Xing determined that the inadequate sizing created a velocity barrier at a wide range of migration flows.

**Additional Barriers:** None downstream, enters what is left of the lower Salt River. Upstream, next culvert crossing is at Centerville Road which is a partial due to lack of depth at lower flows.

**Habitat Upstream:** Quantity = 20,300' of anadromous channel; Quality = poor, severe impacts from over a century of timber harvest, channelization, and unfenced dairy grazing.

**Site #38:** Reas Creek #2; Centerville Road **Priority Ranking =** #64

**Location:** County Map # 1D43. T2N, R2W, Section 3 **Culvert Type:** Concrete box

**Dimensions:** 7.0'H x 10.0'W **Length:** 77.0' **Slope:** 0.6% **Modifications:** None. **Fill Estimate:** 1,007 cubic yards

**Overall condition:** Good. **Sizing:** Good sized for close to 50-year flow.

**Barrier Status:** Passable for most adults and partial barrier for all juveniles. Fish Xing determined that perched concrete floor created a lack of depth at lower flows and possibly a velocity barrier at a range of migration flows.

**Additional Barriers:** Yes, downstream 2,400' is the undersized Port Kenyon Road box culvert. Upstream 5,600' is CSP at Descheger Road.

**Habitat Upstream:** Quantity = 17,900 of anadromous channel; Quality = poor, severe impacts from over a century of timber harvest, channelization, and unfenced dairy grazing.

**Site #39:** Reas Creek #3; Deschger Road **Priority Ranking =** #51

**Location:** County Map # 1D43. T2N, R2W, Section 10

**Culvert Type:** CSP. **Dimensions:** 4.0' diameter.

**Length:** 30.4' **Slope:** 3.0% **Modifications:** None. **Fill Estimate:** 286 cubic yards

**Overall condition:** Poor, starting to rust, slightly crushed, possibly during installation.

**Sizing:** Poor, should pass less than a 10-year flow.

**Barrier Status:** Passable for most adults and nearly a complete barrier for coastal cutthroat trout and all juveniles. Fish Xing determined that 3% slope of culvert created a velocity barrier at a wide range of migration flows.

**Additional Barriers:** Yes, downstream 2,400' is the perched concrete box culvert at Centerville Road and the undersized Port Kenyon Road box culvert. Upstream, none.

**Habitat Upstream:** Quantity = 12,300' of potential anadromous channel; Quality = poor, severe impacts from over a century of timber harvest, channelization, and unfenced dairy grazing.

NOTE: No photos available

**Site #40:** Francis Creek; Port Kenyon Road **Priority Ranking =** #65

**Location:** County Map # 1D33. T3N, R2W, Section 35

**Culvert Type:** Concrete box. **Dimensions:** 7.0'H x 10.0'W. **Length:** 30.0'

**Slope:** Not measured, (<1%) **Modifications:** None. **Fill Estimate:** Not estimated, probably <500 cubic yards.

**Overall condition:** Fair, top of foundation has taken a beating on high flows.

**Sizing:** culvert dimensions are adequate. However, due to extreme amount of sediment in culvert this culvert overflows. Note water level in photo taken in October prior to winter rains.

**Barrier Status:** Not evaluated by Fish Xing because of sediment in culvert. Probably a velocity barrier at higher flows.

**Additional Barriers:** None downstream flows into remnant Salt River channel. Upstream, yes flows through concrete ditch and numerous culverts through downtown Ferndale. Not known what barriers exist upstream of downtown Ferndale (no access to private property.

**Habitat Upstream:** Quantity = approximately 22,000' of potential anadromous channel. Quality = Extremely poor, severe impacts from over a century of timber harvest, urban and residential development, channelization, and unfenced dairy grazing. Probably the poorest habitat encountered during the inventory.

**Site #41:** Barber Creek #1; Grizzly Bluff Road **Priority Ranking =** #56

**Location:** County Map # 1D44. T2N, R1W, Section 22

**Culvert Type:** Concrete box with concrete sill at inlet with 6'-7' drop onto culvert floor.

**Dimensions:** 7'H x 10'W. **Length:** 55.0' **Slope:** Not measured, (2-4%) **Modifications:** None.

**Fill Estimate:** Not estimated, probably 1,000-1,500 cubic yards.

**Overall condition:** Good. **Sizing:** N/A, appears adequately sized.

**Barrier Status:** Not evaluated by Fish Xing. Very high jump to negotiate sill at inlet. Lack of depth and possible velocity barriers may occur within culvert (flat concrete floor).

**Additional Barriers:** Possible downstream - flow drops down steep riprapped section into mainstem Eel River. Upstream, yes flows through culvert on Price Creek School Road.

**Habitat Upstream:** Quantity = approximately 14,700' of potential anadromous habitat. Quality = poor, severe impacts from over a century of timber harvest, channelization, and unfenced dairy grazing.

**Site #42:** Barber Creek #2; Price Creek School Road **Priority Ranking =** #57

**Location:** County Map # 1D44. T2N, R1W, Section 22 **Culvert Type:** SSP pipe arch.

**Dimensions:** 5.0'H x 6.5'W. **Length:** 30' **Slope:** 1.3% **Modifications:** None. **Fill Estimate:** 534 cubic yards.

**Overall condition:** Poor, rusting, crushed, lots of woody debris caught in riparian trees at culvert outlet.

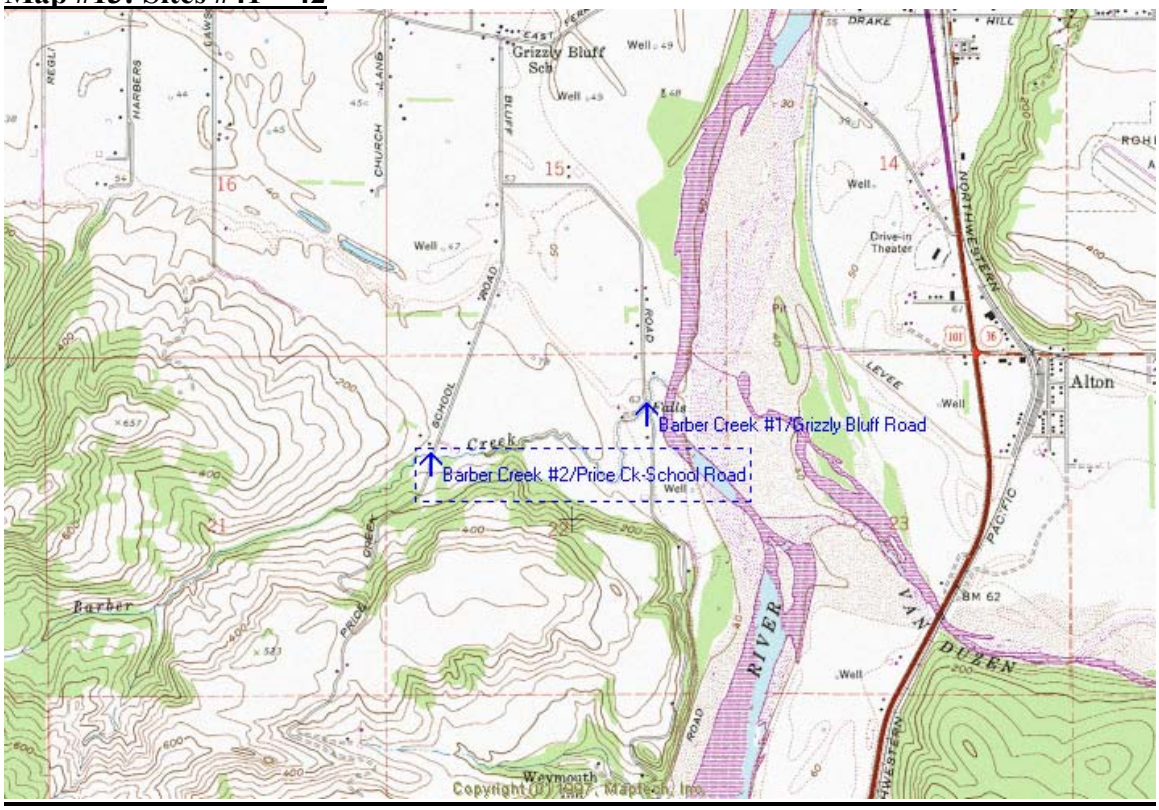
**Sizing:** Poor, sized to handle less than a 10-year flow.

**Barrier Status:** Not a barrier for adults, nearly a complete barrier for juveniles due to excessive velocities over a wide range of migration flows.

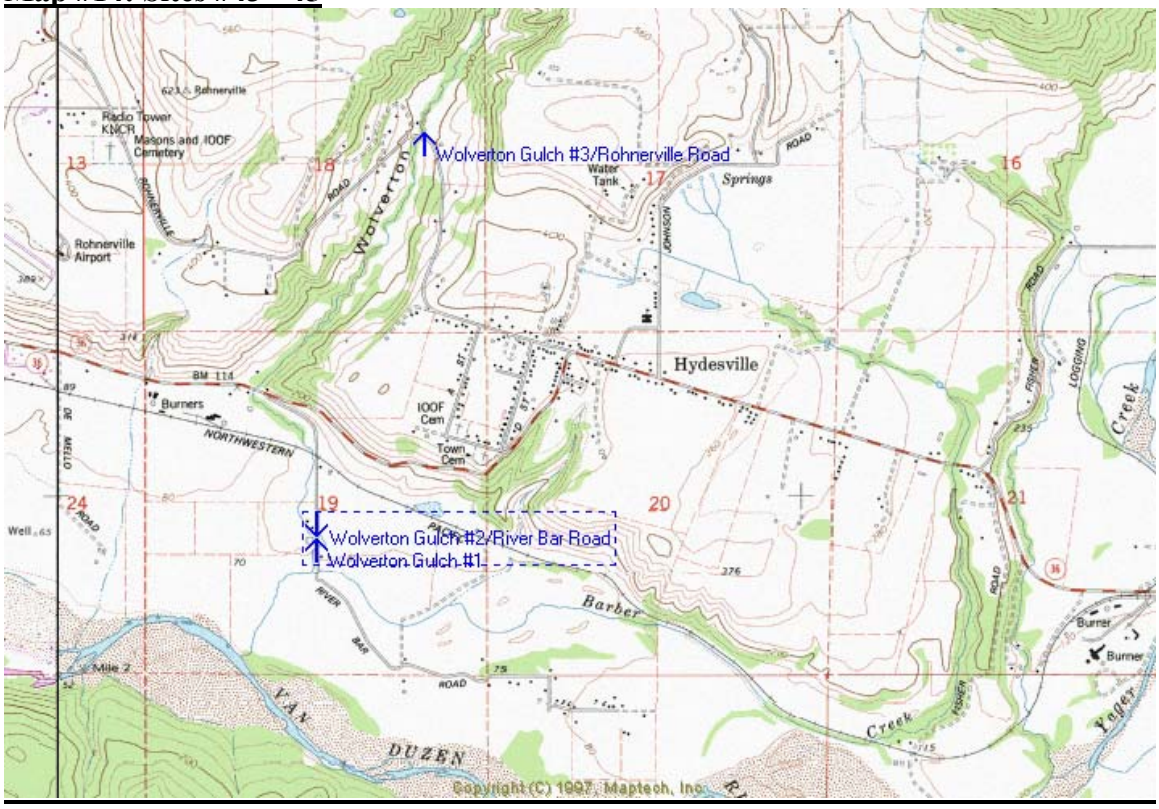
**Additional Barriers:** Yes, downstream - flows through culvert on Grizzly Bluff Road, too high of jump at inlet sill. Upstream, unknown, no access to private property.

