COLORADO RIVER MANAGEMENT

Credit: AmericanRivers.org

RESTORATION OF A STRESSED RIVER SYSTEM

Denise Valentin
Oregon State University
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INTRODUCTION

The Colorado River Basin contains 246,000 square miles. The Colorado River itself starts at the La Poudre Pass in the Rocky Mountain National Park and picks up more water from the Fraser, Eagle, and Gunnison Rivers in Colorado. It flows through Canyonlands National Park in Utah, where it joins forces with the Green River (which starts in Wyoming) and continues down through Glen Canyon. As it churns along, it goes through the Grand Canyon in Arizona and into Lake Mead near Las Vegas, Nevada. It then meanders along the border of Nevada and California, until it winds its way down into Mexico where it is supposed to empty into the Gulf of California. Unfortunately, according to Jesse Weber, overuse usually has it dried up the last 100 miles in Mexico.

Fig. 1. The Colorado River Basin flows through seven (7) U.S. States and into Mexico.

This large water system provides water for 40 million people. It is also used for energy production, industrial use, irrigation, fish and wildlife, and recreational use. The construction of dams, flooding of land, water diversions, and continued overuse of water have caused detrimental degradation and defragmentation to the environment. Fracking (hydraulic fracturing) uses around billion gallons of water yearly, another stressor on water use in the Colorado River Basin.

The changes that have happened to this basin in the past 100 years are many. According to Jim Robbins (2019), there has been a drought in the basin for the past twenty years. Climate change and continuous drought due to smaller snowpack (and smaller snow melts in the spring) will only make the water levels in the reservoirs much smaller. Overuse of water has allowed streams and ponds to dry up, hurting local wildlife.

Native trees and plants have been replaced with invasive species due to water flow change. Old floodplains have been lost, taking away their nutrient filtering abilities and groundwater replenishment. Native fish habitats have been damaged due to dams and logging. The dams and water diversions block water flow, slowing rivers down. This slowing of river water allows for increases in water temperatures allowing for more algal blooms and less fish eggs, hurting fishing recreation and actual food sources.

Restoration is needed now, more than ever. The seven (7) U.S. states in the Colorado River Basin need to work together to bring back the lands and water to clean and sustainable habitats for fish, wildlife, plants, and humans. A unified plan between the seven states and other stakeholders must be created to keep this system working properly when climate change causes more flooding and more droughts.

HISTORICAL TIMELINE

1922 Colorado River Compact – official agreement made among the seven (7) U.S. states in the Colorado River basin (Colorado, New Mexico, Utah, Wyoming, Arizona, California, and Nevada) for (1) equal share of the use of the Colorado River waters for agriculture and industrial development, (2) storage of water, and (3) flood control in the entire basin. Yale Environment 360.

1928 Boulder Canyon Project Act – authorized creation of Hoover Dam and irrigation facilities in the Lower Basin for the states of Arizona, Nevada, and California. Also made Secretary of the Interior sole contracting authority for the lower basin water use of those states. USBR.

1944 U.S.-Mexico Water Treaty – treaty between the United States and Mexico. Mexico was guaranteed an annual water amount plus an additional portion of any surplus water. Also provided the International Boundary and Water Commission (IBWC) the power to manage the provisions of the treaty. The IBWC was also granted approval to administer Minutes (rules) that must be approved or disapproved within 30 days by the Mexican Comisión Internacional de Límites y Agua (CILA). Bark et al. (2014).

1948 Upper Colorado River Basin Compact – created the Upper Colorado River Commission. Apportioned the upper basin water to Colorado, New Mexico, Utah, and Wyoming, plus a small portion of upper Arizona. USBR.

1964 Arizona v. California, U.S. Supreme Court decision on 25-year-old dispute over tributary water flows. Arizona won the right to not have to include water

received from its Gila River tributary when counting water usage from Colorado River. USBR.

1968 The Colorado River Basin Act – Congress put into law a program for comprehensive development of water resources and adequate water supply for both the Upper and Lower Colorado River Basins. Its objectives were to control floods, better the storage and delivery of water, and improve water quality and flow conditions for wildlife and fish. USBR.

1972 Minute 242 – Rule signed by the United States (IBWC) and Mexico (CILA) due to salinity issues of water received in Mexico from the Morelos Dam. This Minute prohibited the United States from ruining water quality prior to entry into Mexico. It also made the United States create a salt reduction and management program. Bark et al. (2014).

