

Bear River Summary

Description

The Bear River rises on the west side of the Sierra just below Lake Spaulding at the 5500 foot elevation and flows southwest 65 miles to its confluence with the Feather River at mile 12 of the Feather, draining portions of Nevada, Placer, Sutter and Yuba counties. The 292 square mile watershed is 20 miles across at its greatest width. The upper Bear reaches eight miles from the headwaters to the Drum afterbay. The middle Bear stretches from the Drum afterbay at 3300 foot elevation to Rollins Reservoir 15 miles downstream at 2100 foot elevation, then approximately ten miles to Lake Combie at 1600 foot elevation and then on another seventeen miles to Camp Far West Reservoir at 300 foot elevation. The lower Bear runs from Camp Far West Reservoir 16 miles to the confluence with the Feather River at the 23 foot elevation. One mile downstream of Camp Far West Dam, at River Mile 15, is a diversion dam operated by the South Sutter Water District. The diversion dam moves Bear River water into the South Sutter Canal and the Camp Far West Canal located, respectively, on the south and north sides of the river. The main tributaries are Steephollow and Greenhorn creeks above Rollins Reservoir and Wolf and Little Wolf creeks between Lake Combie and Camp Far West Reservoir. Rock Creek drains into Camp Far West. Dry Creek runs through the Spenceville Wildlife Area and into the Bear below Wheatland. Yankee Slough, from the south, and Best Slough, from the north, enter the Bear just below the confluence with Dry Creek.

Operations

There are over 990 miles of streams, creeks and rivers within the watershed, one of the most heavily managed in California for water conveyance. Flows are largely controlled by the Nevada Irrigation District and Pacific Gas & Electric Company. Based on unpublished data prepared for a study of the proposed Garden Bar Dam (CDFG, 1992), about 200,000 acre feet of water annually is imported from the South and Middle Forks of the Yuba River via Lake Spaulding through the Drum Canal system, and from the North Fork of the North Fork American River through the Lake Valley Canal. Water in the upper Bear is directed into the South Yuba Canal, the Upper Boardman Canal, and the Drum and Dutch Flat canals. Below Rollins Reservoir, about 290,000 acre feet of water is exported annually through the Bear River Canal for contract deliveries to PCWA and SSWD and for use in PG&E's Halsey, Wise, and Newcastle powerhouses. Below Combie Reservoir, about 43,400 acre feet annually is diverted through NID's Combie Phase I Canal. South Sutter Water District diverts an average of 124,500 acre feet annually below New Camp Far West. For the years 1921 – 1983 the average unimpaired flow near Wheatland is estimated at 323,000 acre feet/year, versus the average impaired (observed) flow over the same time period of about 292,500 acre feet/year. USFWS finds that the annual runoff for the Bear River watershed for water years 1966 – 1994 has averaged 272,800 acre feet/year. Flow monitoring stations listed by the California Data Exchange Center (www.cdec.water.ca.gov) include the South Canal from Bear River, Bear River at Pleasant Grove Road, Bear River at Rollins, Bear River near Wheatland, Bear River at Camp Far West, Combie Lake, Drum Powerhouse, Rollins and Secret

Town. In addition, PG&E, NID, and/or USGS monitor canal flows at various points throughout the system, including the Bear River Canal intake near Colfax (USGS). There are no climate stations on the Bear River below Colfax.

Biodiversity Values

The lower watershed is dominated by grasslands and agricultural production. The middle Bear watershed is largely Blue Oak Woodlands, Blue Oak-Foothill Pine, and Mixed Hardwood/Conifer forests. The upper watershed consists of Montane Hardwood, Mixed Hardwood/Conifer, Sierran Mixed Conifer and Pine forests. Rare, sensitive, threatened and endangered species occurring in the watershed include Chinook salmon, Giant garter snake, Northwestern pond turtle, California horned lizard, Willow flycatcher, Foothill yellow-legged frog, Valley elderberry long-horned beetle, black rails, Stebbin's morning glory, Pine Hill flannelbush, Follett's monardella, Red-anthered rush, Wooley violet and *Monadenia Mormonum*, *buttoni* among others. The Bear River canyon from Highway 174 to the west of Highway 49 may provide the last best regional link between the upland conifer forests and lowland oak forests, critical for wintering deer herds and other migrating wildlife.

