

DATE: March 25, 2015
TO: Dave Steindorf, Chris Shutes
FROM: Sarah Reich, Ed MacMullan
SUBJECT: COMMENTS ON THE DEIR FOR THE UPPER NORTH FORK FEATHER RIVER
HYDROELECTRIC PROJECT: ECONOMIC ISSUES RELATED TO COLDWATER ANGLING AND
WHITEWATER BOATING

I. Introduction and Summary

American Whitewater and the California Sportfishing Protection Alliance hired ECONorthwest (ECONW) to provide comment on the Draft Environmental Impact Report (DEIR) for the Upper North Fork Feather River Hydroelectric Project (UNFFR Project). Our focus is on economic issues pertaining to recreation, specifically coldwater angling and whitewater boating.

We have reviewed the pertinent sections of the DEIR, including Chapters 1 and 3, and Chapter 6, sections 6.6, Fisheries, and 6.8, Recreation. We have also reviewed background information and historical documents related to the UNFFR Project. We conducted a review of documents and data related to the economic value of coldwater angling and whitewater boating in the North Fork of the Feather River (NFFR), the Northern California Region, and elsewhere in California and the Pacific Northwest. We bring this information to bear on the conclusions related to recreation in the DEIR. In general, the DEIR does not adequately describe the current use and economic value of coldwater angling and whitewater boating. This memo presents our findings.

II. Recreational Angling on the NFFR Has Economic Value

The DEIR does not provide information about the use levels related to recreational angling, or its economic value, either under current or historical conditions. Omitting this information leaves the reader and decision makers without an adequate context to evaluate the effects of the proposed project and alternatives.

The UNFFR Project is located in the upper reaches of the NFFR watershed, upstream of Lake Oroville, in Plumas County, California. The UNFFR Project was originally licensed by the Federal Energy Regulatory Commission (FERC) in 1955. Prior to 1955, there was some hydroelectric development in the upper reaches of the watershed, but the NFFR was also widely known for its scenic beauty and productive trout fishery. Human activity and alterations of the natural habitat in the Feather River basin started as early as 1910 with the construction of the Big Bend dam, which “probably blocked most migratory fish from accessing the North Fork Feather River and its tributaries.”¹ Since then, six more dams have been built, all affecting

¹ California State Water Resources Control Board. 2014. *Upper North Fork Feather River Hydroelectric Project Draft Environmental Impact Report*. 6.6-1-2.

physical habitat by altering its streamflows, water temperature regime, and the river's channel morphology. These alterations have "long been identified as important factors limiting coldwater fishery on the North Fork Feather River."²

Several studies document the economic value of coldwater angling on the NFFR, from the 1940s to the 1980s. We are not aware of studies that describe the value of angling after the 1980s.³ In anticipation of the UNFFR project construction, Wales and Hasen (1952) described the fishery resources on the NFFR.⁴ They concluded the NFFR supported a fishery that rivaled any in the state:

*"Destruction of trout fishing streams in California by removal of water for power, irrigation and other purposes is proceeding at an accelerated pace. Certain of these streams are particularly important. Their trout carrying-capacity may be especially high, they may be located in especially beautiful surroundings or they may be easily accessible to many thousands of people. Only a few rivers in California have all of these advantages. Of these few, the North Fork of the Feather is an outstanding example."*⁵

In their 1952 study, Wales and Hansen documented 11 commercial resorts and six Forest Service campgrounds along the NFFR serving anglers and recreationists. Based on use surveys of these facilities, the authors estimate that the NFFR supported approximately 36,000 angling days in the mid-1940s, though they also say "these figures and estimates are almost certainly below the actual numbers."⁶ In discussing the value of this angling, they recognizing both "fishing as a business stimulant" and "fishing as a psychological stimulant." Although they don't estimate a dollar value for either, the California Chamber of Commerce estimated that the average angler in the mid-1940s spent \$120 on fishing-related expenses each year. Based on an average trip length of 10 to 12 fishing days, the State of California Department of Fish and Game estimated that the 36,000 angling days on the NFFR would be worth approximately

² California State Water Resources Control Board. 2014. *Upper North Fork Feather River Hydroelectric Project Draft Environmental Impact Report*. 6.6-1-2.