**Habitat Upstream:** Quantity = 9,700' of potential anadromous channel above culvert. Quality = No records on file at CDFG. Appears poor - warm, muddy flow, highly silted in substrate, collapsing banks, minimal pool development. Result of severe impacts from over a century of timber harvest, channelization, and unfenced dairy grazing.

## Map #13: Sites #41 – 42




## Map #14: Sites #43 - 45



**Site #43:** Wolverton Gulch #1; River Bar Road **Priority Ranking =** #48

**Location:** County Map # 1D44. T2N, R1E, Section 19

**Culvert Type:** SSP pipe. **Dimensions:** 6.5' **Length:** 30' **Slope:** <1%

**Modifications:** None. **Fill Estimate:** 194 cubic yards.

**Overall condition:** Poor, rusting, an slightly crushed. **Sizing:** Not calculated, but appears to be undersized for a culvert so low in the watershed.

**Barrier Status:** Swim-through, probably not a barrier for adults, probably a barrier for juveniles due to excessive velocities at a range of migration flows.

**Additional Barriers:** None downstream Upstream, next culvert on River Bar Road about 200' upstream, may be a velocity barrier to juveniles at some migration flows.

**Habitat Upstream:** Quantity = at least 20,000' of potential anadromous channel above culvert. Quality = poor, severe impacts from over a century of timber harvest, channelization, and unfenced dairy grazing. Habitat conditions start to improve above Highway 36 and appear even better above the Rohnerville Road culvert, finally upstream of unfenced grazing and severe channelization.

**Photo:** No photographs were taken. This site is similar to Wolverton Gulch #2, also located on River Bar Road.

**Site #44:** Wolverton Gulch #2; River Bar Road **Priority Ranking =** #49

**Location:** County Map # 1D44. T2N, R1E, Section 19

**Culvert Type:** SSP pipe. **Dimensions:** 6.5' **Length:** 30' **Slope:** <1%

**Modifications:** None. **Fill Estimate:** 278 cubic yards.

**Overall condition:** Poor, rusting, an slightly crushed, large debris jam at outlet due to riparian trees leaning across stream channel.

**Sizing:** Not calculated, but appears to be undersized for a culvert so low in the watershed. Recent evidence of flow backing up and flooding River Bar Road.

**Barrier Status:** Swim-through, probably not a barrier for adults, a temporary barrier for juveniles due to excessive velocities at the upper range of migration flows.

**Additional Barriers:** Partial, downstream is River Bar Road #1. Upstream, next culvert is on Rohnerville Road about 6,000' upstream, may be a velocity barrier to juveniles at some migration flows. NOTE: debris jam at outlet should be cleared by County Road Maintenance crews.

**Habitat Upstream:** Quantity = at least 20,000' of potential anadromous channel above culvert. Quality = poor, severe impacts from over a century of timber harvest, channelization, and unfenced dairy grazing. Habitat appears better above the Rohnerville Road culvert, finally upstream of unfenced grazing.

**Site #45:** Wolverton Gulch #3; Rohnerville Road **Priority Ranking =** #67

**Location:** County Map # 1D44. T2N, R1E, Section 18

**Culvert Type:** Concrete box. **Dimensions:** 7.0'H x 8.0'W **Length:** 73' **Slope:** 0.3%

**Modifications:** None. **Fill Estimate:** 31,235 cubic yards.

**Overall condition:** Good, relatively new crossing. **Sizing:** Not calculated, but appears properly sized for its location in the watershed (larger than the two county culverts located over a mile downstream).

**Barrier Status:** Swim-through with natural channel bottom, not a barrier for adults. Fish Xing indicated it is probably a temporary barrier for juveniles due to excessive velocities at upper range of migration flows.

**Additional Barriers:** Downstream, both River Bar Road culverts are probably velocity barriers to juveniles. Upstream, unknown, no access to private property.

**Habitat Upstream:** Quantity = about 14,000' of potential anadromous channel above culvert. Quality = fair, severe impacts from over a century of timber harvest. Habitat appears better above the Rohnerville Road culvert, finally upstream of unfenced grazing. However, lots of fine sediment aggraded in channel.

**Site #46:** Jewett Creek; Jewett Road **Priority Ranking =** #55

**Location:** County Map #2E . T4S, R2E, Section 28

**Culvert Type:** SSP (two pipes). **Dimensions:** 5.6' and 4.4' diameters **Length:** 26' **Slope:** 0.6%

**Modifications:** Riprapped jump pool, still extremely perched outlet. **Fill Estimate:** N/A, but about 500 cubic yards.

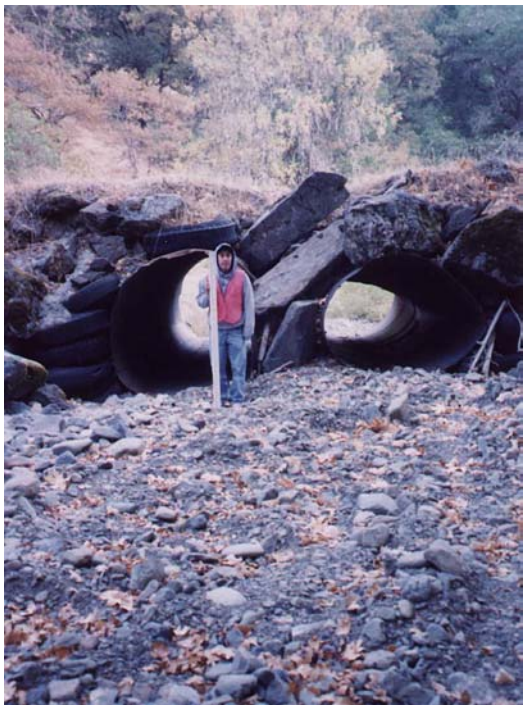
**Overall condition:** Poor, pipes are crushed and heavily rusted.

**Sizing:** Not calculated, but appears properly sized for its location in the watershed.

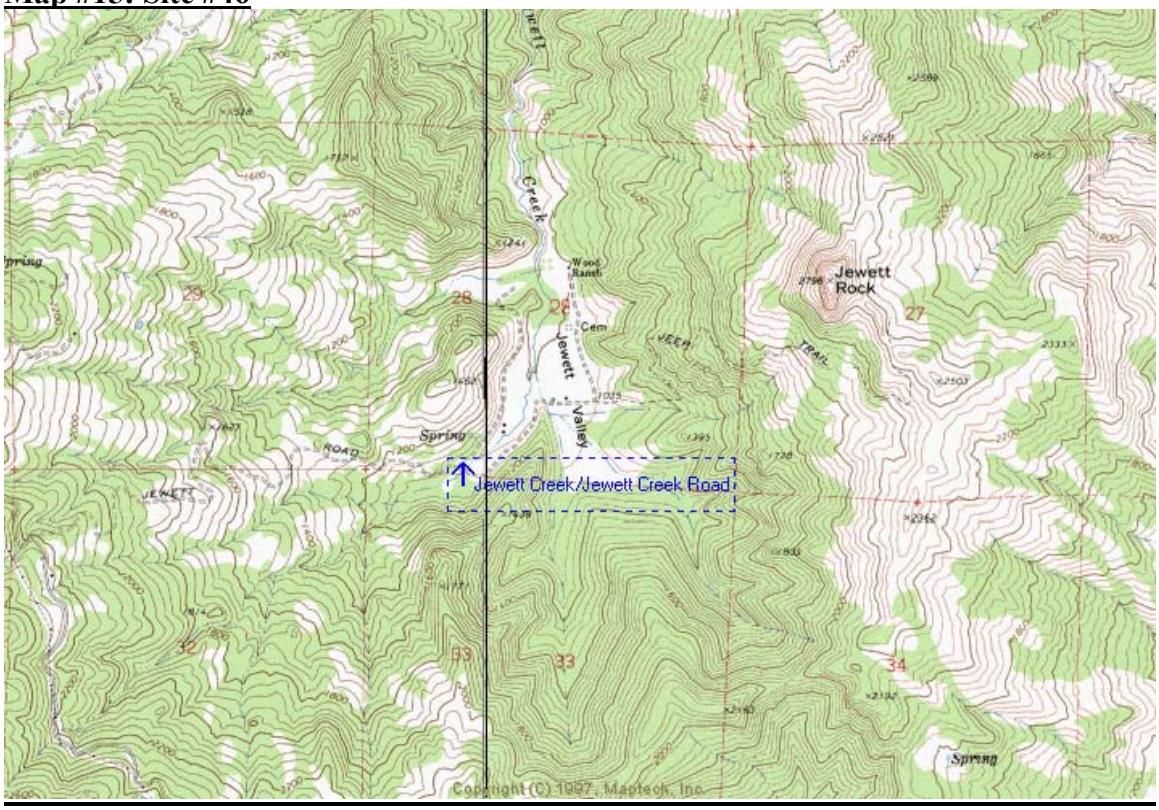
**Barrier Status:** Not analyzed by Fish Xing, but appears to be a jump barrier at most flows for adult steelhead and a total barrier for juveniles.

