

Attachment G

PG&E's Comments on the Willow Creek Listing for Water Temperature

WATER SEGMENT: Willow Creek (Madera County)

POLLUTANT: Water Temperature

SOURCE: Source Unknown

**STATUS of Proposed
2008 303(d) LISTING:** Listed

SWRCB STAFF BASIS: After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

**PG&E's
RECOMMENDATION:** Do Not List

PG&E's COMMENTS: The CVRWQCB states that the readily available data and information contained in their factsheet is sufficient to justify listing of Willow Creek for water temperature. However, all of the data used by the CVRWQCB for the 2008 determination is from 2002 and earlier (1986-1996) and does not represent all of the readily available and relevant data and information that is needed to make a justifiable evaluation of water temperature for this water segment.

In addition, the two lines of evidence that the CVRWQCB references in support of listing this water segment are in direct opposition to each other. Furthermore, as discussed in the Sullivan factsheet (Attachment B), the use of a single annual maximum water temperature is not appropriate for listing water bodies, it should be used as a screening tool used "in concert" with other lines of evidence as described in the State Water Resources Control Board (SWRCB) Listing Policy (SWRCB 2004).

Use of Historical and Outdated Water Temperature and Biological Data to Determine Listing Status

The CVRWQCB used two lines of evidence to determine status of listing for this stream reach. The first line of evidence was based upon historic and pre-license daily water temperature data collected at various times of day during the monitoring period 1986-1996 at two locations, North Fork Willow Creek below Bass Lake and South Fork Willow Creek below the Forest Service Road (PG&E 2001). The second line of evidence was based upon historic

and pre-license fish population/community degradation, as interpreted from data collected in 1964, 1970, 1984, and 2000 reported in Price (2002).

Any listing analysis must assess the current river flow regime. PG&E believes that because the data used by the CVRWQCB to determine listing status is pre-2003 (i.e., pre-license) the historical data do not accurately reflect current water quality and biological conditions and are no longer relevant based on the new FERC License conditions (PG&E obtained a Federal Energy Regulatory [FERC] License for the Crane Valley Project September, 2003).

In addition, more recent and relevant data has been collected since establishment of the FERC License and this data has been provided to the resource agencies per the licensing conditions. A six-year water temperature monitoring program was initiated in 2005. Additional biological monitoring to determine which native aquatic species are using the water segment occurred in 2007, and will continue every five years for the term of the License. These assessments are necessary under the current federally mandated flow regime and operating conditions to determine whether the water body can be considered healthy or impaired.

PG&E Six-Year Water Temperature Monitoring Program Initiated in 2005

PG&E initiated a six-year water temperature monitoring study beginning in 2005 that has provided valuable information regarding existing water temperatures under current federally licensed operating conditions for this water body (PG&E 2006, 2007, 2008, and 2009). An evaluation of current water temperature conditions in this stream reach is ongoing and incomplete to date (four of six years have been collected [2005-2008]).

Listing of this stream reach is premature until these new water temperature studies have been completed and assessment of the stream under the new FERC Licensed conditions and current operating procedures can be completed. Upon completion of the six-year study, a summary report will be prepared that will discuss best management practices based upon the six years of data (2005-2010) and will compare various operating conditions for the project under the new FERC flow requirements.

Monitoring results from the first 4 years of the water temperature monitoring program indicate that water temperatures in lower Willow Creek are in an optimal range for use by Hardhead and other warm water species such as Sacramento pikeminnow and Sacramento sucker.

PG&E Conducted New Biological Monitoring in 2007

Beginning in 2007 and continuing every five years for the term of the federal license, biological monitoring for native aquatic fish, amphibian, and reptile

species and their habitat associations within Willow Creek will be conducted (data for 2007 was reported in July 2008 [Jones & Stokes 2008]). A major focus of the planned research is to determine if hardhead use this reach for reproduction and the critical parameters for its survival.

The primary species of interest listed in the CVRWQCB's factsheet (second line of evidence) for Willow Creek is the hardhead. Hardhead is a sensitive fish species that may use Willow Creek primarily for spawning and early season rearing (Price 2002, Jones & Stokes 2008). Willow Creek from the confluence of Whiskey Creek to the San Joaquin River is considered Critical Habitat for hardhead by the Sierra National Forest. However, no data exist to indicate historical utilization, abundance, or distribution of the species in Willow Creek (Price 2002).

The CVRWQCB factsheet refers to presence/absence data for hardhead in Willow Creek from studies conducted in 1964, 1970, 1984 (Bozemann et al. 1985), and 2000 (Price 2002). The 1964 study indicated that hardhead were found (no specific number given) in most streams of the San Joaquin drainage. In the early 1970s hardhead were found at 9% of sites sampled (exact locations and time of year not given). The Crane Valley Project Fisheries Technical Study conducted on streams of the Crane Valley Project area in 1984 found a small population of hardhead ranging in size from 84 to 130 mm in the lower reaches of Willow Creek (Bozemann et al. 1985). The exact timing (time of year) of this study is not specified. PG&E sampled Willow Creek in October 2000 for hardhead, but none were found (Price 2002).