1992 Grand Canyon Protection Act – requires releases from Glen Canyon Dam to meet environmental, tribal, cultural, and recreational interests. Secretary of the Interior became manager of Glen Canyon Dam and was directed to follow the Glen Canyon Dam Environmental Impact Statement goals. USBR.

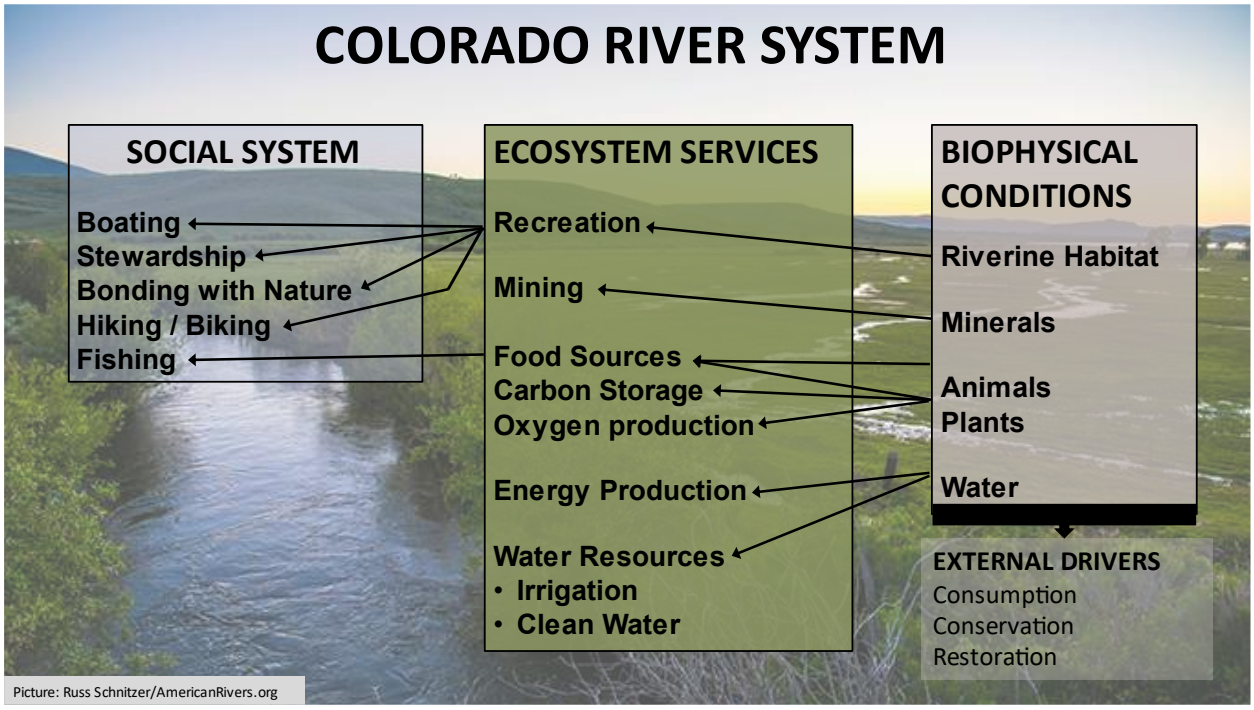
2000 Minute 306 – "Conceptual Framework for United States-Mexico Studies for Future Recommendations Concerning the Ripearian and Estuarine Ecology of the Limitrophe Section of the Colorado River and Its Associated Delta." This minute was created to bring in environmental issues to the legal framework, and work on the Mexican Delta restoration plan. Bark et al. (2014).

2012 Minute 319 – five-year restoration pilot program between United States, Mexico, and non-governmental organizations to jointly provide water for riparian

vegetation in the Colorado River Delta. This was done through a “pulse flow” of water to change hydrological and environmental conditions in the Mexican Delta. Bark et al. (2014).

2019 Upper Basin Drought Contingency Plan (DCP) – plan signed between the 7 U.S. states for how Lake Powell and Lake Mead will be used in emergency response to low water levels. If Lake Mead decreases to a certain level, the Upper Basin states will have to release water from Lake Powell. The long-term plan is for tall seven states to reduce and conserve their water usage.