**Additional Barriers:** Downstream, natural falls/debris jam in channel about a mile below Jewett Road appears to be a partial barrier, with adult steelhead above this barrier in some years. Upstream, none.

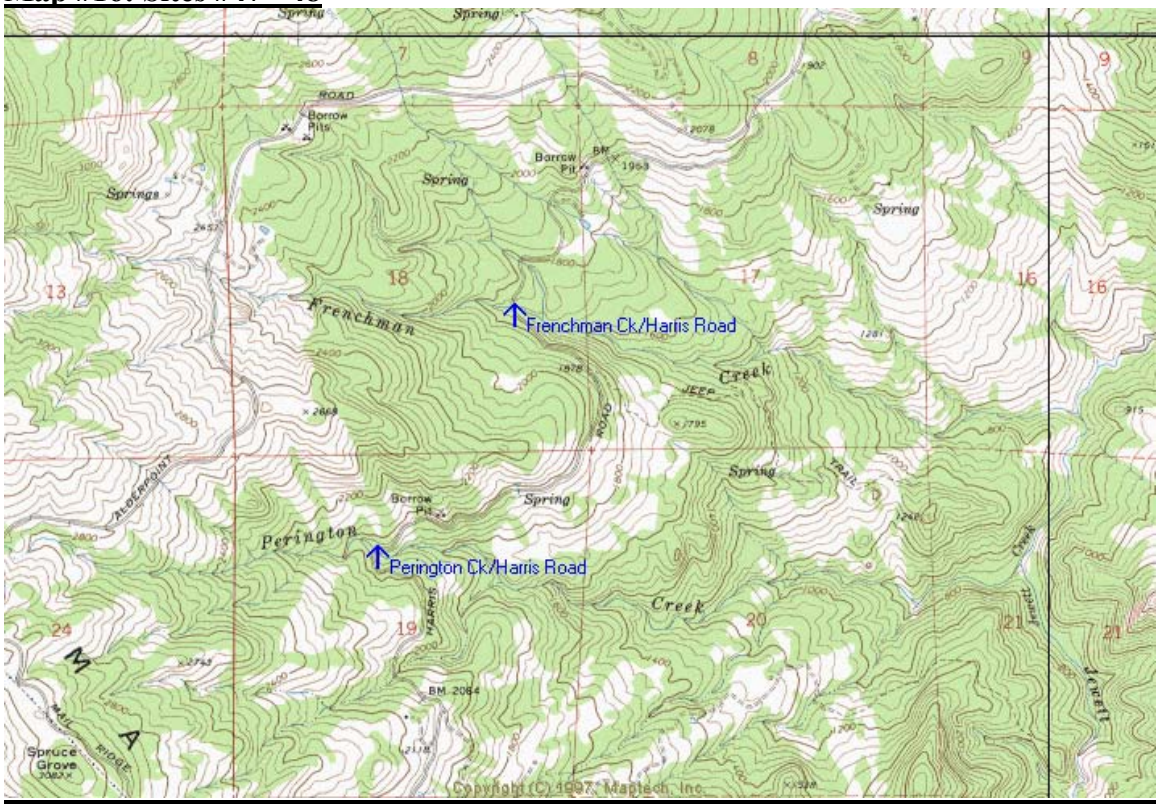
**Habitat Upstream:** Quantity = about 1500' of potential anadromous channel above culvert. Quality = poor, impacts from timber harvest and unfenced grazing. Sparse riparian zone along a wide, aggraded stream channel. Stream was dry in fall prior to winter rain. Landowner is in process of installing cattle exclusion fencing.



## Map #15: Site #46




## Map #16: Sites #47 - 48



**Site #47:** Frenchman Creek; Harris Road **Priority Ranking** = #42

**Location:** County Map #2E . T4S, R2E, Section 18

**Culvert Type:** Concrete box. **Dimensions:** 10' x 10' **Length:** 58' **Slope:** 0.2%

**Modifications:** None. **Fill Estimate:** N/A, but about 1,500 cubic yards.

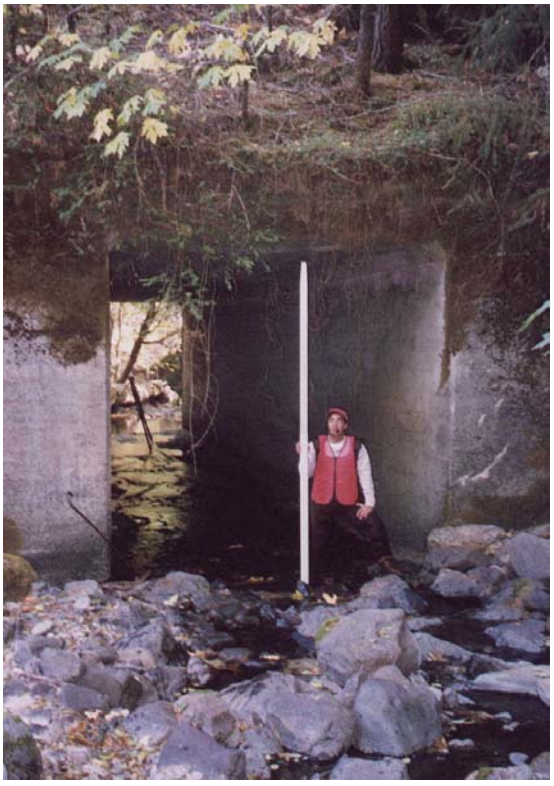
**Overall condition:** Fair, floor worn down to rebar. Irregularities in concrete floor probably improve passage conditions for salmonids.

**Sizing:** Not calculated, but appears properly sized for its location in the watershed.

**Barrier Status:** Not analyzed by Fish Xing, but appears not be a barrier at most flows for adult steelhead and a partial barrier for juveniles (jump). Adults may have problems with lack of depth at lower migration flows.

**Additional Barriers:** Downstream, natural falls/debris jam in channel about a mile below Jewett Road appears to be a partial barrier, with adult steelhead above this barrier in some years. Upstream, none.

**Habitat Upstream:** Quantity = about 1000' of potential anadromous channel above culvert. Quality = Good, ample flow of cool water in late August, dense riparian zone of second-growth conifer and hardwoods. Boulder dominant channel, with numerous deep pools and minimal amounts of fine sediment.



**Site #48:** Perington Creek; Harris Road **Priority Ranking =** #66

**Location:** County Map #2E . T4S, R2E, Section 19

**Culvert Type:** SSP. **Dimensions:** 6.0' diameter **Length:** 60' **Slope:** 10.4%

**Modifications:** None. **Fill Estimate:** N/A, but about 500 cubic yards.

**Overall condition:** Fair, pipe is slightly crushed and starting to rust.

**Sizing:** Not calculated, but appears properly sized for its location in the watershed.

**Barrier Status:** Not analyzed by Fish Xing, but outlet is perched nearly 9' above stream channel.

**Additional Barriers:** Downstream, natural falls/debris jam in channel about a mile below Jewett Road appears to be a partial barrier, with adult steelhead above this barrier in some years. Upstream, none.

**Habitat Upstream:** Quantity = about 700' of potential fish-bearing channel above culvert. However, it is questionable if this reach of Perington Creek is within limit of anadromy (channel is steep and incised). Quality = poor, impacts from timber harvest and unfenced grazing. Sparse riparian zone along a heavily aggraded stream channel. Stream was dry in fall prior to winter rain.

**Site #49:** Tributary to McNutt Gulch #1; Mattole Road **Priority Ranking** = #23

**Location:** County Map # 1E. T1S; R2W, Section 31

**Culvert Type:** SSP pipe. **Dimensions:** 13.0' **Length:** 152' **Slope:** 3.0% **Modifications:** None.

**Fill Estimate:** 20,004 cubic yards.

**Overall condition:** Fair, some rusting of floor, low flow does not reach the outlet.

**Sizing:** Good, should pass greater than a 50-year flow.

**Barrier Status:** Yes, excessive slope and length combine to create a velocity barrier. Lack of depth and leakage create low flow problems for both upstream and/or downstream migration. Jump into culvert outlet is a problem for juveniles.

**Additional Barriers:** None downstream, enters mainstem McNutt Gulch within several hundred feet. Upstream, debris jam creates falls just below next culvert on Mattole Road about 3,000' upstream, a velocity barrier to adults and juveniles at most migration flows.

**Habitat Upstream:** Quantity = approximately 3,000' of potential anadromous channel until next culvert. Quality = fair, impacts from over a century of timber harvest and unfenced grazing. Dense canopy of mostly hardwoods along channel. Cool water temperature at end of summer flows. Appears highly aggraded with lots of fines. Low volume of inchannel LWD, especially conifers.

**Site #50:** Tributary to McNutt Gulch #2; Mattole Road **Priority Ranking** = #34

**Location:** County Map # 1E. T1S; R2W, Section ??

**Culvert Type:** SSP pipe. **Dimensions:** 11.0' **Length:** 155.0'

**Slope:** Overall, 5.6% - but large break-in-slope (upper 40-50' is steepest). **Modifications:** None.

**Fill Estimate:** 30,181 cubic yards.

**Overall condition:** Poor, some rusting through of floor along upper section, after break-in-slope culvert is backwatered. The entire pipe appears bent and collapsing as entire hillslope appears to be moving (or shifted during a past event – flood or earthquake).

