

A Brief History of Ancient Pyramid Lake

W. Alan McKay – Division of Hydrologic Sciences, Desert Research Institute

During the past two decades, the ecologic and hydrologic resources of terminal lakes in the western Great Basin have received an enormous amount of attention among Native Americans, environmental groups, agricultural communities, municipal interests, and regulatory and legislative bodies, owing to the unique role these lakes play in serving diverse and often competing interests. Pyramid Lake in western Nevada is one lake that has received such attention.

Physical Setting

Pyramid Lake, along with Walker and some smaller lakes, are remnants of a larger lake system that covered much of the Great Basin during the Pleistocene era. Often referred to as “great” Lake Lahontan, this pluvial system had its most recent high stand between 15,000 to 17,000 years ago, covering an area of 8,610 square miles and with a surface elevation 630 feet higher than Pyramid Lake is today. Although the formation of Pleistocene Lake Lahontan is thought to have occurred gradually over thousands of years, radiocarbon data suggest that lake recession occurred much more rapidly, possibly in response to changes in jetstream location relative to the lake basin over a 500-year period beginning around 14,000 years ago (Benson et al., 1990). Pyramid and Walker lakes are remnants of this recession.

Today, Pyramid Lake has a surface area of about 174 square miles and a maximum depth of 331 feet. The only perennial surface input to the lake is the Truckee River, with headwaters in Lake Tahoe. As annual rainfall on Pyramid Lake’s surface averages only about 7.5 inches, the Truckee is the primary water source balancing evaporative losses from the lake. Salinity and water levels in Pyramid Lake are directly related to flow in the Truckee.

Cultural and Institutional Setting

Pyramid Lake is on the Pyramid Lake Indian Reservation and managed by the Pyramid Lake Paiute Tribe. The tribe has authority to manage the lake’s fishery and establish water quality standards for the lake and portions of the Truckee River that flow

within reservation boundaries.

Approximately 62 miles up the Truckee River from the lake are the cities of Reno and Sparks, Nevada. Both cities rely almost exclusively on the river for municipal and industrial uses. The river not only *supplies* water, but receives 40 million gallons per day of treated wastewater from the Truckee Meadows Water Reclamation Facility. The agricultural communities of Fernley and Fallon also rely on Truckee River water for irrigation. The lower river and lake are impacted by channelization of the lower river by the U.S. Army Corps of Engineers during the 1960s for flood mitigation, the wisdom of which is now being questioned.

A History of Exploitation, Conflict, and Resolution

Post-European settler John C. Fremont first “discovered” Pyramid Lake in 1844, however the defining event in Pyramid Lake and Truckee River basin history was the Newland’s Project, the nation’s first major reclamation and interbasin water transfer project. The cornerstone of the Newland’s Project was Derby Dam, constructed on the Truckee River in 1905 to divert river water to irrigate thousands of acres in the arid Carson Desert (Wagner and Lebo, 1996). Between 1918 and 1970, average net diversions from the Truckee River to the Newland’s Project were approximately 250,000 acre-feet per year, or 50 percent of total flow for that period. During this time, two native fish species were severely affected: the cui-ui (genus *Chamistes*, pronounced “kwee wee”), a lake sucker found only in Pyramid Lake, and the Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), which became extinct in Pyramid Lake in the 1940s.

During the first decades of the Newland’s Project, the Paiute tribe had virtually no water rights to the river, and thus little legal recourse to mitigate the impact of diversions on the lake and its fishery. The Newland’s Project created a Truckee River corridor so depleted of water that the cui-ui and trout were no longer able to spawn and reproduce naturally. Reduced streamflow also increased lake salinity and eutrophication.



Pyramid Lake. (photo courtesy of W. Alan McKay).

In the 1960s, events slowly began to favor the lake and the tribe. Congress passed the Endangered Species Protection Act in 1966 (preceding the modern Endangered Species Act [ESA] passed in 1974), and the cui-ui was placed on the federal endangered list in 1967. As noted by Wagner and Lebo (1996), the federal listing alone did not stop the decline of the lake and its fishery – the cui-ui population continued to decline for several more years – but it added to a growing awareness outside reservation boundaries of the value of Pyramid Lake and the lower Truckee River. The tribe began to

acquire allies in its struggle to save the lake.

