

DEPARTMENT OF FISH AND GAME

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To: Battle Creek Stream Files

From: Harry Rectenwald and Terry Healey

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9/8/98

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Subject: Stream Surveys of Soap Creek, Ripley Creek and Baldwin Creek in Battle Creek Watershed

A series of reconnaissance level stream surveys were conducted on the following tributaries to Battle Creek that have both good year-round flow and PG&E diversion dams with no required instreamflow release for any purpose: Soap Creek, Ripley Creek and Baldwin Creek. The purpose of the survey was to examine the stream reaches for the following: 1) migration barriers, 2) presence of habitat suitable for steelhead, 3) presence of aquatic organisms, 4) temperature conditions, 5) streamflow needs and 6) habitat restoration opportunities.

Soap Creek

On July 8, 1998 the stream was completely surveyed from the mouth to the PG&E Diversion Dam with the following findings and observations:

- 1) Migration barriers: Partial barrier located approximately 200 yards upstream of the mouth. There is a series of two jumps with good take-off pools; one 24 inches and one 26 inches high. There is a transverse channel at an even gradient that bypasses the jumps at higher flows. The transverse channel was flowing slightly at the time of inspection. This is not a complete barrier except when the flow is very low due to diversion or dry conditions.
A complete barrier was located approximately 100 yards downstream of the PG&E diversion. There is a bolder blocking the stream creating a 70 inch jump. This would be fixable with a great deal of effort. The Soap Creek Diversion Dam is a complete migration barrier and does not have a screen.
- 2) Steelhead habitat: There is spawning and rearing habitat for steelhead approximately one mile in length.
- 3) Aquatic organisms: Stream substrate was relatively clean and supported mayfly and caddis along with other invertebrates. Two small frogs were observed but could not be captured for close examination.
- 4) Temperature: Water temperature was 53 degrees F at Bluff Springs and 58 degrees F at upper Soap Creek. The presence of Bluff Springs provides a cold water source to the stream year round. There is a diversion at Bluff Springs that removes some of the water before it gets to the PG&E dam on Soap Creek. Any future releases to Soap Creek should include PG&E water right water from Bluff Springs.
- 5) Streamflow Conditions: The dam is not required to provide a release of water to the stream under the FERC license. At the time of inspection there was no apparent release gate at the dam, but there was a spill of approximately 15 cfs. A flow of 10 cfs was judged to be sufficient for steelhead spawning and 5 cfs for steelhead rearing and providing a cold water source to South Fork Battle Creek. PG&E flow records at Soap Creek Diversion indicate that the dry season flow is 5 cfs.
- 6) Habitat Restoration Opportunities: There are opportunities to increase the amount of woody debris and spawning gravel in the stream. There are places to stockpile spawning gravel sized for steelhead where it could be transported to downstream spawning areas during storm runoff. Any gravel dredged from the diversion dam should be placed where flood flows could wash it back into the stream. More habitat could be made accessible with removal of the bolder barrier and laddering and screening the diversion structure.

Ripley Creek

On July 16, 1998 Ripley Creek was surveyed completely from the mouth to the Lower Ripley Creek Diversion Dam and partially examined between Lower and Upper Ripley Creek Diversions and along the Wilcox Springs tributary with the following observations and findings:

