



## MEMORANDUM

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**TO: Curtis Steitz (PG&E, Enviromental Services-TPS)**  
**FROM: Ian Chan (Aquatic Ecologist, GANDA)**  
**DATE: May 15, 2007**  
**RE: Hendricks/Toadtown and Butte Canal Fish Rescue**

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***Summary of Hendricks/Toadtown and Butte Canal Fish Rescue Efforts  
April 23-26, 2007***

On April 23<sup>rd</sup> -26<sup>th</sup>, 2007, biologists from Garcia and Associates (GANDA) assisted Pacific Gas and Electric Company (PG&E) with fish rescue efforts on the Hendricks/Toadtown Canal (April 23<sup>rd</sup> and 24<sup>th</sup>), and the Butte Canal (April 25<sup>th</sup> and 26<sup>th</sup>), diversions of the West Branch Feather River and Butte Creek, respectively, in Butte County, CA. The canals were dewatered immediately prior to fish rescue efforts as part of regularly scheduled maintenance (i.e., the morning of April 23<sup>rd</sup> for the Hendricks Canal, and the morning of the 25<sup>th</sup> for the Butte Canal). All fish were removed from the length of each canal from diversion dam to the forks (i.e., the confluence of the two canals), as well as from the section below the forks downstream to DeSabra Forebay (referred to as the Forks-to-Forebay section).

Fish were removed from each canal and all associated features (e.g., sediment traps, flumes, etc.) using Smith Root Model 12 and Model LR-24 backpack electrofishing units. Water levels in the larger (i.e., deeper) sediment traps were drawn down prior to electrofishing with seine nets placed across the spill gates and outflow valves to prevent fish from escaping. GANDA biologists and PG&E personnel conducted all electrofishing, handled fish, and collected all data. A biologist from the California Department of Fish and Game (CDFG) was also present each day to observe and assist as necessary. All fish were identified to species, enumerated, and categorized into 4-inch size classes (0-4 inches, 4-8 inches, 8-12 inches, and 12+ inches). Fish were placed in tank trucks where they were held until being transported and released. Fish removed from the Hendricks/Toadtown Canal were released into the West Branch Feather River, and fish removed from the Butte Canal and Forks-to-Forebay section were released into Butte Creek. Two tank trucks were used each day during fish rescue efforts, both of which were equipped with oxygen tanks and aeration systems.

A total of 694 fish were removed from the Hendricks/Toadtown Canal; a total of 1,244 fish were removed from the Butte Canal; and a total of 127 fish were removed from the Forks-to-Forebay section. Rainbow trout (*Oncorhynchus mykiss*) was the most abundant species collected (375, 768, and 15 individuals total from the Hendricks/Toadtown Canal, Butte Canal, Forks-to-Forebay sections, respectively). Brown trout (*Salmo trutta*) was the only other fish species collected (319, 476, and 112 individuals total from the Hendricks/Toadtown Canal, Butte Canal, Forks-to-Forebay sections, respectively). Fish data are summarized by size class in Tables 1 through 3 for these sections. All fish appeared to be in good condition and photographs of representative specimens from each size class are provided in Figures 1-8 for reference.

Fish were released from the tank trucks following each day's fish rescue efforts. GANDA and CDFG biologists accompanied PG&E personnel to the two fish-release locations on the West Branch Feather River and Butte Creek in order to verify their suitability. Although both locations are bridges set relatively high above the mainstem river channel (i.e., the bridge at Whiskey Flat is approximately 30 feet above West Branch Feather River, and the bridge at Doe Mill Road is approximately 35 feet above Butte Creek; see Figures 9 through 12), the release of fish from these heights did not cause any mortality or appear to otherwise harm any fish. The entry of released fish into the water following the drop from the tank truck's outlet hose seems to be effectively cushioned by the surface turbulence created by the fall of the tank water itself (which typically occurs before any fish hit the water and continues throughout their release). Thus, even the larger and heavier fish did not appear to have problems at these locations.

**TABLE 1.** Fish removed from the Hendricks/Toadtown Canal (4/23/07 and 4/24/07) by size class. Listed size classes correspond with those used in previous years for comparison.

<b>SIZE CLASS</b>	<b>Rainbow Trout</b>	<b>Brown Trout</b>	<b>TOTAL</b>
0"- 4"	312	130	442
4"- 8"	47	152	199
8"- 12"	16	34	50
12"+	0	3	3
<b>TOTAL</b>	<b>375</b>	<b>319</b>	<b>694</b>

**TABLE 2.** Fish removed from the Butte Canal (4/25/07 and 4/26/07) by size class. Listed size classes correspond with those used in previous years for comparison.

<b>SIZE CLASS</b>	<b>Rainbow Trout</b>	<b>Brown Trout</b>	<b>TOTAL</b>
0"- 4"	469	161	630
4"- 8"	225	242	467
8"- 12"	60	68	128
12"+	14	5	19
<b>TOTAL</b>	<b>768</b>	<b>476</b>	<b>1244</b>

**TABLE 3.** Fish removed from the Forks-to-Forebay section between the Hendricks/Butte Canal confluence and DeSabra Forebay (4/26/07) by size class.

<b>SIZE CLASS</b>	<b>Rainbow Trout</b>	<b>Brown Trout</b>	<b>TOTAL</b>
0"- 4"	8	76	84
4"- 8"	7	34	41
8"- 12"	0	2	2
12"+	0	0	0
<b>TOTAL</b>	<b>15</b>	<b>112</b>	<b>127</b>



**FIGURE 1.** Typical rainbow trout of the 0-4-inch size class collected from Hendricks Canal (4/23/07).



**FIGURE 2.** Typical brown trout of the 0-4-inch size class collected from Hendricks Canal (4/23/07).



**FIGURE 3.** Typical rainbow trout of the 4-8-inch size class collected from Butte Canal (4/25/07).



**FIGURE 4.** Typical brown trout of the 4-8-inch size class collected from Butte Canal (4/25/07).



**FIGURE 5.** Typical rainbow trout of the 8-12-inch size class collected from Butte Canal (4/25/07).



**FIGURE 6.** Typical brown trout of the 8-12-inch size class collected from Hendricks Canal (4/23/07).



**FIGURE 7.** Typical rainbow trout of the >12-inch size class collected from Butte Canal (4/25/07).



**FIGURE 8.** Typical brown trout of the >12-inch size class collected from Butte Canal (4/25/07).



**FIGURE 9.** Fish release from the bridge over the West Branch Feather near Whiskey Flat (4/23/07).



**FIGURE 10.** Fish release from the bridge over the West Branch Feather near Whiskey Flat (4/23/07).





**FIGURE 11.** Fish release from the bridge over Butte Creek at Doe Mill Road (4/25/07).



**FIGURE 12.** Fish release from the bridge over Butte Creek at Doe Mill Road (4/25/07).