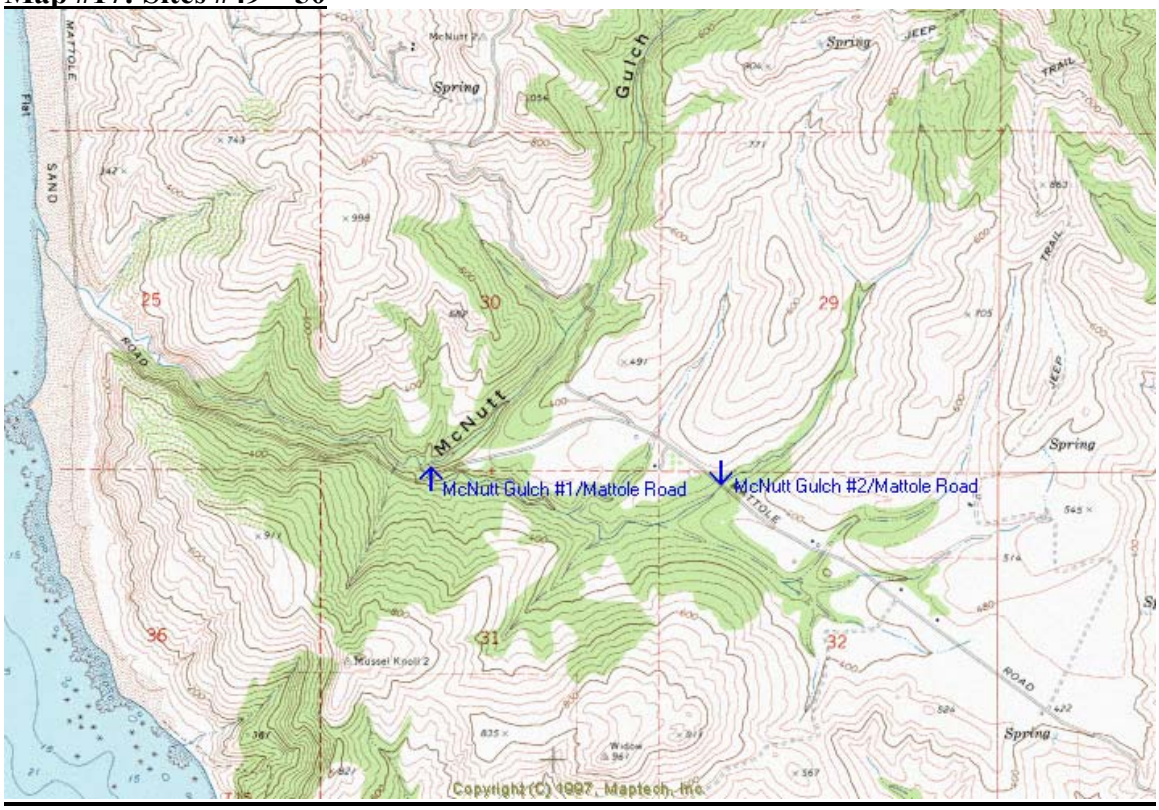
**Sizing:** Good, can handle greater than a 50-year flow.

**Barrier Status:** Yes, excessive slope and length combine to create a velocity barrier. A steep break-in-slope over upper 30' of culvert. Approach to culvert outlet is a problem because of steep drop created by sections of concrete, rebar, and woody debris – remains of older box culvert or bridge?

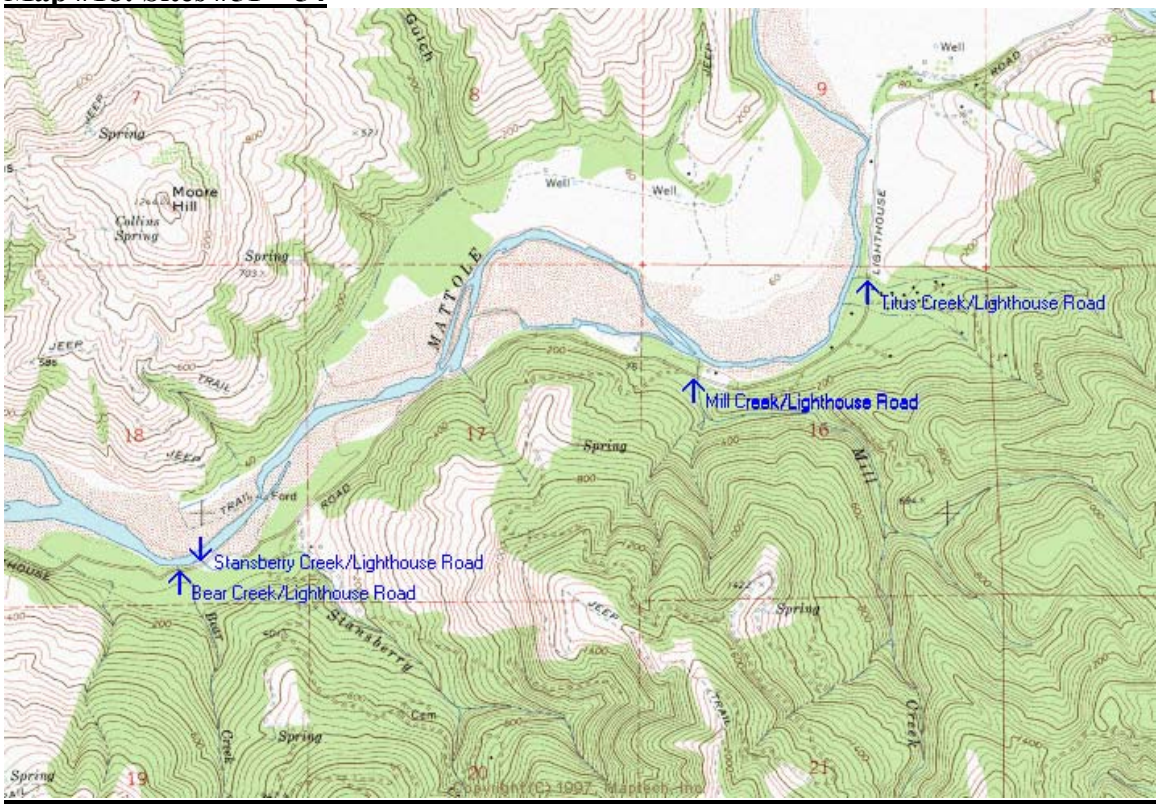
**Additional Barriers:** Yes, immediately downstream is steep drop just described, then approximately 3,000' is McNutt Gulch #1. Upstream, none.

**Habitat Upstream:** Quantity = approximately 9,400' of potential fish-bearing habitat. Quality = fair, severe impacts from over a century of timber harvest, channelization, and unfenced dairy grazing. Cool water temperature at end of summer flows. Appears highly aggraded with lots of fines. Low volume of inchannel LWD, especially conifers.

## Map #17: Sites #49 – 50




## Map #18: Sites #51 – 54



**Site #51:** Bear Creek; Lighthouse Road **Priority Ranking =** #15

**Location:** County Map # 1E. T2S; R2W, Section 19

**Culvert Type:** CSP pipe (2). **Dimensions:** Each 3.0' **Length:** 30.0' **Slope:** Not measured.

**Modifications:** None. **Fill Estimate:** Not calculated, but probably < 150 cubic yards.

**Overall condition:** Extremely poor, the one exposed pipe is rusted and crushed. Second pipe is buried and possibly crushed – not passing any flow.

**Sizing:** Extremely poor, floods road on a regular basis.

**Barrier Status:** Yes, excessive undersizing probably creates a velocity barrier.

**Additional Barriers:** None, except aggraded flood terrace of mainstem Mattole River. Upstream, none.

**Habitat Upstream:** Quantity = 0.3 miles. Quality = HOBO temperature data indicates cool water during summer months.

**Site #52:** Stansberry Creek; Lighthouse Road **Priority Ranking =** #5

**Location:** County Map # 1E. T2S; R2W, Section 18

**Culvert Type:** CSP pipe. **Dimensions:** 5.0' diameter **Length:** 40.0' **Slope:** 4.5%.

**Modifications:** Riprapped approach pools constructed in 1994 below outlet, destroyed in 1997 flood.

**Fill Estimate:** 316 cubic yards. **Overall condition:** Poor, pipe is rusted.

**Sizing:** Poor, unable to pass a 10-year flow.

**Barrier Status:** Yes, excessive jump required to enter culvert, lack of depth to execute a jump, steep gradient and excessive undersizing creates a velocity barrier.

**Additional Barriers:** Downstream none, less than 50 feet of channel to mainstem Mattole River. Upstream, none.

**Habitat Upstream:** Quantity = 3,600'. Quality = HOBO temperature data indicates cool water during summer months. However, lower channel is confined within a levee. Relative lack of inchannel woody debris.

**Site #53:** Mill Creek; Lighthouse Road **Priority Ranking =** #20

**Location:** County Map # 1E. T2S; R2W, Section 16

**Culvert Type:** SSP pipe. **Dimensions:** 12.5' **Length:** 68.5.0' **Slope:** 4.3%.

**Modifications:** Riprapped approach pools constructed below outlet. WA-style steel ramp baffles along culvert floor.

**Fill Estimate:** 316 cubic yards. **Overall condition:** Good. **Sizing:** Good, able to pass a 50-year flow.

**Barrier Status:** Adults temporary barrier, excessive velocities at higher migration flows. Juveniles yes, excessive jump required to enter culvert and velocities even with baffles appears excessive.

**Additional Barriers:** Downstream none, less than 150 feet of channel to mainstem Mattole River. Upstream, none.

**Habitat Upstream:** Quantity = 1.35 miles. Quality = Good, HOBO temperature data indicates cool water during summer months. The best tributary habitat remaining in the lower Mattole River. May provide coolwater refugia during summer. Past records confirm use by spawning coho and steelhead.

**Site #54:** Titus Creek; Lighthouse Road **Priority Ranking =** #46

**Location:** County Map # 1E. T2S; R2W, Section 9 **Culvert Type:** Concrete pipe. **Dimensions:** 4.0' diameter

**Length:** 96.0' **Slope:** 7.0%. **Modifications:** None **Fill Estimate:** 2,467 cubic yards.

**Overall condition:** Poor, floor is worn through. **Sizing:** Poor, unable to pass a 10-year flow.

**Barrier Status:** Yes, steep gradient, length and excessive undersizing creates a velocity barrier.

**Additional Barriers:** Downstream none, less than 200 feet of channel to mainstem Mattole River. Upstream, unknown no access to private property.

