



THE LOWER COLORADO RIVER Multi-Species Conservation Program

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The Lower Colorado River Multi-Species Conservation Program (LCR MSCP) is a multistakeholder partnership that aims to balance the use of water resources in the Lower Basin of the Colorado River with the conservation of native species, to comply with the Endangered Species Act (ESA). Its habitat conservation plan (HCP) outlines a 50-year effort to conserve 26 federal- and state-listed candidate and sensitive species along the lower Colorado River, including birds, fish, small mammals, bats, reptiles, amphibians, insects, and plants. The LCR MSCP area extends over 400 miles of the lower Colorado River from Lake Mead to the southernmost border with Mexico, and includes lakes Mead, Mohave, and Havasu, as well as the historic 100-year floodplain along the main stem of the lower Colorado River (see map). The LCR MSCP provides ESA compliance for current and future operations, including water diversions and hydroelectric power generation within this area.

Although the Bureau of Reclamation is the lead implementing agency, LCR MSCP projects are planned, designed, and implemented with involvement of partners, including the public. Partner involvement occurs primarily through a steering committee that represents 56 water and power users, federal land management agencies, state wildlife agencies, and others. Total LCR MSCP costs are estimated at \$626 million over 50 years, indexed annually to inflation, and are split evenly between nonfederal partners and the federal government.

Habitat Conservation Plan

The HCP outlines general and species-specific measures to conserve species and their habitats. Chief components of the plan include:

- native fish augmentation
- species research
- species and ecosystem monitoring
- conservation area development
- protection of existing habitat
- adaptive management

Created habitat must be actively managed to provide the requirements for species targeted at each site.

Two major thrusts are currently underway. The native fish augmentation program is designed to increase populations of several native fish species in the Colorado River, including the razorback sucker (*Xyrauchen texanus*) and bonytail (*Gila elegans*). Habitat is also being created for species such as the southwestern willow flycatcher (*Empidonax trailii extimus*), the yellow-billed cuckoo (*Cucyuzus americanus occidentalis*), and the Yuma clapper rail (*Rallus longirostris yumanensis*).

Native Fish Augmentation

Razorback sucker and bonytail are two native fish species that were abundant in the Colorado River prior to river development. Historically, the Colorado River had annual

floods of up to 250,000 cubic feet per second during spring snowmelt, followed by relatively calm waters. The razorback and bonytail were adapted to the turbid, heterogeneous flows of the Colorado. Development of lower Colorado River resources, particularly the construction of six dams on the river between the Grand Canyon and Mexico, virtually eliminated annual flood events and reduced water turbidity. Furthermore, non-native fish, better adapted to these new water conditions, were introduced into the lower Colorado River throughout the mid-20th century for sport fishing. These non-native fish, especially certain species of bass, carp, sunfish, and catfish, prey heavily on larval and juvenile razorbacks and bonytails.

Razorback suckers still reproduce in large numbers in Lake Mohave, but few reach adulthood, primarily because of non-native fish predation. Research indicates the genetic variability historically present within this species remains in the Lake Mohave population. To preserve this variability, biologists collect naturally spawned razorback larvae and transport them to several federal and state fish hatcheries to grow them to a target size (300 mm) that allows them to avoid all but the largest predators when they are returned to the wild. Bonytails, however, are near extinction in the wild. Bonytail brood stock is kept at Dexter National Fish Hatchery in New Mexico, where larval bonytail are produced for the fish augmentation program.

The fish augmentation program has two major goals: to augment any existing populations of razorback suckers and



The razorback sucker, whose population has diminished greatly in the Colorado River Basin, can grow to more than three feet long and live for more than 40 years.

bonytails in the mainstem Colorado River below Davis Dam and to replace the Lake Mohave razorback population. After juvenile razorback suckers and bonytails reach the targeted size, they are released into the Colorado River. The goal is to release 660,000 razorback suckers and 620,000 bonytail below Davis Dam over 50 years. In addition, razorbacks are released into Lake Mohave to replace that aging population.

Conservation Area Development and Management

The LCR MSCP requires the creation and management of over 8,100 acres of riparian, marsh, and backwater habitat for the targeted species, including 5,940 acres of cottonwood-willow, 1,320 acres of honey mesquite, 512 acres of marsh, and 360 acres of backwaters.

Native riparian habitat has declined from historical acreage due to factors such as dam construction, river channelization, conversion to irrigated agriculture, urbanization, wildfire, and invasive species. In most areas along the Lower Colorado River, overbank flooding that native plant species need to reproduce no longer occurs.

Active or fallowed agricultural land, as well as areas dominated by non-native plant species such as tamarisk (*Tamarix* sp.) have been targeted for conversion to native riparian habitat. Backhoes and other tools are used to clean out unwanted vegetation, then native species are planted in its place. Created habitat must be actively managed to provide the requirements for species targeted at each site; this often requires irrigation because large, natural floods no longer occur. Site monitoring of such parameters as soil salinity, water use, vegetation type, and species abundance is conducted to provide information on targeted species use, habitat requirements, and changes in conditions over time. The information is used to manage each site or in the design of future sites through an adaptive management process.

While much data exist about the habitat requirements of some species under consideration (such as the southwestern willow flycatcher), little is currently known about many others.

see LCR MSCP, page 33



The Lower Colorado River Multi-Species Conservation Program planning area.

LCR MSCP, continued from page 27

Species research projects are being designed to provide the necessary information to create and manage populations and habitats for all species under consideration.

Progress to Date

Since 2005, more than 24,000 razorback suckers and almost as many bonytails have been stocked into the Colorado River below Davis Dam. Research and monitoring are ongoing to determine the success of this program. In addition, over 23,000 razorbacks have been released into Lake Mohave to augment the existing wild population that provides brood stock for the program. In 1990, an estimated 60,000 adult razorback suckers were present in Lake Mohave. Biologists expected these fish to die off by the mid-1990s due to age-related causes. Augmentation efforts conducted over the last 15 years have begun to replace this aging population; these efforts will continue until target goals are reached.

Several large habitat creation projects have been initiated since 2006. Two sites located near Blythe, California, total more than 1,000 acres each, including 364 acres of cottonwood-willow. Another 92 acres of marsh and backwater habitats have been constructed at Imperial National Wildlife Refuge, near Yuma, Arizona, to provide habitat for fish and marsh bird species.

Future Challenges

Because the LCR MSCP is a 50-year program, and is likely to be extended even longer, adaptive management will be an important component to ensure appropriate adaptation to changes in water and power demands, water priorities, water availability, and other unexpected conditions. For example, quagga mussels (*Dreissena rostriformis bugensis*) have now been detected throughout the lower Colorado River and protocols are being established to mitigate their impacts while transporting fish between fish hatcheries and the river.

Conservation-area development requires the mutual commitment of the LCR MSCP and the landowner or land manager prior to the initiation of any habitat-creation project. This commitment ensures the availability of land and water at each site through the life of the program. Since the native riparian habitat being created at many sites will require active management, including irrigation, throughout the 50 years, this commitment is essential.

Research and monitoring will continue to be important components of the LCR MSCP so that potential issues are identified in time to plan and implement effective management actions.

Visit the LCR MSCP website at www.lcrmscp.gov. Contact John Swett at jswett@lc.usbr.gov, Laura Vecerina at lvecerina@lc.usbr.gov, or Terry Fulp at tfulp@lc.usbr.gov.

Reference.....
Lower Colorado River Multi-Species Conservation Program, 2004. Lower Colorado River Multi-Species Conservation Program, Volumes I-V, www.lcrmscp.gov/publications/eireis2004.html.

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