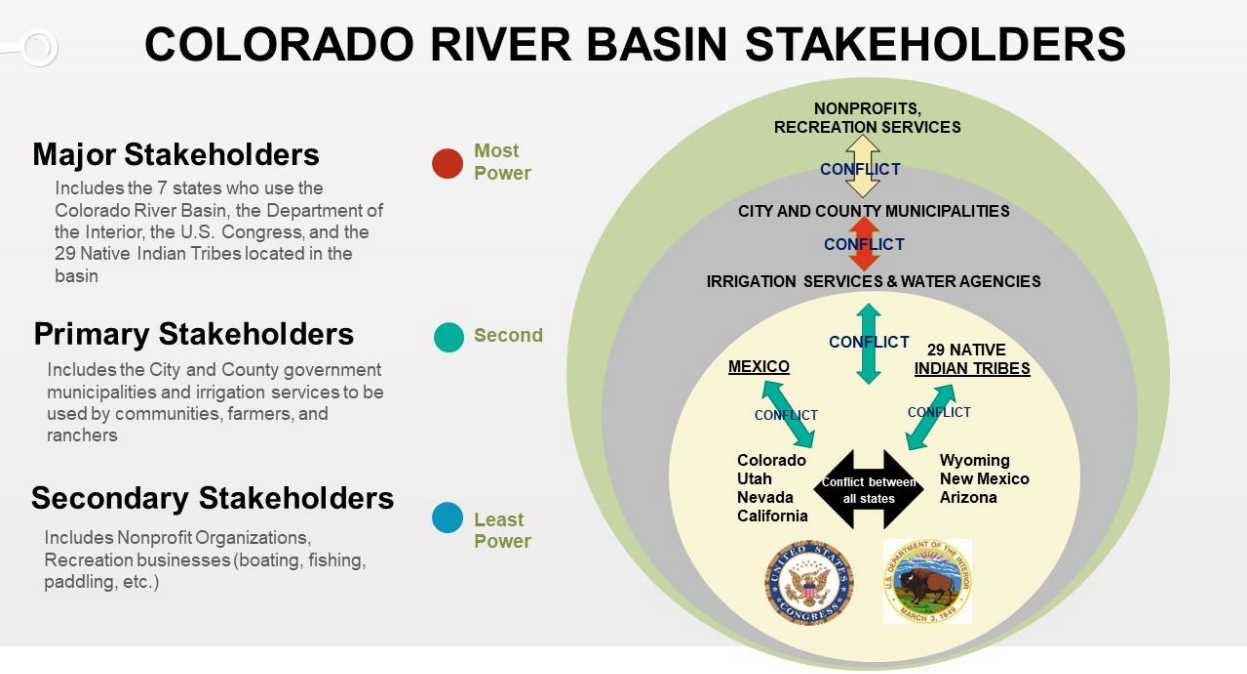
SOCIAL-ECOLOGICAL DIAGRAM



SOCIAL INTERACTIONS & STAKEHOLDERS

The Colorado River Basin has many stakeholders who share different perspectives about water management. Nonprofit organizations and environmentalists want to save endangered species, water resources, riparian communities, and they are

all for restoring the rivers and tributaries. Agriculture's main concern is water for their farming needs. Rancher's needs are for their cattle. Mining and fracking companies only care about profits and not having to pay fines for destroying the environment. State and local governments are concerned about having water for their municipalities. Indian Tribes are concerned about their water rights and the damage to the environment. The Department of the Interior manages many areas that receive water from the river system. According to Stern and Sheikh, P.A. (2020), the U.S. Congress oversees management of the Colorado River Basin through the funds they approve.



ANALSYIS OF THREE STAKEHOLDERS

U.S. CONGRESS

Members of Congress have been involved with the Colorado River Basin since 1928, when they made the Secretary of the Interior sole contracting authority for the lower

basin water use of those states. In 1968, Congress enacted the Colorado River Basin Project Act (see timeline). In 1992, under the Grand Canyon Protection Act, Congress made the Secretary of the Interior the overseer of the management of the Glen Canyon Dam. Congress also oversees the management of current facilities in the basin and the development of new water storage facilities. They also manage the operations and protection of endangered species. They work directly with Indian Tribes to protect their water rights along the Colorado River. Members of Congress co-sponsored the Colorado River Drought Contingency Plan which was written by the seven U.S. states in the Colorado River Basin.