The lower Bear also continues to support remnant and/or "stray" wild and/or hatchery-sustained salmon, and in the past it supported both steelhead and sturgeon as well. The USFWS's Central Valley Project Improvement Act Tributary Production Enhancement Report of May 1998 identifies "Instream flows, high water temperatures, unscreened diversions, poor water quality, partial or complete migration barriers and illegal harvests are factors limiting salmon and steelhead migration, spawning, incubation and rearing success in the Bear River" (p. 4-57). Depleted flows and excessive temperatures also have negative impacts on the trout fishery. In addition, constricted channels in Bear Valley and on the lower Bear at the confluence with the Feather also harm the fisheries, as do gravel mining operations between Rollins and Combie. Depleted flows and high water temperatures are the greatest constraint to instream habitat quality today. Estimates of natural (unimpaired) runoff from 1929-94 average more than 300,000 AF/year (= 418 average cfs) in the lower Bear below Wheatland. Medians flows over approximately the same period average only 21cfs. By comparison, State Water Resources Board records list 28 registered diverters in the basin that account for up to 8,362.5 cfs of potential water diversions. Overall, the volume of recognized diversions greatly exceeds the natural runoff of the watershed. The present system of diversions also results in rapid fluctuations in flow that are much harder on the riverine habitat and fisheries than the more gradual natural seasonal variations.

The Bear River was far more heavily impacted by hydraulic mining (i.e., tons of mining sediment per unit of drainage area) than the Yuba or American Rivers. Closure of Rollins Dam caused a significant reduction in sediment yields and very little sediment remains in the middle Bear today. It is estimated that 125 million cubic meters (160 million cubic yards) of mining sediment is stored in the lower Bear. The high volume of mining sediment, in combination with restricting levees, has caused the lower Bear to change from wide and shallow to deeply incised. The river is listed under Section 303(d) of the Clean Water Act for mercury (primarily in reservoirs and Greenhorn Creek) and

diazinon (between Camp Far West and the Feather). The Bear River CRMP monitored surface water at 20 locations and the results indicated that water quality is generally good. Of the parameters tested, only turbidity and E. coli bacteria were either intermittently or consistently greater than state or federal water quality goals. The USGS is studying mercury and the relationship between methylated mercury and dissolved oxygen. Elevated levels of methylmercury in fish found in Camp Far West, Combie and Rollins reservoirs and portions of the Bear River has resulted in the issuance of a California EPA Health Advisory for Fish. USGS investigators suspect that cooler water would slow conversion to biologically available methylmercury and thus the mercury bioaccumulation process, however additional research is needed to fully understand the effects of improved flows and temperatures on mercury methylation in the lower Bear River.

Recreation

87 percent of the watershed is owned by private individuals or corporations; less than 10 percent of the watershed is managed by the Forest Service, BLM and state agencies, greatly limiting recreational use of public lands. Of the 10 percent of public lands, almost 3 percent consists of the California Department of Fish and Game managed Spenceville Wildlife Area. Additional public recreation is provided by the PG&E Interpretative Station in the upper Bear Valley, reservoir recreation at Rollins, Combie and Camp Far West reservoirs as well as campgrounds below Rollins. The river can also be reached by the public at the Dog Bar bridge. However, most stretches of the Bear River are either inaccessible or closed to the public. For many years, Garden Bar, via the Garden Bar Road served as a crossing for the Bear; however, the area is now private property. (“All the bars on the Bear River were rich in float gold...due to hydraulic mining at Dutch Flat. Among these Bear River bars was Camp Far West, where soldiers located in 1846...[and] Garden Bar, where...miners maintained a vegetable garden....” Oakland Tribune, June 5, 1955.)

Support Groups

The Bear River Coordinated Resource Management Plan (CRMP) was formed in 1998 and included agencies and groups from Placer, Nevada, Yuba and Sutter counties. In 2001, the Bear River CRMP changed its name to the Bear River Watershed Group. The first objective was to obtain grant funding from Proposition 204 funds to conduct a watershed assessment and to prepare a watershed management plan. Funding was obtained in 1999. A Disturbance Inventory was prepared as well as a draft management plan. In 2004, a Department of Conservation grant was obtained to hire a watershed coordinator to explore, in part, water delivery re-routing opportunities that could also improve flows. In addition to the Bear River Watershed Group, groups active in restoring, protecting and enhancing the watershed include the Granite Bay Flycasters, Friends of Spenceville, Wolf Creek Alliance, Trust for Public Land, Placer Legacy, Placer County Resource Conservation District, Nevada County Resource Conservation District, Nevada County Land Trust and Beale Air Force Base. The USFWS is also considering an Anadromous Fishery Restoration Program study of the lower Bear. The Three Rivers Levee Improvement Authority’s Final Environmental Impact Report (November 2004) selected the “southern alignment” as the preferred alternative. The