- 1) Migration Barriers: A series of three partial barriers are located approximately 40 yards upstream of the mouth that measure 58 inches, 18 inches and 30 inches. Each jump had an excellent take-off pool and would not be a barrier at higher flows (15 to 20 cfs). In addition, there was a long transverse side channel bypassing all jumps. This channel appears to have been a historic stream channel now acting as a flood channel. The Lower Ripley Creek Dam is a barrier. Above the lower dam the creek and Wilcox Spring tributary do not have natural migration barriers as they flow across a flat plateau.
- 2) Steelhead Habitat: There is approximately one mile of stream between the lower dam and the mouth. Steelhead spawning habitat is present in this reach but the rearing habitat is too warm in the summer. Although the stream is spring-fed, stream channels flow long distances from the spring sources across a plateau with little or no riparian vegetation.
- 3) Aquatic Organisms: Stream substrate was fair to poor condition and there were limited aquatic invertebrates. Several yellow legged frogs and one western pond turtle was observed.
- 4) Temperature: Water temperature at the Lower Ripley Diversion was 79 degrees F at 12:15 and the air temperature was 112 degrees F.
- 5) Streamflow Conditions: Lower Ripley Creek does not have a fish release required under the FERC license. There was no release and no spill on this date. Leakage and spring accretions provided some flow several 100 yards downstream that gradually builds to a flow of approximately one cfs at the mouth. The dam had a small 2 inch pipe that appeared to be intended as a flow release but it was plugged with silt. It is judged that a flow of 3 cfs should be provided for steelhead spawning based upon PG&E flow data indicating that is the normal flow at the dam during the steelhead spawning season. During the dry season existing conditions could prevail as far as anadromous fish are concerned since the water is too warm for rearing habitat and may contribute to warming of the South Fork Battle Creek.
- 6) Habitat Restoration Opportunities: There are opportunities to increase the amount of spawning gravel and riparian shading along the stream; especially in those stream reaches that flow along the plateau sections. There are places to interject small quantities of spawning gravel into the bedload of the stream. Any gravel dredged from the diversion dam should be placed where flood flows could wash it back into the stream. More habitat could be made accessible with laddering and screening the diversion structure and releases from upper Ripley Creek Diversion; however substantial riparian restoration would be required to create rearing habitat.

Baldwin Creek

Baldwin Creek was inspected on several occasions by Rectenwald, Healey and the land owner Bruce McCambell with the following findings and observations:

- 1) **Migration Barriers:** There are two partial migration barriers one at the mouth and one near the PG&E conduit crossing. The one at the mouth is high and steep; it has a good take-off pool and some transverse flow channels. The passage would be accommodated at normal storm flows in combination with shut down of the Ausbury pump diversion is shut-off (which is the expected case). The barrier could be improved to function at all wet season conditions. The upper barrier has less height with passage at moderate flows which could be improved with minor modification. Baldwin Creek is known for producing large flows during storm events and has a base flow of 25 cfs when the PG&E diversion is shut-off as frequently occurs in the wet season. Although the land owner will permit modifications to barriers all modifications need to be approved by the land owner. The PG&E diversion is a complete barrier and a short distance upstream of the dam is Darrah Springs which produces about 25 to 30 cfs year-round. Above Darrah Springs the streamflow is intermittent.
- 2) **Steelhead Habitat:** There is spawning and rearing habitat approximately three-quarters of a mile in length below the Ausbury Pump diversion dam. Darrah Springs provides a consistent cold water supply for both Baldwin Creek and mainstem Battle Creek; especially for cold water stratification in holding pools used by salmon.
- 3) **Aquatic Organisms:** The stream substrate is very clean but the stream experienced a flash flood that removed much of the substrate and woody debris. There are aquatic invertebrates in the stream.
- 4) **Temperate:** Water temperatures and flows have been recorded at Darrah Springs Hatchery for approximately 40 years. The spring's temperature ranges between 52 and 54 degrees F and flows in the range of 25 to 30 cfs, even during drought. The temperatures at the PG&E Dam are warmer after flows go through the hatchery ranging between 58 and 60 degrees in the summer.
- 5) **Streamflow Conditions:** There is no instreamflow release required at the Ausbury Pump diversion dam under the FERC license. The stream has been inspected with the Ausbury Pump off and on and with and without spill (the pump was off for most of 1998). When there is no spill or pump outage leakage and downstream spring flow produces a flow that builds to approximately 3 cfs at the mouth. A flow of 5 cfs is judged to provide sufficient rearing habitat when combined with the other spring sources below the dam. For spawning habitat the 5 cfs flow would provide a base flow that is added to during the wet season when the Ausbury Pump is shut down because of gravity diversions available in the wet season. Flow fluctuation may be a concern depending on the details of pump operation; however the channel is generally confined in most areas making somewhat resistant to adverse affects of flow fluctuation at the flow of 5 cfs plus accretions.
- 6) **Habitat Restoration Opportunities:** After the flash flood there is a need to add woody debris and spawning gravel. There are places to stockpile steelhead sized spawning gravel where it could be transported to downstream riffles during storm runoff events.