Environmental Water Account

VOLUME I

Draft Environmental Impact Statement
Environmental Impact Report

July 2003

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DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

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BUREAU OF RECLAMATION

U.S. FISH & WILDLIFE SERVICE
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DEPARTMENT
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Chapters 1-9

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to the Delta (at approximately Chipps Island near Pittsburg), and Butte Creek from Centerville Head Dam to the confluence with the Sacramento River. Details regarding the water bodies within the Sacramento River area of analysis and the fisheries resources they support are provided below.

9.1.1.1.1 Lake Shasta

Lake Shasta was formed when Shasta Reservoir was constructed in 1935 through 1945, and its filling in 1948 impounded the Pit, McCloud, and Sacramento rivers. Lake Shasta has a storage capacity of 4.5 million acre-feet, a capacity equal to Folsom and Oroville reservoirs combined. It has 365 miles of shoreline and a surface area of 30,000 acres. When full, the surface water elevation is 1,067 feet above mean sea level (msl) and its' maximum depth is 517 feet.

Thermal stratification, which occurs in Lake Shasta annually between April and November, establishes a warm surface water layer (epilimnion), a middle water layer characterized by decreasing temperature with increasing depth (metalimnion or thermocline), and a bottom, coldwater layer (hypolimnion) within the reservoir. In terms of aquatic habitat, the warm epilimnion of Lake Shasta provides habitat for warmwater fishes, whereas the reservoir's lower metalimnion and hypolimnion form a "coldwater pool" that provides habitat for coldwater fish species throughout the summer and fall portions of the year. Hence, Lake Shasta supports a "two-story" fishery during the stratified portion of the year (April through November), with warm-water species using the upper, warm-water layer and coldwater species using the deeper, colder portion of the reservoir.

Coldwater species include rainbow trout, brown trout, landlocked white sturgeon, and landlocked Coho salmon; and warmwater species include smallmouth bass, largemouth bass, spotted bass, black crappie, bluegill, green sunfish, channel catfish, white catfish, and brown bullhead. Other, nongame species in Lake Shasta include hardhead, golden shiner, threadfin shad, common carp, Sacramento sucker, and Sacramento pikeminnow.

Although developed primarily for irrigation, the multiple-purpose Shasta Reservoir project also provides flood control, improves Sacramento River navigation, supplies domestic and industrial water, generates electric power, conserves fish and wildlife, creates opportunities for recreation, and enhances water quality. Since construction, Shasta Dam plays a major role in maintaining ecosystem values since such a large demand exists on the water resource, meeting Bay-Delta water quality standards, and meeting requirements for the endangered winter-run Chinook salmon (USBR 1999). These regulating and other uses cause water surface elevations to fluctuate by approximately 55 feet over the course of a year, which disturb the reservoir's littoral (shallow, nearshore) habitats. Disruptions to littoral habitat also occur from shoreline wave action caused by wind and boating activity.

9.1.1.1.2 Sacramento River

The upper Sacramento River is often defined as the portion of the river from Princeton (RM 163) (the downstream extent of salmonid spawning in the Sacramento River