

Date: May 21, 2009  
 To: Randy Rouda, LACO Associates  
 From: Michael Carbiener, Senior Fisheries Biologist  
 Subject: ***Fish Resources and Watershed Diversion on Luffenholtz Creek, Humboldt County, California.***

This memorandum provides the results of a site visit and literature review conducted by URS biologists on May 1, 2009 to Luffenholtz Creek in relation to the Moss Subdivision Project. The purpose of the investigation was to determine whether the North Fork of Luffenholtz Creek and Deadman Creek adjacent to and downstream of the project site, and the main stem of Luffenholtz Creek downstream of its confluence with the North Fork, meet the habitat criteria for coastal cutthroat trout (*Oncorhynchus clarki clarki*), if barriers present downstream preclude them from entering the project area, and to determine potential impacts to this species from the proposed project. This investigation found that coastal cutthroat trout are likely to occur within the North Fork and the main stem of Luffenholtz Creek, but manmade barriers currently prevent anadromous runs in Luffenholtz Creek. Deadman Creek exhibits more restricted flows but cannot be excluded as potential habitat for coastal cutthroat trout. Existing and new mitigation measures are recommended in order to minimize the potential to affect coastal cutthroat trout within these streams as a result of the proposed project.

Coastal cutthroat trout have been designated as a Species of Special Concern by the California Department of Fish and Game (CDFG, 1995). This designation does not differentiate between landlocked populations which spend their entire lives in freshwater streams and anadromous populations of this species which migrate between freshwater and the Pacific Ocean. Species of Special Concern should be considered during the CEQA review process, as a result, the potential effects of the proposed project on coastal cutthroat trout will be considered in the Draft Supplemental EIR currently being prepared for the project.

**Project Description**

The project proposes to subdivide a 94 acre parcel into four parcels ranging in size from approximately 20 to 30 acres. Each parcel would be developed with a single family residence. To meet residential water needs, one parcel would divert water from Deadman Creek<sup>1</sup> while the remaining three would divert water from the North Fork of Luffenholtz Creek. The North Fork of Luffenholtz Creek drains an area of approximately 600 acres, with dry season, base flows on the order of 15 to 31 gallons per minute (gpm) (1994 and 1996, respectively [Hunt, 2000]). The North Fork enters the main stem of Luffenholtz Creek approximately one mile upstream of the Pacific Ocean. The main stem of Luffenholtz Creek drains an approximate 3,163 acres (including the North Fork) of residential and timber lands (TRWMWG, 2008) and serves as the municipal water source for the City of Trinidad. Currently, the diversion rate for municipal supply is about 40 million gallons per year (Moss EIR Water Supply Assessment, LACO Associates). There are also an unspecified number of small residential diversions from Luffenholtz Creek, both upstream and downstream of the municipal water diversion. A county

<sup>1</sup> At the time of the site visit conducted for this investigation Deadman Creek was observed to be a high gradient stream with flows (on May 1, 2009) visually estimated at approximately 4 to 8 gallons per minute (gpm).

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maintained dead-end road (Fox Farm Road) currently services the subject property and other residences nearby.

### **Methods**

A site visit was conducted on May 1, 2009 by URS Biologists Michael Carbiener and David Pecora to qualitatively assess the potential for habitat available within Luffenholtz Creek to support coastal cutthroat trout. Also in attendance during this site visit were Jane Arnold of the California Department of Fish and Game (CDFG); Randy Rouda and Mike Nelson of LACO Associates; Michael Wheeler of the County of Humboldt; and Bob Morris and Allison Jackson, representing Mr. Moss. Several locations along the North Fork and main stem of Luffenholtz Creek were visited, including the locations of the diversion and the proposed housing sites. Photos and notes were taken documenting the stream substrate, available habitat types and available instream and overhead cover. Other information such as surrounding vegetation type and land use was also noted. Prior to the site visit, background documents pertaining to the fish resources in Luffenholtz Creek were reviewed to help determine whether coastal cutthroat trout were historically or are currently present.

### **Results**

Habitat within the North Fork of Luffenholtz Creek above Adams Fox Farm Road consists of a moderate to low gradient stream with good spawning and rearing habitat for coastal cutthroat trout. A pool-riffle-run complex with good spawning substrate and good to excellent instream and overhead cover dominates this section of stream. This habitat extends several hundred meters downstream from Adams Fox Farm Road., and ends before the North Fork becomes very steep, dropping nearly 400 feet in elevation in just over a half mile. This high gradient reach of the North Fork consists primarily of cascades providing poor habitat for trout. Substrate consists of boulders and rubble and is not suitable for spawning, and while there is an abundance of instream cover the water velocity and geomorphology create unfavorable conditions. Some rearing habitat is available in this reach. Further downstream, the North Fork joins the main stem of Luffenholtz Creek, flattening out and becoming much more suitable for salmonids. Stream flow increases and due to the lower stream gradient, substrate becomes more suitable for spawning, consisting of cobble, rubble, and gravel. Pools and riffles replace cascade habitat and an abundance of large woody debris and other cover habitat is present.