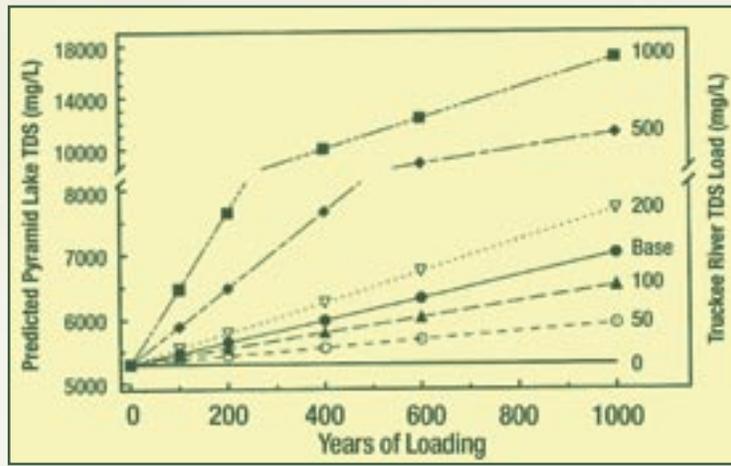
Federal listing also provided the tribe with leverage for subsequent legal battles, lending credence to tribal claims that the lake and river had been mismanaged by those empowered to protect it – the federal government. Federal listing also meant that agencies with jurisdiction in the greater Pyramid Lake/Truckee River Basin now had to consider the ESA in any planned actions. Finally, federal listing effectively aligned the tribe with the U.S. Fish and Wildlife Service (USFWS), a partnership that enhanced the tribe's credibility as a legal entity (Wagner and Lebo, 1996).

With awareness of the lake increasing in the 1970s and 1980s, federal and state agencies began to help manage the fishery. The USFWS played a seminal role in establishing recovery plans for the endangered cui-ui, and provided funding for aggressive hatchery programs for the cui-ui and the re-introduction of the Lahontan cutthroat trout taken from native stock in Summit Lake in northern Nevada. As a result, Pyramid Lake now boasts a dramatically improved cui-ui population and a trophy trout fishery.

Recent Settlements Offer Protection

Key legislative and legal actions during recent decades gave the tribe further control over Pyramid Lake and its resources. Re-authorization of the Clean Water Act (CWA) in 1987 granted tribal entities the right to participate in U.S. EPA programs with a status equivalent to states. The tribe became empowered to establish water quality standards for Pyramid Lake and for portions of the Truckee River within reservation boundaries.

The CWA also gave teeth to the tribe's legal claims that upstream activities were harming river water quality and associated biotic communities. In response to litigation brought by the tribe, the Truckee River Water Quality Settlement was signed in 1996. Under the Water Quality



Predicted Pyramid Lake TDS concentration under various constant Truckee River TDS loadings. Values to the right of each line indicate simulated river TDS (mg/L). Assumed Truckee River flow for this model run was 383,000 ac. ft./yr (530 cfs). (Lebo et al, 1994)

Settlement, signatories – including the U.S. Department of Interior and the cities of Reno and Sparks – agreed to work to improve river water quality.

Finally, in 1990, Congress passed Public Law 101-618, the Truckee River Negotiated Settlement. The cornerstone of the settlement is the Truckee River Operating Agreement (TROA), wherein

the Secretary of the Interior, under the National Environmental Policy Act (NEPA), is required to establish an operating plan in the Truckee River and its reservoirs that addresses protection and recovery of listed and endangered species. Operating the Truckee River under the constraints of NEPA and ESA means that Truckee River water must be allocated and stored in a manner that explicitly addresses environmental factors influencing listed species, as well as municipal

drought storage and recreational uses. A byproduct of this will be the determination and establishment of minimum instream flows of prescribed duration for the purpose of both spawning and meeting water quality objectives. How a new operating agreement for the Truckee River might impact downstream agricultural

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stakeholders is not fully known. The western Nevada agricultural community, particularly in the Lahontan Valley, is clearly anxious about the potential impacts of TROA on the local economy.

As of this writing, a new draft TROA has been issued for public review and comment (www.epa.gov/fedrgstr/EPA-IMPACT/2004/April/Day-15/i8570.htm).

Although it is not known when a final operating agreement will be adopted and signed by all parties, it is hoped this process of negotiation, as opposed to litigation, is symptomatic of a new era of cooperation within the basin.

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