DRAFT

Problem Statement
Bridgeport Reservoir Nutrient TMDL

East Walker River Hydrologic Unit, Mono County
Updated January 2003

Overview

Algae blooms and other nuisance conditions are occurring at Bridgeport Reservoir and appear to result from excessive nutrient loading. Algae blooms may produce toxic by-products directly or from decomposition, reduce dissolved oxygen (DO) concentrations in the water, and create nuisance odors. These conditions adversely affect beneficial uses of the reservoir, which include a healthy fishery, recreational uses, and aesthetic enjoyment. Initial findings (see Schedule/Status below) indicate that high phosphorus and nitrogen levels are entering the reservoir from tributaries and show that internal nitrogen loading is occurring from sediment. Land uses within the Bridgeport Reservoir watershed that contribute excess nutrients or silt/sediment to the system may increase the nutrient loads and algae growth in the reservoir. The goal of the nutrient TMDL is to determine sources of nutrient loading, establish numeric targets that are protective of beneficial uses, and establish load allocations that sustain mesotrophic (productive but not eutrophic) conditions consistent with beneficial uses.

Project Area Description

Geography

Bridgeport Reservoir is located in northern Mono County, California, in the Bridgeport Valley (East Walker River Hydrologic Unit #603.300). The Bridgeport Valley and the town of Bridgeport are located on the east side of the Sierra Nevada range, approximately 75 miles south of Carson City, Nevada. The Bridgeport Valley is characterized as high elevation desert with valley floor elevations ranging from 6,466 feet above mean sea level (amsl) at Bridgeport Reservoir to 6,600 feet amsl at the base of the Sierra Nevada. The Bridgeport watershed covers an area of 236,688 acres (approximately 370 square miles).

Water Body Description

The reservoir is an impoundment of the East Walker River, has 2,914 acres of surface area, and has a holding capacity of 40,500 acre-feet. The primary use of the reservoir is for irrigation of agricultural/pasture lands downstream of the reservoir. Main tributaries to Bridgeport Reservoir include: East Walker River, Virginia Creek, Green Creek, Robinson Creek, Buckeye Creek, and Swauger Creek. A number of these creeks pass through the Bridgeport Valley where diversions occur for pasture irrigation. The amount of irrigated pasture within the valley is approximately 21,000 acres. Irrigation return flows re-enter the reservoir through tributary streams, tail water control ditches, and overland and subsurface flow. The East Walker River continues from the outlet of the dam and crosses the California/Nevada state line approximately 12 miles downstream. The East Walker River joins with the West Walker River and ultimately discharges into Walker Lake in Nevada.

Geology and Soils

The Bridgeport Reservoir Valley consists of alluvial soils with shallower granitic substrate present in the upper watershed. Geothermal activity occurs within the watershed.

Climate and Hydrology

Climate records show that the average annual maximum temperature at Bridgeport Reservoir is 62.2° F and the average annual minimum temperature is 23.8° F. Most precipitation (70 percent) falls as snow during the winter months (typically November through March), but occasional summer convection storms can bring brief but heavy rains.

Aquatic and Terrestrial Biological Resources

Game fish occurring in Bridgeport Reservoir include rainbow and brown trout, Sacramento perch, and green sunfish. Non-game fish occurring in Bridgeport Reservoir include carp, tui chub, Lahontan speckled dace, and Tahoe and mountain suckers. Wildlife such as waterfowl rely on the reservoir for foraging and resting habitat.

Land Use

The majority of land in the valley portion of the watershed is privately owned and the majority of land within the upper elevations of the watershed is publicly owned. Livestock grazing is the prevalent land use on private land. Public lands are managed by the Bureau of Land Management (BLM) and US Forest Service (USFS), and uses include recreation and livestock grazing. The Walker River Irrigation District (WRID) oversees the reservoir operations. Fishing, hunting, and related recreational activities contribute significantly to the local economy.

Listing Basis

Beneficial Uses

Beneficial uses designated for Bridgeport Reservoir and tributaries to the reservoir include: municipal and domestic supply (MUN), agricultural supply (AGR), ground water recharge (GWR), navigation (NAV), water contact recreation (REC-1), non-water contact recreation (REC-2), commercial and sportfishing (COMM), cold freshwater habitat (COLD), wildlife habitat (WILD), and spawning, reproduction, and development (SPWN). A more detailed description of the designated beneficial uses is presented in the *Water Quality Control Plan for the Lahontan Region* (Basin Plan) page 2-1 through 2-2, and 2-20. Beneficial uses identified as impaired include MUN, REC-1, REC-2, COLD, and SPWN.

Water Quality Standards

Water quality standards for Bridgeport Reservoir include narrative and numeric standards established in the Basin Plan. In addition, specific numeric water quality objectives for the East Walker River at Bridgeport Reservoir include total dissolved solids (TDS), chloride (Cl), percent sodium (%Na), boron (B), total nitrogen (Total N), and total phosphorus (Total P) (Basin Plan page 3-42). Specific numeric water quality objectives are also established for Robinson Creek and all other tributaries above Bridgeport Valley for TDS, Cl, Total N, and Total P (Basin Plan page 3-42).

Impairment

Bridgeport Reservoir was listed in 1994 as impaired for nutrients, sediment, and siltation in accordance with Section 303(d) of the Clean Water Act (CWA). It first appeared on 303(d) list as a result of non-point source pollution related to watershed disturbance. Nutrient sources may include internal loading from lake-bottom sediments, livestock waste, fertilizers, on-site septic system discharges, municipal sewage treatment plant discharges, solid waste disposal (landfills), and geothermal springs. Sediment and silt may also be a transport mechanism for nutrients and sources may include in-stream bank erosion, livestock induced streambank or irrigation ditch

erosion, road maintenance activities, forest fire impacts, recreational activities, and irrigation ditch maintenance.

Schedule/Status

The Bridgeport Reservoir TMDL is scheduled to be completed in June 2005. A limnological study to determine many of the TMDL elements including: targets and indicators, source assessment, and linkage analysis is being conducted. Detailed source assessment and groundwater transport evaluation is planned during 2003.

Deliverable/Milestone	**Date**
Revised problem statement introduction sections	February 2003
Ground water monitoring project in Bridgeport Valley to assist in determining sources	March 2003-December 2003
USGS surface water monitoring project completed	March 2003
UC Berkeley limnological study completed	March 2003
Monitoring meeting	February 2003
Stakeholder meeting	April 2003
Stakeholder meeting	June 2003
Technical TMDL written	December 2004
Draft Implementation Plan written	December 2004
Technical TMDL and implementation plan finalized	June 2005
Basin Plan Amendment Hearing	July 2005

References:

Lahontan Regional Water Quality Control Board - *Water Quality Control Plan for the Lahontan Region,* 1994.