Luffenholtz Creek historically supported anadromous runs of steelhead (*O. mykiss*) and coastal cutthroat trout. However, the culvert at Scenic Drive currently provides a barrier to upstream migration that is considered to be impassible (CDFG, 2003, Taylor 2000). A 12 by 12 foot box culvert with a gradient of approximately 10% transmits the waters of the creek under Scenic Drive. Only 250 linear feet of the creek are available to fish below this barrier. At the culvert outfall, the water plunges over the culvert apron and then over a rock wall to a pool approximately 7 feet below (CDFG 2003). Upstream, other culverts also act as migration barriers, including the crossing of Highway 101 and Westhaven Drive (CDFG, 2003).

The North Fork of Luffenholtz Creek contains habitat suitable for coastal cutthroat and rainbow trout (*O. mykiss*) (the resident form of steelhead). Students from Humboldt State University have conducted fish and habitat surveys within various portions of Luffenholtz Creek during the past few decades. In 1975, rainbow trout were detected in the upper portion of the North Fork of Luffenholtz Creek, upstream of the crossing of Adams Fox Farm Road (USDA, 1975). In a 1982 survey, coastal cutthroat trout were observed within the main stem of Luffenholtz Creek, upstream of the water diversion for the

City of Trinidad (USDA, 1982). That survey contains the most recent data available concerning the presence of cutthroat trout in Luffenholtz Creek. However, it is probable that landlocked coastal cutthroat and rainbow trout continue to persist in the watershed.

### **Potential Impacts of Residential Development and Water Diversion**

Diversions from the North Fork of Luffenholtz Creek would affect surface flows in both the North Fork and the main stem downstream of the project site. The magnitude of this affect is dependent on the flows present and the rate of diversion. Water diversions that result in the complete or near complete depletion of surface flows are likely to cause stress and mortality to salmonids. The potential for this to occur is evaluated, using the best available data, in the paragraphs below. Potential mitigation measures intended to minimize these effects are provided following this section.

The proposed project would result in additional water diversions from the North Fork of Luffenholtz Creek to service the proposed residential parcels. The diversion structure to complete this task was installed in 1997, under a previous permit. This structure consists of a sump pump in a perforated concrete case that lies approximately 20 to 30 feet from the active channel. Water infiltrates into a rock filled trench from the streambed, conveying a portion of the stream flow to the sump pump when the pump is active (see Appendix A for plans of the diversion system). As pumped water is conveyed through the streambed substrate and gravel filled trench, this design is not expected to entrain fish in the diversion, affect fish migration, or have any direct impact on fish.

According to Hunt Surveying and Forestry (2000), low flows within the North Fork of Luffenholtz Creek are expected to be 15 gpm or 21,600 gallons per day (gpd). In 1995, the maximum daily water demand of a household was 600 gpd for residences in the City of Trinidad and Westhaven (Winzler and Kelly, 1995). This estimate was reconfirmed by LACO Associates in the Water Supply Assessment for the proposed project. If the three proposed residences that will be diverting water from the North Fork of Luffenholtz Creek require 600 gpd each during periods of low flow, a total of 1,800 gallons may be diverted per day. This equates to a total average diversion rate of 1.25 gpm daily, leaving approximately 13.75 gpm available downstream during low flows. However, residential water is not used at a steady rate. Instantaneous demand may be several times higher during periods of peak use. According to the Initial Study prepared in 1997, a water collector tank would be used in the water supply system for the project. This would help meet peaks in demand without causing spikes in diversion rates from the creek. This tank would be relatively small, such as 2,500 gallons per parcel. The 1997 Initial Study anticipated that the tank could be filled at a continuous rate of 1.25 gpm, as described above. The maximum diversion rate with this system would be 1.25 gpm.

A background study of flows within the mainstem of Luffenholtz Creek was conducted to determine the potential effects of the diversion on downstream users, including fish (Winzler and Kelly, 1995). This study was updated and supplemented by a Water Supply Assessment (LACO Associates, 2009). The Water Supply Assessment estimates dry-year flows in Luffenholtz Creek at 290 gpm at the City of Trinidad municipal water system intake. Based on the 1995 Winzler and Kelly study, the Water Supply Assessment asserts that 112 gpm will be necessary as pass-by flows to support habitat values in Luffenholtz Creek. An additional 160 gpm are expected to be diverted to the municipal water system at full buildout of the currently adopted City of Trinidad General Plan, and 3 gpm is reserved for existing downstream water users. Under this approach, an additional 15 gpm would be available for use in a dry year without compromising habitat values downstream of the municipal water intake. total diversion for the three residences from Luffenholtz Creek as a result of this project would be 1.1 gpm. However,

recommended mitigation measures include a dry season storage tank(s) that may increase the rate of diversion to 5 gpm maximum.