**Habitat Upstream:** Quantity = 2,000' of potential anadromous habitat. Quality = Assessed as "poor", however little is known due to lack of access. During summer, water is withdrawn for domestic use that results in nearly a dry channel.

**Site #55:** East Mill Creek #1; Conklin Creek Road **Priority Ranking =** #17

**Location:** County Map # 1E-1. T2S; R2W, Section 10

**Culvert Type:** SSP pipe. **Dimensions:** 10.3' diameter **Length:** 63.4' **Slope:** 4.6%.

**Modifications:** stepped profile created by railroad rails anchored perpendicular to direction of flow.

**Fill Estimate:** 1,789 cubic yards. **Overall condition:** Poor, floor is rusting, projecting inlet is crushed and folded.

**Sizing:** Poor, unable to pass a 10-year flow.

**Barrier Status:** Yes, steep gradient, excessive undersizing creates a temporary velocity barrier for adults (probably a total barrier to juveniles). The railroad rails probably contribute to passage problems – rails break-up slope in steps, yet there is no depth for fish to leap out of when ascending. Woody debris pinned across the also creates a velocity increase right at inlet (turbulence too).

**Additional Barriers:** Downstream none, less than 150 feet of channel to mainstem Mattole River. Upstream, no, culvert at Chambers Road is a swim-through.

**Habitat Upstream:** Quantity = approximately 14,000' of potential anadromous habitat. Quality = Fair, lower reaches appear highly aggraded with minimal amounts of inchannel LWD. Cool summer water temperatures and numerous juvenile steelhead observed during initial site visit.

**Site #56:** East Mill Creek #2; Chambers Road **Priority Ranking =** #36

**Location:** County Map # 1E-1. T2S; R2W, Section 3

**Culvert Type:** SSP pipe. **Dimensions:** 8.5' diameter **Length:** 54' **Slope:** 1.6%.

**Modifications:** None **Fill Estimate:** 1,361 cubic yards.

**Overall condition:** Fair, projecting inlet is crushed and folded.

**Sizing:** Moderately undersized, should to pass about a 25-year flow.

**Barrier Status:** No, culvert is set below grade with natural channel bottom. Even at low flow there was a backwatering of downstream end of culvert.

**Additional Barriers:** Downstream yes, less than 0.3 miles to Conklin Creek Road culvert. Upstream, unknown, no access to private property.

**Habitat Upstream:** Quantity = approximately 10,500' of potential anadromous habitat. Quality = Fair, stream reach above culvert appears highly aggraded with minimal amounts of inchannel LWD. Cool water and numerous juveniles observed during initial site visit prior to winter rains.

**Site #57:** Clear Creek; Mattole Road **Priority Ranking** = #7

**Location:** County Map # 1E-1. T2S; R2W, Section 11 **Culvert Type:** SSP pipe. **Dimensions:** 9.0' diameter

**Length:** 88.2' **Slope:** 8.7%. **Modifications:** Parallel steel tracks down length of culvert floor (to protect bottom from wear and transport bedload?)

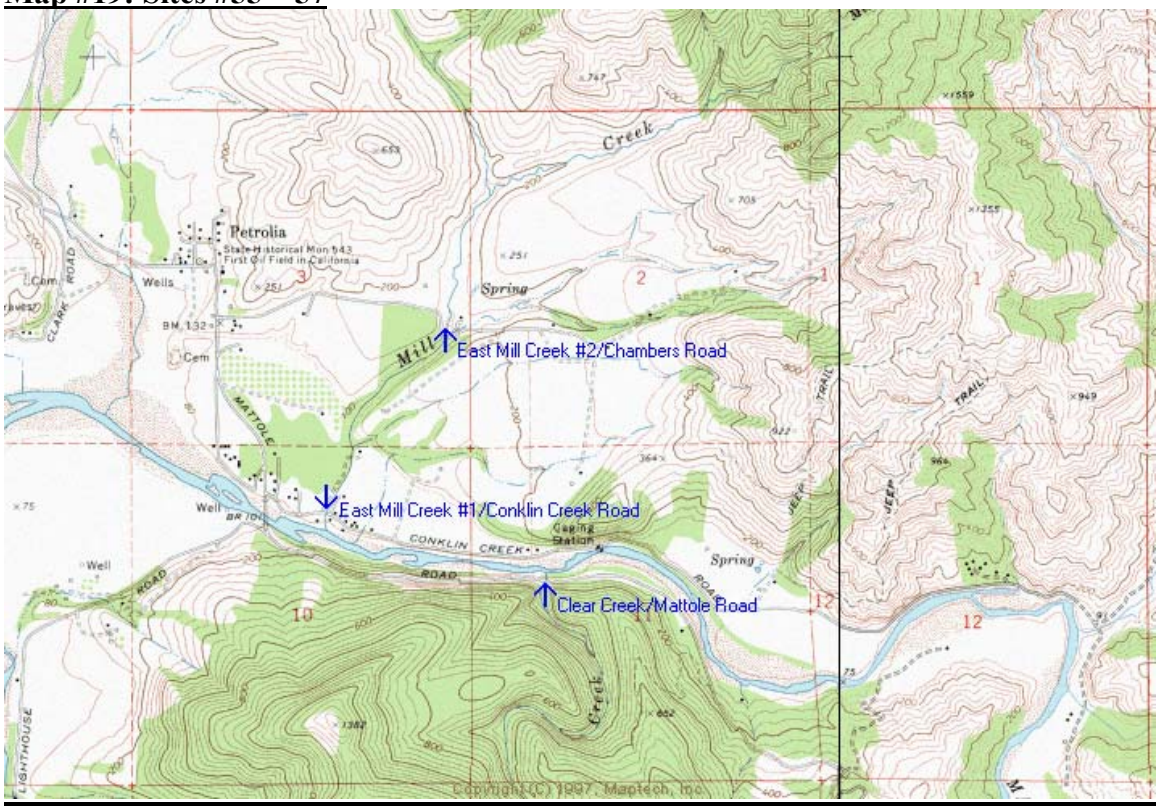
**Fill Estimate:** 5,308 cubic yards. **Overall condition:** Good. **Sizing:** Good, should pass at least a 50-year flow.

**Barrier Status:** Yes, extremely steep gradient creates a total velocity barrier. The parallel steel tracks probably contribute to passage problems by increasing velocities, they have minimal roughness and would also interfere with a fishes swimming motion.

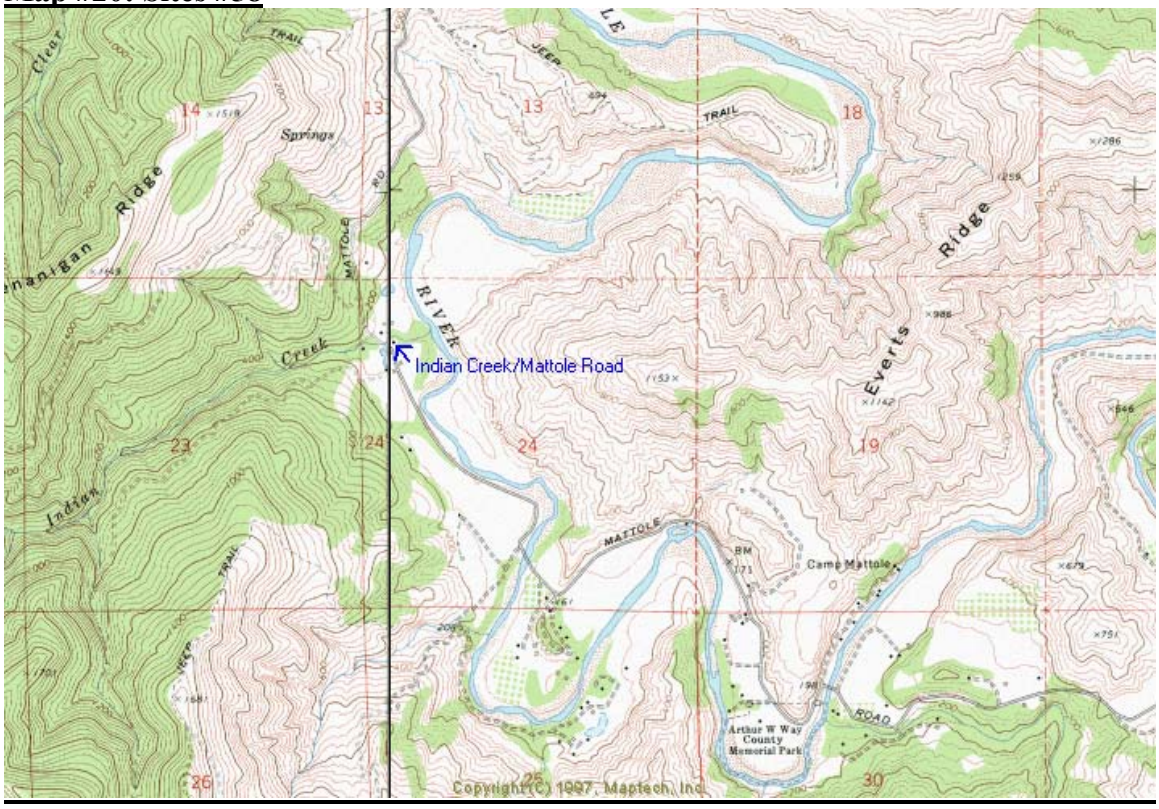
**Additional Barriers:** Downstream none, less than 150 feet of channel to mainstem Mattole River. Upstream, none until natural falls about 0.7 miles.

**Habitat Upstream:** Quantity = 0.7 miles. Quality = Good, some of the best coolwater refugia in lower Mattole River. Steep, boulder-dominant channel, dense riparian zone, good flow in late summer. CDFG surveys last observed coho and steelhead above culvert in 1983.