³ Although several papers were published in the 1990s (Loomis, J. & J. Cooper. 1990. "Economic Benefits of Instream Flow to Fisheries: A Case Study of California's Feather River." *Rivers*. 1.1. 23-30.; Resource Decisions. 1999. *A Cost-Benefit Analysis of Flow Alternatives Associated with Pacific Gas & Electric's Rock Creek-Cresta Project Relicensing.*), these relied on angling use data from the 1980s.

⁴ Wales, J., and H. Hansen. 1952. *The Effect on the Fishery of the North Fork of the Feather River, California, of Proposed Hydro-Electric Developments with Special Reference to Cresta and Rock Creek Projects*.

⁵ Wales and Hansen. 1952. Pg. 10.

⁶ Wales and Hansen. 1952. Pg. 11.

\$360,000 each year.⁷ Those 36,000 angling days that occurred on the NFFR in the 1940s would be worth approximately \$4 million annually in today's dollars.⁸

Angling opportunities are dependent upon available instream flow in that flow rates determine (at least in part) water temperatures, dissolved oxygen rates, and the amount of fish life the river can support at a given point in time.⁹ Resource managers predicted in the 1940s and 1950s that after PG&E completed the UNFFR Project, a decline in coldwater habitat and ecological changes resulting from the dams could result in a decline in angling quality. Later studies in the 1960s and 1970s confirmed these changes materialized.¹⁰

These changes led to a decrease in the economic value associated with angling activity. The California Department of Fish and Game estimated angling activity on the NFFR between 1981 and 1985. On average during this time, there were approximately 7,000 angler days on two reaches of the NFFR (Rock Creek and Cresta).¹¹ Two studies discussed the economic value of these angler days, in terms of the consumer surplus or net willingness to pay.¹² They found the benefit anglers received from a day of fishing was between about \$32 and \$45 in 2014 dollars.¹³ A 2006 study by the U.S. Fish and Wildlife Service found that Californian trout anglers' net willingness to pay for a day of trout fishing was about \$90 in 2014 dollars.¹⁴ The U.S. Fish and Wildlife Service conducted a review of studies of the value of in-river trout fishing in the western United States, to provide information for economic analyses in FERC relicensing efforts. The review found the median value across 70 estimates of a day of angling was about

⁷ Wales and Hansen. 1952. Appendix, Summary.

⁸ Dollar values are converted to 2014 dollars using the Consumer Price Index (CPI). Available at <http://www.bls.gov/cpi/data.htm>

⁹ Garcia & Associates. 2003. *2002 Angler Creel Survey: Rock Creek-Cresta Project (FERC No. 1962) North Fork Feather River*. San Ramon, CA.; Lindquist, D. & L. Bowie. 1988. "Watershed Restoration in the Northern Sierra Nevada: A Biotechnical Approach." *Proceedings of the California Riparian Systems Conference*. Davis, CA

¹⁰ *Case Study Report #10: Rock Creek Diversion Dam, North Fork Feather River*. 1975. Retrieved March 23, 2015, from http://www.calwater.ca.gov/Admin_Record/C-064104.pdf

¹¹ Resource Decisions. 1999. *A Cost-Benefit Analysis of Flow Alternatives Associated with Pacific Gas & Electric's Rock Creek-Cresta Project Relicensing*.

¹² This value differs from the estimate of value in the 1940s because it measures what anglers are willing to pay for fishing above the amount they actually pay. This value estimates the economic benefit anglers receive from a fishing trip. It does not include angler's spending on fishing equipment or travel and lodging expenses.

¹³ Loomis, J. & J. Cooper. 1990. "Economic Benefits of Instream Flow to Fisheries: A Case Study of California's Feather River." *Rivers*. 1.1. 23-30.; Resource Decisions. 1999.

¹⁴ U.S. Fish and Wildlife Service. 2006. *Trout Fishing in 2006: A Demographic Description and Economic Analysis*. Report 2006-6. Retrieved March 19, 2015, from <https://www.troutmagnet.com/pdf/USFWS.pdf>

\$66 in 2014 dollars.¹⁵ These values translate into a fishery that provides benefits of between about \$225,000 and \$630,000 in today's dollars, assuming the number of anglers has remained constant since the 1980s.¹⁶ If angler participation has increased, the total benefit would be greater.