NATIVE INDIAN TRIBES

The 29 federally recognized Indian Tribes in the Colorado River Basin own 20% of the water rights in that basin. This amount is more than the State of Arizona's water rights. There are also 13 other Indian Tribes that are working with the government to settle their claims. The Tribes plan on expanding and using more of that water for irrigation systems and other businesses. Indian Tribes do, however, care about the environment and the effects of their additional water usage and have asked the Bureau of Reclamation to do a study on the possible effects. Each Indian Tribe has different water needs and some may sell their water rights. Tribal leaders are not freely disclosing their future plans with the water, which has many other stakeholders worried. Brett Walton (2015).

MEXICO

Mexico receives water under the U.S.-Mexico Water Treaty of 1944. The Colorado River is the only freshwater source to the Sea of Cortes. The water is collected at the

Morelos Dam, and is used to both irrigate the farmland in the Mexicali Valley and provide water to the cities of Tijuana, Mexicali, and Tecate. The Colorado River Delta region in Mexico has been decreed a Biosphere Reserve and is part of UNESCO. Water to this region has been dwindling, and in some instances, the flow stops before it reaches the delta. Another issue Mexico faces is the high levels of nutrients (phosphorous, nitrogen, selenium) and heavy metals found in the water. Varady et al. (2001).

CONSIDERATIONS OF MULTICULTURAL PERSPECTIVES

There have been numerous meetings and workshops concerning the Colorado River Basin. Not only did the University of Arizona and the University of California Institute for Mexico and the United States (UC MEXUS) hold programs about environmental issues at the border, but other U.S. universities held meetings also.

11/1997	Program held to discuss the 1995-1996 drought; organized by the University of New Mexico.
10/1998	"The UC-Mexico Salton Sea Workshop"; organized by UC MEXUS
11/1998	"Water, Energy, and the Quality of Life in the Imperial and Mexicali Valleys"; organized by UC MEXUS.
2/1999	Program held to discuss transboundary groundwater issues; organized by University of California at Irvine.
10/2000	"to the Sea of Cortés" program where 200 participants from both the United States and Mexico attended to discuss allocation, restoration, and perspectives (historical, legal, and wildlife conservation).

Varady et al. (2001).

Each state has numerous parties that meet to discuss water usage and rights. For example, according to the Colorado Basin Roundtable, there are nine (9) Colorado Basin Roundtable groups. The groups have members from local citizens, recreation businesses, farmers, and water entities that meet to discuss protection, development, and conservation of water supplies.

In January 2019, the Aspen Institute and Nicholas Institute for Environmental Policy Solutions held a roundtable to discuss the Colorado River Basin. A second roundtable was held in May 2020 (via internet webinar), and had 40 federal and state government participants from the seven (7) Colorado Basin states. The main goals of these roundtables were to find ways to collaborate, discuss progress of initiatives, and review models and progress reports. The Western States Water Council (WSWC) was involved in these roundtables. The WSWC was created by State Governors and consists of state representatives of 18 western states that meet to gain cooperation among the western states regarding water usage and conservation, and exchange views and perspectives amongst its members.

CONCLUSION

With the rise in temperatures on the planet, drought is going to be the biggest factor that affects the Colorado River Basin. All stakeholders must come together to conserve water. The federal government is going to have to take the lead on the following and pass some strict laws:

1. Pay farmers to not farm all their land and conserve water
2. Create more indoor gardening businesses to conserve water usage

3. Research and update irrigation technology and make it mandatory for all farmers and golf courses – 70% of all water usage goes to irrigation
4. Stop developers from using grass in housing developments in arid communities and use drought-tolerant landscapes
5. Create a nationwide plan that looks at the needs of not only humans, but also flora and fauna

Climate change is real and more droughts are coming. We must find a way to have both sustainable agriculture and a surplus of water for future needs. Continued rise of population is going to be put of a burden on our water sources. Sea level rise will cause those living on the coastlines and riverways to move inland, adding even more stress on our fragile water systems. We need bright people to come up with new ways to clean, collect, and store water. We need to stop damaging our ecosystems with development and mining. We need to take care of our planet … as they say there is no Planet B.

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