## Map #19: Sites #55 – 57




## Map #20: Sites #58



**Site #58:** Indian Creek; Mattole Road **Priority Ranking =** #13

**Location:** County Map # 1E. T2S; R2W, Section 24 **Culvert Type:** Concrete box.

**Dimensions:** 9.5'H x 10.0'W **Length:** 48.3' **Slope:** 2.1%. **Modifications:** None **Fill Estimate:** 2,271 cubic yards.

**Overall condition:** Good. **Sizing:** Good, should pass greater than a 100-year flow.

**Barrier Status:** Partial for adults, nearly complete for juveniles. Too shallow at low flows, excessive velocities at higher flows. Direct observation of juveniles suggest entry jump as well as flow velocities were problems. Kingfishers observed at outlet pool when juvenile steelhead were jumping.

**Additional Barriers:** Downstream none, less than 300 feet of channel to mainstem Mattole River. Upstream, none.

**Habitat Upstream:** Quantity = 1.2 miles. Quality = Good, has potential coolwater refugia. Moderately-steep, boulder/cobble-dominant channel, dense riparian zone, good flow in late summer.

**Site #59:** Granny Creek; Mattole Road **Priority Ranking =** #54

**Location:** County Map # 1E. T2S; R2W, Section 32 **Culvert Type:** SSP pipe.

**Dimensions:** 10.0' diameter **Length:** 160.0' **Slope:** 2.6%. **Modifications:** None

**Fill Estimate:** 21,568 cubic yards. **Overall condition:** Poor, floor rusting and eroding away (see lower left photo).

**Sizing:** Good, should pass greater than a 100-year storm flow.

**Barrier Status:** Partial/temporary for adult steelhead (only 20% passable), complete for adult coho and all juveniles. Too shallow at low flows, excessive velocities at higher flows. Both excessive slope and long length of culvert cause passage problems.

**Additional Barriers:** Downstream none, less than 300 feet of channel to mainstem Mattole River. Upstream, unknown, no access to private property.

**Habitat Upstream:** Quantity = 3,900' of potential anadromous channel. Quality = Poor, channel nearly dry in summer, remaining pools shallow and warm, impacts of unfenced grazing apparent in riparian zone and within stream channel.

**Site #60:** Saunders Creek; Mattole Road **Priority Ranking =** #16

**Location:** County Map # 1E. T2S; R2W, Section 33 **Culvert Type:** Concrete arch with flat bottom.

**Dimensions:** 9.3'H x 8.0'W **Length:** 100.0' **Slope:** 3.1%. **Modifications:** None **Fill Estimate:** 14,207 cubic yards.

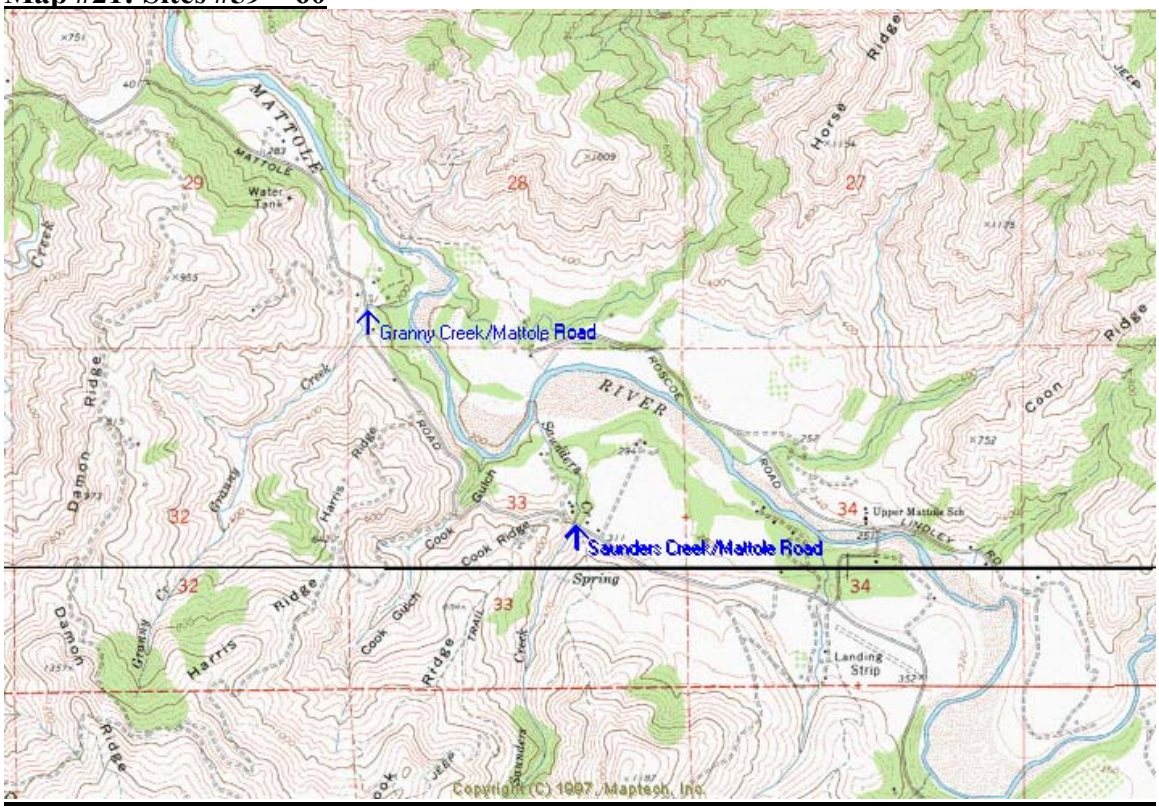
**Overall condition:** Poor, concrete floor cracked and eroding. **Sizing:** Good, should pass greater than a 50-year flow. Above inlet is plaque with the date 1939 – has passed many storm flows.

**Barrier Status:** Partial for adult steelhead (only 24% passable), complete for adult coho and all juveniles. Too shallow at low flows, excessive velocities at higher flows. Both excessive slope and smooth floor cause passage problems. Juveniles were observed failing to swim even several feet up culvert due to velocity. Measured velocities of 10-12 feet per second during a low-moderate winter migration flow.

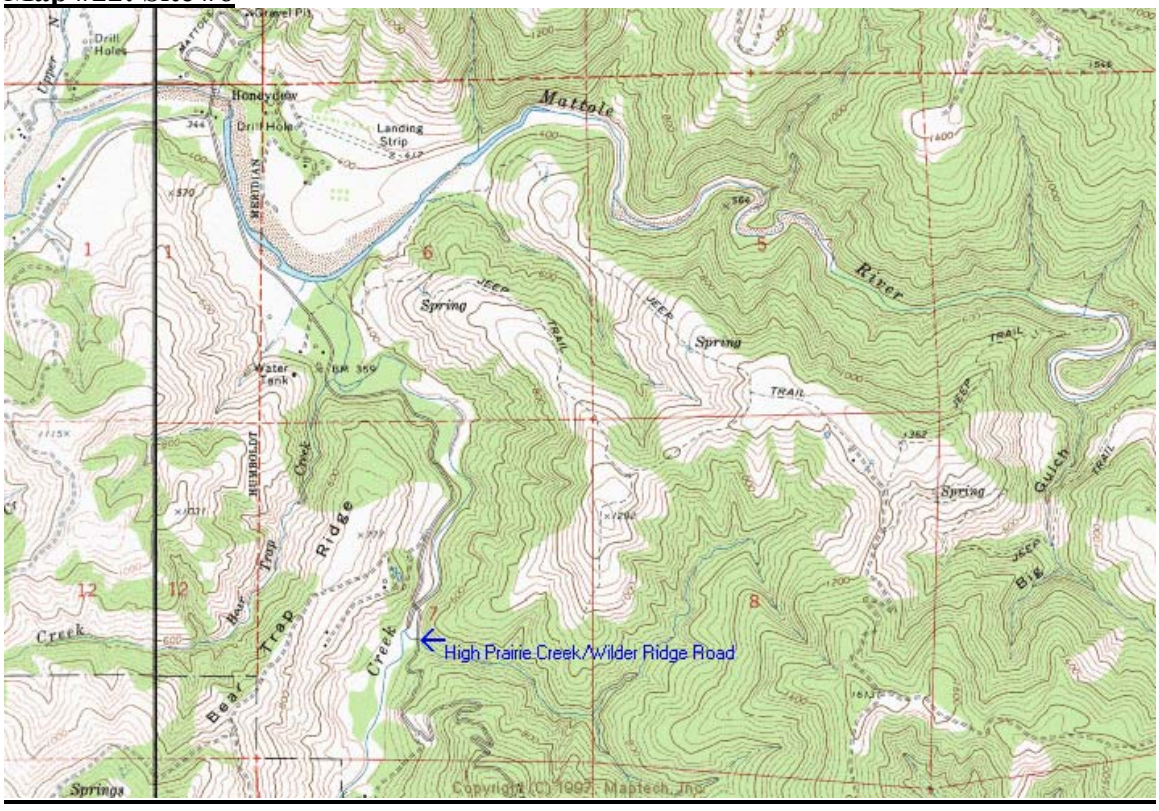
**Additional Barriers:** Downstream none, less than 300 feet of channel to mainstem Mattole River. Upstream, unknown, no access to private property.

**Habitat Upstream:** Quantity = 3,600' of potential anadromous channel. Quality = Fair, channel was nearly dry in summer, remaining pools shallow and warm, impacts of unfenced grazing apparent in riparian zone and within stream channel. Steelhead observed at culvert during both winter visits.

## Map #21: Sites #59 – 60




## Map #22: Site #6



**Site #61:** High Prairie Creek; Wilder Ridge Road **Priority Ranking =** #50

**Location:** County Map # 1E. T3S; R1E, Section 7

**Culvert Type:** Concrete box. **Dimensions:** 8.0'H x 8.0'W **Length:** 32.7' **Slope:** 6.0%.

**Modifications:** WA-style baffles (steel plates) – put in backwards, are not reducing velocities. **Fill Estimate:** <1,000 cubic yards.

**Overall condition:** Fair, floor cracked and eroded. **Sizing:** Moderately undersized for drainage area above culvert and regional hydrology.