proposed setback would extend along the north side of the Bear River from 0.2 miles southwest of SR 70 to the confluence with the Feather River, encompassing 322 acres. The Feather River Wildlife Area is located directly across the Feather River from its confluence with the Bear and it is hoped that CDF&G will manage the Area and the setback lands as a single project. The design of the setback project will meet CDF&G and USFWS criteria for an enhanced fishery and wildlife area. The Reclamation Board has given approval to the project with restrictions on the number of additional houses that may be built in the Plumas Lakes floodplain.[more] As part of its Proposition 13 Yuba/Feather Flood Control Project, Yuba County Water Agency is considering, with the support of California Department of Fish and Game, USFWS and NOAA, a proposal to set back the north levee of the lower Bear from the Interceptor Canal to the confluence with the Feather. The set back would result in significant restoration and enhancement improvements to the riparian habitat and fishery of the Bear-Feather confluence region. The Three Rivers Levee Improvement Authority's Final Environmental Impact Report (November 2004) selected the "southern alignment" as the preferred alternative. The proposed setback would extend along the north side of the Bear River from 0.2 miles southwest of SR 70 to the confluence with the Feather River, encompassing 322 acres. The Feather River Wildlife Area is located directly across the Feather River from its confluence with the Bear and it is hoped that CDF&G will manage the Area and the setback lands as a single project. The design of the setback project will meet CDF&G and USFWS criteria for an enhanced fishery and wildlife area. The Reclamation Board has given conditional approval to the project with restrictions on the number of additional houses that may be built in the Plumas Lakes floodplain.

Challenges

Improving flows in the Bear River will likely depend on continued importation and storage of Yuba and American River water, hence such improvements will be of ongoing concern to advocates for and users of those waters. In the upper Bear, improved flows will depend on South Yuba Canal and/or Drum-Chicago Park hydropower bypasses by PG&E and NID respectively. In the lower Bear, re-routing options could lessen or eliminate such concerns, however they could also impact hydropower operations along the Bear River Canal at PG&E's Halsey and Wise power plants (though such impacts may be offset in part by increased hydropower production at the Combie and New Camp Far West hydropower units). The balance, as needed, could be obtained by donation, by discretionary allocation, by FERC- or court-ordered operational changes, or by way of negotiated agreements, however the complexities of existing NID-PG&E agreements make it difficult to determine actual or expected costs and impacts absent a detailed simulation model of the intertwined system. Reliable answers to these and other questions await completion of the water and hydropower operations simulation model being developed as part of the Upper Yuba River Studies Program (or its equivalent), including open and transparent calibration and verification by NID, PG&E, and PCWA in collaboration with others. Proposed and new housing developments near Lincoln, Wheatland and Spenceville and potentially at Plumas Lakes will also affect the Bear River corridor with increased traffic, runoff and diminished wildlife habitat, but can be offset in part by habitat improvements associated with the setback of confluence levees noted above.

Target Flows

For the upper and middle Bear, optimum flows and their timing have not yet been determined. Minimum flows in the Bear Valley reach are currently maintained at 5cfs year round. Minimum flows between Drum and Rollins generally result in conditions that are too warm for trout, and will likely need to be increased in conjunction with FERC relicensing. Minimum releases below Rollins (10cfs) and Combie (5cfs) from approximately June-November result in warm water temperatures that are suitable only for bass or other warm water species. (Reducing diversions into the Bear River canal could improve flow conditions in both of these reaches, and potentially below NCFW as well.) In the lower Bear River below NCFW, the CALFED Ecosystem Restoration Program Plan’s Final Plan for the Anadromous Fish Restoration Program (August 2001) makes the following minimum streamflow recommendations (with the exception of the lower recommendations for January through June, the ERPP flows match the recommendations made in the CDF&G 1991 unpublished Bear River Investigation):

Month	Flows CFS (ERPP)	Flows CFS (CDF&G)
October 1 – 14	100	100/250
October 15- December	250	250
January – March	250	190
April – June	250	190
July – September	10	10

When compared to current conditions, the recommended flows will require more water in June, October, and November. Additional water would also be required in some years in April as South Sutter Water District maintains minimum instream flows below Camp Far West of 25 cfs from April 1 to June 30.

Partnership Benefits

Improved Bear River flows would benefit to trout and anadromous fisheries and habitat of the lower Bear River, ideally in conjunction with improved flows in the salmon-accessible foothill creeks such as Secret Ravine/Dry Creek, Coon Creek, and Dry Creek running through Beale AFB and the Spenceville Wildlife Area. Efforts by Placer County through its Placer Legacy Program to restore habitat along Coon Creek and the Bear River as well as the efforts of the Dry Creek Conservancy and Auburn Ravine/Coon Creek Workgroup would also benefit from the re-routing and improved timing of flows. The proposed setback of levees at the Bear-Feather confluence (see below) would provide significant habitat improvements for anadromous fish.