It is important to keep in mind that the estimates of value from these historical studies don't measure the same thing: the estimate from the 1940s focused on the amount anglers spent at local businesses on things, such as equipment, bait, gas, and lodging, to fish. The more recent studies focused on the amount above what they spent that anglers would have been willing to pay to fish in the NFFR. Both values underscore, however, that angling on the NFFR has value to anglers and the broader economy. Based on the decline in angler days logged on the NFFR, it is also reasonable to conclude that the economic value of fishing has declined, despite the fact that the population of Plumas County and the state of California has increased by 73 percent and 439 percent respectively over that time.

This conclusion is consistent with historical predictions. Researchers have also suggested that, on a trajectory of what the fishery could have been with management aimed at multiple uses, fishing use on the NFFR would have increased, not decreased, from levels in the 1940s. In their 1952 report, Wales and Hansen said:

Due to the highly accessible location of the North Fork it would be inevitable that without power development it would eventually become one of the most heavily fished trout streams in California. The recreational value of this canyon would rank well up among similar areas in the State.¹⁷

In 1987, the California Department of Fish and Game concluded:

It is the Department's view that PG&E's Rock Creek-Cresta Project is responsible for the mitigation of 76,000 angler-days in the Project area. This use estimate would have existed today without power development.¹⁸

It is possible, given population growth in California, that the estimate of lost angler days would be even greater today, nearly 30 years since DFG made this conclusion.

¹⁵ Black, R., B. McKenney, and R. Unsworth. 1998. "Secondary Methods for Valuing Non-Power Benefits: Benefit Transfer." *Economic Analysis for Hydropower Project Relicensing: Guidance and Alternative Methods*. U.S. Fish and Wildlife Service. Retrieved March 23, 2015, from <http://www.fws.gov/policy/hydroindex.htm>

¹⁶ We are unaware of new data on angler participation on the NFFR. However, studies of trout fishing nationally have found participation holding steady or decreasing over the last 20 years.

¹⁷ Wales and Hansen 1952. Pg. 17

¹⁸ Wixom, L.H. 1989. *North Fork Feather River Fisheries Management Plan*. Draft. California Department of Fish and Game. April. Pg. 34.

Using the estimates Resource Decisions (1999) developed for net willingness to pay for angling on the NFFR at theoretical higher flow levels, the annual value of a fishery managed to enhance coldwater angling could be worth \$8 million today. This estimate is in line with the value of other coldwater in-stream fisheries. For example, Duffield (1987) calculated the value of fishing on Montana's rivers between \$106,000 and \$17 million per year depending on the river, with visitation levels calculated from use data collected during the 1980s.¹⁹ The higher values were associated with scenic, coldwater streams with robust trout populations. Presumably, use has increased with population, and values would be even higher if calculated today.

II. Whitewater Boating on the NFFR Has Economic Value

Similarly, the DEIR does not provide information about the use levels related to whitewater boating, or its economic value. It does not address whitewater boating at all, which leaves the reader and decision makers without information to determine how the proposed project and its alternatives may affect the value of whitewater boating.

Like angling, whitewater recreation (e.g., kayaking, rafting, canoeing) is dependent upon instream flow rates. Required flows are often too low for whitewater boating activities, though there are some low flow technical boating opportunities under base flow conditions in some water year types on the Rock Creek and Cresta reaches. Otherwise, whitewater recreation can only take place during special release days (typically once a month in the summer).

During these days, extra water is released from the NFFR dams and instream flows are high enough to support whitewater recreation. Resource Decisions (1999) concluded, based on river surveys conducted by WRC Environmental, a firm specializing in whitewater evaluation, that: "...the river conditions, even with adequate flows is unlike that of any other California river."²⁰ Others have noted that these features, combined with relatively easy access from the road, attract whitewater enthusiasts who use the river like a whitewater park, running the same short stretches of river several times a day.²¹

Demand for whitewater boating on the NFFR consists of individual recreational paddlers. No commercial guide licenses have been issued for the NFFR. The Outdoor Program Coordinator at Feather River College, Rick Stock, operates guided trips on the river under a special educational permit, but only in educational capacities.²² While it is not currently an ideal destination for commercial guides because of the limited time conditions are boatable, the NFFR is growing in popularity among individual paddlers. Each year since 2001, when regular

¹⁹ Duffield, J. 1987. *The Net Economic Value of Fishing in Montana*. Montana Department of Fish, Wildlife, and Parks.