**Barrier Status:** Fish Xing determined the culvert is a complete for all adults and juveniles. Too shallow at low flows, excessive velocities at higher flows. Both excessive slope and smooth floor cause passage problems. The baffles are poorly installed, and flow is turbulent and fast during even moderate runoff. Lack of depth in outlet pool for jump into culvert.

**Additional Barriers:** Downstream none, less than 100 feet of channel to mainstem Honeydew Creek. Upstream, unknown, no access to private property.

**Habitat Upstream:** Quantity = 7,200' of potential anadromous channel. Quality = Poor, channel was nearly dry in summer, remaining pools shallow and warm, channel highly aggraded from timber harvesting and poor road construction.

**Site #62:** Painter Creek; Shelter Cove Road **Priority Ranking =** #10

**Location:** County Map # 2E. T4S; R2E, Section 33 **Culvert Type:** Concrete box. **Dimensions:** 7.0'H x 8.0'W

**Length:** 53.0' **Slope:** 1.1%. **Modifications:** concrete divider down middle of culvert to concentrate low flows. Divider may create excessive velocities when ½ of culvert is full (at about 20-30 c.f.s.).

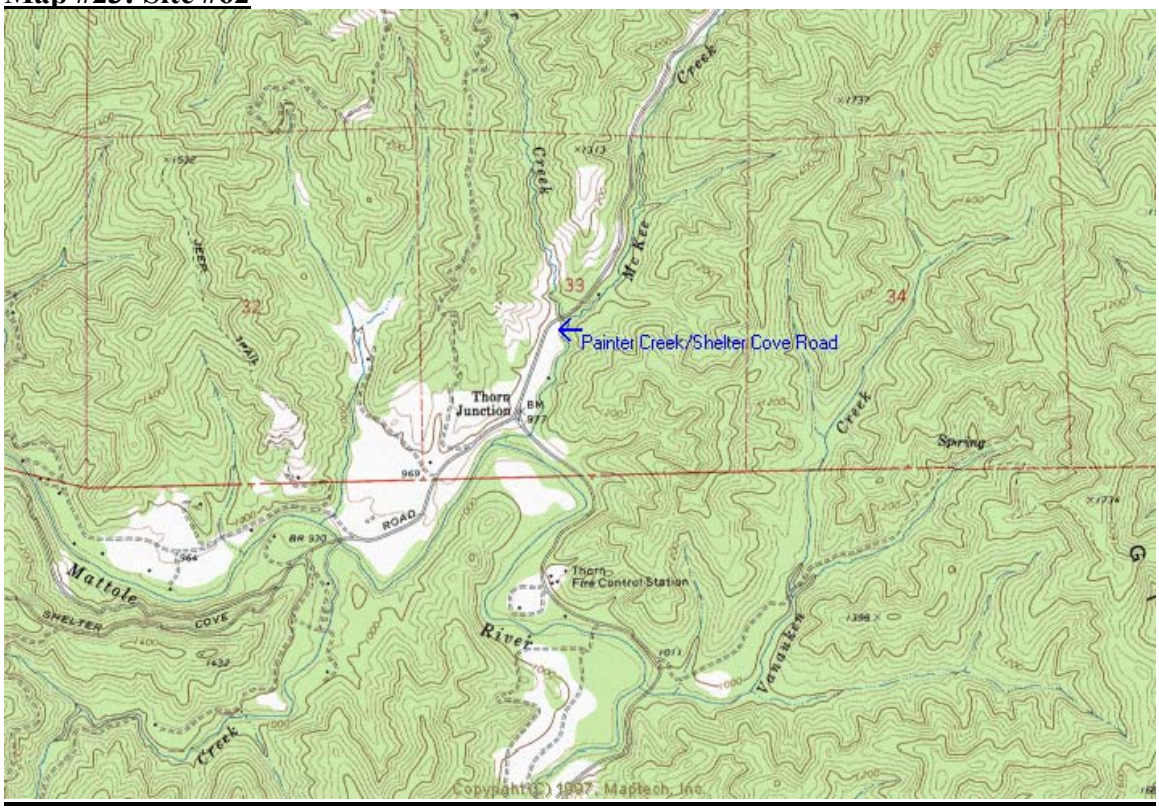
**Fill Estimate:** 3,197 cubic yards. **Overall condition:** Good. **Sizing:** Not calculated, but appears properly sized for the drainage area above culvert and regional hydrology.

**Barrier Status:** Fish Xing determined the culvert is a partial and temporary barrier for adults and a total barrier to juveniles. Excessive jump (3'-5') required to enter culvert. Fish Xing predicted that coho adults should have access on nearly 60% of expected migration flows, however no coho have ever been observed above culvert. The concrete divider reduces the "target" size of outflow that fish must jump into for entry.

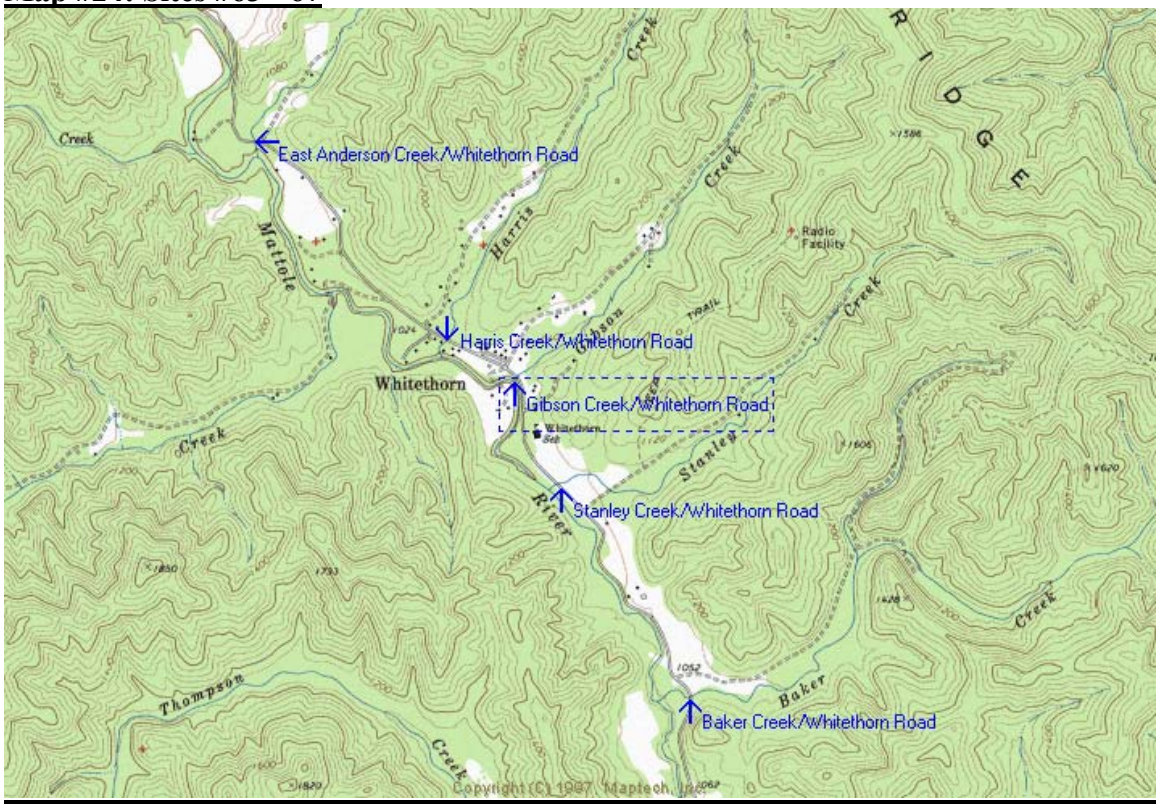
**Additional Barriers:** Downstream none, less than 200 feet of channel to mainstem Honeydew Creek. Upstream, unknown, no access to private property.

**Habitat Upstream:** Quantity = 1.1 miles of potential anadromous channel. Quality = Good to fair, cool flow in summer, fairly aggraded with low volumes of inchannel LWD. In summer, coho and steelhead juveniles observed aggregated in pool below culvert.

## Map #23: Site #62




## Map #24: Sites #63 - 67



**Site #63:** East Anderson Creek; Whitethorn Road **Priority Ranking =** #20

**Location:** County Map # 2E. T5S; R2E, Section

**Culvert Type:** SSP. **Dimensions:** 7.0' diameter **Length:** 60.3' **Slope:** 4.6%.

**Modifications:** None. **Fill Estimate:** 2,707 cubic yards.

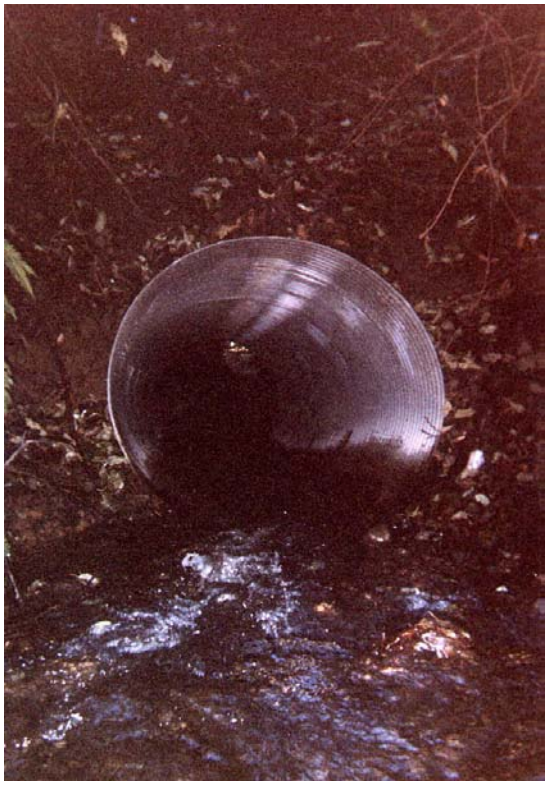
**Overall condition:** Poor, crushed, and rusting out (note seepage through floor in outlet photo).