New data and information collected in 2007 provide a better indication of the presence/absence of hardhead in Willow Creek (Jones & Stokes 2008). Fish survey sites were located in lower Willow Creek (two of the sites used in 2000 were sampled again in 2007). The study found that a natural waterfall approximately 805 m above the confluence of the San Joaquin River precludes upstream migration of hardhead. The total surveyable reach in lower Willow Creek was therefore 0.5 miles (800 m) above the confluence with the San Joaquin River.

A total of 698 fish were captured during the surveys (native species represented 93% of the total catch and were dominated by Sacramento pikeminnow (~73%), Sacramento sucker (~15%), smallmouth bass (~7%), and hardhead (a total of 26 fish or ~4%). Other fish species made up 1% or less of the total catch and included rainbow trout, green sunfish, prickly sculpin, and brown bullhead (Jones & Stokes 2008). Hardhead are typically found in association with Sacramento pikeminnow and usually with Sacramento sucker (Moyle 2002), as was the case with this study. Most hardhead in Willow Creek were caught in May and July and nearly all the hardhead that were captured in 2007 represented ages 0+, 1+, and possibly 2+

fish (Jones & Stokes 2008). Based upon the presence of young-of-the-year juveniles, it appears that hardhead may use Willow Creek primarily for spawning and early season rearing, which may be why no hardhead were found in the October 2000 study. Spawning habitat (riffles, runs, and pools with gravel (Moyle 2002)) is available in Willow Creek for hardhead. It may be that the viable and healthy population of Hardhead from Horseshoe Bend use lower Willow Creek for spawning and early season rearing; and then after some form of environmental cue, the young-of-the-year hardhead move back down into the larger pools in the Horseshoe Bend Reach of the San Joaquin River (Price 2002).

As suggested in the PG&E report (Price 2002), nonnative species could also be a limiting factor for hardhead populations in Willow Creek, not water temperature. Nonnative game species such as bass, bullhead, and sunfish have been introduced into Bass Lake above the survey area for recreational fishing. They could be washed downstream during high winter and spring flows into lower Willow Creek (Jones & Stokes 2008). Brown and Moyle (1993) found hardhead presence in the San Joaquin River and its tributaries was positively correlated with percentage of native species.

CVRWQCB Lines of Evidence in Conflict

Willow Creek supports both warm and cold water species and it is inappropriate to base water temperature criteria only on the cold water species (Sullivan criteria for Steelhead of 21°C) listed in the 303(d) factsheets as the first line of evidence.

It has been documented that the native warm water species (including hardhead) that are found in Willow Creek prefer water temperatures between 25°C and 30°C (Knight 1985). Knight (1985) concluded that the water temperature that fish will select given a range of water temperatures was 26°C for the Sacramento pikeminnow and 28.4°C for the hardhead. Limited data suggest that the Sacramento sucker prefers water temperatures around 26°C (Knight 1985). Insufficient data were available to set a maximum water temperature criterion for all species; however, an instantaneous maximum water temperature of 37°C or more could result in mortality of the Sacramento pikeminnow (Knight 1985) and it is assumed likely to be lethal for the other native species as well.

Therefore, it is apparent that the water temperature regimes in Willow Creek are currently suitable for hardhead and other native species (Knight 1985). During the 2007 study, water temperatures were suitable for hardhead in all survey months (Jones & Stokes 2008); and water temperature data from four years of water temperature monitoring in Willow Creek also indicate that water temperatures in Willow Creek were suitable for hardhead (PG&E 2006, 2007, 2008, and 2009). The Sullivan criterion for Steelhead (21°C) is not

suitable for hardhead and should not be used for determining whether water temperatures in Willow Creek are impaired because this value is not optimal for hardhead. As discussed in PG&E's Sullivan factsheet (Attachment B), the use of a single annual maximum water temperature (for a single fish species) is not appropriate for listing water bodies and cannot be applied to all fish species (Steelhead criterion does not apply to hardhead); it should be used as a screening tool used "in concert" with other lines of evidence as described in the State Water Resources Control Board (SWRCB) Listing Policy (SWRCB 2004).

PG&E's Conclusion

Therefore, the historic water temperature and biological data used to list this water segment are not accurate, not current, and the data collected under the new flow regime should be analyzed prior to making a listing determination. As shown in the discussions above, listing Willow Creek for water temperature is not justified when all the available and relevant data are considered. Further, the two lines of evidence presented by the CVRWCB are in conflict based on the fact that exceedance of the 21°C criterion is administered for salmonid species (Steelhead) and does not correlate with the potential decline of a species that has been documented to prefer warmer water temperatures (hardhead). Based upon evidence presented by Knight (1985), in the absence of sufficient available data to set a maximum water temperature criterion for hardhead; an instantaneous maximum water temperature of 37°C or more could result in mortality of the Sacramento pikeminnow and it is assumed likely to be lethal for the other native species (hardhead) as well. Water temperatures in Willow Creek never exceeded this water temperature and in all years (2005-2008) never exceeded the upper optimal limit for water temperature (28.4°C) for hardhead.

Thus, a complete and accurate listing analysis of Willow Creek for water temperature must include an assessment of current stream conditions (water quality and biological) and therefore the proposed listing is not accurate and since it is based upon obsolete data the listing should be changed to 'Delist'. There is insufficient justification for listing Willow Creek for water temperature based upon the evidence presented in this factsheet.

References

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