²⁰ Resource Decisions. 1999. Pg. 22.

²¹ Personal communication with Dave Steindorf, American Whitewater. March 18, 2015.

²² Personal communication with Rick Stock, Program Coordinator, Outdoor Recreation Leadership Program, Feather River College. March 19, 2015.

releases through the Rock Creek and Cresta reaches began, American Whitewater and local paddling groups have hosted the Feather River Festival. Attendance has grown over 8 years from about 200 paddlers to 1,500 paddlers. The Feather Festival has become the largest river festival on the West Coast. It has expanded from an event that attracted primarily local residents to a regional event that attracts people from all over the western U.S., and even some participants from the East Coast.²³

No agency formally collects data on whitewater boating participation on the NFFR. Since regular releases began in 2002, there has been one effort to formally estimate use during boatable conditions. During recreational release weekends in 2002, 2003, and 2004, surveyors collected use data for PG&E's Public Recreation Monitoring Report. The number of visitor days ranged from about 230 to about 600 between 2002 and 2004, increasing each year.²⁴ To our knowledge, PG&E has not conducted official user surveys since 2004. However, based on participation in the Feather River Festival, it appears that use has continued to increase since 2004, as more people become familiar with the river and aware of the recreational flow releases.

Two studies used the PG&E user data from 2002 to 2004 to estimate the value of boating on the NFFR. These studies employed a methodology called Zonal Travel Cost Modeling to estimate the value of a recreation day. The first study (Oliver et al. 2005) used only observations from 2004, and estimated the average net willingness to pay for a day of boating at about \$190 in 2014 dollars.²⁵ The second study (Wright 2013) assessed observations in all three years, and found net willingness to pay for a day of boating ranged from about \$80 per day for Californians in 2003 to about \$200 per day for Californians in 2004. Including observations from boaters who came from out of the Oregon, California, Nevada region resulted in higher values, ranging from about \$300 to over \$1,200 net willingness to pay per day.²⁶ From these values, Wright estimated a total average net willingness to pay ranging from about \$150,000 to almost \$1.2 million per year in 2014 dollars. Oliver estimated a total annual benefit from recreational boating of about \$175,000 in 2014 dollars. Both of these studies' estimates of net willingness to pay per boating day were generally higher than the \$107 (in 2014 dollars) that Resource Decisions produced in 1999 using a benefit-transfer technique relying on data from the Pit and Trinity Rivers.²⁷

²³ Personal communication with Dave Steindorf, American Whitewater. March 18, 2015.

²⁴ Wright, J. *Valuing Recreational Water Releases on the North Fork of the Feather River: A Travel Cost Study*. Chico: California State University Chico Department of Geography.

²⁵ Oliver, A., S. Wever, A. James, K. Del Paine, & P. Tsournos. 2005. *The Benefits of Supplemental Water Releases on the Feather River*. Chico: California State University Chico Department of Economics.

²⁶ Wright recognized that most users surveyed traveled only a few hours to get to the NFFR. The few out-of-state visitors (from Hawaii and Texas) were outliers, and skewed the average value of total observations upward.

²⁷ Resource Decisions. 1999. Pg. 23.

III. Conclusion

The DEIR omits information about the value of coldwater fishing and whitewater boating from its discussion of recreational resources impacted by the UNFFR Project. Studies indicate that the NFFR currently supports recreational use that contributes economic value to participants and the broader economy. In the case of coldwater fishing, historical use patterns and evidence from coldwater fisheries elsewhere in the U.S. suggest that managing the resource to enhance coldwater fishing opportunities likely would increase the overall value of coldwater fishing activities in the NFFR. Similarly, whitewater boating use and associated economic value on the NFFR has grown since recreational releases began in 2002, and management of the resource to support this increasing use likely would continue to generate increasing economic value.