### **Proposed Mitigation Measures**

The following measures to protect water resources were proposed in the Initial Study completed for the proposed project in 1997 (The City of Trinidad, 1997). The mitigation numbers used in this memo are from the Initial Study.

#### ***Mitigation Measure 7***

Streamside Management Areas of 100 feet from both sides of the stream transition lines of the North Fork of Luffenholtz and Deadman Creek shall be established, and erosion control and other measures for development within these areas shall include the following:

- a. During construction, land clearing and vegetation removal will be minimized.
- b. Construction sites will be planted with native or naturalized vegetation and mulched with natural or chemical stabilizers to aid in erosion control and insure re-vegetation.
- c. Long slopes will be minimized to increase infiltration and reduce water velocities down cut slopes by such techniques as soil roughing, serrated cuts, selective grading, shaping, benching, and berm construction.
- d. Concentrated runoff will be controlled by the construction and continued maintenance of culverts, conduits, non-erodible channels, diversions dikes, interceptor ditches, slope drains or appropriate mechanisms. Concentrated runoff will be carried to the nearest drainage course. Energy dissipaters may be installed to prevent erosion at the point of discharge where discharge is to natural ground or channels.
- e. Runoff shall be controlled to prevent erosion by onsite or offsite methods. Onsite methods include, but are not limited to, the use of infiltration basins, percolation pits, or trenches. Onsite methods are not suitable where high groundwater or slope stability problems would inhibit or be aggravated by onsite retention or where retention will provide no benefits for groundwater recharge or erosion control. Off-site methods include detention or dispersal of runoff over non-erodible vegetated surfaces where it would not contribute to downstream erosion or flooding.
- f. Disposal of silt, organic, and earthen material from sediment basins and excess material from construction will be disposed of out of the Streamside Management Area to comply with California Department of Fish and Game and Regional Water Quality Control Board.
- g. No pesticides or herbicides shall be used within the Streamside Management Areas.

Winter operations (generally October 15 through April 15) shall employ the following special considerations:

- a. Slopes will be temporarily stabilized by stage seeding and/or planting of fast germinating seeds such as barley or rye grass; and mulched with protective coverings such as natural or chemical stabilizations.
- b. Runoff from the site will be temporarily detained or filtered by berms, vegetated filter strips, and/or catch basin[s] to prevent the escape of sediment from the site. Drainage controls are to be maintained as long as necessary to prevent erosion throughout construction.

#### ***Mitigation Measure 10***

A complete hydraulic report and drainage plan shall be submitted for approval by the Department of Public Works. This will require the construction of drainage facilities adjacent to and across Adams Fox

Farm Road. The applicant shall dedicate drainage release easements to the County of Humboldt for all cross drains as directed by the Department of Public Works.

#### **Additional Recommended Mitigation Measures**

In order to reduce potential impacts of the proposed project to Luffenholtz Creek and fish resources in the watershed, including coastal cutthroat trout, the following additional mitigation measures are recommended for the project.

##### ***Measure 1: Erosion Control***

Pads for the construction of residential structures have already been cleared of trees. In the period since, brush and saplings have overgrown these pads. As a result, some ground clearing will be required prior to construction. It is recommended that Mitigation Measure 7 (above) be applied during the future ground clearing to minimize erosion and sedimentation issues.

##### ***Measure 2: Water Storage for Dry Season Use***

The California Department of Fish and Game has recommended that the proposed project use water storage as a means to prevent water diversion during the dry season. To create a dry season reservoir, a water storage tank would be filled prior to the dry season, and that water used as a supply to meet all residential demand during the dry season. The dry season is expected to be a period of 105 days, beginning August 1st and ending November 15th (Mattole Restoration Council et al., 2005). Based on the experience of the nearest metered water system (the City of Trinidad), each residence will be assumed to require a minimum of 327 gallons per day, to a dry season total storage requirement of 34,650 gallons.

##### ***Measure 3: Filling of Dry Season Storage Tanks***

In order to provide water during the dry season, the water storage tank(s) would be filled prior to the onset of the dry season, preferably by May 31 to have a minimal impact on flows and water quality (Sanctuary Forest, 2008). If water were diverted at a rate of 5gpm to fill the storage tanks(s) and meet daily water demand, the process would take about 21 days of continuous diversion. If water were diverted at a rate of 2 gpm to fill the tanks and meet daily water demand, the process would take about 52 days of continuous diversion. To avoid excess short-term withdrawals during the periods in which the tanks required by 2009 Mitigation Measure No. 2 are being filled, pumps shall be sized or otherwise regulated to draw a maximum of two gallons per minute on Deadman Creek and a combined maximum of five gallons per minute on the North Fork of Luffenholtz Creek

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