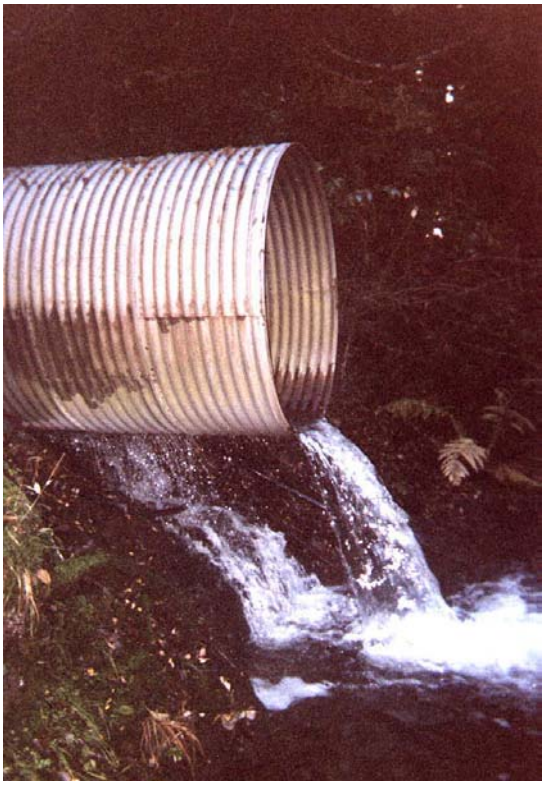
**Sizing:** Undersized, can pass about a 15-year storm flow.

**Barrier Status:** Fish Xing determined culvert is a temporary barrier for adults (20-40% passable for coho and 60-80% passable for steelhead) and a total barrier to juveniles. Excessive jump required to enter culvert, even for adults. Excessive velocity caused by steep slope (at inlet, steeper slope along first 20').

**Additional Barriers:** Downstream none, empties directly into mainstem Mattole River. Upstream, unknown due to lack of access on private property (primarily Barnun Timber).

**Habitat Upstream:** Quantity = 1.1 miles of potential anadromous channel. Quality = Has not been surveyed and no access to private property. Appears to have dense riparian and fair instream cover, but creek is dry at county road crossing in summer due to extraction of surface water for residential use.





**Site #64:** Harris Creek; Whitethorn Road **Priority Ranking** = #40

**Location:** County Map # 2E. T5S; R2E, Section

**Culvert Type:** Concrete box. **Dimensions:** 8.0'H x 7.8W **Length:** 60.0' **Slope:** 0.6%.

**Modifications:** Not smooth floor, but has dividers which create pools partially filled with substrate (see sketch).

**Fill Estimate:** 978 cubic yards. **Overall condition:** Good.

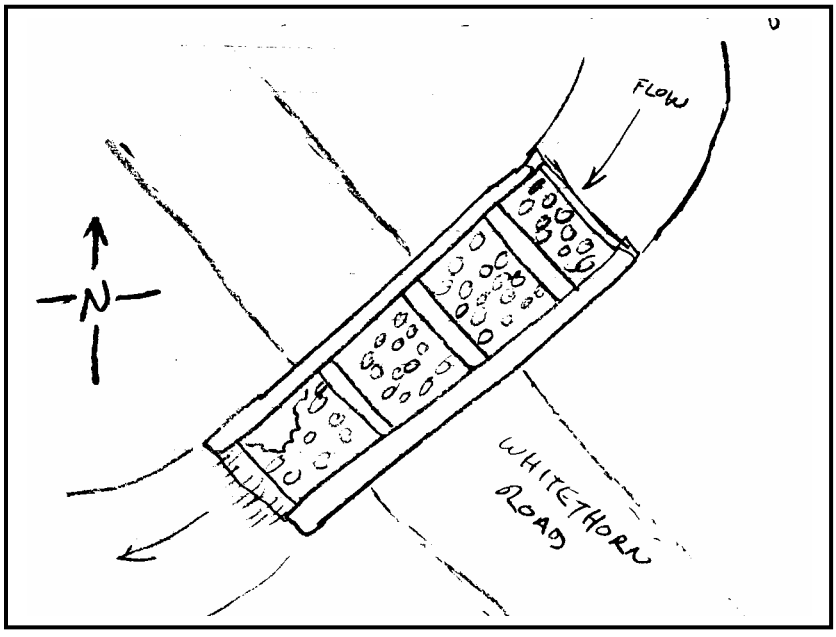
**Sizing:** Adequate should pass just about a 50-year storm flow.

**Barrier Status:** Fish Xing determined the culvert is not a barrier for adults and a partial barrier to juveniles. For juveniles, an excessive jump is required to enter culvert. Velocity information inaccurate because of modified floor.

**Additional Barriers:** Downstream none, empties directly into mainstem Mattole River several hundred feet below Whitethorn Road. Upstream ??

**Habitat Upstream:** Quantity = 0.75 to 1.75 miles of potential anadromous channel. Quality = Unknown, no access to private property (culvert is adjacent to Whitethorn store). Adjacent to county road creek has dense riparian of second-growth conifer and hardwoods. Clear-cut timber harvesting conducted in 1999, and heavy domestic water extraction during summer months.

**Note:** No photo taken at Harris Creek culvert. However, a sketch is provided from the field notes.



**Site #65:** Gibson Creek; Whitethorn Road **Priority Ranking =** #19

**Location:** County Map # 2E. T5S; R2E, Section ??

**Culvert Type:** CSP. **Dimensions:** 5.0' diameter **Length:** 81.0' **Slope:** 5.7%.

**Modifications:** None. **Fill Estimate:** 2,782 cubic yards. **Overall condition:** Poor, pipe is rusted, bent (break-in-slope near upper end), with flow seeping through culvert floor.

**Sizing:** Undersized for the drainage area above culvert and regional hydrology, estimated to convey about a 20-year flow.

**Barrier Status:** Fish Xing determined the culvert is a nearly a complete barrier for adults and a complete barrier to juveniles. An excessive jump (4.9' at low flow) is required to enter culvert. Velocities are also excessive due to steep slope and length of pipe.

**Additional Barriers:** Downstream none, empties directly into mainstem Mattole River below Whitethorn Road. Upstream, unknown, no access to private property.

**Habitat Upstream:** Quantity = 1.0 to 1.7 miles of potential anadromous channel. Quality = Unknown, may have good spawning and spring rearing habitat. However, extraction of water during summer months dries up portions of stream channel.

**Photo Note:** Only outlet photo taken.

**Site #66:** Stanley Creek; Whitethorn Road **Priority Ranking** = #15

**Location:** County Map # 2E. T5S; R2E, Section ??

**Culvert Type:** SSP. **Dimensions:** 10.0' diameter **Length:** 84.3' **Slope:** 0.5%.

**Modifications:** LWD backflood structures at pooltail below outlet. Structures have failed and stream flows underneath.

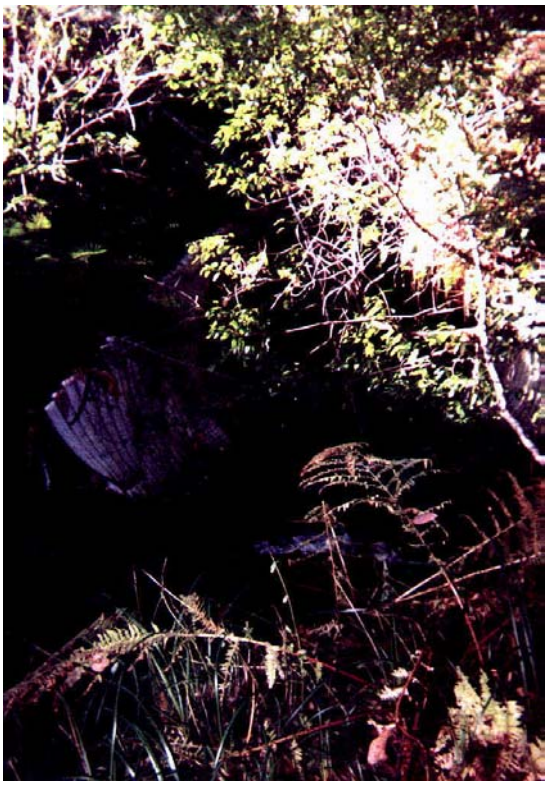
**Fill Estimate:** 2,087 cubic yards. **Overall condition:** Extremely poor, pipe is rusted, twisted and crushed, with flow seeping through culvert floor in numerous places. Projecting inlet is slightly crushed.

**Sizing:** Good, should pass nearly a 100-year storm flow.

**Barrier Status:** Fish Xing determined the culvert is probably not a barrier for adults, but a complete barrier to juveniles. For juveniles, an excessive jump is required to enter culvert. Leakage through rusted bottom may be harmful to out-migrating juveniles. Steelhead observed above culvert, however coho only seen below culvert.

**Additional Barriers:** Downstream none, empties directly (< 200') into mainstem Mattole River below Whitethorn Road. Upstream, unknown, no access to private property.

**Habitat Upstream:** Quantity = approximately 9,200' of potential anadromous channel.
Quality = heavily logged, but recovering. Has cool summer water temperatures and dense riparian canopy.



**Site #67:** Baker Creek; Whitethorn Road **Priority Ranking =** #43

**Location:** County Map # 2E. T5S; R2E, Section ?? **Culvert Type:** SSP pipe arch on concrete footers with natural channel bottom.

**Dimensions:** 10.0'H x 16.0'W **Length:** approximately 40' **Slope:** <1.0%. **Modifications:** None.

**Fill Estimate:** Not measured, but < 1,000 cubic yards.

**Overall condition:** Good. **Sizing:** Good, should pass greater than a 50-year storm flow.

**Barrier Status:** Not a barrier, short of a bridge the BEST crossing observed in Humboldt County.

**Additional Barriers:** Downstream none, empties directly (< 300') into mainstem Mattole River below Whitethorn Road. Upstream ??

**Habitat Upstream:** Quantity = approximately 8,700' of potential anadromous channel.
Quality = Good; cool summer water temperatures, dense riparian canopy, pools formed by bedrock and/or woody debris.